DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

LAKE PONTCHARTRAIN, LA., AND VICINITY AND MISSISSIPPI RIVER - GULF OUTLET, LA.

DESIGN MEMORANDUM NO. 12 REVISED

SEABROOK LOCK SOURCES OF CONSTRUCTION MATERIALS

PREPARED BY
U. S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION
VICKSBURG, MISSISSIPPI

UNDER THE DIRECTION OF THE DISTRICT ENGINEER
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DECEMBER 1978

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY

STATUS OF DESIGN MEMORANDUMS

Design Memo No.	Title	Status
1	Hydrology and Hydraulic Analysis Part I - Chalmette Part II - Barrier Part III - Lakeshore Part IV - Chalmette Extension	 Approved 27 Oct 66 Approved 18 Oct 67 Approved 6 Mar 69 Approved 1 Dec 67
2	Lake Pontchartrain Barrier Plan, GDM, Advance Supplement, Inner Harbor Navigation Canal Levees	Approved 31 May 67
2	Lake Pontchartrain Barrier Plan, GDM, Citrus Back Levee	Approved 29 Dec 67
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 1, Lake Pontchartrain Barrier, Rigolets Control Structure, Closure Dam, and Adjoining Levees	Approved 10 Nov 70
2	Lake Pontchartrain Barrier Plan, GDM Supplement No. 2, Lake Pontchartrain Barrier, Rigolets Lock and Adjoining Levees	Approved 19 Oct 71
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 3, Lake Pontchartrain Barrier, Chef Menteur Pass Complex	Approved 19 Sep 69
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 4, New Orleans East Back Levees	Approved 18 Aug 71
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 5, Orleans Parish Lakefront Levees - West of IHNC	Scheduled Indefinite
2	Lake Pontchartrain Barrier Plan, GDM, Supplement 5A, Citrus Lakefront Levees - IHNC to Paris Road	Approved 12 Jul 76

STATUS OF DESIGN MEMORANDUMS (cont'd)

Design Memo No.	Title	Status
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 5B, New Orleans East Lakefront Levee - Paris Road to South Point	Approved 5 Dec 72
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 5C, Orleans Parish Outfall Canals - West of the IHNC	Scheduled Indefinite
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 5D, Orleans Parish Lakefront Levees, Orleans Marina	Submitted Apr 78
	Lake Pontchartrain Barrier Plan, GDM Supplement No. 6, St. Charles Parish Lakefront Levees	Approved 4 Nov 70
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 7, St. Tammany Parish, Mandeville Seawall	Indefinite
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 8, IHNC Remaining Levees	Approved 6 Jun 68
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 9, New Orleans East Levee from South Point to GIWW	Approved 1 May 73
2	Lake Pontchartrain Barrier Plan, GDM, Supplement No. 10, Jefferson Parish Lakefront Levees	Scheduled Indefinite
3	Chalmette Area Plan, GDM	Approved 31 Jan 67
3	Chalmette Area Plan, GDM, Supplement No. 1, Chalmette Extension	Approved 12 Aug 69
4	Lake Pontchartrain Barrier Plan, and Chalmette Area Plan, GDM, Florida Avenue Complex, IHNC	Scheduled Jun 79

STATUS OF DESIGN MEMORANDUMS (cont'd)

Design Memo No.	Title	Status
5	Chalmette Area Plan, DDM, Bayous Bienvenue and Dupre Control Structures	Approved 29 Oct 68
6	Lake Pontchartrain Barrier Plan, DDM, Rigolets Control Structure and Closure	Indefinite
7	Lake Pontchartrain Barrier Plan, DDM, Chef Menteur Control Structure and Closure	Indefinite
8	Lake Pontchartrain Barrier Plan, DDM, Rigolets Lock	Approved 20 Dec 73
9	Lake Pontchartrain Barrier Plan, DDM, Chef Menteur Navigation Structure	Indefinite
10	Lake Pontchartrain Barrier Plan, Corrosion Protection	Approved 21 May 69
12	Sources of Construction Materials	Approved 30 Aug 66
1	Lake Pontchartrain, Louisiana, and Vicinity, and Mississippi River-Gulf Outlet, Louisiana, GDM, Seabrook Lock	Approved 4 Nov 70
2	Lake Pontchartrain, Louisiana and Vicinity, and Mississippi River-Gulf Outlet, Louisiana, DDM, Seabrook Lock	Scheduled Jan 79
Report	Lake Pontchartrain Barrier Plan, Seabrook Lock Breakwater	Scheduled Sep 79
12	Lake Pontchartrain and Vicinity, Louisiana, Sources of Construction Materials (Revised)	Scheduled Nov 78

LAKE PONTCHARTRAIN, LA, AND VICINITY
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DESIGN MEMORANDUM NO. 12
SOURCES OF CONTRUCTION MATERIALS

SEABROOK LOCK

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SECTION 1 - GENERAL

1-1. Project authorization. The Flood Control Act approved 27 October 1965 (Public Law 89-298) authorized a project for hurricane-flood protection on Lake Pontchartrain, Louisiana, substantially in accordance with the recommendations of the Chief of Engineers in House Document No. 231, 89th Congress, 1st Session, except that the recommendations of the Secretary of the Army in that document shall apply with respect to the Seabrook Lock feature of the project.

1-2. Location. The authorized lock complex is located on the south shore of Lake Pontchartrain at its junction with the Inner Harbor Navigation Canal (IHNC). The IHNC provides access from Lake Pontchartrain to the Mississippi River and, indirectly, to the Gulf of Mexico through the Mississippi River Gulf Outlet and the Gulf Intracoastal Waterway. Plate No. 1 shows the lock's location with respect to adjacent geographical features.

1-3. Description of lock complex. The Seabrook Lock Complex is illustrated on Plates 1 through 8, and will consist of the following three major components: a navigation lock, a rock and shell dam, and an outlet structure.

The navigation lock will be 84-ft wide, 860-ft center to center of the operating sector gate pintles, with an 800-ft usable length and a nominal draft of 15 ft. Two reinforced concrete gate bays with hydraulically-operated steel sector gates will be located at each end of the lock. The connecting chamber walls will consist of steel sheet pile cells topped with a concrete wall supported on bearing piles within the cells. Guide walls will be provided at each end of the lock.

The outlet structure will consist of three gated bays, each 32-ft wide with a sill elevation of -15.8 ft m.s.l. The gates will be the vertical steel lift gates operated by electric motordriven wire rope hoists. Top of the gates will be 4.2 ft m.s.l. in the closed position. A lakeward stilling basin and landward retaining walls will be provided.

The rock dike will form a closure between the lock landward gate bay, the outlet structure, and the adjacent shorelines. It will consist of a clam shell core covered by riprap and derrick stone with a steel sheet pile cutoff wall in the dike.

The rock and shell dam between the east shore and the outlet structure and between the outlet structure and the easterly lockwall will provide maintenance vehicular access to the outlet structure and lockwall. The rock and shell dam between the west shore and the landward gate bay will provide public access to the observation areas on the westerly lockwall and nonpublic vehicular access to the operations and maintenance building adjacent to the landward gate bay end of the westerly wall.

The westerly lockwall is designed to accommodate public access for viewing lockages and has been designed to blend aesthetically with the adjacent Lake Pontchartrain shoreline.

1-4. Operation of lock and outlet structure. The proposed operating procedure for the Seabrook Lock and Outlet Structure is essentially as follows:

a. The lock will normally be left open with no lockages for current velocities up to 3 ft per second in the lock chamber. Navigation through the lock during this period will be controlled by the lockmaster because of obvious limitations in the channel width.

b. When velocities through the lock chamber fall within the range of 3 ft per second to 6 ft per second, the lock gates will be left open unless a vessel approaches, in which case the gates will be closed and a normal lockage operation accomplished. This condition will exist for about 7 hr on an average day.

c. When velocities through the lock chamber reach 6 ft per second (this will occur when there is about 1 ft differential between the IHNC and lake), the lock gates will be closed and operated only as required for lockage operations.

d. Because of the flow interruption that will be experienced by closing the lock gates as described above, a plan for operating the gated outlet structure to reduce flood stages in the IHNC during hurricanes has been formulated. The operating procedure for stage relief in the IHNC provides for the gates of the outlet structure to be fully opened when a stage of 3.5 occurs on the IHNC side of the lock and to remain open for the duration of the hurricane. Flows from the IHNC will pass into the lake continually throughout the hurricane regardless of the track.

Lockages will continue for some period of time after the outlet structure gates have been fully opened and cease when a stage of 5.0 is obtained on the IHNC side of the lock. At this time, the lock personnel will fully close both sets of lock gates and leave the lock site. The complex will remain unmanned throughout the duration of the hurricane.

e. The complex will also be used for salinity control in Lake Pontchartrain. With coordination with the Louisiana Wildlife and Fisheries Commission, a method of operation to provide an acceptable salinity level in Lake Pontchartrain will be formulated.

f. To satisfy riparian flow requirements, the outlet structure will normally be operated to provide an opening of approximately 260 sq ft. One gate bay will be partially opened on a continual basis to provide this flow area. After completion of the Seabrook Complex, a data collection system will be established, and it will serve to determine any future modifications to the operating procedure described herein as may be necessary. The Complex will otherwise be operated as described above.

1-5. Purpose and scope. The purpose of this design memorandum is to present the results of investigations, the sources of cementitious materials and aggregates, riprap, and construction procedures to be specified for the construction of the lock and outlet structure.

SECTION II - CONCRETE INVESTIGATION

2-1. General. This investigation of concrete materials for the lock and outlet structure was made in accordance with the requirements in EM 1110-2-2000, Standard Practice for Concrete. Studies for the structure were made to assure adequate advanced planning of the concrete materials which are most likely to be used in the structure. This planning anticipated as many problems as could be envisioned during construction and resulted in recommendations for specifying good practices, which should alleviate such problems. The preliminary concrete investigation resulted in the obtaining of necessary base data which determined the scope of future investigations. All of this investigation was completed by reviewing the planning documents and preliminary designs. It revealed such basic data as: concrete quantities, concrete qualities, number of anticipated contracts, climatic and exposure conditions, and expected locations within the structure requiring various classes of concrete.

2-2. Concrete Quantities. There will be approximately 60,000 cu yd of concrete placed in the Seabrook Lock and Outlet Structure as shown below.

Seabrook Lock and Outlet Structure

Navigation Lock	Concrete Quantities, cu yd
Lock walls	31,140
Sector gates and gate bays	19,900
Outlet structures and stilling basin	5,730
Seepate cutoff concrete cap	290
Dolphin-concrete ring	455
Miscellaneous	41
Permanent approach wall - concrete cap	807
Erosion protection - concrete steps	1,502
Total	59,885

2-3. Concrete Qualities. Since the lock and outlet structure components are relatively thin, only two basic classes of concrete will be required. A 3000 psi concrete will be required for all parts of the structure except structural girders and anchorages. The 5000 psi at 28 days concrete for the girders will be a contractor* requirement but the contractor-proposed mixture proportions will be verified prior to fabrication of the girders. The portland cement and possibly pozzolan used in the anchorages will be paid for separately as the rest of the concrete in the piers. The strength requirements will be based on 28 days for concrete containing only portland cement or portland-pozzolan cement but concrete containing fly ash as

* CE 1401.01, Standard Guide Spec. Require Government Designed Mixes (WES).

a cement replacement will be proportioned to comply with the strength requirements at 90 days. The maximum water-cement ratio planned to be used on these projects is 0.60 as required by Table III in EM 1110-2-2000 for durability of exposed concrete, strength requirements will necessitate a lower w/c ratio. Concrete in ogee sections and stilling basin will be limited to a w/c ratio of 0.45. A small amount of 2000 psi concrete will be used in sidewalks, etc.

Concrete Qualities

	Design Compressive Strength, f'_c
(1) General structural concrete	3000 psi
(2) Structural girders	5000 psi
(3) Nonstructural concrete	2000 psi

2-4. Number of Contracts. The concrete structure will probably be awarded in one contract. The quantity of concrete required will justify the use of CE 1401.01, Standard Guide-Specification for Concrete. A few additional small contracts for recreational facilities may be awarded later. These contracts will probably use ready-mixed concrete and an end-result type specification for concrete strength. These contracts will not be discussed in this design memorandum, but the maximum 1-1/2-hr delivery time will be strictly adhered to and adequate Government quality assurance procedures will be established.

2-5. Climatic and Exposure Conditions. The climatic and exposure conditions to which the concrete and its placement would be subjected are considered very good for the structures. The project site is located on the Inner Harbor Navigation Canal and Lake Pontchartrain, which is a moderate climatic area of the Southern United States. The specific climatic and exposure conditions for the project area are as follows:

a. Temperature. The ambient temperatures of the Seabrook Lock and Outlet Structure project area are temperate and conducive to long-season recreational use. Extremes are very rare. The weather station at New Orleans, Louisiana, recorded a low of 33° and a high of 97° during 1977. The yearly mean temperature is 66.7°. Snowfall is extremely rare, and when it does occur, it remains on the ground only a short time. Freezing and thawing will not be a problem as there are normally no freezing cyles in the winter and the humidity is normally high, helping to prevent shrinkage cracking of the concrete.

b. Wind. Wind records in the project area indicate that winds of high velocity are rare, and in most cases such winds are associated with

hurricanes, which occasionally cross the area during summer or early fall. There have been some destructive local windstorms in the area with winds in excess of 100 miles per hour, generally connected with tropical disturbances. The average yearly wind velocity is about 8.0 mph from the southeast. Summer and fall velocities are somewhat lower than winter and spring.

c. Rainfall. A number of stations, operated by or in cooperation with the National Weather Service for the collection of precipitation data, are located in or near the Lake Pontchartrain area. The pertinent data are collected and published by the Weather Service in its climatological bulletins. The average annual rainfall for the basin is about 60 in., but there is variation depending on the location of the station. The heaviest period of precipitation is in November, December, and January. Records show that large amounts of rainfall occur in practically every month during the year.

2-6. Project Access. Land access to the Seabrook Lock Complex construction site will not be a problem as it is in a highly developed area. Short access roads may be necessary.

SECTION III - CEMENTITIOUS MATERIALS INVESTIGATION

3-1. General. Since portland cement is normally the concrete ingredient with the highest unit cost, it was necessary to investigate various options. The investigations revealed that natural cement and slag cement are not available in sufficient quantities for this project. All portland cement producers within a radius of approximately 300 miles of the project were contacted and estimated cost and other significant data were obtained; these data are shown in Table 3-2. Cement and aggregate studies indicate that Type I or Type II, low alkali cement should be specified. An estimate of quantities of cementitious materials required for the project is given in Table 3-1 below.

Table 3-1. Cementitious Quantities

	Seabrook Lock					
	1-1/2-in. Aggregate			3-in. Aggregate		
Cementitious Materials	Portland Cement	Portland-Pozzolan	Portland Cement/ Fly Ash	Portland Cement	Portland-Pozzolan	Portland Cement/ Fly Ash
Portland cement, cwt	261,000	--	195,200	245,950	--	184,380
Portland-pozzolan, cu ft	--	132,475	--	--	125,120	--
Fly Ash cu ft	--	--	33,130	--	--	31,280

3-2. Types of Portland Cement Investigated. When investigating the availability of various types of portland cement, it was found that Type I was readily available within a reasonable distance from the project site, and that many producers are no longer manufacturing Type II cement. Since most of the aggregates available require the use of low alkali cement, this was investigated also.

3-3. Availability. The investigations revealed adequate supplies of portland cement Type I, low alkali, but limited supplies of Type II that meet the heat of hydration requirements at 7 days. The above investigation also reviewed the availability of portland-pozzolan cement and the conclusions are that it will be available and potentially and economically feasible for optional bidding by the contractors. The following are large bulk manufacturers-suppliers of Type I and Type II portland cement and portland-pozzolan cement in the area investigated that expressed an interest in supplying the project.

1. Citadel Cement Corp.
   P. O. Box 6238
   Birmingham, AL 35217

2. Dundee Cement
   P. O. Box 67
   Clarksville, MO 63336

3. Ideal Basic Industries
   P. O. Box 1381
   ? ? ? ? ? what city?

4. Lone Star Industries, Inc.
   New Orleans Plant
   P. O. Box 3368
   New Orleans, LA

5. Louisiana Cement
   14900 Intracoastal Drive
   New Orleans, LA 70129

6. Martin Marietta Cement
   Southern Division
   15 South 20th Street
   Birmingham, AL 35233

7. River Cement
   P. O. Box 14545
   St. Louis, MO 63178

8. Louisiana Industries
   New Orleans, LA

3-4. Testing Requirements to be Specified. Alternate 2 (or prequalified cement source, ETL 1110-1-93, on p 7 of the March 1976 version of CE 1401.01) will be specified. This alternate requires the cement to be sampled at the mill of shipping point, stored in sealed bins and tested by the Government. If feasible, the Corps of Engineers Quality Assurance Programs for portland cement will be included in the lock and outlet structure specifications.

3-5. Laboratory Studies. Concrete mixtures containing materials generally representative of the materials that could be used on this project were investigated. The concrete mixture studies were made to determine necessary cementitious materials contents needed to obtain the required compressive strength of 3000 and 5000 psi for mixtures containing both 1-1/2-in. and 3-in. MSA. The results of these studies are shown in Exhibit A.

Table 3-2

Sources of Cementitious Materials

Name and Address of Producer/Manufacturer	Location of Plant	Type of Material	Site[1] Cost $/Ton	Annual Price Increase $/Ton	Mode of Transportation	Remarks
Citadel Cement Corp. Birmingham, AL	Demopolis, AL	I	$52.74	--	Rail	Meets Heat of Hydration at 7 days
	Birmingham, AL	II, LA	$52.74		Rail	
Dundee Cement St. Louis, MO	St. Louis, MO	I	$52.74	$5.00	Barge, Truck	Not Producing Type II
		IP	$52.74	$5.00	Barge, Truck	
Ideal Basic Industries Mobile, AL	Mobile, AL	I	$53.40[2]	$6.00	Truck	Could possibly meet Heat of Hydration at 7 days
		II, LA	$53.40	$6.00	Truck	
Lone Star Industries New Orleans, LA	New Orleans, LA	I	$49.29	$5.00	Truck	Meets Heat of Hydration at 7 days
		II, LA	$49.29	$5.00	Truck	
Louisiana Cement New Orleans, LA	New Orleans, LA	I	$51.40	$8.50[4]	Truck	Not Producing Type II at the Present but would meet HH @ 7 days but not LA
		II	$51.40	$8.50	Truck	
Martin Marietta Birmingham, AL	Calera, AL	I	$62.00[3]		Rail, Truck	Not Producing Type II
River Cement St. Louis, MO	St. Louis, MO	I	--			Not Available in New Orleans
Louisiana Industries New Orleans, LA	Artesia, MS	I	$59.00	$5.00	Truck	Meets Heat of Hydration at 7 days
		II, LA	$61.50	$5.00	Truck	

[1] 1978 Cost

[2] 1979 Cost

[3] 1980 Cost

[4] $5.00 Cement Increase plus $3.50 Freight Increase

SECTION IV - POZZOLAN INVESTIGATION

4-1. General. There are no natural deposits of pozzolan material in the southern United States. The minimal amount of construction of mass concrete type structures in recent years has also limited the types of pozzolan available for the project.

4-2. Types of Pozzolans Investigated. The only pozzolan considered commercially available in the project area is fly ash pozzolan. However, some former pozzolan sources in the southern United States were checked with negative results. Therefore, only fly ash is specified for use as a replacement for cement in concrete.

4-3. Availability. Fly ash sources in Missouri, Alabama, and Texas were checked and results are shown in Table 4-1. The principal suppliers of fly ash in this area are as follows:

AMAX Resource Recovery Systems, Inc.
228 West Valley Avenue
Homeswood, AL 35209

Walter M. Handy Co., Inc.
1988 S Glenstone
Springfield, MO 65804

General Portland, Inc.*
Trinity Division
P. O. Box 47524
Dallas, TX 75247

Dundee Cement Co.**
P. O. Box 67
Clarksville, MO 63336

4-4. Cost Data Justifications. The volume of concrete and structure configuration indicate that heat should not be a major problem. The use of pozzolan, therefore, must be justified only by economic considerations. The cement to fly ash ratio used in the cost study was 70 to 30 percent for concrete containing 1-1/2-in. maximum size aggregate and 75 to 25 percent for 3-in. aggregate concrete. The cost study was made for 3000 psi concrete at 28 days age. The study shows that a savings can be effected by the use of fly ash replacement. The results are presented below and in Exhibit B.***

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* General Portland, Inc., also manufactures a portland-pozzolan cement, but they cannot provide sealed storage.

** The Dundee plant in St. Louis, Missouri, manufactures a portland-pozzolan cement.

*** The data shown above and in Exhibit B include the additional cost of handling and storage and batching facilities when fly ash is used.

Cost Savings of Concrete with Fly Ash

Aggregate Size, in.	Fly Ash % by Volume	Concrete Cost, cu yd	Cost Savings per cu yd
1-1/2	0	$26.78	--
1-1/2	30	25.70	$1.08
3	0	27.84	--
3	25	27.41	$0.43

4-5. Quantity of Pozzolan. Approximately 60,000 cu yd of concrete will be required in the structure, requiring approximately 261,600 cwt of portland-pozzolan or 64,200 cwt of fly ash if either of these options is used. If pozzolan is used, the requirements in paragraph 5.2, p 9 of CE 1401.01, March 1976, will be specified.

4-6. Conclusion. Based on the cost study, the use of fly ash will be included as an option in the job specification.

Table 4-1

Sources of Pozzolan

Name and Address of Producer/Manufacturer	Location of Plant	Type of Material	Site Cost $/Ton	Annual Price Increase $/Ton	Mode of Transportation	Remarks
Amax Resource Recovery Systems Atlanta, GA	Stilesboro, GA	Pozzolan-Fly Ash	$26.20[1]	$1.50	Rail	
Walter N. Handy Springfield, MO	LaDue, MO	Pozzolan-Fly Ash	$23.50	10%	Rail	10% 1979 $2.35 1980 $2.59
General Portland, Inc. Dallas, TX	Dallas, TX	Pozzolan-Fly Ash	$30.00[2]	--	Rail	Not in market area
Dundee Cement St. Louis, MO	St. Louis, MO	Portland-Pozzolan	$52.74	$5.00	Barge, Truck	

[1] 1978 Cost.

[2] 1980 Cost.

SECTION V - AGGREGATE INVESTIGATION

5-1. General. Investigations were undertaken to establish the location and capabilities of major producers of concrete aggregates, and filter and bedding materials within a 150-mile radius of the jobsite. The concrete aggregate must meet the grading requirements as described in paragraph 3-4.a. and 3-4.c. of EM 1110-2-2000, Change 7, dated 20 July 1973, "Standard Practice for Concrete." Alternate 2 as specified in paragraph 7.5.1.1 of CE 1401.01 dated March 1976 will be specified for fine aggregate. An estimate of the quantities of construction materials for the structure are presented below. All of the material except shell backfill must come from the sources investigated or equivalent sources.

Aggregate Quantities

1.	Concrete Coarse Aggregate (No. 4 - 1-1/2 in.)	28,531 cu yd
2.	Concrete Sand	15,359 cu yd
3.	Fill (wet sand)	405,000 cu yd
	(shell)	169,380 cu yd

5-2. Description of Each Source. Locations, quantities, and transportation facilities available for many of the concrete aggregate sources were field checked by personnel of the New Orleans District. Other sources were contacted by telephone or were referred by other districts. Most sources provide graded aggregate furnished to specification and so pit-run sample test results were not used as the sole criterion for acceptance or rejection. A summary of acceptance test data is presented in Tables C2 and C3 of Exhibit C. Locations of sand and gravel suppliers are shown in Plate 11. Photographs of the suppliers' operations and structures containing the concrete aggregates to establish their service records are shown in Exhibits D and E, respectively.

5-3. Cost Data. The cost of aggregate per ton at the plant for the producers that responded to our inquiries is shown on Table C1 of Exhibit C. A cost comparison of the use of 1-1/2- and 3-in. maximum size aggregate is also shown below:

Producer	Aggregate Size	Type Delivery	Cost per Ton at Site
Louisiana Industries, Price, LA	No. 4-1-1/2	Truck	6.60
Reed Crushed Stone, KY	1-1/2-3 in.	Barge	9.50

A cost comparison per cubic yard of concrete mixtures containing 1-1/2-in. or 3-in. maximum size aggregate is shown below. Details of these calculations are shown in Exhibit B. The costs used in the comparison calculations were those furnished by the producers shown above.

Maximum Aggregate Size	Fly Ash	Cost of Concrete, cu yd, $	Cost Savings Using 3-in. Maximum Size Agg., $
1-1/2	With	25.70	
3	With	27.41	-1.71
1-1/2	Without	26.78	
3	Without	27.84	-1.06

There would be more expense with the use of 3-in. maximum size aggregate. The cost of handling and storage of the additional aggregate size was not considered in these calculations but would increase the expense. The contractor will have the option of using the 1-1/2- to 3-in. size range.

5-4. Service Records. A service record was developed on a number of potential concrete aggregate sources. This investigation was conducted by visiting the quarry sites and organizations such as state highway departments, Corps of Engineers Districts, private contractors, etc., who have utilized the aggregate to develop information on the material and to locate structures containing the aggregate for close inspection. Exhibit D contains photographs of the concrete aggregate quarry operations, and Exhibit E contains photographs of the material in service. The concrete aggregate sources investigated were:

Concrete Aggregate

a. Ratcliff Sand Co., Mobile, AL (source No. 1).

b. Gifford-Hill, Inc., Fluker, LA (source No. 18).

c. Smith Sand and Gravel, Mt. Herman, LA (source No. 20).

d. Louisiana Industries, Price, LA (source No. 21).

e. B & B Gravel Co., Bluff Creek, LA (source No. 22).

f. Gifford-Hill, Inc., Arcola, LA (source No. 23).

g. Lambert Sand and Gravel, Baines, LA (source No. 28).

h. American Sand and Gravel, Hattiesburg, MS (source Nos. 43 and 45).

i. Hammitt and Green, Inc., Columbia, MS (source No. 47).

j. Blain Sand and Gravel, Columbia, MS (source No. 49).

k. Green Bros., Inc., Brookhaven, MS (source No. 52).

l. Green Bros., Crystal Springs, MS (source No. 55).

m. Traxler Sand and Gravel, Crystal Springs, MS (source No. 57).

n. Blain Sand and Gravel, Crystal Springs, MS (source Nos. 60 and 61).

o. St. Catherine Sand and Gravel, Natchez, MS (source No. 66).

Photographs of the aggregate in service from some of the producers listed above were not available, and source No. 21 would not allow a photograph of its quarry operation. All concrete aggregate sources investigated will produce satisfactory material when used with low alkali cement.

5-5. Listed Sources. The following concrete aggregate sources shall be listed in the specifications:

a. Source No. 18, Gifford-Hill, Inc., Amite, LA. The pit is located 1 mile north of Fluker, Louisiana, on US Highway 51 and is approximately 80 miles from the Seabrook Lock construction site. Production of natural sand and gravel is sufficient to furnish the project. The maximum size coarse aggregate is 1-1/2 in. Transportation would either be by truck of rail. Tests indicate that the aggregate would be satisfactory in concrete, but the use of low alkali cement is indicated unless further testing indicates otherwise.

b. Source No. 20, Smith Sand and Gravel, Mt. Herman, LA. The pit is located 5 miles northwest of Franklinton, Louisiana, and approximately 102 miles from the project site. Production of natural sand and gravel is adequate to supply the project with the maximum size coarse aggregate being 1-1/2 in. Transportation to the site would be by truck. Tests indicate that the aggregate should be used with low alkali cement unless further testing indicates otherwise.

c. Source No. 21, Louisiana Industries, New Orleans, LA. The pit is at Price, Louisiana, and approximately 60 miles from the project site. Production of natural sand and gravel is adequate to supply the project. The maximum size coarse aggregate is 1-1/2 in. and transportation to the site would be by truck or rail. The quality history study indicates that the material is satisfactory for use in concrete, however, complete physical tests and petrographic examinations have not been conducted on this material and should be done before the material is used.

d. Source No. 23, Gifford-Hill, Inc., Roseland, LA. The pit is 1 mile north of Arcola, Louisiana, and approximately 77 miles from the project site. Production of natural sand and gravel is adequate to supply the project. The maximum size coarse aggregate is 1-1/2 in. and transportation would be by rail or truck. Tests indicate the presence of reactive aggregate but the quality history study found no evidence of alkali-aggregate reactivity.

e. Source No. 49, Blain Sand and Gravel, Columbia, MS. The pit is 9 miles south of the intersection of Mississippi Highways 13 and 43 off Highway 43 and approximately 95 miles from the project site. Production of natural sand and gravel should be adequate to supply materials for the project. The maximum size coarse aggregate is 1-1/2 in. and transportation would be by truck. Tests indicate that the material would make satisfactory concrete aggregate.

5-6. Conclusions. The sources listed above would be satisfactory concrete aggregates when used with low alkali cement.

SECTION VI - PROTECTION STONE INVESTIGATION

6-1. General. Sources within reasonable transportation distance of the project site were investigated as to availability and suitability of the material for use as riprap and are shown in Exhibit C. A quality history was developed for each source. Material and transportation costs were obtained.

6-2. Quantities Required. The following quantities are required for the project.

Erosion Protection	
Riprap (Type B)	65,305 tons
Riprap (Type C)	48,423 tons
Derrick Stone	9,755 tons
Cover Stone	43,222 tons

6-3. Quality Requirements. The quality requirements for materials to be used for protection stone for this project will be in accordance with the guidelines established by ETL 1110-2-120, dated May 1971, and LMVSP-OS-018, dated March 1976. The gradation limits of the various size stone are given in Table 6-1. Stone for slope and scour protection shall be of a hard, durable quality that will not disintegrate under the elements nor be easily broken in handling. It shall be clean and free from earth and be roughly angular, not rounded, in shape. Stone must weigh at least 160 lb per cu ft and have a maximum absorption of 2 percent, unless other tests and service records show satisfactory results. Scour protection for Seabrook Lock was designed as follows.

a. Cover Stone for Dam. Cover stone for the dam was designed assuming an 8-ft wave attack due to a hurricane critical to the south shore of Lake Pontchartrain with the lock, dam, and other units of the hurricane barrier in place. These conditions governed the selection of stone protection for both sides of the dam. Cover stone for the dam resulting from use of these criteria will consist of random placement of two layers of the gradation listed in Table 6-1 to a total thickness of 5 ft.

b. Toe Protection Along Outside of Chamber Walls. Stone protection along the outside toe of the chamber walls was sized to prevent displacement due to the underwater rolling effect produced by waves striking the vertical face of wall. This stone protection will consist of an 18-in. layer of the Type B riprap with a gradation as shown in Table 6-1. This gradation is different than the Type B riprap listed in Design Memorandum No. 12. A change was required in order to make the riprap size and thickness compatible (i.e., maximum stone size and 1.5 times the minimum median stone size equal to the thickness of the stone protection). However, the minimum medium stone size was not changed.

c. Bottom Protection. Bottom protection landward and lakeward of the lock and outlet structure as well as within the lock chamber was designed to resist forces resulting from the maximum anticipated velocities

in these various areas. Stone protection is these areas will consist of an 18-in. layer of Type B riprap except landward and lakeward of the outlet structure protection in these two areas will consist of 30 in. of derrick stone. As a result of hydraulic model studies performed by WES, derrick stone protection was determined to be required over the entire elevation - 16.8 upper approach area and downstream 75 ft beyond the stilling basin end sill. This is the erosion protection that will be used for the outlet structure approaches as reflected by Plates 42, 43, and 44. Type B riprap and derrick stone gradations will be as shown in Table 6-1.

d. Toe Details. Toe details for the erosion protection at the Seabrook Lock Complex presented some unique problems, particularly where the toes intersected the soft lacustrine excavation slopes. In general, most of these toes were designed to prevent the heavier protective stone from bearing directly on the softer adjacent existing soil materials and to prevent loss of the slope protection stone by undermining due to settlement or erosion. One area which deserves special mention here is the termination of the outlet structure stilling basin stone protection. A pile of derrick stone in the form of an inverted toe will be provided in this location to provide a reservoir of material to supplant any downstream erosion and still maintain the integrity of the apron stone protection.

e. Filter Design. The gradations for the protective stone have been selected so that the underlying finer material will not "pipe" or wash through the voids of the overlying coarser material. The criterion used required that the D_{85} size of the underlying finer material be greater than the one-fifth the D_{15} criterion, a 12-in. layer of Type C riprap was placed beneath the Type B riprap. The gradation for the Type C riprap is shown in Table 6-1. The filter design is in accordance with EM 1110-2-1901.

Table 6-1. Gradations for Stone Protection

A. Cover stone, derrick stone and Type B riprap.

Percent Lighter by Weight	Limits of Stone Weight in Pounds		
	Cover Stone	Derrick Stone	Type B Riprap
100	5000-8000	1000-2000	200-400
50	3000-5500	600-1500	90-180
15	2000-3500	350-800	20-40

B. Type C Riprap.

Sieve Size	Percent By Weight Passing
6 in.	100
4 in.	90-100
1-1/2 in.	45-95
3/4 in.	15-50
1/2 in.	5-30
No. 4	0-5

These gradations can be produced by most of the riprap and derrick stone producers currently in operation shown on Table C1 of Exhibit C.

6-4. Summary of Test Results. Test results for riprap are given in Table C4 of Exhibit C and in more detail on the data sheets in Exhibit C.

6-5. Service Records. A service record was developed on a number of the potential riprap sources. This investigation was conducted by visiting the quarry sites and organizations such as state highway departments, Corps of Engineers Districts, private contractors, etc., who have utilized the aggregate or stone to develop information on the material and to locate structures containing the stone for close inspection. Exhibit F contains photographs of the riprap quarry operations, and Exhibit G contains photographs of the material in service. The riprap sources investigated were:

Riprap

a. Reed Crushed Stone, Gilbertsville, KY (source No. 70).

b. Three Rivers Rock Co., Smithland, KY (source No. 74).

c. Westlake Quarry, Neely's Landing, MO (source No. 75).

d. Bussen Quarry, Jefferson's Barracks, MO (source No. 78).

e. Southern River Rock Co., Perryville, MO (source No. 87).

Photographs of the riprap in service from Reed Crushed Stone were not available. A geological description of the quarry operations of Southern River was not available. All riprap sources investigated produce satsifactory material. Transportation of material to the project site from the five sources listed above would be by barge.

6-6. Listed Sources. The following riprap sources shall be listed in the specification:

a. Source 70. Reed Crushed Stone, Gilbertsville, KY. This source is located near Gilbertsville, Kentucky, on the Tennessee River. The quarry is located near the Kentucky Dam. Crushed limestone for riprap is produced by this operator and concrete aggregates up to 6 in. are available. The source is approximately 941 river miles from the project site.

The St. Louis Limestone of Mississippian Age (AAPG, 1970) is quarried by the producers at this location. Three ledges totaling approximately 180 ft are presently quarried. The lower ledge consists of approximately 70 ft of gray, dense, medium to massively bedded fine to coarse grained limestone with oolitic beds predominant in the coarser materials. Stylolites and chert nodules are encountered throughout this section. The intermediate ledge consists of approximately 50 to 60 ft of gray to dark

gray, dense, fine to coarse grained, medium to massively bedded limestone. The upper ledge consists of approximately 50 ft of gray to dark gray, dense, medium to coarse grained, massive limestone. The upper quarried ledge is overlain by 30 to 40 ft of weathered limestone and soil.

One prominent joint set at approximate right angles is distinguishable in the quarry faces and very little weathering is apparent on the planes. In general a thin layer of calcite is present on joint surfaces. There were no major solution widened joints or cavities viewed in the quarry walls.

The producer presently owns 160 acres and estimates reserves to be several million cubic yards. The materials are processed by blasting, then loaded on trucks by power shovels. The raw materials are initially crushed by a primary jaw crusher, then conveyed to secondary conical crushers and screens by belt. Following crushing and screening the materials are transported by belt to bins, and then to stockpiles by truck.

b. Source 74. Three Rivers Rock Co., Smithland, KY. This source is located at Mile 7 on the Cumberland River near Smithland, Kentucky, and approximately 929 river miles from the project site. Production is from the Ste. Genevieve Limestone of Mississippian Age (AAPG, 1970). Riprap and crushed coarse concrete aggregates up to 6 in. are available from this source, and the daily production of graded materials is 3200 cu yd. Approximately 365 acres are owned by the producer, and reserves are estimated to be in excess of 200 million tons.

Four ledges totaling approximately 135 ft are presently quarried. Ledge 4 (lowest ledge) consists of approximately 98 ft of gray, dense, massive bedded, fossiliferous limestone overlain by 3 to 5 ft of black shale. Ledge 3 consists of approximately 45 ft of gray, dense, massive, finely crystalline limestone overlain by gray, dense, occasionally oolitic, finely crystalline limestone. Ledge 2 consists of approximately 10 ft of finely crystalline, massive bedded limestone with lenticular shaley beds in the lower 3 ft. Ledge 1 consists of approximately 25 ft of predominantly gray, dense, finely crystalline limestone, becoming oolitic in the upper 10 to 15 ft.

A single joint system at approximate right angles was noted in the quarry faces. There was very little weathering along the joint, but secondary calcite was prevalent along joint planes. There were no major solution cavities seen in the quarry faces.

Materials from this source have been used by the USAE Districts of Nashville, Memphis, New Orleans as protection stone on the Mississippi, Ohio, and Red Rivers; however, their exact locations could not be specified by the producer. Material from this source was used at Kentucky Dam, as shown in Exhibit G.

Source 75. Westlake Quarry and Materials Co., Neely's Landing, MO. This source is located at Neely's Landing, Missouri, and is approximately 938 river miles from the project site. Protection stone is quarried from the Baily Formation of Devonian Age (AAPG, 1966). The quarry is on the western valley wall of the Mississippi River. The paleozoic rocks in this

area are overlain by a variable thickness loess cover. The paleozoic units are approximately horizontal, and no faulting or folding was seen in the quarry faces exposed.

Four ledges are presently being quarried, although overburden is being removed from an upper ledge for eventual production. Ledge 1 (upper ledge), presently not quarried, consists of dark gray, hard, massive bedded limestone with chert seams. Ledge 2 is approximately 60-ft thick and Ledge 3 consists of approximately 12 ft of gray, hard, finely crystalline, medium bedded limestone.

A single joint, set at approximate right angles, is exposed in the quarry faces. The joints in the upper ledge are highly weathered and solution widened, and red clay seams are found along the planes. The joints in the lower ledges of the quarry do not exhibit solution widening, although secondary calcite is found along many joint planes.

d. Source 78. Bussen Quarry Co., St. Louis, MO. This source, located in St. Louis, Missouri, at Mississippi River Mile 168.5 is 1035 river miles from the project site. The quarry is locally known as the Jefferson Barracks Quarry and production is from the St. Louis Limestone of Mississippian Age (AAPG, 1966). The units that are quarried outcrop in the valley wall of the Mississippi River at this location and strike northwest with a 1° dip to the northeast.

Five ledges are presently being quarried, and a tabulation of the produced materials, together with the available laboratory data, are shown in Exhibit D. Ledge 1 (upper ledge) consists of 10 to 15 ft of hard, light gray, fine grained massive limestone. Ledge 2 consists of 15 ft of soft to moderately hard argillaceous limestone, and Ledge 3 consists of approximately 30 ft of interbedded fine grained brown to gray limestone and thin shale beds and seams. Ledge 4 consists of approximately 20 ft of interbedded dark gray, finely crystalline limestone underlain by 3 to 5 ft of black fissile shale. Ledge 5 consists of approximately 6 ft of finely crystalline massive limestone. Joints in Ledge 1 are somewhat solution widened, and red mud seams and partings are also found within this unit. The weathering is primarily limited to the upper ledge of the quarry only.

Production is accomplished by initially blasting the raw materials from the quarry face, then passing the materials through a jaw crusher, and then a grizzly for grading. The production of protection stone having a maximum weight of 300 lb is 750 tons per day.

Bussen Quarry services local government agencies with protection stone, while a large quantity of quarried materials is utilized for production of crushed aggregates for concrete. Representatives of the Bussen Quarry stated that they could manufacture the lighter gradations of protection stone (less than 300 lb) but are not equipped to supply the heavier gradations. Also, the owner felt that he would not be competitive with other quarries located further south on the Mississippi River.

Protection stone from this source has been previously used by the USAE along the Mississippi River.

Barge transportation is the most feasible means of transport of materials from this quarry to the site.

e. Source 87. Southern River Rock Co., Perryville, MO. This source is located near Perryville, Missouri, and the quarry operation is at Mile 123.1 on the Mississippi River. The source is approximately 944 river miles from the project site. Ledge rock for riprap production is plentiful and plant capacity is approximately 2000 tons per day.

The stone is of the Salem Formation, Mississippian Age, and is worked in four ledges.

6-7. Estimated Costs of Materials. The estimated costs are shown in Table C1 of Exhibit C. The costs include the cost of the material at the source and transportation costs to the site but does not include any profit or placement charges that are often reflected in riprap prices bid by contractors.

6-8. Conclusion. The investigations indicate that protection stone of acceptable quality and in sufficient quantities for the construction of the project is available from a number of sources at competitive prices. It is recommended that the sources listed above be included in the job specifications as sources of protection stone.

SECTION VII - CONSTRUCTION PLANT INVESTIGATION

7-1. General. Alternate 2, semi-automatic plant, as provided in paragraph 10 of CE 1401.01, March 1976, will be substituted for batching and mixing concrete.

7-2. Plant Requirement, Type, and Capacity. The determination of the type and capacity of the concrete plant is in accordance with the applicable parts of EM 1110-2-2000. The plant requirements are determined from the quantity of concrete that will be required for the lock and outlet structure placements. The location of batch plant may be "on-site" or "off-site" due to the proximity of the project site to local commercial sources. Mixers may be either tilting drum, spiral blade, vertical shaft, or truck type. Batch plant capacity requirements are determined by the criteria that no uncooled concrete is to be left uncovered over 1 hr. The plant capacity required will be approximately 96 cu yd/hr for placement of uncooled concrete in a 5-ft lift. Production requirement is discussed in greater detail in Exhibit H.

7-3. Washing and/or Rescreening Requirements. Not normally required for nominal 1-1/2-in. maximum size aggregate, as long as the aggregate complies with the cleanliness specifications.

7-4. Mixer Requirements. The type, expected capacity, and quantity will be as outlined in paragraph 4-1b in EM 1110-2-2000, Change 3. The capacity of the plant is determined from the number of mixers, the rated capacity of each mixer, and the charging, mixing, and discharging time of each mixer. The total time should be increased by 15 seconds per cycle when the capacity for sustained operation is computed. Thus, a plant containing two 2-cu yd mixers, each of which can be charged in 20 seconds and discharged in 15 seconds, leads to the following computation:

> The mixing formula in paragraph 10.10 of the Standard Guide Specifications requires 1 min 15 sec mixing time for 2-cu yd mixers. The time of a cycle is 20 sec (charging) plus 1 min 15 sec (mixing) plus 15 sec (discharging) plus 15 sec (contingency) or 2 min 05 sec. Thus, the plant capacity is 4 cu yd in 2 min 05 sec or approximately 116 cu yd per hr.

Therefore, two 2-cu yd mixers will provide the required capacity plus some contingency for placement of uncooled concrete in a 5-ft lift height. These mixer requirements are based on the largest expected continuous placement (approximately 54- by 48- by 12-ft) in the lock chamber walls, which are to contain approximately 40 percent of the total concrete volume. If the mixer requirements are based on the largest continuous concrete placement in the gate bay slab and outlet structure slab, two 4-cu yd mixers will be required (approximately 186 cu yd/hr). However, these two sections contain only approximately 18 percent of the estimated total concrete volume in the project.

7-5. Special Requirements. Some special requirements may be necessary to assure adequate handling, testing, and placement of the concrete. This would include any special requirement for treatment of water to meet Corps of Engineers Specification CRD-C 400-63.

7-6. Plant Location at Project Site. The concrete production plant for the Seabrook Lock and Outlet Structure will be located on the south side of Lake Pontchartrain near the project site. Ample area appears to be available in the New Orleans Lakefront Airport area for the Resident Engineer's office, contractor's plant area, and general aggregate stockpile area.

SECTION VIII - CONVEYING CONCRETE

8-1. Bucket Size. Transportation of concrete from the mixer to the forms should be done as rapidly as possible so that properties of the concrete as discharged from the mixer are not materially changed. The devices used for receiving the concrete from the mixers and conveying it to and depositing it in the forms should be designed to maintain the concrete in the same condition in which it is discharged from the mixer. A 4-cu yd maximum size bottom dump bucket as specified in alternate 1 of CE 1401.01, March 1976, paragraph 11.2, is satisfactory.

8-2. Time of Delivery. Concrete mixed in stationary mixers and transported in non-agitating equipment shall be placed within 30 min after it has been mixed unless otherwise authorized by the Contracting Officer. If the concrete is truck-mixed or when an agitator is used for transporting concrete mixed by stationary mixers, the concrete shall be delivered within 1-1/2 hr after introduction of the cement to either the water or aggregate. If the temperature of the concrete exceeds 85°F, this time shall be reduced to 45 min. These requirements are in accordance with the Standard Guide Specifications for Concrete.

8-3. Special Conveyance. Conveyor belts, pumps, chutes, etc., may be specified and their use allowed only after permission of the Contracting Officer. Before their use is allowed, Technical Report No. TR-C-74-4, US Army Waterways Experiment Station and American Concrete Institute Title No. 72-33, "Placing Concrete with Belt Conveyors," ACI Journal, September 1975, pp 474-490, will be reviewed.

SECTION IX - INSULATION REQUIREMENTS

9-1. General. The specifications for insulation of placements shall be in accordance with paragraphs 3-10 and 5-6 of EM 1110-2-2000, and Cold Weather paragraphs 16.4 and 16.5 of CE 1401.01. Determination of period of time required for cold weather protection was based upon paragraphs 3-10 of EM 1110-2-2000. The results showed only a slight possibility that weather protection would be needed.

SECTION X - INSPECTION REQUIREMENTS

10-1. General. The inspection requirements for this project will be as presented at the OCE Sponsored Construction Quality Management Seminar; the Government will strive to establish a mutual understanding of the construction quality management system with the Contractor. The Contractor will be advised that it is his responsibility to control the quality for the project and that the Corps of Engineers will not interfere with these responsibilities unless the materials and/or workmanship being incorporated in the project do not meet the requirements of the project contract documents. The Contractor will be informed in the contract documents that he will be required to regulate, test, and inspect his procedures, equipment, materials, and personnel in such a way that it is most likely that the requirements of the contract will be met. The Government (Resident Engineer Staff) will verify (1) that the Contractor's quality control system is working and (2) that the end results comply with the contract documents and other requirements established by the District Engineering Divisions. Both the Contractor's and the Government's Laboratory will be evaluated by the Division Laboratory.

10-2. Contractor Quality Control. The quality control requirements stipulated beginning on page 93 of CE 1401.01, Standard Guide Specifications for Concrete, will be included in the project specifications. The size of the organization and qualifications of personnel to perform quality control will be determined by the Contractor based on his needs for control. The Contractor's quality control reports will be used to aid the Government in verifying that the Contractor's quality control system is working but will not be used to assure material and/or workmanship accetpability.

10-3. Government Quality Assurance. The Government will establish procedures to review the Contractor's Quality Control Plan and recommend, as appropriate, changes to same which will help verify that the culmination of the plan will reasonably and statistically help assure that the materials and/or workmanship will comply with the requirements of the project contract documents. The Government will review the Contractor's quality control tests to confirm the likelihood that the finished product will comply. In addition, all end product testing to be performed by the Government will be as stipulated in EM 1110-2-2000, Standard Practice for Concrete, Section 5-1c. The Government will be performing off-site tests on the following items, which pertain to concrete prior to approval for use:

(1) Aggregate (Engineering Division)

(2) Water

(3) Portland Cement

(4) Air-entrainment admixtures

(5) Chemical admixtures, if proposed by the Contractor

(6) Concrete Mixture Proportioning (Engineering Division)

(7) Curing Compound

The bulk of the on-site testings of items pertaining to concrete will consist of the following:

(1) Aggregate grading and cleanliness

(2) Fine aggregate FM ?

(3) Slump

(4) Air content

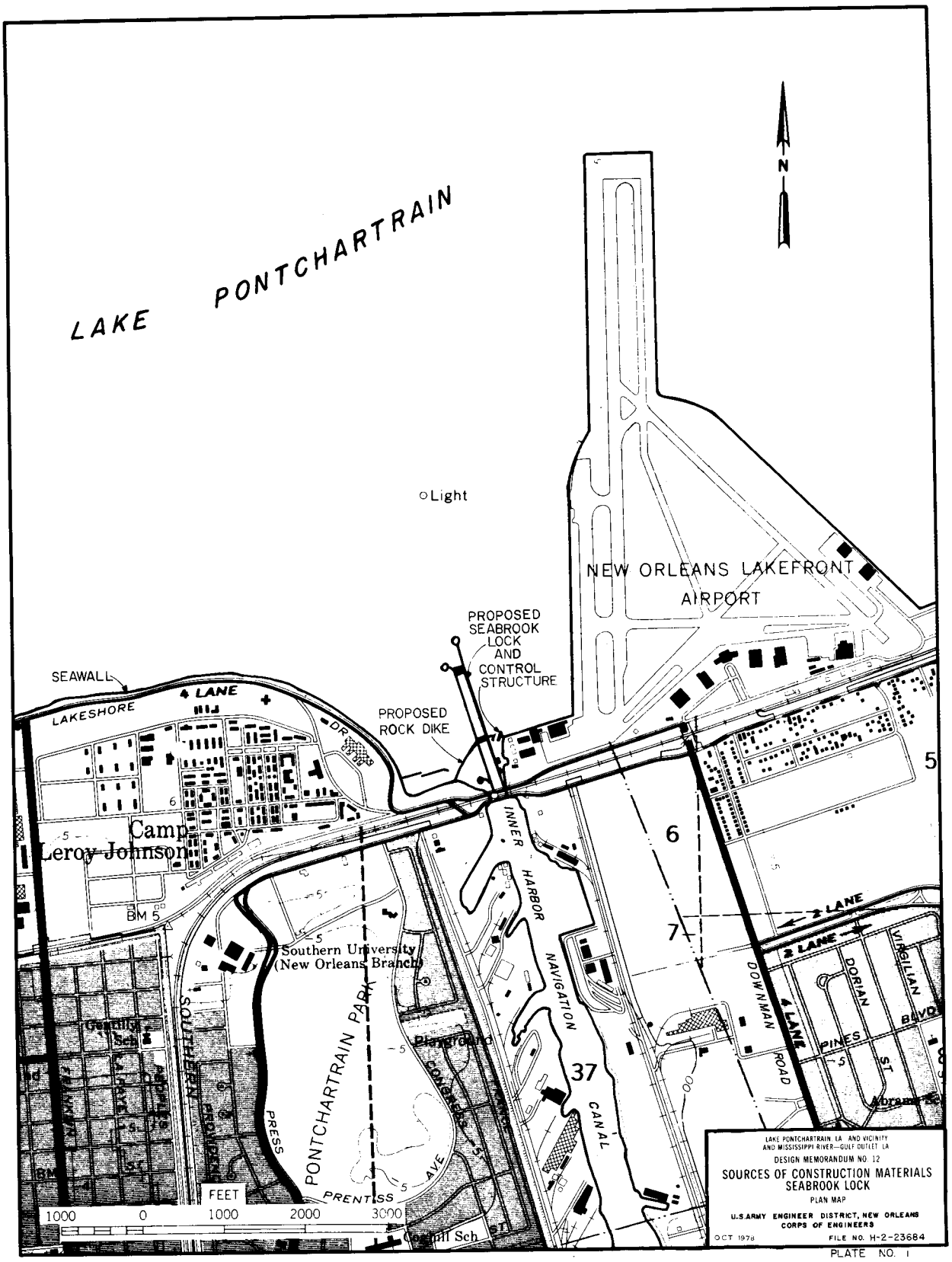
(5) Strength testing

(6) Scale checks

SECTION XI - CONCLUSION AND RECOMMENDATIONS

11-1. Conclusion. It is concluded that there are adequate concrete-type materials available to construct the concrete structures without difficulty. These materials can be delivered to the construction site on existing highways with the use of short project access roads to be constructed. Barge transportation to the project sites will also be available all year. Also, there are no adverse climatic conditions to be considered in the construction of the structure.

11-2. Recommendations. It is recommended that this Construction Materials Memorandum, as presented herein, be adopted as the basis for further detailed design studies, plans, and specifications for the Seabrook Lock Complex.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Light
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LAKESHORE
DR
Camp Leroy Johnson
BM 5
Southern University (New Orleans Branch)
SOUTHERN
PONTCHARTRAIN PARK
Playground
PRESS
PRENTISS
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LAKE PONTCHARTRAIN LA AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET LA
DESIGN MEMORANDUM NO. 12
SOURCES OF CONSTRUCTION MATERIALS
SEABROOK LOCK
PLAN MAP
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
OCT 1978
FILE NO. H-2-23684

PLATE NO. 1

LMVED-TD (NOD 28 Aug 80) 5th Ind
SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg, Miss. 39180 18 DEC 80

TO: District Engineer, New Orleans, ATTN: LMMNED-MP

The action proposed in the 4th Ind is satisfactory, subject to resolving comments in paras 7, 8, and 9 of DAEN-CWE-BB letter, 6 Dec 79, subject as above. OCE comments should be resolved during the preparation of plans and specifications and responded to in accordance with LMVD Supplement No. 1 to ER 1110-2-1200. Additional indorsement to this chain of correspondence is not necessary.

FOR THE DIVISION ENGINEER:

Robert J Kaufman
for R. H. RESTA
Chief, Engineering Division

4 Incl
nc

CF:
DAEN-CWE-BB

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160

REPLY TO
ATTENTION OF:

LMNED-MP

28 August 1979

SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

Division Engineer, Lower Mississippi Valley
ATTN: LMVED-TD

1. The subject Design Memorandum is submitted herewith for review and approval, and has been prepared generally in accordance with the provisions of ER 1110-2-1150.

2. Approval of this Design Memorandum is recommended.

1 Incl (16 cys) fwd sep
as

Thomas A. Sands
THOMAS A. SANDS
Colonel, CE
District Engineer

LMVED-TD (NOD 28 Aug 79) 1st Ind
SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg, Miss. 39180 23 OCT 79

TO: District Engineer, New Orleans, ATTN: LMNED-MP

1. Reference:

a. LMVED-TD M/L, 9 Feb 78, subject: Information Regarding Status of Cultural Resource Investigations and Environmental Impact Statements to be Included in Engineering Documents.

b. LMVED M/L, 29 Mar 78, subject: Effect of Schedule Delays.

c. LMVED-TL M/L, 23 Jul 79, subject: Information Regarding Endangered Species to be Included in Engineering Documents.

2. The transmittal letter should have included the necessary data required by the above-referenced letters.

3. The DM is approved subject to resolution of the following comments:

a. General. This DM makes reference that CE 1401.01, Standard Specifications for Concrete, will be used as guide specifications for plans and specifications. In Dec 78, the above guide specifications were superseded by CW 03305, Concrete, which should be used as guide specifications for this project.

b. Para 1-3, page 1-1. The elevation of the dam which forms the closure between the lock landward gatebay and the shoreline was changed to 7.2 ft NGVD in an LMNED-PP letter, 19 Oct 66, subject: Lake Pontchartrain La., and Vicinity - Report on Controlling Elevation of Seabrook Lock. This lower elevation would permit dam overtopping from the canal to the lake, thus affording better stage relief along the IHNC than the authorized plan, and would not significantly increase the level of Lake Pontchartrain. However, with the delay (possible indefinite stoppage) of construction of the control structure at Chef Menteur and Rigolets, you should reevaluate the elevation of the dam to determine if it should be further modified.

c. Table 3-1, page 3-1. Portland-Pozzolan (Type IP) cement is sold by the hundred weight and should be expressed as cwt in lieu of cu ft as shown. Using a specific gravity of 3, which is close enough for estimating purposes, the units will be 247,728 cwt of Portland-Pozzolan for the 1-1/2-in. aggregate and 233,974 cwt for 3-in. aggregate.

LMVED-TD (NOD 28 Aug 79) 1st Ind 23 OCT 79
SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

d. Para 4-3, page 4-1. The following should be listed as a source for fly ash:

Trinity Materials, Inc.
P. O. Box 708
Hattiesburg, Miss. 39401

e. Para 4-5, page 4-2. The values shown should be 247,728 cwt of Portland-Pozzolan cement and 33,130 cu ft of fly ash.

f. Para 5-1, page 5-1.

(1) In the second sentence, "Change 7" should be "Change 2" of EM 1110-2-2000.

(2) Use Alternate 1 for fine-aggregate grading as Alternate 2 is used for mass concrete with low-cement content.

g. Para 6-3, page 6-1. The stone used in the dam (bedding, core, and cover) should be designed using the criteria set forth in the U. S. Army Coastal Engineering Research Center's Shore Protection Manual, Volume II, Chapter 7, dated 1977. Furthermore, all the parameters used in this design should be presented.

h. Para 8-2, page 8-1. The maximum placing temperature permitted should be 85 degrees F.

FOR THE DIVISION ENGINEER:

for Robert J. Kaufman
R. H. RESTA
Chief, Engineering Division

CF:
DAEN-CWE-B (12 cy)
w 12 cy Incl 1

LMNED-MP (NOD 28 Aug 79) 2d Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, and Mississippi River - Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

DA, New Orleans District, Corps of Engineers, P.O. Box 60267, New Orleans, LA 70160 11 August 1980

TO: Division Engineer, Lower Mississippi Valley, ATTN: LMVED-TD

1. References:

a. LMVED-TD 1st Ind dated 23 Oct 79.

b. LMVED-TD 1st Ind dated 23 Jan 80. (Incl 2)

2. In response to paragraph 2 of referenced 1.a. above, the following information is offered to comply with data needed in the letter of transmittal:

a. Status of EIS. The final statement was filed with CEQ on 9 January 1975. By court order dated 30 December 1977, a new environmental impact statement has been ordered. The revised draft environmental impact statement is scheduled to be submitted to the Environmental Protection Agency in August 1981 and the final statement is officially scheduled for submission in May 1982. This document will present the results of ongoing studies of alternative plans.

b. Section 404 Evaluation. In response to a request from former Congressman F. Edward Hebert, the New Orleans District conducted a public meeting to discuss the entire project on 22 February 1975. A portion of this meeting was dedicated to a presentation of methods for the disposal of dredged effluents for all portions of the project with the exception of the St. Charles Lakefront Levee, as required by Section 404 of the Federal Water Pollution Act of 1972. The Statement of Findings on the meeting was forwarded to the Environmental Protection Agency on 22 August 1975 for review and approval. Approval of the plan for the disposal of dredged material was granted on 1 October 1975 contingent upon the complete elimination of the St. Charles Parish portion of the project. On 15 October 1975, clarification of the status of the St. Charles Parish Lakefront Levee was provided to the Environmental Protection Agency to indicate compliance with the conditional approval. EPA has clarified their position by stating that deauthorization of the levee is not essential to meeting their condition. Furthermore, EPA stated that it was not their intent to require the elimination of hurricane protection studies in St. Charles Parish.

c. Status of Cultural Resources Investigations. An architectural survey of the Mississippi River-Gulf Outlet, Shiplock project, conducted by the New Orleans District in 1979 revealed no significant structures near the proposed action. The area has been filled and developed; urban and business development precludes discovery of historic or prehistoric remains. If cultural resources are uncovered during construction, work will cease and the contractor will immediately notify the District Engineer.

d. Endangered Species. Based on extensive environmental studies conducted to date in connection with the tidal passes to Lake Pontchartrain, the proposed action is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of critical habitat of such species.

e. Effect of Schedule Delays. The subject design memorandum was scheduled for submission in May 1979. Submission of the design memorandum in August 1979 will not affect the schedule construction start for this feature of the Lake Pontchartrain project.

3. We have reviewed the comments provided in paragraph 3 of 1.a. above and our responses are as follows:

a. Para. 3.a. Concur.

b. Para. 3.b. Concur.

c. Para. 3.c. Concur.

d. Para. 3.d. Concur.

e. Para. 3.e. Concur.

f. Para. 3.f. Concur.

g. Para. 3.g. Concur, Sections 6-1. through 6-3. have been revised to reflect designs using the SPM. The revised pages are inclosed as incl 3.

h. Para. 3.h. The maximum placing temperature permitted will be 90°F. An approved retarder will be used to facilitate placing and finishing when the temperature reaches or exceeds 85°F.

LMNED-MP (NOD 28 August 1979) 2d Ind 11 August 1980
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, and Mississippi River - Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

4. In response to comments contained in reference 1.b. above, the following responses apply to the indicated paragraphs.

a. Para 1.a. Concur.

b. Para. 1.b.(1)(2). Concur, new data sheets, including petrographic data, for sources 18, 20, 21, 23, and 49 are inclosed (Incl 4).

c. Para. 1.c. Concur on the use of low alkali cement.

d. Para. 1.d. See para. 4.b. above.

e. Para. 1.e. Concur, the use of commercial concrete batch plants is being investigated. Letters have been sent to local New Orleans concrete producers so that the individual and combined capabilities can be assessed. Results of this study will be included in the DM when responses to our solicitations have been received.

f. Para. 1.f. In regards to the number of sources listed in Exhibit c, EM 1110-2-2000 indicates that "all sources considered should be investigated". Because of the feasibility of barging, sources as far away as St. Louis, MO. were considered. The five sources selected for inclusion in the specification were selected on the basis of cost, test results, and availability. Most, if not all, of the other operating sources listed could provide suitable aggregate, but would cost more or cannot provide adequate amounts. The suggestion that the pits closed should be shown as "inactive" in tables C2 and C3 does not seem necessary as this information is indicated in table C1 under the "Material Availability" column. The statements that are suggested to be added to Section V will be added.

FOR THE DISTRICT ENGINEER:

FREDERIC M. CHATRY
Chief, Engineering Division

3 Incl (16 Copies)
2-4 As Stated

LMVED-TD (NOD 28 Aug 79) 3d Ind
SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg, Miss. 39180 19 SEP 80

TO: District Engineer, New Orleans, ATTN: LMNED-MP

1. Resolution of the 1st Ind comments is satisfactory except as follows:

a. Para 3b. Concur is not adequate for response to this comment. The impact of not constructing the Chef Menteur and Rigolets complexes and adjoining levees of the Lake Pontchartrain low level hurricane protection plan on the functions of the Seabrook overtopping dam should be determined now in case the high level plan is selected.

b. Para 3g. The revisions to Section 6 are satisfactory except for the coverage presented in 6-3d addressing the stone size for the lakeward and landward approaches to the lock and the lock chamber. The type B stone for these areas of the lock is not considered adequate protection against high prop turbulence. WES should be consulted and requested to develop a riprap size that will be stable. It is our understanding that WES has an ongoing model study that could be easily expanded to perform the needed test.

c. Para 3h. The maximum placing temperature of concrete should be 85 degrees as stated in the 1st Ind. The 90-degree limit with retarder should be used only for smaller cast-in-place structural concrete structures where CW03301 is used for guide specifications.

d. Paras 4a and 4e. The method for submitting for review the requested specifications and study results on capabilities of local concrete producers should be indicated.

FOR THE DIVISION ENGINEER:

Robert J Kampman
for R. H. RESTA
Chief, Engineering Division

3 Incl
wd 15 cy incl 2-4

CF:
DAEN-CWE-B (12 cy)
w 12 cy incl 2-4

ED-TD

LMNED-MP (NOD 28 Aug 79) 4th Ind
SUBJECT: Lake Pontchartrain, Louisiana & Vicinity, and Mississippi River-Gulf Outlet, Louisiana, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials:

DA, New Orleans District, Corps of Engineers, P.O. Box 60267, New Orleans, LA 70160 6 November 1980

TO: Division Engineer, Lower Mississippi Valley, ATTN: LMVED-TD

1. In response to comment 1.a. on the 3rd Indorsement, we propose to leave the elevation of the dam unchanged for either high level or barrier plans. In both cases the highest stage at the dam is the same and occurs on the IHNC side, 11.5 feet NGVD, during the design hurricane. For this reason the overtopping from the IHNC side of the dam is the most critical and is unaffected by choice of plans. Rock sizes determined for the barrier plan remain unchanged if the high level plan is adopted instead.

2. In response to comment 1.b., change the rock gradation of the type B and C stone to that listed in the table below. This stone size is used at several project locations to withstand a 4-foot wave. Thicknesses of riprap are changed to 4.5 feet for the Type B and 2 feet for the Type C riprap; thicknesses reflect placement under water. These changes are an interim action to reflect the need for stone large enough to withstand propeller wash. We will request that WES modify their ongoing Section 32 Propeller Wash Study to analyze the Seabrook Lock rock gradations. When the results of this model study are finalized, rock gradations listed below may be changed during preparation of plans and specifications.

Percent Lighter by Weight	Limits of Stone Weight in Pounds	
	Type B	Type C
100	800 - 2,000	80 - 200
50	400 - 600	40 - 60
15	125 - 480	13 - 48

3. In response to comment 1.c., concur.

4. In response to comment 1.d., the requested specifications and study results on capabilities of local concrete producers will be provided when available in subsequent indorsements to this chain of correspondence.

FOR THE DISTRICT ENGINEER:

FREDERIC M. CHATRY
Chief, Engineering Division

3 Incl
No Change

LMVED-TD (OCE 6 Dec 79) 1st Ind 23 JAN 80
SUBJECT: Lake Pontchartrain, LA and Vicinity, and Mississippi River-Gulf Outlet, LA, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

d. Para 6. Source 21 and also source 18 were tested in 1977 at which time a complete analysis of these sources was performed. Therefore, new Aggregate Data Sheets, including petrographic information, should replace those presented in the subject DM. This should also be done on any other source where more recent Aggregate Data Sheets are available which include a petrographic summary.

e. Para 7. Commercial concrete batch plants should be investigated as to their use in producing concrete for this project. In addition to the type of plant, suppliers of materials, and capacity of the plant, a logistics study should be made to determine if a combination of two or more of these producers of concrete can meet the rate of placement of 96 cy/hr for the largest block size discussed in Exhibit H.

f. Para 10. Additional information should be presented as to the basis for selection or rejection of the 94 sources listed in Exhibit C. We suggest that in Exhibit C, under the remarks column of Tables C2 and C3, a comment should be made after each source that is known to be closed, that it is "inactive." In addition to indicating the inactive sources in Exhibit C, a statement should be made in Section V that the owners of these sources might reopen the sources for use by the Contractor for this project and allow the Contractor to use his own equipment to produce the required concrete aggregate. Also, a statement should be made that the crushed stone from Three Rivers Rock Co., Source 74, is Alkali-Carbonate Reactive and will require special attention if used as a part of the aggregate for this project in accordance with Appendix C of EM 1110-2-2000 and WESCI letter, dated 8 Mar 78.

FOR THE DIVISION ENGINEER:

Robert E. Lang Jr.

R. H. RESTA
Chief, Engineering Division

CF:
DAEN-CWE-BB

LMVED-TD (OCE 6 Dec 79) 1st Ind
SUBJECT: Lake Pontchartrain, LA and Vicinity, and Mississippi River-Gulf Outlet, LA, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg, Miss. 39180 23 JAN 80

TO: District Engineer, New Orleans, ATTN: LMNED-MP

Basic letter is referred for necessary action subject to the following comments referenced to paragraphs of the letter:

a. Para 3. The fine and coarse aggregate gradation limits in either ASTM C33 or the Louisiana Standard Specifications for Road and Bridges would be acceptable for the grading of concrete aggregate for this project. The aggregate sources presented in para 5-5 of DM No. 12 will meet at least one of the above standard gradations. You should furnish the requested specifications for approval.

b. Para 4.

(1) Petrographic data should be presented for these specific three sources and also on any other natural fine and coarse aggregate source, crushed stone sources, and riprap sources where data are available. However, the petrographic report need only be summarized on the bottom of the Aggregate Data Sheet. If additional information is required, it can be obtained from the complete petrographic report that is on file at WES or within your District.

(2) We do not concur that additional testing of the aggregate is required to determine if low-alkali cement is required in addition to a petrographic examination. This additional testing is not considered necessary since past testing on natural coarse aggregate sources in Arkansas, Mississippi, and Louisiana indicates that nearly all sources have some amount of potentially reactive aggregate and at least 70 percent of fine aggregate sources also have potentially reactive aggregate. Also, by recommending the use of low-alkali cement, we are not increasing the cost of this project due to the fact that nearly all cement produced for use in Arkansas, Louisiana, and Mississippi meets low-alkali requirements.

c. Para 5. In regard to the second sentence of this comment, see comment in para b(2) above.

Incl 2

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF:
DAEN-CWE-BB

6 December 1979

SUBJECT: Lake Pontchartrain, LA and Vicinity, and Mississippi River-Gulf Outlet, LA, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

TO: Division Engineer, Lower Mississippi Valley
ATTN: LMVED-TD

1. Reference 1st Indorsement, LMVED-TD, 23 October 1979, on letter LMNED-MP, 28 August 1979, subject as above.

2. The following comments (discussed by telephone with Mr. U. T. Ammon on 26 November 1979) on the subject design memorandum, transmitted with above referenced correspondence, are furnished for appropriate action.

3. Paragraph 5-1. The grading requirements do not have to comply with guide specification as stated in this paragraph. EM 1110-2-2000, paragraphs 3-4d and 3-4e permit use of local grading when the aggregate grading does not conform to standard specifications. A review of the fine and course aggregate gradings for the sources listed in paragraph 5-5 show they do not meet standard specification requirements. A study of local grading practices should be accomplished and recommended specification limits should be submitted for approval by the Division Engineer.

4. Paragraphs 5-5a, d, and e and Exhibit C Sources 18, 23 and 49. Approval of these sources should be withheld until petrographic data are submitted. The use of low-alkali cement should be proven by mortar bars or petrographic results confirmed by either service record or quick chemical test (Refer to EM 1110-2-2000, Appendix B - paragraph 39).

5. Paragraph 5-5b and Exhibit C Source 20. The fineness modular values have been reversed. Also, EM 1110-2-2000, Appendix B, paragraph 3g, indicates that additional test data are required prior to recommending the use of low-alkali cement.

6. Paragraph 5-5c and Exhibit C Source 21. Test data for this source are required prior to approval.

7. Section VII. The use of commercial concrete supplies would be feasible for the project. The existing suppliers, type and capacity of batch plants, and their aggregate sources should be included.

DAEN-CWE-BB

6 December 1979

SUBJECT: Lake Pontchartrain, LA and Vicinity, and Mississippi River-Gulf Outlet, LA, Design Memorandum No. 12, Revised, "Seabrook Lock, Source of Construction Materials"

8. Paragraph 7-6. Any restrictions, on batch plant location adjacent to New Orleans Lakefront Airport, should be included.

9. Section VIII. Any restrictions on placing equipment adjacent to New Orleans Lakefront Airport should be included.

10. Exhibit C. This list of 94 aggregate sources and their test data is not adequately explained in this design memorandum; adequate explanations should be included.

FOR THE CHIEF OF ENGINEERS:

for Jack R. Thompson

LLOYD A. DUSCHA
Chief, Engineering Division
Directorate of Civil Works

SECTION VI - PROTECTION STONE INVESTIGATION

6-1. General. Sources within reasonable transportation distance of the project site were investigated as to availability and suitability of the material for use as riprap and are shown in Exhibit C. A quality history was developed for each source. Material and transportation costs were obtained.

6-2. Quantities Required. The following quantities are required for the project.

RIPRAP TYPE B	50,000 tons
RIPRAP TYPE C	21,800 tons
RIPRAP TYPE 1	29,200 tons
RIPRAP TYPE 2	10,800 tons
RIPRAP TYPE 3	20,100 tons
RIPRAP TYPE 4	7,100 tons
Derrick Stone	22,000 tons
Cover Stone	39,700 tons

6-3. Quality Requirements. The quality requirements for materials to be used for protection stone for this project will be in accordance with the guidelines established by ETL 1110-2-120, dated May 1971, and LMVSP-0S-018 dated March 1976. The gradation limits of the various size stone are given in Table 6-1. Stone for slope and scour protection shall be of a hard, durable quality that will not disintegrate under the elements nor be easily broken in handling. It shall be clean and free from earth and be roughly angular, not rounded, in shape. Stone must weigh at least 160 lb per cubic foot and have a maximum absorption of 2 percent, unless other tests and service records show satisfactory results. Scour protection for Seabrook Lock was designed as follows.

a. Cover stone for dam. Cover stone for the dam was designed assuming an 8-foot wave attack due to a hurricane critical to the south shore of Lake Pontchartrain with the lock, dam and other units of the hurricane barrier in place. These conditions governed the selection of stone protection for both sides of the dam. Cover stone for the dam resulting from use of these criteria will consist of random placement of two layers of the gradation listed in Table 6-1 to a total thickness of 6 feet. Gradations for the riprap underlayers are also listed in Table 6-1. Thicknesses selected are for placement in the wet: 4.0 ft for the first underlayer, Type 1 riprap; 1.5 ft for the second underlayer, Type 2 riprap.

b. Toe protection along outside of chamber walls. Stone protection along the outside toe of the chamber walls was sized to prevent displacement due to the underwater rolling effect produced by waves striking the vertical face of the wall. This stone protection will consist of a 36-inch layer of the Type B riprap and a 18-inch underlayer of Type C riprap with gradations as shown in Table 6-1. Thicknesses reflect placement underwater.

c. Bottom protection. Bottom protection landward and lakeward of the lock and outlet structure as well as within the lock chamber was designed

to resist forces resulting from the maximum anticipated velocities in these various areas. Stone protection in these areas will consist of the 36-inch layer of Type B riprap except landward and lakeward of the outlet structure. Protection in these two areas will consist of 4.5 feet of derrick stone. As a result of hydraulic model studies, performed by WES, derrick stone protection was determined to be required over the entire elevation - 16.8 upper approach area and downstream 75 feet beyond the stilling basin end sill. This is the erosion protection that will be used for the outlet structure approaches as reflected by Plates 8, 9, and 10. Underlayers will consist of 3.0 feet of Type 3 riprap in the first underlayer and 1.5 feet of Type 4 riprap in the second underlayer. Thicknesses reflect design for underwater placement. Gradations are given in Table 6-1.

d. Toe details. Toe details for the erosion protection at the Seabrook Lock Complex presented some unique problems particularly where the toes intersected the soft lacustrine excavation slopes. These toes as reflected by Plates 9 and 10 have been revised from those shown in Design Memorandum No. 1, General, to more effectively protect the main embankments from erosion. In general, most of these toes were designed to prevent the heavier protective stone from bearing directly on the softer adjacent existing soil materials and to prevent loss of the slope protection stone by undermining due to settlement or erosion. One area which deserves special mention here, is the termination of the outlet structure stilling basin stone protection. A pile of derrick stone in the form of an inverted toe will be provided in this location to provide a reservoir of material to supplant any downstream erosion and still maintain the integrity of the apron stone protection.

e. Filter design. The gradations for the protective stone have been selected so that the underlying finer material will not "pipe" or wash through the voids of the overlying coarser material. The criterion used required that the D85 size of the underlying finer material be greater than the one-fifth the D15 size of the overlying coarser material.

TABLE 6-1 - Gradations for Stone Protection

A. Cover stone and derrick stone (Uniform Stone)

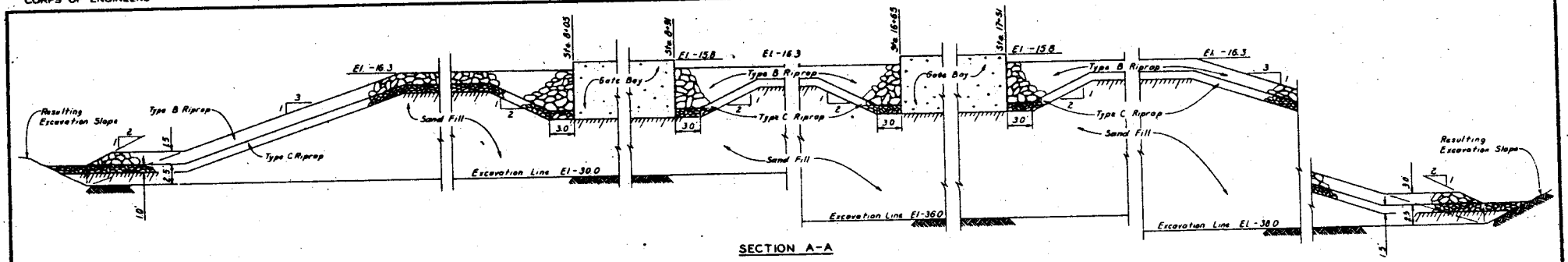
Percent Lighter by Weight	Limits of Stone Weight in Pounds	
	Cover Stone	Derrick Stone
100	3470	1640
25	2770	1310
0	2080	980

B. Graded Riprap

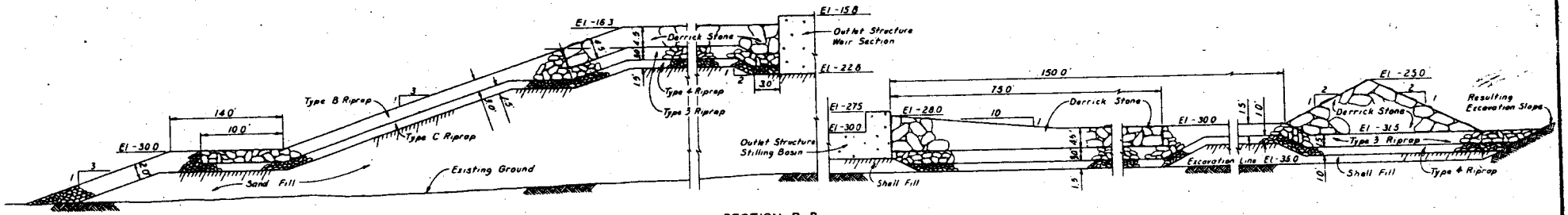
Percent Lighter by Weight	Limits of Stone Weight in Pounds					
	Type B	Type C	Type 1	Type 2	Type 3	Type 4
100	200-400	20-40	720-1000	36-50	320-470	16-23
50	90-180	9-18	280-470	14-23	130-220	6-11
15	20-40	2-4	60-310	3-15	30-150	1-7

CORPS OF ENGINEERS

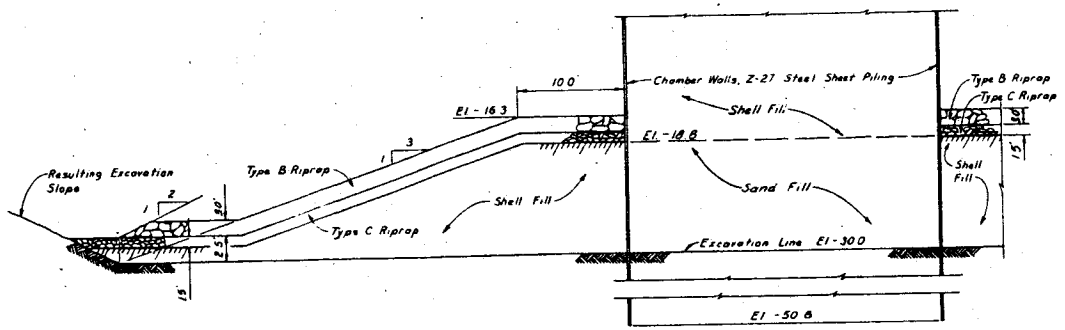
U. S. ARMY



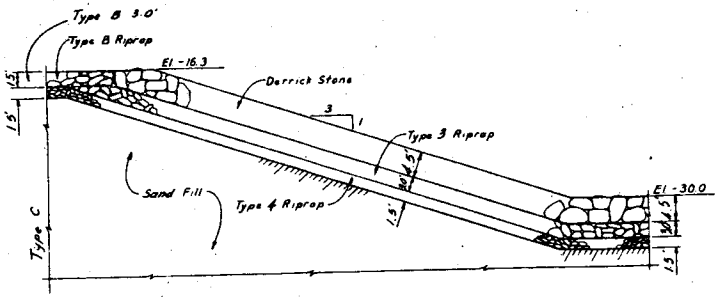
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Not to Scale

LAKE PONTCHARTRAIN, LA. AND VICINITY
AND MISSISSIPPI RIVER-GULF OUTLET, LA

DESIGN MEMORANDUM NO 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

PLAN MAP

EROSION PROTECTION SECTIONS
SECTIONS A-A, B-B, C-C, & D-D

SCALE AS SHOWN

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS, U.S. ARMY
NEW ORLEANS, LA.

STATE LA | COUNTY 90 | AGGREGATE DATA SHEET | TESTED BY USAEWES | DATE July 1977

LAB SAMPLE NO. NO-57 G-51 and S-36 | TYPE OF MATERIAL Natural Sand and Gravel

LOCATION: Between LA Hwy 16 and the railroad; approx 12 miles southeast of Franklinton and 8.4 miles NW of Sun, LA.

PRODUCER: Louisiana Industries, Inc., (Price Plant), P. O. Box 781, Sun, LA.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Alluvial deposits of the Bogue Chitto River (Holocene).

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.	*			100	
1 IN.				96	
¾ IN.				73	
½ IN.				32	
⅜ IN.				14	100
NO. 4				1	97
NO. 8					79
NO. 16					66
NO. 30					55
NO. 50					19
NO. 100					3
NO. 200					1
−200[a]					0.4
F.M.[b]					2.83

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR, S.S.D. (CRD-C 107, 108)				2.50	2.62
ABSORPTION, % (CRD-C 107, 108)				2.7	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	1
SOFT PARTICLES, % (CRD-C 130)				0.0	—
% LIGHTER THAN SP GR 2.40 (CRD-C 127) (2.00 Sand)				18.3	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				3.8	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				*	3.9
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING				*	
UNIT WT, LB/CU FT (CRD-C 106)					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.0
SPEC HEAT, BTU/LB DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____, _____ DAYS, _____

LINEAR THERMAL EXPANSION, MILLIONTHS DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			FAT	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DF E_{300}			
FINE AGG.	COARSE AGG:	DF E_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Gravel: The pale orange gravel was comprised mainly of chert. A large portion of the chert was porous. Quartz and sandstone comprised the remainder of the gravel sample.

Sand: Quartz is the most common constituent in the sand with lesser amounts of chert and sandstone.

Chalcedony was present in both the gravel and sand.

REMARKS:

* Insufficient material for testing.

ENG FORM 6011-R
1 MAR 1968

Incl 4

STATE: LA	INDEX NO.: 15	**AGGREGATE DATA SHEET**	TESTED BY: USAEWES
LAT.: 30	LONG: 90		DATE: June 1977

LAB SYMBOL NO.: No. 57, G-9, and S-5 TYPE OF MATERIAL: Pit run

LOCATION: On east side of US Hwy 51 approx. 2.15 miles north of intersection of LA Hwy 10 in Fluker, LA (Mitchell Plant # 29)

PRODUCER: Gifford-Hill Co., Inc. (Mitchell Plant # 29), P.O. Box 196, Fluker, LA

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING: Separated over the No. 4 sieve before testing.

GEOLOGICAL FORMATION AND AGE: Pleistocene Terrace (Prairie) Deposits and Hollocene Alluvium

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4 1½"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				92	
¾ IN.				74	
⅜ IN.				35	
No. 4				14	
NO. 8				1	100
NO. 16					89
NO. 30					76
NO. 50					55
NO. 100					11
NO. 200					1
-200[a]					0.5
F.M.[b]					2.69

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	#4-1½"		FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.54		2.63
ABSORPTION, % (CRD-C 107, 108):			2.3		0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	1
SOFT PARTICLES, % (CRD-C 130)			0.2		—
% LIGHTER THAN SP GR 2.40 (CRD-C 122)			8.6		0.0
% FLAT AND ELONGATED (CRD-C 119, 120)			0.5		--
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)			3.9		4.7
L.A. ABRASION LOSS, % (CRD-C 117, GRADING B)			20.5		--
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.2		0.3
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, MM/L:					
Rc, MM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The gravel was primarily dense chert with a substantial amount of porous chert. Saturated porous chert near the concrete surface can cause popouts when frozen. The sand was similar but with more quartz and less chert. Chalcedony particles were detected.

REMARKS:

TAN-1-1 (Pit run)

ENG FORM 1 MAR 1968 6011-R

STATE: La.	INDEX NO.: 10	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 90 W		DATE: June 1977

LAB SYMBOL NO.: No. 57 G-12, S-8 TYPE OF MATERIAL: Gravel, sand & pit run

LOCATION: On W. bank of Bogue Chitto River approx. 5 miles NW of Franklinton, La. Just E. of La. Hwy. 1066.

PRODUCER: Smith Sand & Gravel Co., Route 1, Box 348, Mt. Herman, La.

SAMPLED BY: Domes & Moore

TESTED FOR: New Orleans District

USED AT: Bayou Bienvenue Control Structure

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Holocene alluvial depcsits of the Bogue Chitto River.

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			89		
¾ IN.			59		
½ IN.			22		
⅜ IN.			12		
NO. 4			5		96
NO. 8					89
NO. 16					82
NO. 30					70
NO. 50					25
NO. 100					4
NO. 200					1
-200(a)					0.8
F.M.(b)					2.44

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.52		2.62
ABSORPTION, % (CRD-C 107, 108):			2.2		0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	——	——	——	——	2
SOFT PARTICLES, % (CRD-C 130)			0.0		——
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 sand)			12.2		0.1
% FLAT AND ELONGATED (CRD-C 119, 120)			3.7		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)			6.3		4.0
L.A. ABRASION LOSS, % (CRD-C 117,) GRADING B			18.5		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.3		1.7
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The gravel was primarily dense and porous chert and some quartz. The excessive amount of porous chert when saturated near the concrete surface can cause popouts when frozen. The sand was similar but with more quartz and less chert. Some chert particles were chalcedonic so both the sand and gravel should be considered potentially reactive with alkalies in the cement.

REMARKS

WAS-1-1 (Gravel)
WAS-1-2 (Sand)
WAS-4-1 (Pit run)

ENG FORM 1 MAR 1968 6011-R

STATE LA | DIST OR DIV | CODE 90 | AGGREGATE DATA SHEET | TESTED BY USAEWES | DATE July 1977

LAB SYMBOL NO NO-57 G-51 and S-36 | TYPE OF MATERIAL Natural Sand and Gravel

LOCATION: Between LA Hwy 16 and the railroad; approx 12 miles southeast of Franklinton and 8.4 miles NW of Sun, LA.

PRODUCER: Louisiana Industries, Inc. (Price Plant), P. O. Box 781, Sun, LA.

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Alluvial deposits of the Bogue Chitto River (Holocene).

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				73	
⅜ IN.				32	
#4				14	100
NO. 8				1	97
NO. 16					79
NO. 30					66
NO. 50					55
NO. 100					19
NO. 200					3
-200(a)					1
F.M.(b)					0.4
					2.83

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.50	2.62
ABSORPTION, % (CRD-C 107, 108):				2.7	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				18.3	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				3.8	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115) 137				*	3.9
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING A				*	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.0
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The coarse aggregate is a very pale orange gravel composed of mostly chert with some quartz and sandstone. The fine aggregate is a pale yellowish brown spherical quartz sand composed mainly of quartz with some chert and sandstone. Fifty-one to 58 examined was porous chert. Reactive chalcedony is present in some of the chert.

REMARKS:

ENG FORM 1 MAR 1968 6011-R

STATE: LA	INDEX NO.: 12	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG 90		DATE: November 1977

LAB SYMBOL NO.: No-57 G-40, S-26 TYPE OF MATERIAL: Natural

LOCATION: 0.1 mile East of U. S. 51, approx 1.0 mile North of the intersection with LA Hwy 10 in Arcola, LA

PRODUCER: Gifford-Hill Co. (Plant No. 33) P. O. Box 263, Roseland, LA 70486

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Tangipahoa River Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-1/2"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				92	
¾ IN.				68	
½ IN.				35	
⅜ IN.				16	
NO. 4				1	100
NO. 8					94
NO. 16					79
NO. 30					64
NO. 50					16
NO. 100					1
NO. 200					
-200(a)					0.3
F.M.(b)					2.46

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-1/2"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)				2.56	2.63
ABSORPTION, % (CRD-C 107, 108):				1.2	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(2.00	Sand)		5.3	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				3.1	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				1.9	4.3
L.A. ABRASION LOSS, % (CRD-C 117, GRADING A				24.4	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.0
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F&T HW-CD HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

The gravel was primarily dense and porous chert and vuggy chert. Saturated porous chert near the concrete surface can cause popouts when frozen. The sand was similar but with more quartz and less chert. Some chert particles were chalcedonic so both the sand and gravel should be considered potentially reactive with alkalies in the cement.

REMARKS:

ENG FORM 1 MAR 1966 6011-R

STATE MS	DIST & NO. 7	AGGREGATE DATA SHEET	TESTED BY USAEWES
LAT 31	LONG 89		DATE July 1977

LAB SYMBOL NO. No. 57, G-24, S-18 TYPE OF MATERIAL Natural

LOCATION Plant located 0.3 mile West of MS Hwy 43 approx. 9 miles South of intersection with Hwy 13, Southeast of Columbia, MS (Ford Plant)

PRODUCER Blain Sand & Gravel Co., Box 1001, Columbia, MS

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				97	
¾ IN.				81	
½ IN.				50	
⅜ IN.				32	
NO. 4				1	100
NO. 8					86
NO. 16					79
NO. 30					70
NO. 50					14
NO. 100					1
NO. 200					
-200[a]					0.3
F.M.[b]					2.51

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)				2.49	2.63
ABSORPTION, % (CRD-C 107, 108)				2.8	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 sand)				19.0	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				1.4	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				*	3.0
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING B				20.3	
UNIT WT, LB/CU FT (CRD-C 106)					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.2
SPEC HEAT, BTU/LB DEG F (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128) Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

The gravel was primarily porous chert with some vuggy and porous chert, and some quartz. Saturated porous chert near the concrete surface can pop out when frozen. The sand was similar but with more quartz and less chert. Some chert particles were chalcedonic so both the sand and gravel should be considered potentially reactive with alkalies in the cement.

REMARKS:

MAR-1-1

* Insufficient material for test.

ENG FORM 1 MAR 1966 6011-R

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT A

TYPICAL CONCRETE MIXTURES

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT A

TYPICAL CONCRETE MIXTURES

General Index

1. General. These typical concrete mixtures were furnished by the Waterways Experiment Station. The first mixture was the mixture designed for the concrete temperature control study. The other mixtures were taken from mixtures designed for past projects or research at the Waterways Experiment Station using Type II cement.

2. Table of Contents

JOB NAME		CONCRETE MIXTURE PROPORTIONS (WORK SHEET) (CRD-C 3)	DATE 6/9/76
JOB. NO.	MIXTURE SER. NO.		INITIALS

PORTLAND CEMENT TYPE II SER. NO. ADDITION RC-705 BRAND AND MILL Lone Star	POZZOLAN SER. NO. TYPE None SOURCE	A. E. ADMIX: SER. NO. N.V.R. NAME Lab stock AMOUNT % ML
OTHER CEMENT SER. NO. BRAND AND MILL None	CHEMICAL ADMIX SER. NO. % ML NAME None	

FINE AGGREGATE	COARSE AGGREGATE	
TYPE Natural SER. NO. Pollock Pit SOURCE Louisiana Industries, Pollock, LA	TYPE Natural Louisiana Industries SOURCE Pollock, LA	SER. NO. SIZE 1-1/2 in.

MATERIALS

MATERIAL	SIZE RANGE	BULK SPECIFIC GRAVITY	UNIT WEIGHT (SOLID), LB/CU FT	ABSORPTION, PERCENT	TOTAL MOISTURE CONTENT, PERCENT	NET MOISTURE CONTENT, PERCENT
CEMENT		3.15	196.56			
F. AGGREGATE	#4 - 200	2.62	163.49	0.6		+1.5
C. AGGREGATE (A)	#4-1-1/2 in.	2.54	158.50	2.0		-1.1
C. AGGREGATE (B)						
C. AGGREGATE (C)						
C. AGGREGATE (D)						
POZZ/OTHER CEMENT						

PROPORTIONS

MATERIAL	CALCULATED BATCH DATA (1 CU YD) SOLID VOLUME CU FT/BATCH	SAT. SURF DRY BATCH WT, LB	FACTOR	ACTUAL BATCH DATA CU FT SAT. SURF DRY BATCH WT, LB	WATER CORRECTION, LB	ACTUAL BATCH WT.
CEMENT	2.289	450.0 (13)				
F. AGGREGATE	6.914	1130.4				
C. AGGREGATE (A)	12.841	2035.3				
C. AGGREGATE (B)						
C. AGGREGATE (C)	(11)					
C. AGGREGATE (D)	(10)					
POZZ/OTHER CEMENT						
WATER	3.606	225.0 (3)		(1)		
AIR	1.350					
TOTAL AIR FREE	(5)	(4)		(2)		
TOTAL YIELD	27,000 (14)					

MIXTURE DATA

SLUMP 2-3/4 IN. REMOLD EFF DROPS TH UW LB/CU FT ACT UW LB/CU FT	AIR CONTENT (D) % AIR CONTENT (E) % AIR CONTENT (F) 5.0 % BLEEDING %	MIXING WATER F AMBIENT F CONCRETE F S/A 35 PERCENT VOL.
TH CF LB/CU YD ACT CF 450.0 LB/CU YD W/C 0.50 WT		

WES FORM NO. 476
REV MAR 1972

(OVER)

JOB NAME		CONCRETE MIXTURE PROPORTIONS (WORK SHEET) (CRD-C 3)	DATE 6/9/76
JOB. NO.	MIXTURE SER. NO.		INITIALS

PORTLAND CEMENT TYPE II SER. NO. ADDITION RC-705 BRAND AND MILL Lone Star	POZZOLAN SER. NO. TYPE Fly Ash SOURCE	A. E. ADMIX: SER. NO. N.V.R. NAME Lab stock AMOUNT % ML
OTHER CEMENT SER. NO. BRAND AND MILL None	CHEMICAL ADMIX SER. NO. % ML NAME None	

FINE AGGREGATE	COARSE AGGREGATE	
TYPE Natural SER. NO. Pollock Pit SOURCE Louisiana Industries, Pollock, LA	TYPE Natural Louisiana Industries SOURCE Pollock, LA	SER. NO. SIZE 1-1/2 in.

MATERIALS

MATERIAL	SIZE RANGE	BULK SPECIFIC GRAVITY	UNIT WEIGHT (SOLID), LB/CU FT	ABSORPTION, PERCENT	TOTAL MOISTURE CONTENT, PERCENT	NET MOISTURE CONTENT, PERCENT
CEMENT		3.15	196.56			
30% FA		2.50	156.00			
F. AGGREGATE	#4 - 200	2.62	163.49	0.6		+1.5
C. AGGREGATE (A)	#4-1-1/2 in.	2.54	158.50	2.0		-1.1
C. AGGREGATE (B)						
C. AGGREGATE (C)						
C. AGGREGATE (D)						
POZZ/OTHER CEMENT						

PROPORTIONS

MATERIAL	CALCULATED BATCH DATA (1 CU YD) SOLID VOLUME CU FT/BATCH	SAT. SURF DRY BATCH WT, LB	FACTOR	ACTUAL BATCH DATA CU FT SAT. SURF DRY BATCH WT, LB	WATER CORRECTION, LB	ACTUAL BATCH WT
CEMENT	1.602	314.9 (13)				
30% FA	0.687	107.2				
F. AGGREGATE	6.914	1130.4				
C. AGGREGATE (A)	12.841	2035.3				
C. AGGREGATE (B)						
C. AGGREGATE (C)	(11)					
C. AGGREGATE (D)	(10)					
POZZ/OTHER CEMENT						
WATER	3.606	225.0 (3)		(1)		
AIR	1.350					
TOTAL AIR FREE	(5)	(4)		(2)		
TOTAL YIELD	27.000 (14)					

MIXTURE DATA

SLUMP 2-3/4 IN. REMOLD EFF DROPS TH UW LB/CU FT ACT UW LB/CU FT	AIR CONTENT (D) % AIR CONTENT (E) % AIR CONTENT (F) 5.0 % BLEEDING %	MIXING WATER F AMBIENT F CONCRETE F S/A 35 PERCENT VOL.	TH CF LB/CU YD ACT CF 422.1 LB/CU YD W/C 0.53 WT

WES FORM NO. 476
REV MAR 1972

(OVER)

JOB NAME		CONCRETE MIXTURE PROPORTIONS (WORK SHEET) (CRD-C 3)	DATE 6/9/76
JOB. NO.	MIXTURE SER. NO.		INITIALS

PORTLAND CEMENT TYPE II SER. NO. ADDITION RC-705 BRAND AND MILL Lone Star	POZZOLAN SER. NO. None TYPE SOURCE	A. E. ADMIX: SER. NO. N.V.R. NAME Lab stock AMOUNT % ML
OTHER CEMENT SER. NO. None BRAND AND MILL	CHEMICAL ADMIX SER. NO. None NAME	% ML

FINE AGGREGATE	COARSE AGGREGATE	
TYPE Natural SER. NO. Pollock Pit SOURCE Louisiana Industries, Pollock, LA	TYPE Natural #4-1-1/2 in. Limestone 1-1/2-3 in. SOURCE	SER. NO. SIZE 3 in.

MATERIALS

MATERIAL	SIZE RANGE	BULK SPECIFIC GRAVITY	UNIT WEIGHT (SOLID), LB/CU FT	ABSORPTION, PERCENT	TOTAL MOISTURE CONTENT, PERCENT	NET MOISTURE CONTENT, PERCENT
CEMENT		3.15	196.56			
F. AGGREGATE	#4-200	2.62	163.49	0.6		+1.5
C. AGGREGATE (A)	#4-1-1/2 in.	2.54	158.50	2.0		-1.1
C. AGGREGATE (B)	1-1/2-3 in.	2.68	167.23	0.7		-0.5
C. AGGREGATE (C)						
C. AGGREGATE (D)						
POZZ/OTHER CEMENT						

PROPORTIONS

MATERIAL		CALCULATED BATCH DATA (1 CU YD) SOLID VOLUME CU FT/BATCH	SAT. SURF DRY BATCH WT, LB	FACTOR	ACTUAL BATCH DATA CU FT SAT. SURF DRY BATCH WT, LB	WATER CORRECTION, LB	ACTUAL BATCH WT
CEMENT		1.960	385.3 (13)				
F. AGGREGATE		5.823	922.9				
C. AGGREGATE (A)		7.487	1186.7				
C. AGGREGATE (B)		7.488	1252.2				
C. AGGREGATE (C)		(11)					
C. AGGREGATE (D)		(10)					
POZZ/OTHER CEMENT							
WATER		3.175	198.09 (3)		(1)		
AIR		1.067					
TOTAL	AIR FREE	(5)	(4)		(2)		
	YIELD	27.000 (14)					

MIXTURE DATA

SLUMP 2-3/4 IN. REMOLD EFF ____ DROPS TH UW ____ LB/CU FT ACT UW ____ LB/CU FT	AIR CONTENT (D) ____ % AIR CONTENT (E) ____ % AIR CONTENT (F) 5.0 % BLEEDING ____ %	MIXING WATER ____ F AMBIENT ____ F CONCRETE ____ F S/A 28 PERCENT VOL.	TH CF ____ LB/CU YD ACT CF 385.3 LB/CU YD W/C 0.52 WT

WES FORM NO. 476
REV MAR 1972

(OVER)

JOB NAME		CONCRETE MIXTURE PROPORTIONS (WORK SHEET) (CRD-C 3)	DATE 6/9/76
JOB. NO.	MIXTURE SER. NO.		INITIALS

PORTLAND CEMENT TYPE II SER. NO. ADDITION RC-705 BRAND AND MILL Lone Star	POZZOLAN SER. NO. TYPE Fly Ash SOURCE	A. E. ADMIX: SER. NO. N.V.R. NAME Lab stock AMOUNT % ML
OTHER CEMENT SER. NO. BRAND AND MILL None	CHEMICAL ADMIX SER. NO. % ML NAME None	

FINE AGGREGATE	COARSE AGGREGATE	
TYPE Natural SER. NO. Pollock Pit SOURCE Louisiana Industries, Pollock, LA	TYPE Natural #4-1-1/2 in. Limestone 1-1/2-3 in. SOURCE	SER. NO. SIZE 3 in.

MATERIALS

MATERIAL	SIZE RANGE	BULK SPECIFIC GRAVITY	UNIT WEIGHT (SOLID), LB/CU FT	ABSORPTION, PERCENT	TOTAL MOISTURE CONTENT, PERCENT	NET MOISTURE CONTENT, PERCENT
CEMENT		3.15	196.56			
25% FA		2.50	156.00			
F. AGGREGATE		2.54	158.50			
C. AGGREGATE (A)		2.68	167.23			
C. AGGREGATE (B)						
C. AGGREGATE (C)						
C. AGGREGATE (D)						
POZZ/OTHER CEMENT						

PROPORTIONS

MATERIAL	CALCULATED BATCH DATA (1 CU YD) SOLID VOLUME CU FT/BATCH	SAT. SURF DRY BATCH WT, LB	FACTOR	ACTUAL BATCH DATA CU FT SAT. SURF DRY BATCH WT, LB	WATER CORRECTION, LB	ACTUAL BATCH WT
CEMENT	1.470	288.9 (13)				
25% FA	0.490	79.5				
F. AGGREGATE	5.823	922.9				
C. AGGREGATE (A)	7.487	1186.7				
C. AGGREGATE (B)	7.488	1252.2				
C. AGGREGATE (C)	(11)					
C. AGGREGATE (D)	(10)					
POZZ/OTHER CEMENT						
WATER	3.175	198.09 (3)		(1)		
AIR	1.067					
TOTAL AIR FREE	(5)	(4)		(2)		
TOTAL YIELD	27,000 (14)					

MIXTURE DATA

SLUMP 2-3/4 IN. REMOLD EFF ____ DROPS TH UW ____ LB/CU FT ACT UW ____ LB/CU FT	AIR CONTENT (D) ____ % AIR CONTENT (E) ____ % AIR CONTENT (F) 5.0 % BLEEDING ____ %	MIXING WATER ____ F AMBIENT ____ F CONCRETE ____ F S/A 28 PERCENT VOL.
TH CF ____ LB/CU YD ACT CF 368.4 LB/CU YD W/C 0.54 WT		

WES FORM NO. 476
REV MAR 1972

(OVER)

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT B

FLY ASH AND 3-IN. MAXIMUM SIZE AGGREGATE JUSTIFICATION

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT B

FLY ASH AND COST JUSTIFICATION

General Index

1. General. The use of fly ash is based on economic justification. The cost study shows savings that may be gained by the use of fly ash in concrete mixtures depending upon cost of handling.

2. Table of Contents

COST DATA

Unit Cost

The calculations on the following pages were based on the unit prices shown below:

	Seabrook Lock
Portland cement, Ideal Basic Industries	$2.47/cwt
Fine aggregate, Louisiana Industries	0.26/cwt
Coarse aggregate (A), Louisiana Industries	0.33/cwt
Coarse aggregate (B), Reed Crushed Stone	0.48/cwt
Fly ash, Walter N. Handy Co.	1.18/cwt
Portland-pozzolan, Type IP, Dundee Cement	2.64/cwt

All costs include cost of delivery to the site.

CONCRETE MIXES

Portland Cement II
3000 - 3500 psi

1-1/2-in. Aggregate, without Fly Ash		Seabrook Lock
Portland cement	450 lb @ $2.47/cwt	$11.12
Fine aggregate	1130 lb @ $0.26/cwt	2.94
Coarse aggregate	2035 lb @ $0.33/cwt	6.72
Plant and Labor		6.00
		$26.78

1-1/2-in. Aggregate, with Fly Ash		
Cement (70% by vol)	315 lb @ $2.47/cwt	$ 7.78
Fly ash (30% by vol)	107 lb @ $1.18/cwt	1.26
Fine aggregate	1130 lb @ $0.26/cwt	2.94
Coarse aggregate	2035 lb @ $0.33/cwt	6.72
Plant and labor		6.00
Additional handling cost of fly ash		1.00
		$25.70

Cost of mix without fly ash, cu yd	$26.78
Cost of mix with fly ash, cu yd	25.70
Savings with fly ash, cu yd	$ 1.08
Cost of mix with Type II portland cement, cu yd	$26.78
Cost of mix with portland pozzolan cement, cu yd (436 lb @ $2.64/cwt)	27.17
Additional cost with portland pozzolan cement, cu yd	$ 0.39

Seabrook Lock

3-in. Aggregate, without Fly Ash			1-1/2-in. Aggregate
Portland cement	385 lb @ $2.47/cwt =	$ 9.51	
Fine aggregate	923 lb @ 0.26/cwt =	2.40	
Coarse aggregate (A)	1188 lb @ 0.33/cwt =	3.92	
Coarse aggregate (B)	1252 lb @ 0.48/cwt =	6.01	
Plant and labor		6.00	
		$27.84	$26.78

3-in. Aggregate, with Fly Ash			1-1/2-in. Aggregate
Cement (75% by vol)	289 lb @ $2.47/cwt =	$ 7.14	
Fly ash (25% by vol)	80 lb @ 1.18/cwt =	0.94	
Fine aggregate	923 lb @ 0.26/cwt =	2.40	
Coarse aggregate (A)	1188 lb @ 0.33/cwt =	3.92	
Coarse aggregate (B)	1252 lb @ 0.48/cwt =	6.01	
Plant and labor		6.00	
Additional handling cost of fly ash		1.00	
		$27.41	$25.70

Cost of cu yd batch, without fly ash	$27.84
Cost of cu yd batch with fly ash	27.41
Savings per cu yd with fly ash	$ 0.43
Cost with portland cement, cu yd	$27.84
Cost with portland pozzolan cement, cu yd (373 lb @ $2.64/cwt)	28.18
Additional cost with portland-pozzolan cement	$ 0.34

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT C

CONCRETE AGGREGATES AND RIPRAP

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT C

SUMMARY OF AGGREGATE AND STONE TEST RESULTS

General Index

1. General. Exhibit C contains the data of the sand and gravel sources and that of the stone sources for Seabrook Lock. It also summarizes the acceptance test data from all the test data sheets that are compiled for each source.

2. Table of Contents

Table of Contents (Continued)

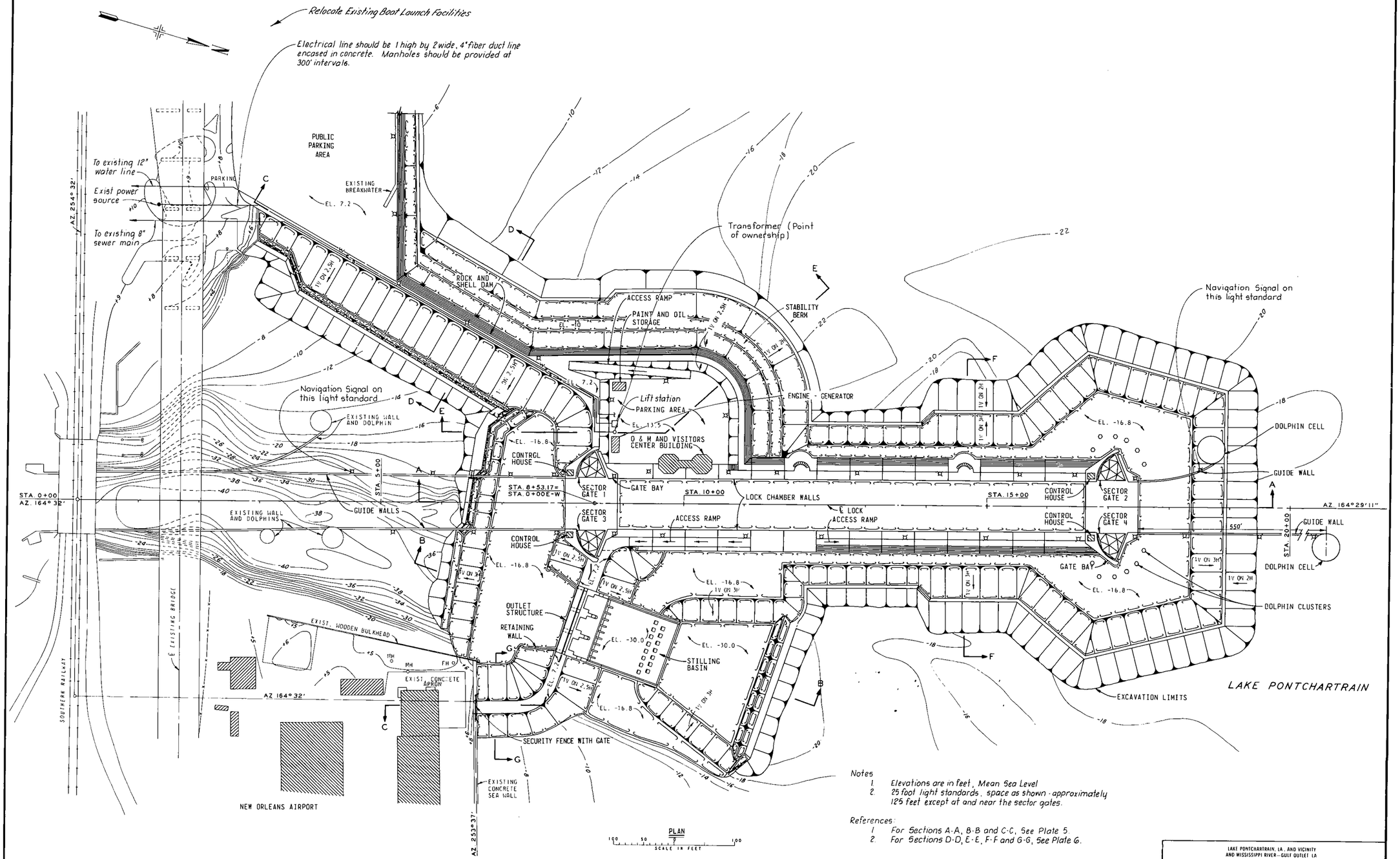
Source No.	Source, Location
1	Radcliff Sand Co., Mobile, AL
2	Radcliff Sand & Gravel Co, Mobile, AL
3	Leggett Sand & Gravel Co., Hansboro, MS
4	Kivett & Reel, Inc., Sun, LA
5	Canal Sand & Gravel Co., Sun, LA
6	Canal Sand & Gravel Co., Bush, LA
7	Sloat Dredging Co., Pearl River, LA
8	Traxler Gravel Co., Gulfport, MS
9	St. Tammany Sand & Gravel Co., Bush, LA
10	Jahncke Services, Inc., Bush, LA
11	Dixie Sand & Gravel Co., Franklinton, LA
12	Carion, Inc., Nicholson, MS
13	Unknown Contractor, Bonnet Carre Spillway
14	Jahncke Services, Inc., Bluff Creek, LA
15	Gulf Sand & Gravel Co., Amite, LA
16	Comite Sand & Gravel Co., Tangipahoa, LA
17	Baton Rouge Sand Co., Watson, LA
18	Gifford-Hill, Inc., Fluker, LA
19	Dixie Sand & Gravel Co., Sun, LA
20	Smith Sand & Gravel Co., Franklinton, LA
21	Louisiana Industries, Price, LA
22	B & B Gravel Co., Bluff Creek, LA
23	Gifford-Hill, Inc., Arcola, LA

Table of Contents (Continued)

Source No.	Source, Location
24	A-1 Sand & Gravel Co., Magnolia, LA
25	Red Stick Sand & Gravel Co., Baywood, LA
26	Red Stick Sand & Gravel Co., Baywood, LA
27	Red Stick Sand & Gravel Co., Baywood, LA
28	Lambert Gravel Co., Bains, LA
29	Holloway Sand & Gravel Co., Jackson, LA
30	Mt. Vernon Gravel Co., St. Francisville, LA
31	Girod Gravel Co., Woodville, LA
32	Big River Industries, Erwinville, LA
33	Feliciana Sand & Gravel Co., Jackson, LA
34	New Orleans District Engineers, Miss. River Mile 234
35	Martin Gravel Co., Weyanoke, LA
36	River Materials, Miss. River Mile 249
37	Big River Industries, Erwinville, LA
38	Great River Corp., Miss. River Mile 293
39	Feliciana Sand & Gravel Co., St. Francisville, LA
40	Radcliff Gravel Co., Richton, MS
41	Richton Sand & Gravel Co., Richton, MS
42	Underwood Sand & Gravel Co., Beaumont, MS
43	American Sand & Gravel Co., Hattiesburg, MS
44	American Sand & Gravel Co., Hattiesburg, MS
45	American Sand & Gravel Co., Hattiesburg, MS
46	Underwood Builders, Beaumont, MS

Table of Contents (Continued)

Table of Contents (Continued)



Notes

1. Elevations are in feet, Mean Sea Level
2. 25 foot light standards, space as shown approximately 125 feet except at and near the sector gates.

References:

1. For Sections A-A, B-B and C-C, See Plate 5.
2. For Sections D-D, E-E, F-F and G-G, See Plate 6.

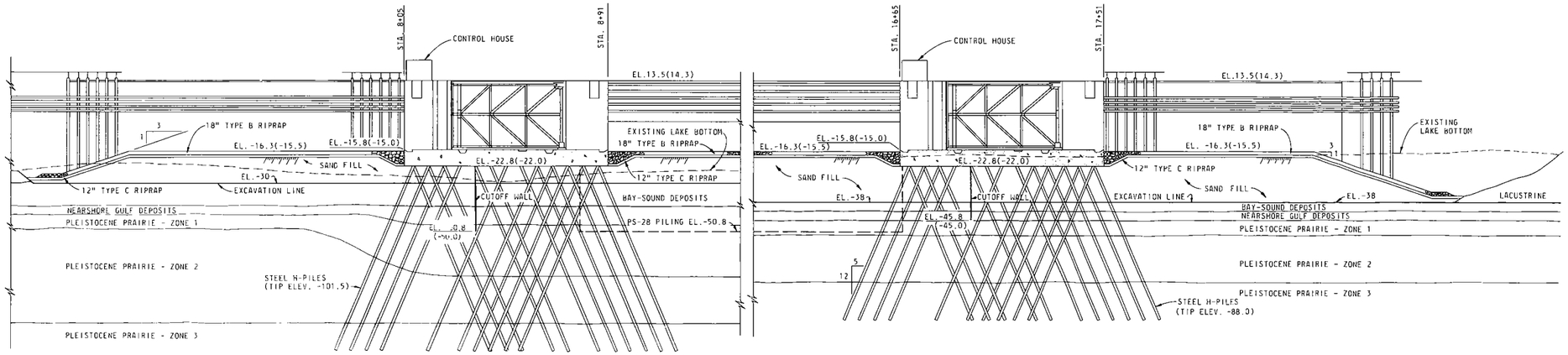
LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

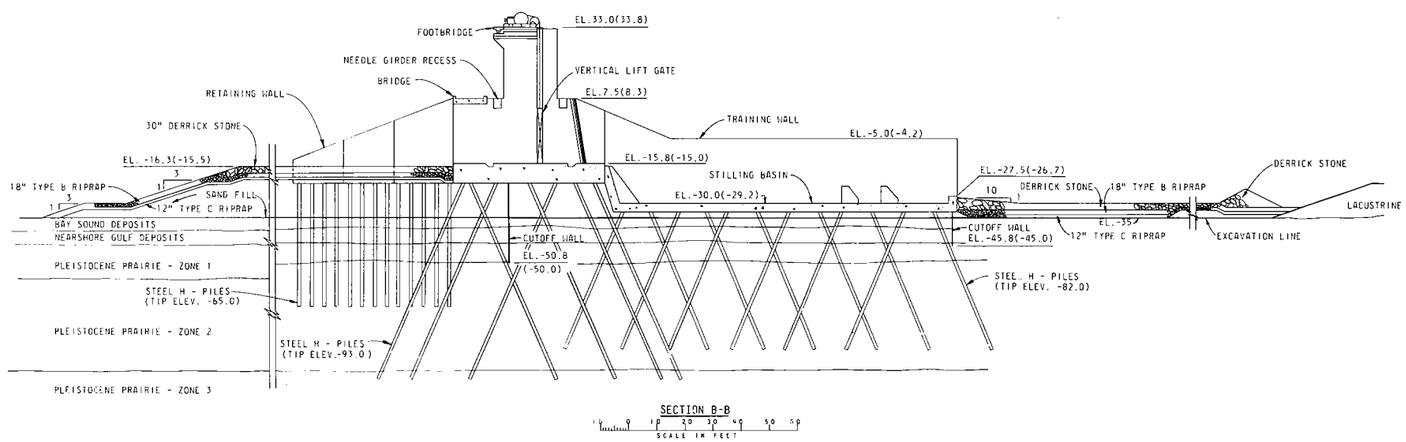
PLAN MAP
PLAN OF LOCK COMPLEX
SCALE AS SHOWN

U.S. ARMY ENGINEER DISTRICT ROCK ISLAND CORPS OF ENGINEERS U.S. ARMY ROCK ISLAND, ILL.	U.S. ARMY ENGINEER DISTRICT NEW ORLEANS CORPS OF ENGINEERS U.S. ARMY NEW ORLEANS LA.
DATE OCT 1978	FILE NO H-2-23684



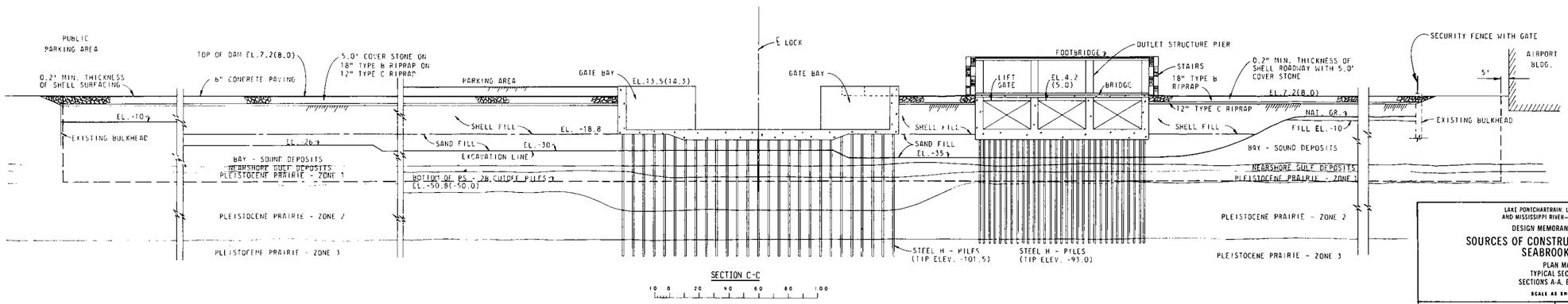
SECTION A-A

SCALE IN FEET



SECTION B-B

SCALE IN FEET



SECTION C-C

SCALE IN FEET

NOTES:

1. ELEVATIONS ARE IN FEET, MEAN SEA LEVEL EXCEPT THOSE IN PARENTHESIS WHICH ARE IN FEET, MEAN LOW GULF. MLG IS 0.78 FEET BELOW MLS.

REFERENCES:

1. FOR LOCATION OF SECTIONS, SEE PLATE 4.

LAKE PONTCHARTRAIN, LA. AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET, LA

DESIGN MEMORANDUM NO 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

PLAN MAP
TYPICAL SECTIONS
SECTIONS A-A, B-B, & C-C

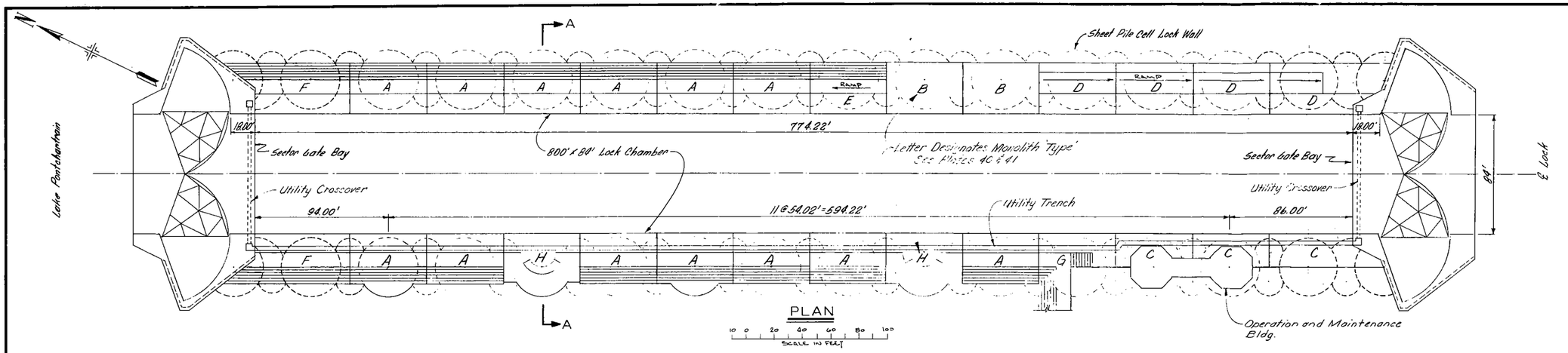
SCALE AS KNOWN

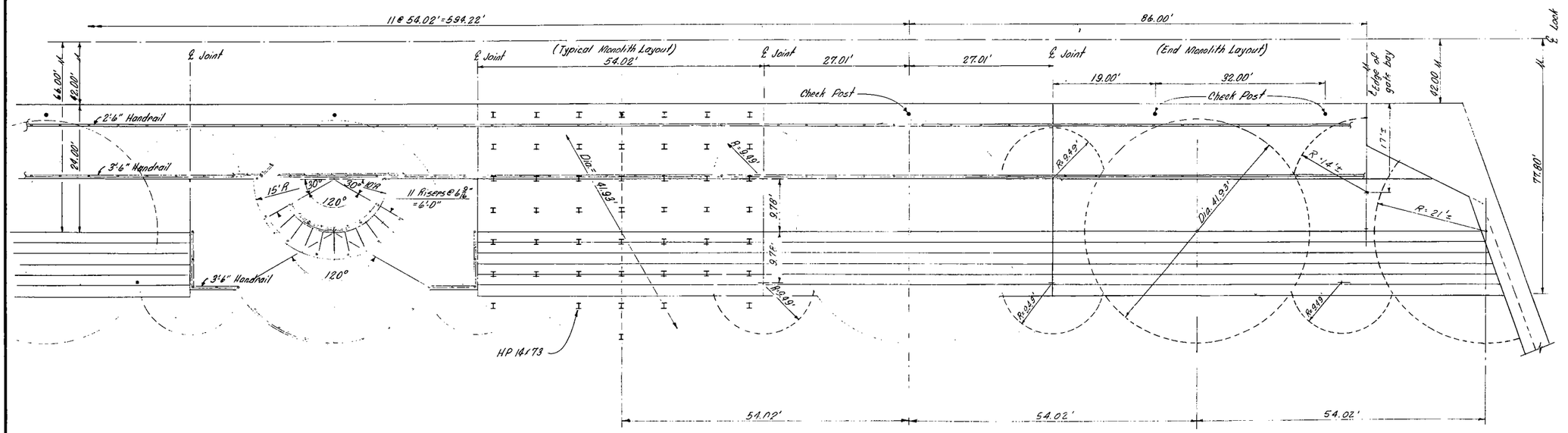
U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS, U.S. ARMY ROCK ISLAND, ILL	U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS, U.S. ARMY NEW ORLEANS, LA
DATE OCT 1978	FILE NO H-2-23684

PLATE NO. 3

CORPS OF ENGINEERS

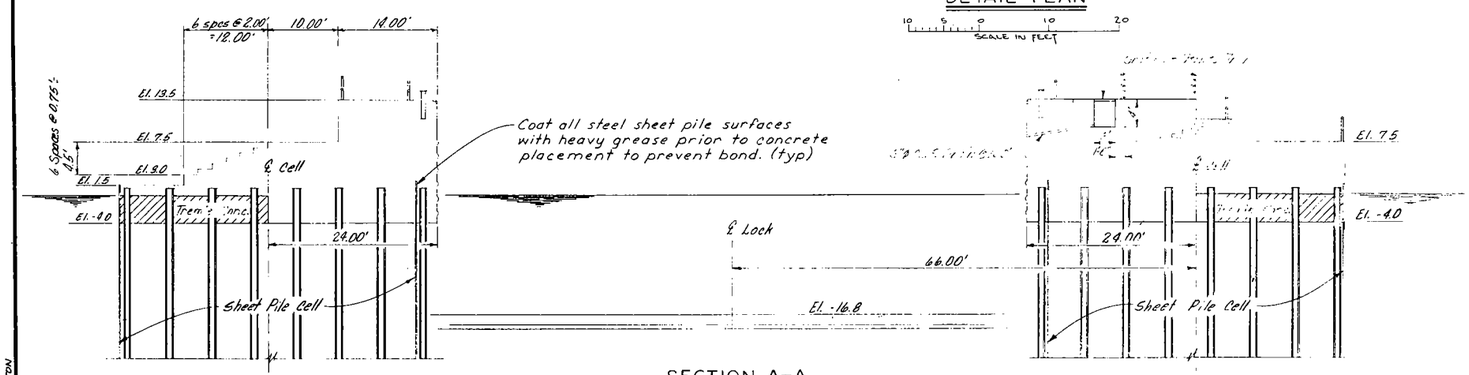
U. S. ARMY





DETAIL PLAN

10 5 0 10 20
SCALE IN FEET



SECTION A-A

10 5 0 10 20
SCALE IN FEET

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET, LA.

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

PLAN MAP
LOCK CHAMBER WALLS
PLAN AND SECTIONS

SCALE AS SHOWN

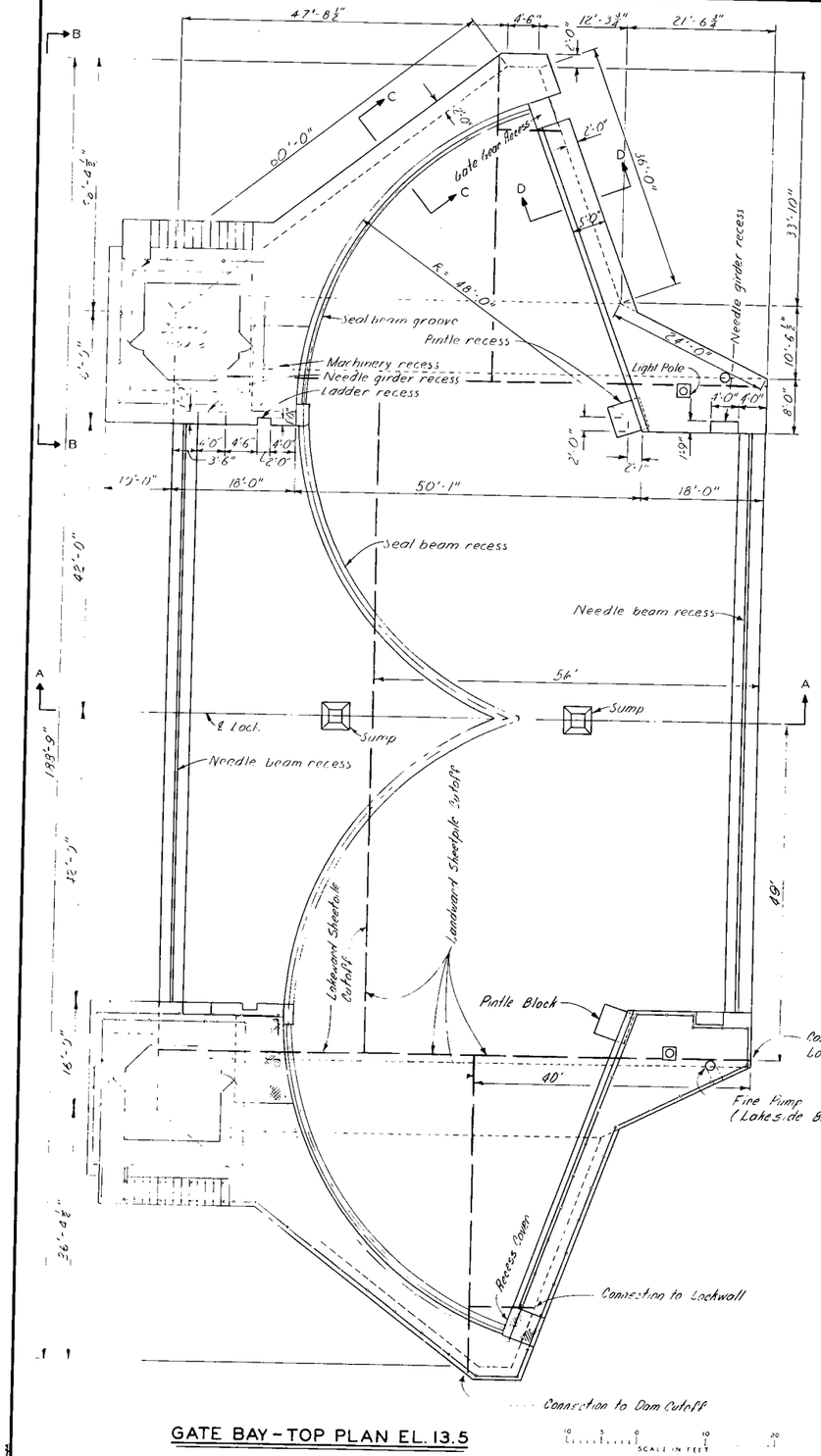
U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS, U.S. ARMY ROCK ISLAND, ILL.	U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS, U.S. ARMY NEW ORLEANS, LA.
DATE OCT 1978	FILE NO. H-2-23884

V.W. ASHTON

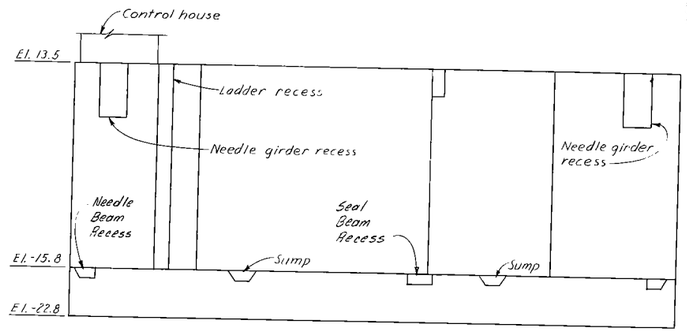
PLATE NO. 4

CORPS OF ENGINEERS

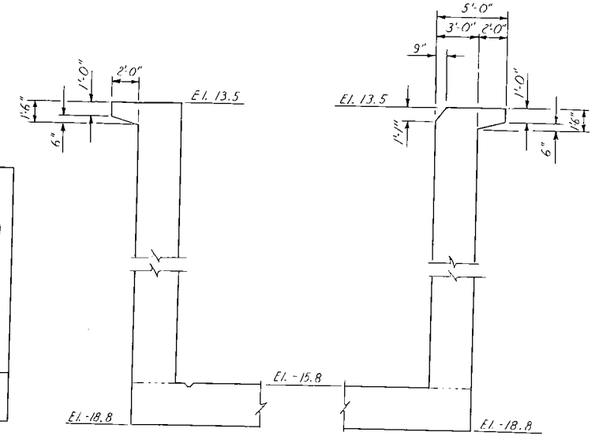
U. S. ARMY



GATE BAY - TOP PLAN EL. 13.5



SECTION A-A



SECTION C-C

SCALE IN FEET

SECTION D-D

SCALE IN FEET

SECTION B-B

LAKE PONTCHARTRAIN, LA. AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

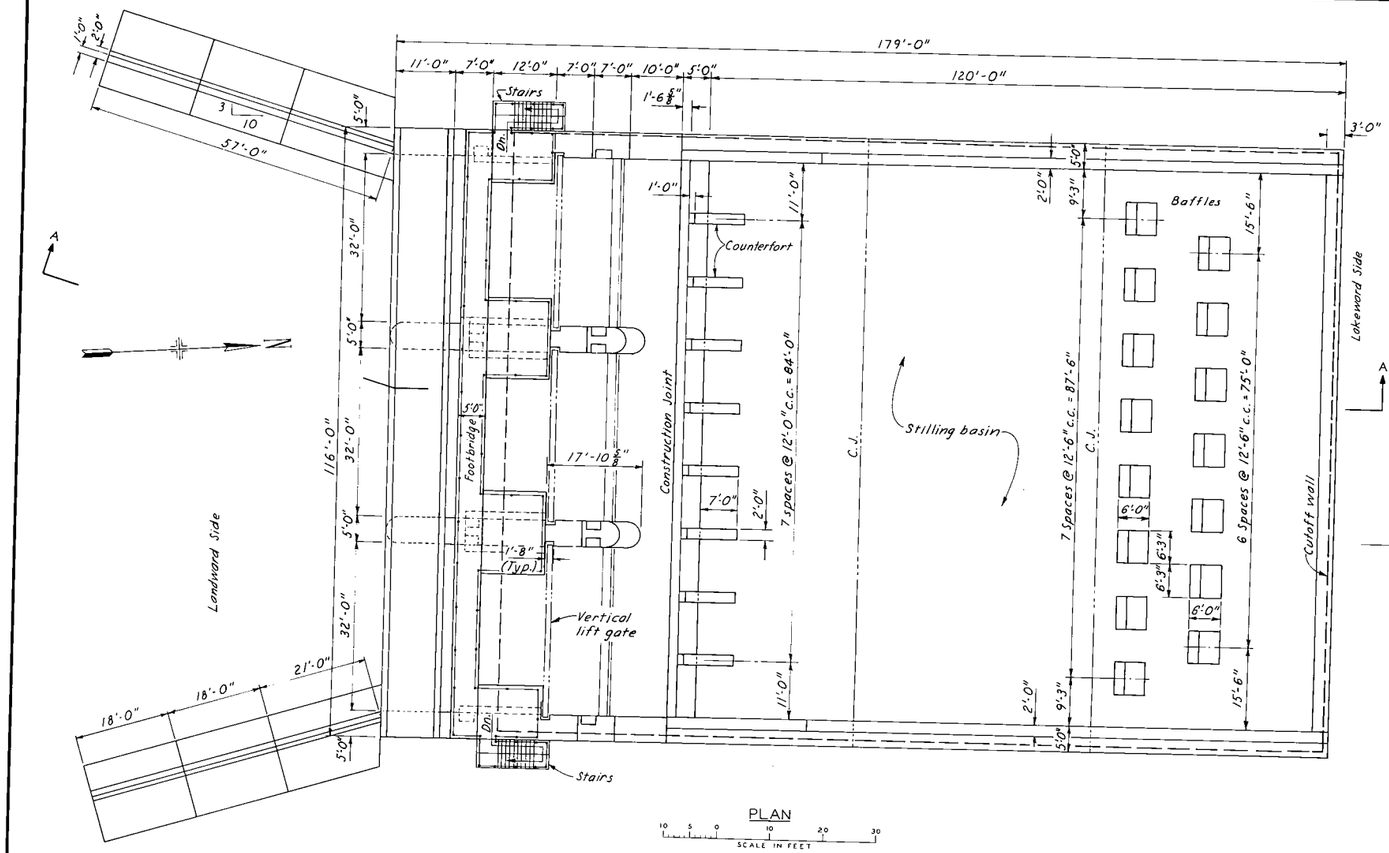
PLAN MAP
LOCK GATE BAYS
PLAN AND SECTIONS
SCALE AS SHOWN

U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS U.S. ARMY ROCK ISLAND, ILL.	U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS U.S. ARMY NEW ORLEANS, LA.
DATE: OCT 1978	FILE NO. H-2-23684

PLATE NO. 5

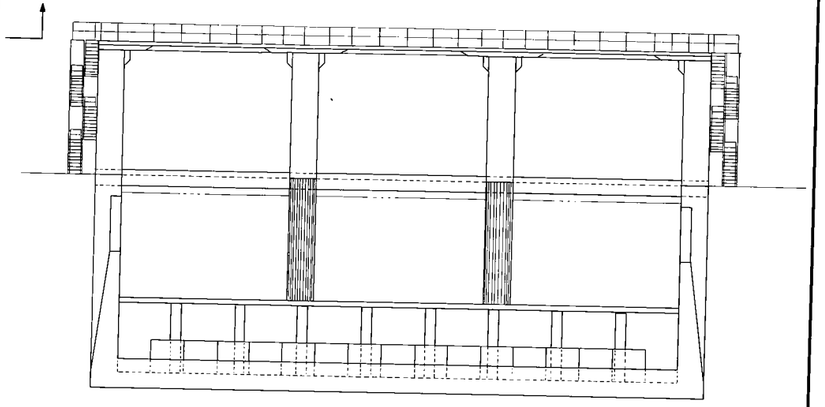
CORPS OF ENGINEERS

U. S. ARMY

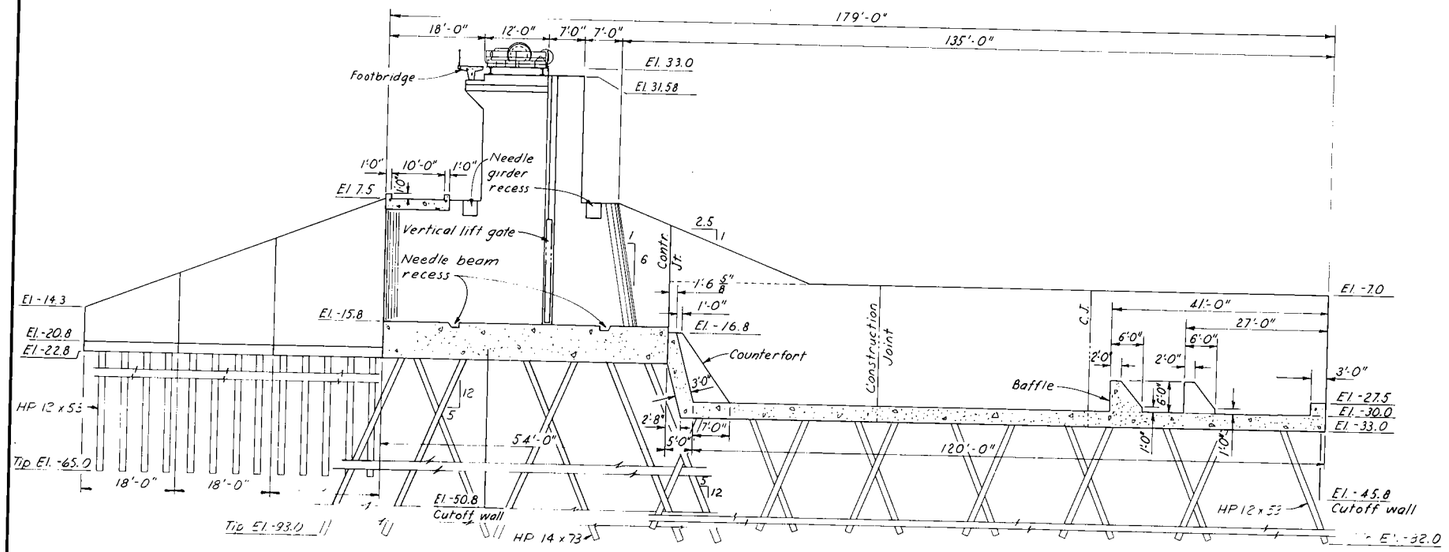


PLAN

SCALE IN FEET



LAKEWARD ELEVATION



SECTION A-A

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET, LA

DESIGN MEMORANDUM NO. 12

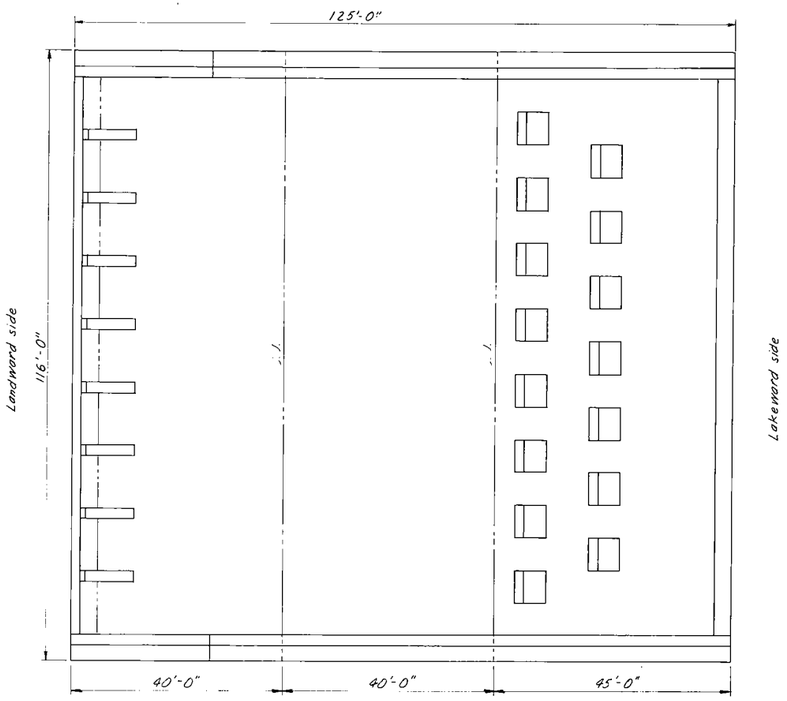
SOURCES OF CONSTRUCTION MATERIALS
SEABROOK LOCK

PLAN MAP
OUTLET STRUCTURE
PLAN AND SECTIONS

SCALE AS SHOWN

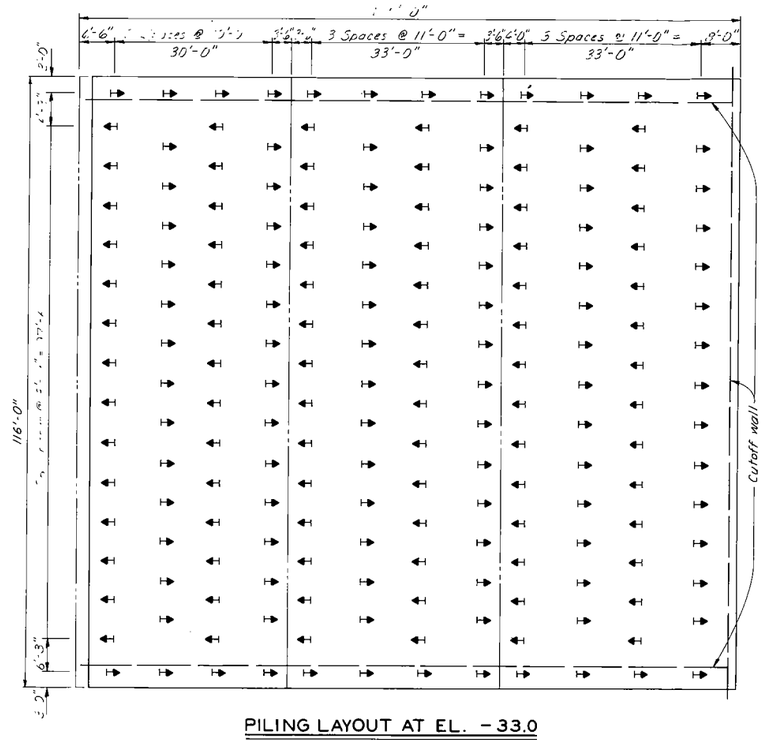
U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS, U.S. ARMY ROCK ISLAND, ILL.	U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS, U.S. ARMY NEW ORLEANS, LA.
DATE OCT 1978	FILE NO H-2-23684

PLATE NO. 6



PLAN

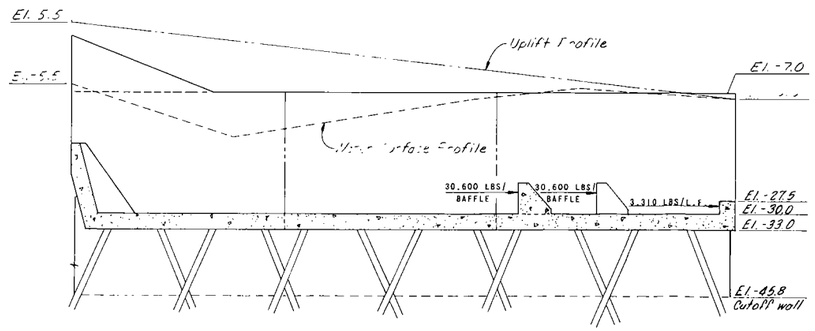
10 5 0 10 20 30
SCALE IN FEET



PILING LAYOUT AT EL. -33.0

10 5 0 10 20 30
SCALE IN FEET

PILE LOADING



Notes:

1. The pile foundation was analysed by the computer program "Indeterminate Pile Analysis" (713 F3 A5 B40).
2. A modulus of subgrade reaction of k ton/ft^3 was used.
3. Load are in KIPS.

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET, LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS
SEABROOK LOCK

PLAN MAP
OUTLET STRUCTURE
STILLING BASIN LAYOUT & PILE ANALYSIS

SCALE AS SHOWN

U.S. ARMY ENGINEER DISTRICT ROCK ISLAND CORPS OF ENGINEERS U.S. ARMY ROCK ISLAND ILL	U.S. ARMY ENGINEER DISTRICT NEW ORLEANS CORPS OF ENGINEERS U.S. ARMY NEW ORLEANS LA
DATE OCT 1978	FILE NO H-2-23684

CORPS OF ENGINEERS

U. S. ARMY

LEGEND FOR EROSION PROTECTION

INDICATES LOCATION TYPE "B" RIPRAP (15% 350 LBS. TO 600 LBS., 20% 200 LBS. TO 350 LBS., 25% 60 LBS. TO 200 LBS., 25% 15 LBS. TO 60 LBS., 15% LESS THAN 15 LBS.).

INDICATES LOCATION OF DERRICK STONE (500 LBS. TO 4000 LBS. WITH 70% HEAVIER THAN 1500 LBS.).

INDICATES LOCATION OF COVER STONE (2500LBS. TO 8000 LBS.).

PUBLIC PARKING AREA

PARKING

EXISTING BREAKWATER

EL. 7.2

AZ 254° 32'

STABILITY BERM

PARKING AREA

EL. 13.5

DOLPHIN CELL

GUIDE WALL

EXISTING WALL AND DOLPHIN

STA 0+00
AZ 164° 32'

STA 5+00

EXISTING WALL AND DOLPHINS

GUIDE WALLS

SECTOR GATE 1

SECTOR GATE 3

SECTOR GATE 2

SECTOR GATE 4

CONTROL HOUSE

EL. 25.0

1V ON 2.5H

1V ON 2H

AZ 164° 29' 11"

STA 20+00

DOLPHIN CELL

DOLPHIN CLUSTERS

BUTLET STRUCTURE

RETAINING WALL

EL. -30.0

STILLING BASIN

EXIST. WOODEN BULKHEAD

EXISTING BRIDGE

SOUTHERN RAILWAY

MH

FH

EXIST. CONCRETE APRON

AZ 164° 32'

EXCAVATION LIMITS

LAKE PONTCHARTRAIN

NEW ORLEANS AIRPORT

EXISTING CONCRETE SEA WALL

AZ 253° 37'

PLAN

100 50 0 100
SCALE IN FEET

NOTES:
1. ELEVATIONS ARE IN FEET, MEAN SEA LEVEL.

REFERENCES:
1. FOR SECTIONS A-A, B-B AND C-C, SEE PLATE
2. FOR SECTIONS D-D, E-E, F-F AND G-G, SEE PLATE

LAKE PONTCHARTRAIN, LA. AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

PLAN MAP
EROSION PROTECTION—PLAN

SCALE AS SHOWN

U S ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS U S ARMY
ROCK ISLAND ILL

U S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS U S ARMY
NEW ORLEANS LA

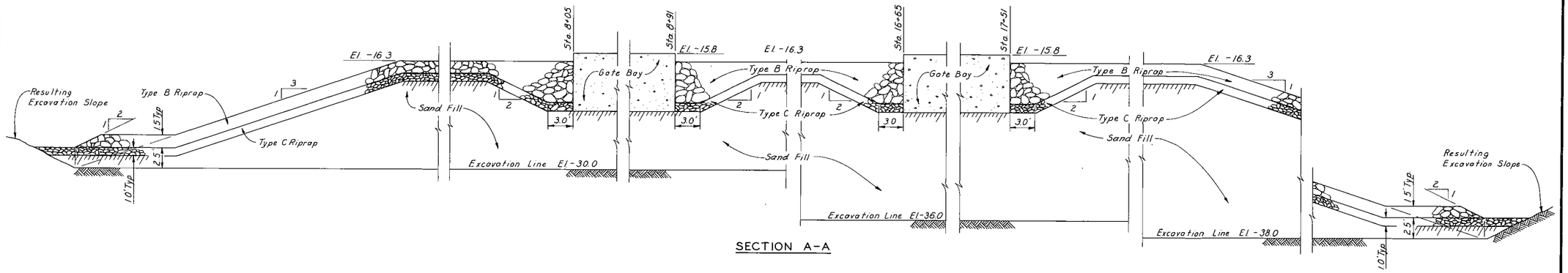
DATE OCT 1978

FILE NO H-2-23684

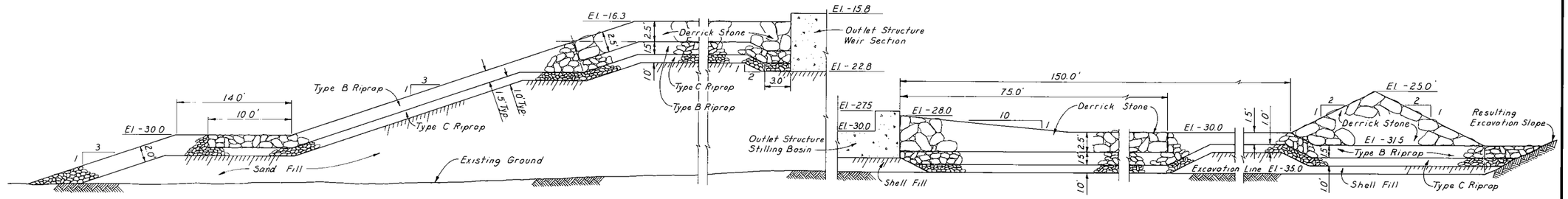
PLATE NO. 8

CORPS OF ENGINEERS

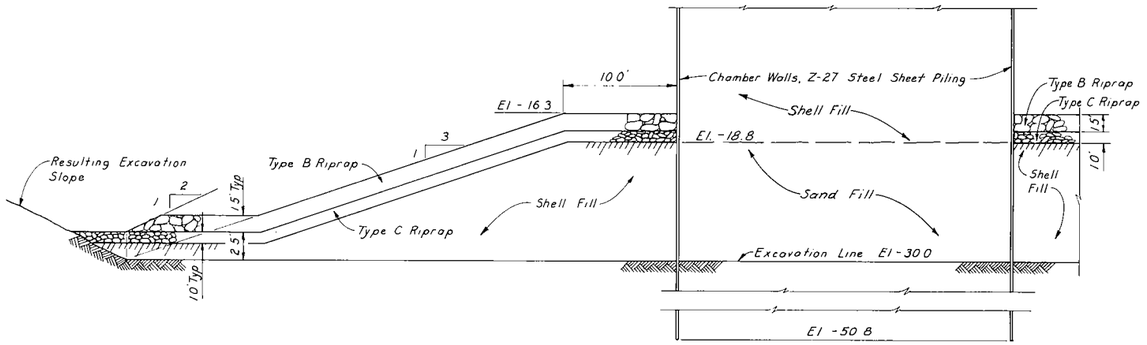
U. S. ARMY



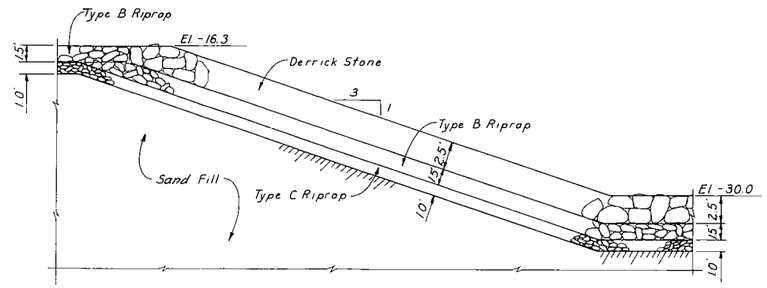
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

10 5 0 10
SCALE IN FEET

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER--GULF OUTLET, LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS SEABROOK LOCK

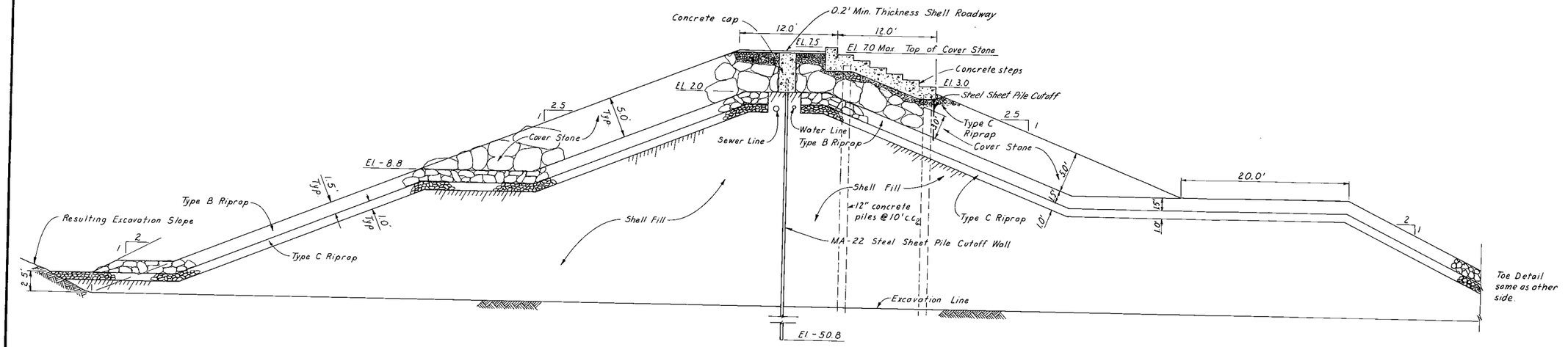
PLAN MAP
EROSION PROTECTION SECTIONS
SECTIONS A-A, B-B, C-C, & D-D
SCALE AS SHOWN

U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND CORPS OF ENGINEERS, U.S. ARMY ROCK ISLAND, ILL.	U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS, U.S. ARMY NEW ORLEANS, LA.
DATE OCT 1978	FILE NO H-2-23684

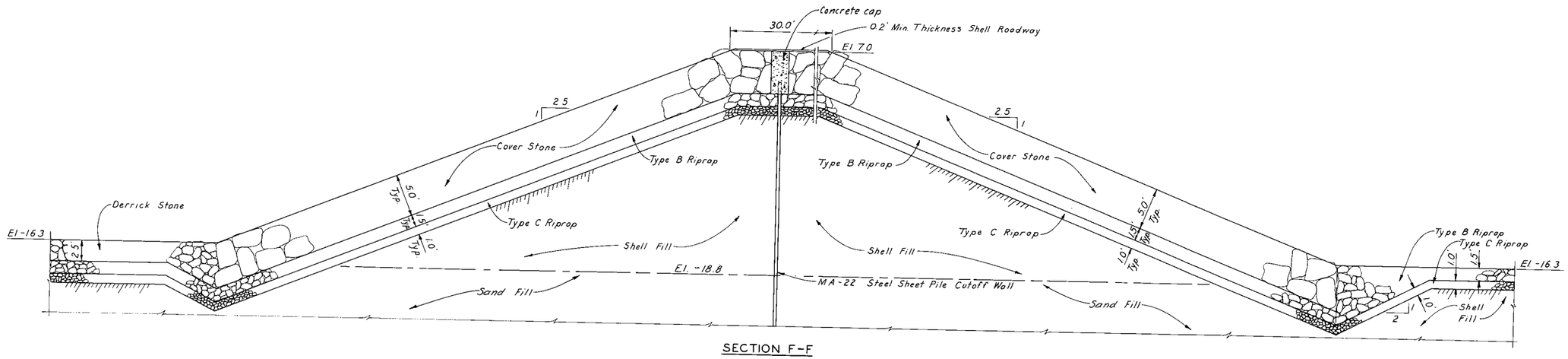
PLATE NO. 9

CORPS OF ENGINEERS

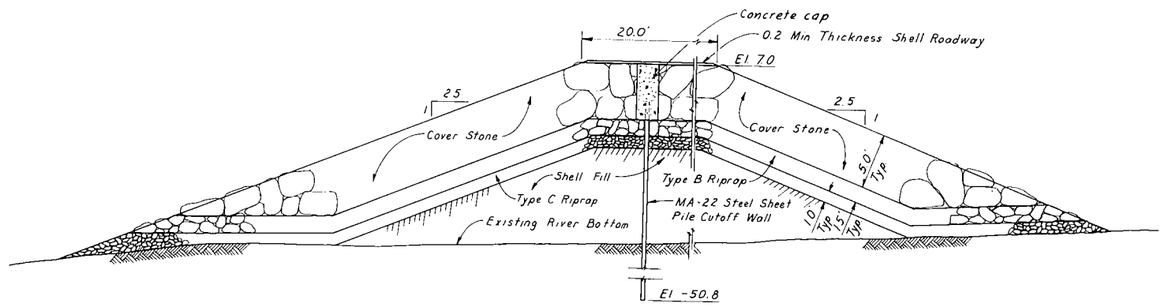
U. S. ARMY



SECTION E-E



SECTION F-F



SECTION G-G

10 5 0 10
SCALE IN FEET

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER - GULF OUTLET, LA

DESIGN MEMORANDUM NO. 12

SOURCES OF CONSTRUCTION MATERIALS
SEABROOK LOCK

PLAN MAP
EROSION PROTECTION SECTIONS
SECTIONS E-E, F-F, & G-G
SCALE AS SHOWN

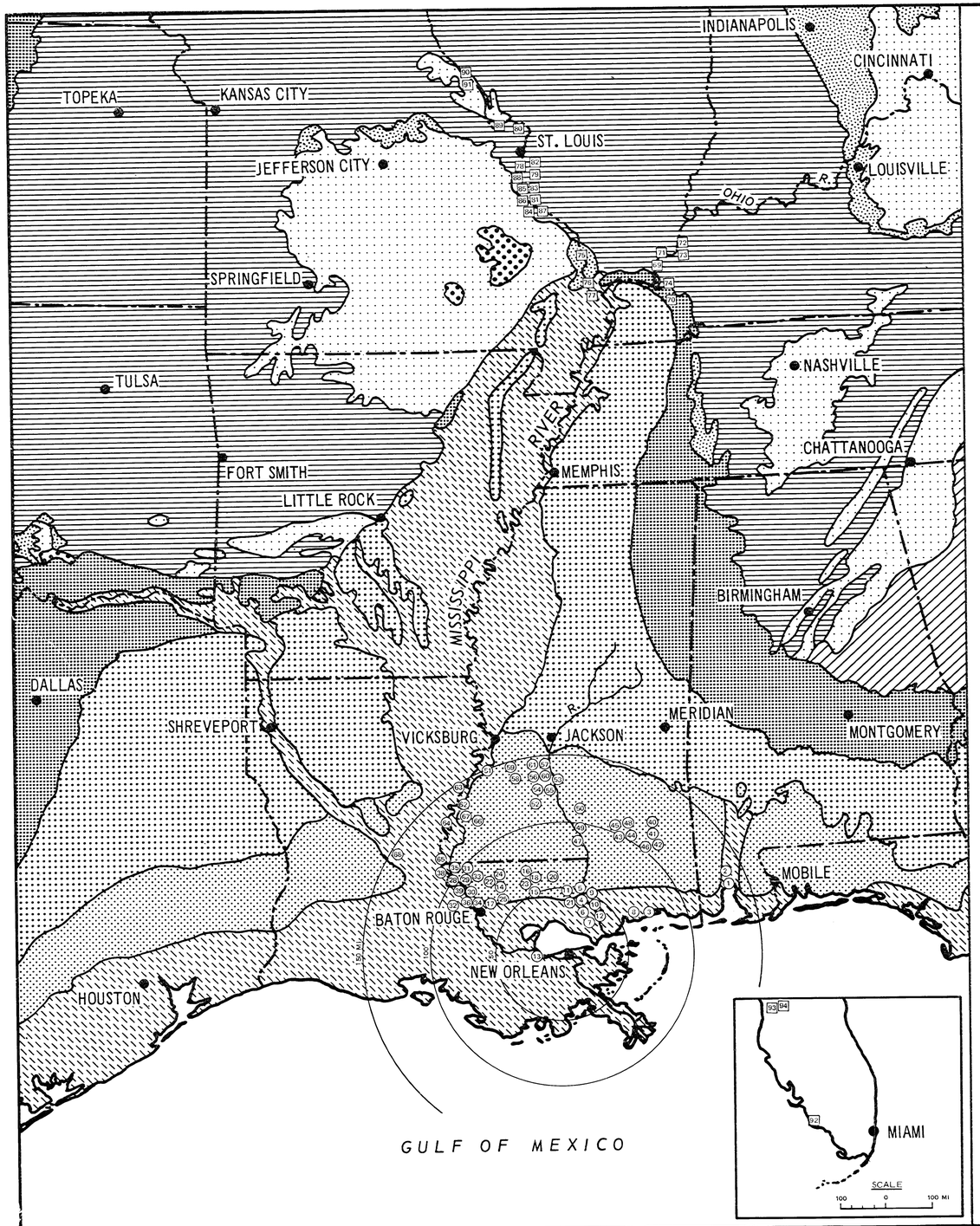
U.S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS, U.S. ARMY
ROCK ISLAND, ILL.

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS, U.S. ARMY
NEW ORLEANS, LA.

DATE OCT 1978

FILE NO H-2-23684

PLATE NO. 10



QUATERNARY
Recent and Pleistocene

UPPER TERTIARY
Pliocene and Miocene in western States includes Recent and Pleistocene

LOWER TERTIARY
Oligocene, Eocene, and Paleocene in Alaska includes some Miocene

CRETACEOUS
In parts of Rocky Mountains and Alaska includes Jurassic and Triassic

YOUNGER PRECAMBRIAN
In southeastern United States and Alaska includes metamorphosed Paleozoic

UPPER PALEOZOIC
Permian, Pennsylvanian, and Mississippian in parts of Rocky Mountains and Alaska includes middle and lower Paleozoic

MIDDLE PALEOZOIC
Devonian and Silurian

LOWER PALEOZOIC
Ordovician and Cambrian in parts of Missouri, Oklahoma, and Arkansas includes Devonian and Silurian

OLDER PRECAMBRIAN
Metamorphic and igneous rocks

SITE NO.	PROD AND/OR OWNER	LOCATION
1	RADCLIFF SAND CO.	MOBILE, AL
2	RADCLIFF SAND & GRAVEL CO.	MOBILE, AL
3	LEGGETT SAND & GRAVEL CO.	HANSBORO, MS
4	KIVETT & REEL, INC.	SUN, LA
5	CANAL SAND & GRAVEL CO.	SUN, LA
6	CANAL SAND & GRAVEL CO.	BUSH, LA
7	STOAT DREDGING CO.	PEARL RIVER, LA
8	TRAXLER GRAVEL CO.	GULFPORT, MS
9	ST. TAMMANY SAND & GRAVEL CO.	BUSH, LA
10	JAHNCKE SERVICES, INC.	BUSH, LA
11	DIXIE SAND & GRAVEL CO.	FRANKLINTON, LA
12	CORION, INC.	NICHOLSON, MS
13	UNKNOWN CONTRACTOR	BONNET CARRÉ SPILLWAY
14	JAHNCKE SERVICES, INC.	BLUFF CREEK, LA
15	GULF SAND & GRAVEL CO.	AMITE, LA
16	COMITE SAND & GRAVEL CO.	TANGIPAHOA, LA
17	BATON ROUGE SAND CO.	WATSON, LA
18	GIFFORD-HILL, INC.	FLUKER, LA
19	DIXIE SAND & GRAVEL CO.	SUN, LA
20	SMITH SAND & GRAVEL CO.	FRANKLINTON, LA
21	LOUISIANA INDUSTRIES	PRICE, LA
22	B & B GRAVEL CO.	BLUFF CREEK, LA
23	GIFFORD-HILL, INC.	ARCOLA, LA
24	A-1 SAND & GRAVEL CO.	MAGNOLIA, LA
25	RED STICK SAND & GRAVEL CO.	BAYWOOD, LA
26	RED STICK SAND & GRAVEL CO.	BAYWOOD, LA
27	RED STICK SAND & GRAVEL CO.	BAYWOOD, LA
28	LAMBERT GRAVEL CO.	BAINES, LA
29	HOLLOWAY SAND & GRAVEL CO.	JACKSON, LA
30	MT. VERNON GRAVEL CO.	ST. FRANCISVILLE, LA
31	GIROD GRAVEL CO.	WOODVILLE, LA
32	BIG RIVER INDUSTRIES	ERWINVILLE, LA
33	FELICIANA SAND & GRAVEL CO.	JACKSON, LA
34	NEW ORLEANS DISTRICT ENGINEERS	MISS. RIVER MILE 234
35	MARTIN GRAVEL CO.	WEYANOKE, LA
36	RIVER MATERIALS	MISS. RIVER MILE 249
37	BIG RIVER INDUSTRIES	ERWINVILLE, LA
38	GREAT RIVER CORP.	MISS. RIVER MILE 293
39	FELICIANA SAND & GRAVEL CO.	ST. FRANCISVILLE, LA
40	RADCLIFF GRAVEL CO.	RICHTON, MS
41	RICHTON SAND & GRAVEL CO.	RICHTON, MS
42	UNDERWOOD SAND & GRAVEL CO.	BEAUMONT, MS
43	AMERICAN SAND & GRAVEL CO.	HATTIESBURG, MS
44	AMERICAN SAND & GRAVEL CO.	HATTIESBURG, MS
45	AMERICAN SAND & GRAVEL CO.	HATTIESBURG, MS
46	UNDERWOOD BUILDERS	BEAUMONT, MS
47	HAMMITT & GREEN, INC.	FOXWORTH, MS
48	AMERICAN SAND & GRAVEL CO.	HATTIESBURG, MS
49	BLAIN SAND & GRAVEL CO.	COLUMBIA, MS
50	BLAIN SAND & GRAVEL CO.	PRENTISS, MS
51	VICKSBURG SAND & GRAVEL CO.	PORT GIBSON, MS
52	GREEN BROTHERS, INC.	BROOKHAVEN, MS
53	GREENE BROTHERS SAND & GRAVEL CO.	GEORGETOWN, MS
54	GREENE BROTHERS SAND & GRAVEL CO.	CRYSTAL SPRINGS, MS
55	GREEN BROTHERS, INC.	CRYSTAL SPRINGS, MS
56	TRAXLER GRAVEL CO.	CRYSTAL SPRINGS, MS
57	TRAXLER SAND & GRAVEL CO.	CRYSTAL SPRINGS, MS
58	GREEN BROTHERS SAND & GRAVEL CO.	CARPENTER, MS
59	TRAXLER SAND & GRAVEL CO.	CARPENTER, MS
60	BLAIN SAND & GRAVEL CO.	CRYSTAL SPRINGS, MS
61	BLAIN SAND & GRAVEL CO.	CRYSTAL SPRINGS, MS
62	ST. CATHERINE GRAVEL CO.	NATCHEZ, MS
63	UNKNOWN PRODUCER	MISS. RIVER MILE 378
64	ST. CATHERINE SAND & GRAVEL CO.	NATCHEZ, MS
65	F & C ENGINEERING CO.	MISS. RIVER MILE 306
66	ST. CATHERINE SAND & GRAVEL CO.	NATCHEZ, MS
67	R. L. HENSLEY & SONS	WASHINGTON, MS
68	LAKE PEARL SAND & GRAVEL CO.	MANSURA, LA
69	RIVER SAND & STONE	OHIO RIVER MILE 896
70	REED CRUSHED STONE	GILBERTSVILLE, KY
71	WILLIAMS STONE QUARRY	ROSICLARE, IL
72	RIGSBY-BARNARD STONE QUARRY	CAVE-IN-ROCK, IL
73	DENNY & SIMPSON STONE CO.	CAVE-IN-ROCK, IL
74	THREE RIVERS ROCK CO.	SMITHLAND, KY
75	WESTLAKE QUARRY	MISS. RIVER MILE 71.5
76	WESTLAKE QUARRY	MISS. RIVER MILE 46.5
77	SOUTHERN RIVER ROCK CO.	MISS. RIVER MILE 94.5
78	BUSSEN QUARRIES	JEFFERSON BARRACK, MO
79	COLUMBIA QUARRY CO.	COLUMBIA, IL
80	RIVERVIEW STONE AND MATERIALS	MUSICKS FERRY, MO
81	SOUTHERN RIVER ROCK CO.	BRICKEYS, MO
82	STOLLE QUARRY, INC.	DUPO, IL
83	MARKHAM & BROWN, INC.	MISS. RIVER MILE 139
84	WESTLAKE QUARRY	LITTLE ROCK, MO
85	WESTLAKE QUARRY	MISS. RIVER MILE 144
86	CHARLIE BUSSEN QUARRY	LITTLE ROCK, MO
87	SOUTHERN RIVER ROCK CO.	MISS. RIVER MILE 128.1
88	BUSSEN QUARRY	GLEN PARK, MO
89	WESTLAKE QUARRY	GOLDEN LANDING, MO
90	WAYNE B. SMITH	LOUISIANA, MO
91	WAYNE B. SMITH	LOUISIANA, MO
92	FLORIDA ROCK CORP.	NAPLES, FL
93	FLORIDA CRUSHED STONE CO.	BROOKSVILLE, FL
94	FLORIDA ROCK INDUSTRIES,INC.	BROOKSVILLE, FL

LEGEND

○ SAND AND GRAVEL SOURCE

□ STONE SOURCE

SCALE
100 0 100 MI

LAKE PONTCHARTRAIN, LA., AND VICINITY
AND MISSISSIPPI RIVER—GULF OUTLET, LA.

SOURCES OF CONSTRUCTION MATERIALS
SEABROOK LOCK

GENERALIZED GEOLOGY AND LOCATION MAP

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

DECEMBER 1978

Table C1

Sources of Sand, Gravel, and Stone

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
1	Radcliff Sand Co. Mobile, AL	Mobile, AL	30	88	1	Sand	Unknown	--		N/A	150	Truck	
2	Radcliff Sand & Gravel Co, Mobile, AL	Saraland Pit, 10 mi N of Mobile, AL	30	88	2	Sand	Unknown	--		N/A	160	Truck	
3	Leggett Sand & Gravel Co., Hansboro, MS	Harrison Co., MS Sec 19, T7S, R 10W	30	89	1	Sand	Pit Closed						
4	Kivett & Reel, Inc. Sun, LA	Sun, LA	30	89	2	Sand Gravel	Pit Closed						
5	Canal Sand & Gravel Co., Sun, LA	Pit No. 2 Sun, LA	30	89	3	Sand Gravel	Pit Closed						
6	Canal Sand & Gravel Co., Bush, LA	Bush, LA	30	89	4	Sand Gravel	Pit Closed						
7	Sloat Dredging Co. Slidell, LA	5 mi N of Pearl River, LA	30	89	5	Sand Gravel	Pit Closed						
8	Traxler Gravel Co. Gulfport, MS	Harrison Co., MS Sec 17, T 7S, R 12W	30	89	6	Sand	Pit Closed						
9	St. Tammany Sand and Gravel Co., Sun, LA	3/4 mi S of Bogue Chitto River	30	89	7	Sand Gravel	Pit Closed						
10	Jahncke Services, Inc. Bush, LA	1/2 mi N of Lock No. 2 on Pearl River	30	89	8	Gravel	Pit Closed						

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
11	Dixie Sand & Gravel Co. Amite, LA	15 mil SE of Franklinton, LA, Sec 16, T 4S, R 12E	30	89	9	Sand Gravel	Pit Closed				--		
12	Carion, Inc. Picayune, MS	N of Hwy 11 on Pearl River	30	89	10	Sand Gravel	Unknown			N/A	40		
13	Unknown Contractor	Bonnet Carre Spillway	30	90	1	Sand	Unknown			N/A	20		
14	Jahncke Services, Inc. Jackson, LA	1-1/4 mi N of Hwy 126 & 37	30	90	2	Sand Gravel	Pit Closed						
15	Gulf Sand & Gravel Co. Amite, LA	Amite, LA	30	90	3	Gravel	Pit Closed						
16	Comite Sand & Gravel Co. Amite, LA	10 mi N of Amite, LA	30	90	4	Sand Gravel	Pit Closed						
17	Baton Rouge Sand Co. Baton Rouge, LA	16 mi NE of Baton Rouge on Amite River	30	90	5	Sand Gravel	Pit Closed						
18	Gifford-Hill, Inc. Amite, LA	1 mi N of Fluker, LA	30	90	6	Sand Gravel	Plentiful	2000 1200	2.40 4.20	7.20 9.00	80	Truck, Rail	.06
19	Dixie Sand & Gravel Co. Amite, LA	15 mi SE of Franklinton, LA Sec 16, T 4S, R 12E	30	90	7	Sand Gravel	Pit Closed						
20	Smith Sand & Gravel Mt. Herman, LA	5 mi NW of Franklinton, LA	30	90	8	Sand Gravel	Adequate	1800	1.50 3.00	7.62 9.12	102	Truck	.06

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
21	Louisiana Industries New Orleans, LA	Price, LA	30	90	9	Sand Gravel	Adequate	900 1200	1.50 3.00	5.10 6.60	60	Truck, Rail	.06
22	B & B Gravel Co. Baton Rouge, LA	Bluff Creek, LA	30	90	11	Sand Gravel	Unknown		1.67 2.22	8.53 9.08	98	Truck	.07
23	Gifford-Hill, Inc. Roseland, LA	1 mi N of Arcola, LA	30	90	12	Sand Gravel	Adequate	1500 1000	2.40 4.20	7.02 8.82	77	Truck, Rail	.06
24	A-1 Sand & Gravel Co. Baton Rouge, LA	0.6 mi E of Magnolia, LA	30	90	18	Sand Gravel	Pit Closed						
25	Red Stick Sand & Gravel Co., Baton Rouge, LA	3.6 mi S of Hwy 37 & 63	30	90	20	Sand Gravel	Unknown	---	--	N/A	94	Truck	.055
26	Red Stick Sand & Gravel Co., Baton Rouge, LA	Fedler Pit, Baywood, LA	30	90	20	Sand Gravel	Unknown	--	--	N/A	94	Truck	.055
27	Red Stick Sand & Gravel Baton Rouge, LA	Davis Pit, Baywood, LA	30	90	20	Gravel	Pit Closed						
28	Lambert Gravel Co. St. Francisville, LA	2 mi W of Baines on Hwy 66	30	91	1	Sand Gravel	Adequate	1000 1000	2.75 4.00	8.63 9.88	98	Truck	.06
29	Holloway Sand & Gravel Co., Jackson, LA	E Feliciana Parish, T 35, R 1W	30	91	2	Sand Gravel	Adequate	1500 1500	4.50 4.50	10.14 10.14	94	Truck	.06
30	Mt. Vernon Gravel Co. Mt. Vernon, LA	6 mi SE of St. Francisville, LA	30	91	3	Sand Gravel	Pit Closed						
31	Girod Gravel Co. Woodville, MS	15 mi S of Woodville, MS on Bayou Sara Creek	30	91	4	Sand	Pit Closed						
32	Big River Industries Baton Rouge, LA	18 mi W of Baton Rouge, LA at Erwinville, LA	30	91	5	Lightweight Materials					90		

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
33	Feliciana Sand & Gravel Jackson, LA	1 mi W of Jackson, LA	30	91	6	Sand Gravel	Pit Closed						
34	New Orleans District Engineers	Mile 234, Miss. River	30	91	7	Sand	Unknown						
35	Martin Gravel Co. St. Francisville, LA	E of Weyanoke, LA	30	91	8	Sand Gravel	Pit Closed						
36	River Materials Bain LA	Mile 249, Miss. River	30	91	9	Sand Gravel	Pit Closed						
37	Big River Industries Erwinville, LA	1/2 mi W of Erwinville, LA	30	91	10	Lightweight Materials	Same as Source 32				90		
38	Great River Corp. Tunica, LA	Mile 292.7, Miss. River	30	91	11	Sand Gravel	Pit Closed						
39	Feliciana Sand & Gravel Jackson, LA	4.8 mi N of St. Francisville, LA	30	91	--	Gravel					99		
40	Radcliff Gravel Co. Richton, MS	Richton, MS	31	88	1	Gravel	Pit Closed						
41	Richton Sand & Gravel Co., Richton, MS	1 mi S of Richton, Sec 6, T 4N, R 9W	31	88	2	Gravel	Pit Closed						
42	Underwood Sand & Gravel Richton, MS	0.7 mi E of Hwy 15, 2.8 mi N of Hwy 98	31	88	--	Sand Gravel	Pit Closed						
43	American Sand & Gravel Hattiesburg, MS	Forrest Co., MS Sec 33, T 5N, R 13W	31	89	1	Sand Gravel	Plentiful	2000	2.10 3.40	9.06 10.36	116	Truck	.06

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
44	American Sand & Gravel Hattiesburg, MS	Forrest Co., MS Sec 13, T 4N, R 13W, 2.9 mi NE of Hattiesburg	31	89	2	Sand	Pit Closed						
45	American Sand & Gravel Hattiesburg, MS	1 mi N of Hwy 42 on Glendale Rd	31	89	--	Sand Gravel	Plentiful	2000	2.10 3.40	9.30 10.60	120	Truck	.06
46	Underwood & Builders Mobile, AL	7 mi W of Beaumont, MS	31	89	3	Sand Gravel	Limited	800	1.65 2.50	11.25 12.10	160	Truck, Rail	.06
47	Hammitt & Green, Inc. Foxworth, MS	1 mi N of Foxworth, MS	31	89	4	Sand Gravel	Limited	700	2.00 3.65	8.30 9.95	105	Truck	.06
48	American Sand & Gravel Hattiesburg, MS	Hattiesburg, MS	31	89	5	Gravel	Plentiful	2000	3.40	10.36	116	Truck	.06
49	Blain Sand & Gravel Columbia, MS	9 mi S of Hwy 43 & Hwy 13	31	89	--	Sand Gravel	Adequate	1500	1.25 2.75	6.95 8.45	95	Truck	.06
50	Blain Sand & Gravel, Inc. Mt. Olive, MS	2 mi W of Prentiss, MS	31	89	--	Sand Gravel	Plentiful	2000	1.75cy 2.75	11.00 12.59	164	Truck	.06
51	Vicksburg Sand & Gravel Vicksburg, MS	3 mi NE of Port Gibson, MS	31	90	1	Sand Gravel	Pit Closed						
52	Green Brothers, Inc. Crystal Springs, MS	5 mi NE of Brookhaven, MS	31	90	--	Sand Gravel	Plentiful	2500	1.35 2.65	7.95 9.25	132	Truck	.05
53	Greene Brothers Sand & Gravel, Georgetown, MS	Georgetown, MS	31	90	2	Sand	Pit Closed						
54	Greene Brothers Sand & Gravel, Georgetown, MS	7 mi S of Crystal Springs	31	90	3	Sand	Pit Closed						
55	Greene Brothers, Inc. Crystal Springs, MS	5.4 mi SE of Crystal Springs, MS	31	90	--	Sand Gravel	Plentiful	4000	1.35 2.65	9.35 10.65	160	Truck	.05

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
56	Traxler Gravel Co. Utica, MS	1 mi SE of Crystal Springs, MS	31	90	4	Sand	Pit Closed						
57	Traxler Sand & Gravel Co., Jackson, MS	0.5 mi S of Crystal Springs, MS	31	90	--	Sand Gravel	Unknown	--	1.50 2.50	11.22 12.22	162	Truck	.06
58	Greene Brothers Sand & Gravel Co., Crystal Springs, MS	5 mi E of Carpenter, MS	31	90	5	Sand Gravel							
59	Traxler Sand & Gravel Co., Utica, MS	4 mi E of Carpenter, MS	31	90	6	Gravel	Pit Closed						
60	Blain Sand & Gravel Co., Mt. Olive, MS	1 mi SE of Crystal Springs, MS (South Pit)	31	90	--	Sand Gravel	Plentiful	3000	1.75 2.75	11.47 12.47	162	Truck	.06
61	Blain Sand & Gravel Co., Mt. Olive, MS	1 mi SE of Crystal Springs, MS (North Pit)	31	90	--	Sand Gravel	Plentiful	5000	1.75 2.75	11.47 12.47	162	Truck	.06
62	St. Catherine Gravel Co., Natchez, MS	4.5 mi NE of Natchez	31	91	1	Sand Gravel	Pit Closed						
63	Unknown Producer	Mile 378, Miss. River	31	91	2	Sand Gravel	Unknown						
64	St. Catherine Sand & Gravel Co., Natchez, MS	S of Natchez, MS	31	91	8	Sand Gravel	Pit Closed						
65	F & C Engineering Co., (Contractor)	Mile 306, Miss. River	31	91	9	Sand	Pit Closed						
66	St. Catherine Sand & Gravel Co., Natchez, MS	3.1 mi E of Hwy 61 & 84	31	91	10	Sand Gravel	Plentiful	1000 2000	2.50 3.50	15.78 16.78	166	Truck	.12/yd
67	R. L. Hensley & Sons Washington, MS	2.5 mi E of Hwy 61 & 98	31	91	--	Sand Gravel	Unknown			N/A	165	Truck	

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
68	Lake Pearl Sand & Gravel Marksville, LA	Between Hesmer, LA, & Mansura, LA	31	92	11	Sand Pit Closed Gravel						
69	River Sand & Stone Golconda, IL	Mile 896, Ohio River	37	88	3	Crushed Limestone						
70	Reed Crushed Stone Gilbertsville, KY	Gilbertsville, KY	37	88	11	Crushed Limestone Plentiful	5000	2.75	9.50B	941 B 570 T	Barge, Rail, Truck	
71	Williams Stone Quarry Rosiclare, IL	Rosiclare, IL	37	88	21	Crushed Limestone Plentiful	4000	7.00	43.72T	612 T 956 B	Truck Barge	.06
72	Rigby-Barnard Stone Quarry, Cave-In-Rock, IL	Cave-In-Rock, IL	37	88	22	Crushed Limestone Plentiful	2500	2.50	39.70T	620 T	Truck	.06
73	Denny & Simpson Stone Co. Cave-In-Rock, IL	Cave-In-Rock, IL	37	88	28	Crushed Limestone Plentiful	2500		N/A	620 T	Truck	
74	Three Rivers Rock Co. Smithland, KY	Smithland, KY	37	88	29	Crushed Limestone Plentiful	5000	2.50	37.60T 8.25B	585 T 929 B	Truck, Barge	.06
75	Westlake Quarry Neely's Landing, MO	Mile 71.5, Upper Miss. River	37	89	17	Limestone Ledge Rock Plentiful	2500	1.80	36.72T 8.00B	582 T 938 B	Truck, Barge	.06
76	Westlake Quarry Gray's Point, MO	Mile 46.5, Upper Miss. River	37	89	18	Limestone Ledge Rock Plentiful	4000	1.80	7.90B	572 T 913 B	Truck Barge	

(Continued)

Table C1 (Continued)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
77	Southern River Rock Perryville, MO	Mile 94.5, Upper Miss. River	37	89	20	Limestone Ledge Rock	Unknown			N/A	961 B	Barge	
78	Bussen Quarries St. Louis, MO	St. Louis Co., MO Sec 12, T 43N, R 6E	38	90	4	Limestone Ledge Rock	Plentiful	4000	2.50	10.50B	1035 B 691 T	Barge, Rail, Truck	
79	Columbia Quarry Co. Dupo, IL	2.5 mi NE of Columbia, IL	38	90	10	Crushed Limestone	Plentiful	5000		N/A	679 T	Truck	
80	Riverview Stone & Materials, St. Louis, MO	St. Louis Co., MO Sec 33, T 48N, R 6E	38	90	24	Limestone Ledge Rock	Plentiful	6000		N/A	1070 B 711 T	Barge, Truck	
81	Southern River Rock Co. Perryville, MO	1/2 mi SW of Brickeys, MO	38	90	29	Limestone Ledge Rock	Unknown			N/A	1000 B	Barge	
82	Stolle Quarry, Inc. Dupo. IL	St. Clair Co., IL, Sec 13, 14, T 1N, R 10W	38	90	35	Crushed Limestone	Plentiful	2000	2.70	57.50T	685 T	Truck	.08
83	Markham & Brown, Inc. Dallas, TX	Mile 139, Upper Miss. River	38	90	37	Ledge Rock	Plentiful	10,000	2.50	8.60B	1005 B	Barge	
84	Westlake Quarry Bridgeton, MO	Ste. Genevieve Co., MO, Sec 19, R 9E, T 38N	38	90	38	Crushed Limestone	Pit Closed						
85	Westlake Quarry St. Louis, MO	Mile 144, Upper Miss. River	38	90	39	Ledge Rock	Unknown			N/A	1010 B	Barge	

(Continued)

Table C1 (Concluded)

Source	Name and Address of Producer/ Owner	Location of Pit/Quarry	TM6-370 Locations Lat	Long.	Index	Material Availability Type	Quantity	Plant Capacity Tons/Day	Plant Cost $/Ton	Site Cost $/Ton	Haul Distance to Seabrook Lock Site	Mode of Transportation	Freight Cost $/Ton Mile
86	Tower Rock Stone Co Ste. Genevieve, MO	Ste. Genevieve Co., MO, Sec 12, R 8E, T 38N	38	90	40	Limestone Ledge Rock	Unknown			N/A	996 B	Barge	
87	Southern River Rock Perryville, MO	Mile 128.1, Upper Miss. River	38	90	41	Ledge Rock	Plentiful	2000	2.85/yd	N/A	994 B	Barge	
88	Bussen Quarry Glen Park, MO	Glen Park, MO	38	90	43	Limestone Riprap	Unknown			N/A			
89	Westlake Quarry St. Louis, MO	Calhoun Co., IL Sec 1, T 14S, R 3E	38	90	45	Limestone Ledge Rock	Plentiful	2500		N/A	1094 B	Barge	
90	Wayne B. Smith Louisiana, MO	Pike Co., MO Sec 17, R 6W, T 54N	39	91	4	Gravel	Plentiful	3000	2.75	N/A	1149 B 792 T	Barge Truck	
91	Wayne B. Smith Louisiana, MO	Pike Co., MO Sec 20, T 54N, R 1W	39	91	6	Limestone Ledge Rock	Plentiful	3000	4.00	N/A	1149 B 792 T	Barge, Truck	
92	Florida Rock Corp. Naples, FL	10 mi E of Naples, FL	26	81	4	Limestone Riprap	Limited	450	5.00	N/A	766 T 462 B	Truck Barge	
93	Florida Crushed Stone Brooksville, FL	Hernando Co., FL Sec 8, T 22S, R 19E	28	82	1	Crushed Limestone	Plentiful	12,000	5.00	N/A	555	Truck	
94	Florida Rock Industries, Inc., Jacksonville, FL	Hernando, Co., FL Sec 22, T 21S, R 19E	28	82	2	Crushed Limestone	Unknown		5.25	N/A	550	Truck, Rail	

N/A - Not Available
B - Barge
T - Truck

Table C2

Fine Aggregate

Summary of Test Data

Source No.	Name of Producer	Date Tested	Specific Gravity	Abosrption Percent	Organic Impurities No.	Lighter than 2.00 Sp. Gr. Percent	$MgSO_4$ Loss Percent	Friable Particles Percent	Freezing-Thawing DFE300	Remarks
1	Radcliff Sand Co.	1950	2.63	0.1	1	--	2.91	--	--	
2	Radcliff S & G Co.	1960	--	--	--	--	--	--	--	Grading Only
3	Leggett S & G Co.	1951	2.60	0.6	--	--	3.55[1]	--	--	
4	Kivett & Reel	1949	2.62	0.5	1	--	3.40	--	--	
5	Canal S & G Co.	1948	2.62	0.4	1	--	3.80	--	--	
6	Canal S & G Co.	1947	2.66	0.2	1	--	2.19	--	3	
7	Sloat Dreding	1947	2.64	0.3	1	--	2.02	--	--	
8	Traxler Gravel Co.	1952	2.59	1.2	1	--	--	--	--	
9	St. Tammany S & G Co.	1952	2.61	0.3	--	--	--	--	--	
11	Dixie S & G Co.	1970	2.62	0.7	--	--	--	--	--	
12	Carion, Inc.	1964	2.62	0.4	OK	--	2.40	--	--	
13	Unknown Contractor	1948	2.58	1.2	4	--	--	--	--	
14	Jahncke Services, Inc.	1962	2.62	0.3	--	--	2.60	--	--	
16	Comite S & G Co.	1949	2.60	0.5	2	--	2.8	--	7	
17	Baton Rouge Sand Co.	1958	2.62	0.7	2	--	1.8	--	--	
18	Gifford-Hill	1968	2.64	0.4	--	--	--	--	--	
18	Gifford-Hill	1977	2.63	0.3	1	0.0	4.7	0.3	--	
19	Dixie S & G Co.	1970	2.62	0.7	--	--	--	--	--	
20	Smith S & G Co.	1972 1977	2.63 2.62	0.5 0.6	1 2	0.0 0.1	2.5 4.0	-- 1.7	9 --	

[1] $NaSO_4$ Loss Test

(Continued)

Table C2 (Continued)

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	Organic Impurities No.	Lighter than 2.00 Sp. Gr. Percent	$MgSO_4$ Loss Percent	Friable Particles Percent	Freezing-Thawing DFE300	Remarks
21	Louisiana Industries	1974	2.62	0.5	--	--	--	--	--	
22	B & B Gravel	1977	2.63	0.4	2	0.0	4.8	0.0	--	
23	Gifford-Hill Co.	1977	2.63	0.4	1	0.0	4.3	0.0	--	
24	A-1 S & G Co.	1977	2.63	0.3	2	0.0	1.2	0.2	--	
25	Red Stick S & G	1977	2.63	0.3	1	0.0	4.8	0.0	--	
28	Lambert Gravel Co.	1962	2.63	0.4	1	--	3.6	--	--	
28	Lambert Gravel Co.	1977	2.63	0.5	2	0.0	--	5.5	--	
29	Holloway S & G Co.	1965	2.62	0.5	--	--	--	--	--	
30	Mt. Vernon Gravel Co.	1969	2.61	0.4	--	--	--	--	--	
31	Girod Gravel Co.	1969	2.62	0.7	--	--	3.2	--	--	
32	Big River Industries	1956	1.90	16.2	--	--	--	--	--	
33	Feliciana S & G Co.	1957	2.64	0.7	--	0.0	--	--	--	
33	Feliciana S & G Co.	1961	2.62	0.7	1	0.1	2.8	--	--	
33	Feliciana S & G Co.	1977	2.62	0.5	1	0.1	4.8	0.9	--	
34	NOD Engineers	1957	2.58	1.9	4	--	--	--	--	
35	Martin Gravel Co.	1961	2.64	0.6	--	0.01	--	--	--	
36	River Materials	1964	2.61	0.5	3	--	2.5	--	--	
37	Big River Industries	1964	--	OK	--	--	1.5	--	--	
38	Great River Corp.	1971	2.63	0.4	0	2.0	3.0	--	--	
42	Underwood S & G	1977	2.63	0.3	1	0.0	3.2	0.1	--	
43	American S & G	1951	2.64	0.2	1	--	2.08[1]	--	--	
44	American S & G	1969	2.63	0.4	--	--	--	--	--	

[1] $NaSO_4$ Loss Test

(Continued)

Table C2 (Continued)

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	Organic Impurities No.	Lighter than 2.00 Sp. Gr. Percent	$MgSO_4$ Loss Percent	Friable Particles Percent	Freezing-Thawing DFE300	Remarks
44	American S & G	1970	2.63	0.5	--	--	--	--	--	
45	American S & G	1977	2.62	0.4	1	0.0	3.1	0.2	--	
46	Underwood Builders	1957	2.66	0.2	--	--	--	--	--	
47	Hammitt & Green, Inc.	1975	2.64	0.4	--	0.0	2.7	--	--	
49	Blain S & G Co.	1977	2.63	0.3	1	0.0	3.0	0.2	--	
50	Blain S & G, Inc.	1977	2.62	0.6	1	0.0	4.9	1.8	--	
51	Vicksburg S & G	1948	2.60	0.5	2	--	2.2	--	--	
52	Greene Bros.	1958	2.62	0.5	2	--	2.5	--	--	
53	Greene Bros.	1977	2.64	0.3	1	0.0	5.8	0.3	--	
54	Greene Bros.	1960	2.62	0.5	--	--	3.3	--	--	
55	Greene Bros.	1977	2.63	0.3	1	0.0	6.3	0.2	--	
56	Traxler Gravel	1968	2.55	2.6	--	--	--	--	--	
56	Traxler Gravel	1968	2.62	0.6	--	--	--	--	--	
56	Traxler Gravel	1968	2.62	0.6	1	--	3.4	--	--	
56	Traxler Gravel	1968	2.62	0.4	--	--	--	--	--	
56	Traxler Gravel	1968	2.62	0.6	--	--	--	--	--	
57	Traxler S & G	1977	2.63	0.4	1	0.0	4.4	0.4	--	
58	Greene Bros.	1967	2.60	0.4	1	0.1	4.0	0.2	--	
60	Blain S & G	1977	2.64	0.3	1	0.0	5.1	1.0	--	
61	Blain S & G	1977	2.64	0.4	1	0.0	3.9	0.5	--	
62	St. Catherine	1949	2.62	0.4	2	--	2.9	--	--	

(Continued)

Table C2 (Concluded)

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	Organic Impurities No.	Lighter than 2.00 Sp. Gr. Percent	$MgSO_4$ Loss Percent	Friable Particles Percent	Freezing-Thawing DFE300	Remarks
62	St. Catherine	1977	2.62	0.7	1	0.1	4.9	2.7	--	
63	Unknown Producer	1948	2.61	0.6	5	--	2.3	--	--	
64	St. Catherine	1957	2.62	0.6	3	2.0	--	--	--	
65	F & C Engineering	1957	2.62	0.9	3		--	--	--	
65	F & C Engineering	1957	2.63	0.7	2	--	--	--	--	
65	F & C Engineering	1957	2.62	1.0	4	--	--	--	--	
65	F & C Engineering	1957	2.61	1.1	3	--	--	--	--	
66	St. Catherine S & G	1968	2.62	0.8	--	--	--	--	--	
67	R .L. Hensley	1977	2.62	0.6	2	0.0	3.9	0.6	--	
68	Lake Pearl S & G	1959	2.62	0.7	0	0.0	7.8	--	--	

Table C3

Coarse Aggregate

Summary of Test Data

Source No.	Producer and Size Range, in.	Date Tested	Specific Gravity	Absorption Percent	Soft Particles Percent	Lighter than 2.40 Sp. Gr. Percent	Flat and Elongated Percent	$MgSO_4$ Loss Percent	Abrasion Loss Percent	Friable Particles Percent	Remarks
4	Kivett & Reel 1-1/2 - No. 4	1949	2.53	2.5	--	12.6	--	9.36	--	--	
5	Canal S & G 1-1/2 - No. 4	1948	2.48	3.3	--	29.2	--	16.3	20.0	--	
6	Canal S & G 1-1/2 - No. 4	1947	2.51	2.4	--	--	--	9.71	18.5	--	
7	Sloat Dredging 1-1/2 - No. 4	1947	2.60	2.9	--	--	--	12.1	18.1	--	
9	St. Tammany S & G 1-1/2 - No. 4	1952	2.49	3.6	--	--	--	--	--	--	
10	Jahncke Servies 1-1/2 - No. 4	1968	2.55	1.9	--	--	--	--	--	--	
11	Dixie S & G 1-1/2 - No. 4	1970	2.49	3.0	--	--	--	--	--	--	
12	Carion, Inc. 3/4 in. - No. 4	1964	2.49	3.2	--	--	--	12.3	17	--	
14	Jahncke Services 1-1/2 - No. 4	1962	2.55	2.1	--	--	--	3.7	--	--	
15	Gulf S & G 1 - No. 4	1960	2.52	2.6	1.5	12.2	--	2.4	18.6	--	
16	Comite S & G 1-1/2 - No. 4	1949	2.52	2.0	0.0	--	6.9	4.2	23.0	--	
17	Baton Rouge Sand 1-1/2 - No. 4	1958	2.54	2.7	0.0	8.7	0.6	3.2	15.9	--	

(Continued)

Table C3 (Continued)

Source No.	Producer and Size Range, in.	Date Tested	Specific Gravity	Absorption Percent	Soft Particles Percent	Lighter than 2.40 Sp. Gr. Percent	Flat and Elongated Percent	$MgSO_4$ Loss Percent	Abrasion Loss Percent	Friable Particles Percent	Remarks
18	Gifford-Hill Co										
	1-1/2 - No. 4	1977	2.54	2.3	0.2	8.6	0.5	3.9	20.5	0.2	
19	Dixie S & G										
	1-1/2 - No. 4	1970	2.49	3.0	--	--	--	--	--	--	
20	Smith S & G										
	1-1/2 - No. 4	1972	2.54	2.5	0.0	11.7	1.0	3.2	18.1	--	
	1-1/2 - No. 4	1977	2.52	2.2	0.0	12.2	3.7	6.3	18.5	0.3	
21	Louisiana Industries										
	1-1/2 - No. 4	1974	2.51	3.1	--	--	--	--	--	--	
22	B & B Gravel										
	1-1/2 - No. 4	1977	2.53	1.9	0.0	8.7	2.9	4.1	19.9	0.3	
23	Gifford-Hill										
	1-1/2 - No. 4	1977	2.56	1.2	0.0	5.3	3.1	1.9	24.4	0.2	
24	A-1 S & G										
	1 in. - No. 4	1977	2.49	3.0	0.0	23.3	2.7	7.1	18.9	0.2	
26	Red Stick S & G										
	1-1/2 - No. 4	1977	2.52	2.2	0.0	10.3	1.3	5.5	19.5	0.2	
27	Red Stick S & G										
	1-1/2 - No. 4	1977	2.52	2.1	0.0	8.1	1.9	6.7	18.9	0.3	
28	Lambert Gravel										
	1-1/2 - No. 4	1962	2.55	1.6	0.9	16.7	2.4	4.2	20.8	--	
	1-1/2 - No. 4	1977	2.53	1.7	0.0	9.2	0.3	--	--	0.1	
29	Holloway S & G										
	1-1/2 - No. 4	1965	2.54	2.6	--	--	--	--	--	--	
30	Mt. Vernon Gravel										
	1-1/2 - No. 4	1969	2.50	2.7	1.4	16.2	1.6	--	17.5	--	

Table C3 (Continued)

Source No.	Producer and Size Range, in.	Date Tested	Specific Gravity	Absorption Percent	Soft Particles Percent	Lighter than 2.40 Sp. Gr. Percent	Flat and Elongated Percent	$MgSO_4$ Loss Percent	Abrasion Loss Percent	Friable Particles Percent	Remarks
32	Big River Industries										
	1/2-in. - No. 30	1956	1.85	17.9	--	--	--	--	30.5	--	
33	Feliciana S & G										
	1-1/2 - No. 4	1957	2.55	2.1	0.0	6.4	1.0	3.3	17.6	--	
		1961	2.55	2.8	--	12.7	--	--	--	--	
	2-in. - No. 4	1977	2.52	2.1	0.0	--	2.5	--	19.8	3.5	
35	Martin Gravel										
	1-1/2 - No. 4	1961	2.47	1.9	--	7.1	--	--	--	--	
36	River Materials										
	1-in. - No. 4	1964	2.54	1.6	0.0	11.1	2.5	2.4	17.9	--	
37	Big River Industries										
	3/4-in. - No. 8	1964	--	--	--	--	--	2.9	--	--	
38	Great River Corp.										
	1-1/2 - No. 4	1971	2.56	1.0	--	11.1	--	3.1	20.7	--	
39	Feliciana S & G										
	1-1/2 - No. 4	1977	2.53	1.7	0.0	12.0	1.3	--	21.5	0.0	
40	Radcliff Gravel	1948	--	--	--	--	--	--	--	--	
41	Richton S & G										
	1-1/2 - No. 4	1953	2.58	1.4	--	--	--	0.56	18.1	--	
42	Underwood S & G										
	1-1/2 - No. 4	1977	2.55	2.3	0.0	7.4	1.2	1.6	17.9	0.1	
43	American S & G										
	1-1/2 - No. 4	1951	2.57	1.0	--	--	--	1.72[1]	19.4	--	
	1-in. - No. 4		2.55	1.3	--	4.1	--	5.62[1]	17.7	--	

[1] Na_2SO_4 Loss Test

(Continued)

Table C3 (Continued)

Source No.	Producer and Size Range, in.	Date Tested	Specific Gravity	Absorption Percent	Soft Particles Percent	Lighter than 2.40 Sp. Gr. Percent	Flat and Elongated Percent	$MgSO_4$ Loss Percent	Abrasion Loss Percent	Friable Particles Percent	Remarks
45	American S & G										
	1-1/2 - No. 4	1977	2.52	1.8	0.0	13.0	1.2	4.0	19.0	0.1	
	1-1/2 - No. 4		2.53	1.7	0.0	14.0	1.0	4.6	18.0	0.1	
46	Underwood Builders										
	1-1/2 - No. 4	1957	2.56	1.5	--	--	--	--	--	--	
47	Hammitt & Green, Inc.										
	1-1/2 - No. 4	1975	2.51	3.3	0.0	18.5	--	5.9	19.8	--	
48	American S & G										
	3/4-in. - No. 4	1975	2.56	1.9	--	--	--	--	--	--	
49	Blain S & G										
	1-1/2 - No. 4	1977	2.49	2.8	0.0	19.0	1.4	--	20.3	0.2	
50	Blain S & G										
	1-1/2 - No. 4	1977	2.45	4.4	0.0	26.6	4.2	14.5	26.8	0.4	
51	Vicksburg S & G										
	1-1/2 - No. 4	1948	2.52	1.5	0.0	--	9.2	4.1	24.3	--	
53	Greene Bros.										
	1-1/2 - No. 4	1977	2.54	2.1	0.0	7.6	1.9	3.0	17.8	0.5	
55	Greene Bros.										
	1-1/2 - No. 4	1977	2.55	1.9	0.0	6.5	3.1	6.8	22.7	0.1	
57	Traxler S & G										
	1-1/2 - No. 4	1977	2.54	2.2	0.0	7.7	1.4	4.6	21.7	0.2	
58	Greene Bros.										
	1-1/2 - No. 4	1967	2.52	3.1	--	15.0	--	--	--	--	
	1-1/2 - No. 4		2.52	3.0	0.0	15.0	1.5	7.2	19.3	0.2	
59	Traxler S & G										
	1-1/2 - No. 4	1967	2.54	2.6	--	12.8	--	--	--	--	

(Continued)

Table C3 (Concluded)

Source No.	Producer and Size Range, in.	Date Tested	Specific Gravity	Absorption Percent	Soft Particles Percent	Lighter than 2.40 Sp. Gr. Percent	Flat and Elongated Percent	$MgSO_4$ Loss Percent	Abrasion Loss Percent	Friable Particles Percent	Remarks
60	Blain S & G 2-in. - No. 4	1977	2.54	1.9	0.0	8.4	0.1	3.3	19.0	0.5	
61	Blain S & G 1-1/2 - No. 4	1977	2.56	1.5	0.2	4.7	1.6	2.6	19.8	0.5	
62	St. Catherine S & G 2-in. - No. 4	1949	2.57	1.4	--	--	--	--	--	--	
		1977	2.55	1.7	0.0	7.2	0.3	3.3	22.0	0.2	
63	Unknown Producer 2-in. - No. 4	1948	2.64	1.4	0.0	--	7.6	1.2	21.6	--	
64	St. Catherine S & G 1-1/2 - No. 4	1957	2.57	2.1	--	12.9	3.0	--	20.3	--	
66	St. Catherine S & G 1-in. - No. 4	1968	2.57	1.7	--	--	--	--	--	--	
67	R. L. Hensley 2-in. - No. 4	1977	2.57	0.9	0.0	3.4	0.7	--	21.4	0.4	
68	Lake Pearl S & G 1-1/2 - No. 4	1959	2.55	1.8	0.0	8.2	0.3	2.2	17.9	--	

Table C4

Riprap

Summary of Test Data

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	$MgSO_4$ Loss Percent	Unit Weight lb/cu ft	Abrasion Loss Percent	Freezing-Thawing 20 Cycles % Loss	Wetting and Drying % Loss	Remarks
69	River S & G Co.	1969	2.70	0.5	5.8	--	28.1	--	--	
		1969	2.69	0.7	5.8	--	25.1	--	--	
70	Reed Crushed Stone	1973	2.68	0.6	--	--	--	--	--	
		1973	2.69	0.5	--	--	--	--	--	
		1973	2.68	0.8	--	--	--	--	--	
71	Williams Stone Co.	1970	2.70	0.28	--	--	--	--	--	
		1970	2.72	0.53	--	--	--	--	--	
		1970	2.71	0.41	--	--	--	--	--	
		1970	2.74	0.49	--	--	--	--	--	
72	Rigsby-Barnard	1970	2.66	0.78	--	--	--	--	--	
			2.67	0.66	--	--	--	--	--	
			2.63	1.26	--	--	--	--	--	
			2.66	0.95	6.3	--	26.7	--	--	
73	Denny & Simpson	1970	2.71	0.14	--	--	--	--	--	
			2.71	0.42	--	--	--	--	--	
			2.71	0.54	--	--	--	--	--	
			2.73	0.48	5.95	--	21.6	--	--	
74	Three Rivers	1975	2.62	2.33	16.4	--	35.7	--	--	
75	Westlake Quarry	1973	2.65	0.4	--	165.1	--	6.07	--	
76	Westlake Quarry	1969	2.71	0.3	--	--	29.2	--	--	
		1969	2.70	0.4	--	--	23.8	--	--	
77	Southern River Rock	1973	2.78	0.6	--	173.2	--	14.2	--	
		1973	2.80	0.5	--	174.4	--	50.4	--	
		1973	2.74	0.6	--	170.7	--	0.3	--	

(Continued)

Table C4 (Continued)

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	$MgSO_4$ Loss Percent	Unit Weight lb/cu ft	Abrasion Loss Percent	Freezing-Thawing 20 Cycles % Loss	Wetting and Drying % Loss	Remarks
78	Bussen Quarries	1972	2.69	0.3	--	167.6	--	1.1	--	
		1972	2.65	0.8	--	165.1	--	26.2	--	
		1972	2.68	0.5	--	166.1	--	30.9	--	
79	Columbia Quarry	1970	2.64	1.3	0.4	--	24.8	--	--	
80	Riverview Stone	1972	2.62	1.8	--	163.2	--	5.1	--	
81	Southern River Rock	1970	2.55	2.4	1.5	158.9	38.6	--	--	
		1970	2.63	0.9	0.4	163.8	35.5	--	--	
82	Stolle Quarry	1970	2.68	0.8	4.4	--	27.5	--	--	
83	Markham & Brown	1972	2.57	3.0	--	160.1	--	34.0	--	
		1972	2.71	0.3	--	168.8	--	5.8		
84	Westlake Quarry	1965	2.66	0.3	--	167.7	33.4	6.8	--	
		1965	2.67	0.2	--	166.3	31.0	9.0	--	
		1965	2.52	2.2	--	157.0	30.1	2.8	--	
		1965	2.65	0.2	--	165.1	24.9	0.2	--	
85	Westlake Quarry	1969	2.68	0.5	2.4	167.0	32.3	--	--	
		1969	2.70	0.8	3.3	168.2	34.4	--	--	
86	Bussen Quarries	1965	2.61	1.6	--	162.6	26.6	0.4	--	
		1964	2.64	0.7	--	164.5	24.7	0.2	--	
		1965	2.61	1.5	--	162.6	28.5	1.5	--	
		1965	2.61	1.1	--	162.6	28.4	0.8	--	
		1965	2.62	0.7	--	163.2	28.9	0.2	--	
87	Southern River Rock	1972	2.63	1.3	--	163.8	--	7.2	--	
88	Bussen Quarries	1975	2.54	1.9	--	158.2	--	1.2	--	
89	Westlake Quarry	1973	2.67	0.5	--	166.4	--	9.0	--	
		1973	2.65	0.4	--	165.1	--	24.8	--	

(Continued)

Table C4 (Concluded)

Source No.	Name of Producer	Date Tested	Specific Gravity	Absorption Percent	$MgSO_4$ Loss Percent	Unit Weight lb/cu ft	Abrasion Loss Percent	Freezing-Thawing 20 Cycles % Loss	Wetting and Drying % Loss	Remarks
90	Wayne B. Smith	1972	2.65	0.5	3.6	--	--	--	--	
91	Wayne B. Smith	1972	2.63	0.9	--	163.8	--	1.7	--	
		1972	2.64	0.8	--	164.5	--	1.7	--	
92	Florida Rock Corp.	1974	2.54	1.9	--	--	--	--	0.3	
93	Florida Rock Corp.	1971	2.57	1.2	12.38	--	35.0	--	--	
		1971	2.55	2.1	--	--	--	--	--	
94	Florida Rock Products	1949	2.48	2.5	10.89	--	36.2	--	--	

SOURCE NO. 1

RADCLIFF SAND COMPANY

MOBILE, AL

STATE: Ala.	INDEX NO.: 1	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory		
LAT.: 30	LONG.: 88		DATE: 7 February 1950		
LAB. SYMBOL NO.: 76-96			TYPE OF MATERIAL: Sand		
LOCATION: Mobile, Alabama					
PRODUCER: Radcliff Sand Company, Mobile, Alabama					
SAMPLED BY:					
TESTED FOR: Tennessee-Tombigbee Waterway					
PROCESSING BEFORE TESTING: Graded in the laboratory					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					97
NO. 8					89
NO. 16					57
NO. 30					25
NO. 50					8
NO. 100					1
NO. 200					
- 200(a)					
F.M.(b)					3.23

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.63
ABSORPTION, PER CENT (CRD-C 107, 108):					0.1
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					2.91
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					32
Rc, mM/L:					32

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR: 6.6

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The sample consists of 87% dense hard quartz, 5% dense hard quartzite, 5% essentially dense, white brown reddish-brown or black chert, 2% white or brown loosely cemented sandstone, and 1% miscellaneous materials consisting of mica and feldspar. Some of the particles of chert contain chalcedony. Chalcedony is one of the minerals which have been shown to be reactive with some of the minor alkalies of portland cement.

REMARKS:

SOURCE NO. 2

RADCLIFF SAND & GRAVEL CO.

MOBILE, AL

Issued Sept 1961

STATE: Ala.	INDEX NO.: 2	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory		
LAT.: 30 N	LONG.: 88 W		DATE: 29 July 1960		
LAB. SYMBOL NO.: 180/166			TYPE OF MATERIAL:		
LOCATION: About 10 miles north of Mobile, Alabama in Saraland, Alabama					
PRODUCER: Saraland Pit, Radcliff Sand and Gravel Company - Undeveloped					
SAMPLED BY: Fowler					
TESTED FOR: Jackson Lock and Dam					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE: Alluvium deposits, Recent age					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					100
NO. 8					100
NO. 16					100
NO. 30					99
NO. 50					85
NO. 100					40
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107,108):					
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½") (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

The sand consists of 95% quartz, 1% quartzite, 1% organic matter and 3% miscellaneous (detrital minerals, feldspar, and minor others). Some of the particles are coated with clay. Charred wood and organic matter result in high colorimetric values.

REMARKS:

Colorimetric value exceeds 500 p.p.m.

WES FORM 726 JAN. 1951

SOURCE NO. 3

LEGGETT SAND & GRAVEL CO.

HANSBORO, MS

STATE: Miss.	INDEX NO.: 1	AGGREGATE DATA SHEET	TESTED BY: So. Atlantic Div. Lab.
LAT.: 30° 22' N	LONG.: 89° 05' W		DATE: 15 August 1951

LAB. SYMBOL NO.: 122/2 (F.A.) TYPE OF MATERIAL: Natural Sand

LOCATION: Harrison Co. E½ NW¼, Sec. 30 & W½ W½ NE¼ & W½ W½ SE¼, Sec. 19, T 7 S., R. 10 W

PRODUCER: Leggett Sand & Gravel Co. (Formerly Bayou Sand & Gravel Pit Co.) Hansboro, Miss. Commercial

SAMPLED BY: Frank Pigford, Construction Inspector, Keesler AFB, Miss.

TESTED FOR: Keesler AFB, Miss.

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Not indicated

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					98
NO. 8					94
NO. 16					*84
NO. 30					71
NO. 50					14
NO. 100					* 1
NO. 200					
- 200 (a)					
F.M. (b)					2.38

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.60
ABSORPTION, PER CENT (CRD-C 107,108):					0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. NaSO4 (c) ½-1", #4-½" (CRD-C 115)					3.55
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122).	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					67
Rc, mM/L:					35

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE II CEMENT, RATIO 7 DAYS, 134 %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127): Petrographic analysis of the sand shows it to consist of quartz (90%), chert (9%), quartzite (1%), trace of sandstone, and a trace of miscellaneous minerals. The chert is predominant in the larger sieve size fractions, but diminishes in the smaller sieve size fractions. The sand size particles vary in shape from subangular to subrounded with fairly smooth surfaces. The particles are hard and fresh. The chert particles were found to contain chalcedony which has been shown to be reactive with the alkalies in Portland Cement.

REMARKS:

* Sample fails to meet specified grading on #16 and #100 sieves.

WES FORM 726 JAN. 1951

SOURCE NO. 4

KIVETT & REEL, INC.

SUN, LA

STATE: La.	INDEX NO.: 2	AGGREGATE DATA SHEET	TESTED BY: SAD
LAT.: 30	LONG.: 89		DATE: 25 March 1949

LAB. SYMBOL NO.: 57/155 gravel, 57/156 sand TYPE OF MATERIAL: Gravel & Sand

LOCATION: Sun, La.

PRODUCER: Kivett & Reel, Sun, La.

SAMPLED BY:

TESTED FOR: Pearl River Locks

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				53	
½ IN.				8	
⅜ IN.				3	100
NO. 4				2	98
NO. 8					80
NO. 16					59
NO. 30					42
NO. 50					9
NO. 100					2
NO. 200					
- 200[a]					
F.M.[b]					3.10

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):				2.53	2.62
ABSORPTION, PER CENT (CRD-C 107,108):				2.5	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR 2.40 (CRD-C 129):				12.6	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				9.36	3.40
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:				683	220
Rc, mM/L:				88	47

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE II CEMENT, RATIO 28 DAYS, 88.3 %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100 F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

The gravel is composed of 59% dense chert, 24% porous chert, 12% vuggy chert, 4% quartz, and 1% miscellaneous materials. The sand consists of 81% quartz, 12% dense chert, 4% porous chert and 3% miscellaneous materials. Several of the chert particles were found to contain chalcedony. Chalcedony has been shown to be reactive with some of the minor alkalies of portland cement.

REMARKS:

SOURCE NO. 5

CANAL SAND & GRAVEL CO.

SUN, LA

STATE: La.	INDEX NO.: 3	AGGREGATE DATA SHEET	TESTED BY: SAD & WES
LAT.: 30	LONG.: 89		DATE: 23 March 1948

LAB. SYMBOL NO.: 75/33 gravel, 75/34 sand TYPE OF MATERIAL: Gravel & Sand

LOCATION: Sun, La., Canal Sand & Gravel Co., No. 2 Pit

PRODUCER: Canal Sand & Gravel Co., Sun, La.

SAMPLED BY: Crawford Mobile District

TESTED FOR: Pearl River Lock No. 1

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				79	
½ IN.				36	
⅜ IN.				5	100
NO. 4					96
NO. 8					85
NO. 16					70
NO. 30					49
NO. 50					7
NO. 100					0.2
NO. 200					
- 200(a)					
F.M.(b)					2.93

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT. SURF. DRY (CRD-C 107, 108):				2.48	2.62
ABSORPTION, PER CENT (CRD-C 107, 108):				3.3	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):				29.2	—
PER CENT FLAT AND ELONGATED (CRD-C 119, 120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				16.3	3.8
ABRASION LOSS (L. A.), %, (CRD-C 117): *				20.0	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc; mM/L				533	198
Rc, mM/L				95	18

MORTAR-MAKING PROPERTIES (CRD-C 116) **

TYPE III CEMENT, RATIO 3 DAYS, 126 %, 7 DAYS, 133 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

The gravel is composed of 26% dense chert, 43% vuggy chert, 27% porous chert, 3% quartz, and 1% miscellaneous. The sand consists of 88% quartz, 11% chert, and 1% miscellaneous. A significant amount of the chert contains chalcedony. Chalcedony is one of the minerals which has been shown to be reactive with some of the minor alkalies in portland cement.

REMARKS: *"B" grading, loss at 100 rev. = 4.0.
** Tests conducted by WES

SOURCE NO. 6

CANAL SAND & GRAVEL CO.

BUSH, LA

STATE: La.	INDEX NO.: 4	AGGREGATE DATA SHEET	TESTED BY: SAD
LAT.: 30	LONG.: 89		DATE: 25 September 1947

LAB. SYMBOL NO.: 57/150 gravel, 57/151 sand TYPE OF MATERIAL: Gravel & Sand

LOCATION: Bush, La.

PRODUCER: Canal Sand & Gravel Co., Bush, La.

SAMPLED BY:

TESTED FOR: Pearl River Lock No. 1

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				72	
½ IN.				29	
⅜ IN.				2	
NO. 4				0	100
NO. 8					99
NO. 16					93
NO. 30					72
NO. 50					13
NO. 100					1
NO. 200					
- 200[a]					
F.M.[b]					2.22

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.51	2.66
ABSORPTION, PER CENT (CRD-C 107,108):				2.4	0.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				9.71	2.19
ABRASION LOSS (L. A.), %, (CRD-C 117):			18.5		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:			833		12
Rc, mM/L:			67		15

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE II CEMENT, RATIO 7 DAYS, 88.5 %, 28 DAYS, 103 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. 57/152*	COARSE AGG: 57/150	DFE_{300}	3		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

(Tested by CRD) The gravel is composed of 26% dense chert, 46% vuggy chert, 24% porous chert, 4% quartz, and a trace of miscellaneous materials. The sand consists of 86% quartz, 12% chert, and 2% miscellaneous materials including, sandstone, zircon, biotite, amphiboles, and carbonates. Some of the chert is fine-grained quartz, but many of the pebbles contain chalcedony. Chalcedony has been shown to be deleteriously reactive with the minor alkalies of portland cement.

REMARKS: *Blend of a coarse & fine sand.

SOURCE NO. 7

SLOAT DREDGING CO.

SLIDELL, LA

STATE: La.	INDEX NO.: 5	AGGREGATE DATA SHEET	TESTED BY: SAD & WES		
LAT.: 30	LONG.: 89		DATE: 30 December 1947		

LAB. SYMBOL NO.: 57/157 gravel, 57/158 sand TYPE OF MATERIAL: Gravel & Sand

LOCATION: Approximately 5 miles north of Pearl River, La.

PRODUCER: Sloat Dredging Co., Slidell, La.

SAMPLED BY:

TESTED FOR: Pearl River Locks

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				83	
½ IN.				42	
⅜ IN.				15	
NO. 4				1	100
NO. 8					96
NO. 16					85
NO. 30					64
NO. 50					14
NO. 100					1
NO. 200					
- 200[a]					
F.M.[b]					2.40

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):				2.60	2.64
ABSORPTION, PER CENT (CRD-C 107, 108):				2.9	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				12.10	2.02
ABRASION LOSS (L. A.), %, (CRD-C 117):				18.1	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:				417	133
Rc, mM/L:				55	39

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE II CEMENT, RATIO 28 DAYS, 89 %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): (Gravel Only) ** The gravel is composed of 31% dense chert, 22% vuggy chert, 27% porous chert, 20% quartz, and a trace of miscellaneous rocks and minerals. Most of the chert is fine-grained quartz, but some of the pebbles contain chalcedony. Chalcedony has been shown to be deleteriously reactive with the minor alkalies of portland cement.

REMARKS: *"B" grading, loss at 100 rev. = 3.6
** Tests conducted by WES

SOURCE NO. 8

TRAXLER GRAVEL CO.

GULFPORT, MS

STATE: Miss.	INDEX NO.: 6 (rev.)	AGGREGATE DATA SHEET	TESTED BY: SAD Testing Lab.
LAT.: 30° N	LONG.: 89° W		DATE: 18 June 1952

LAB. SYMBOL NO.: 122/63 (F.A.) TYPE OF MATERIAL: Natural Sand

LOCATION: 80 acres in corner of the SE ¼ of the NE ¼, sec 17, T7S, R12W, and N½ of NE¼, of SE¼ of sec. 17, T7S, R12W.

PRODUCER: Traxler Gravel Co., Gulfport, Miss. Property owned by Mrs. Rena Cuevas (Commercial)

SAMPLED BY:

TESTED FOR: Mix Design for Concrete. Keesler AFB, Miss.

PROCESSING BEFORE TESTING:

USED AT: AC and W Station, Crystal Springs, Ala. (1956)

GEOLOGICAL FORMATION AND AGE: Not indicated

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					99
NO. 8					94
NO. 16					80
NO. 30					53
NO. 50					*6
NO. 100					*1
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.59
ABSORPTION, PER CENT (CRD-C 107,108):					1.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	(1)
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127): None

REMARKS: * Sample fails to meet requirements of Federal Specification SS-A-281a on grading.

WES FORM 726 JAN. 1951

SOURCE NO. 9

ST. TAMMANY SAND AND GRAVEL CO.

SUN, LA

STATE: La.	INDEX NO.: 7	AGGREGATE DATA SHEET	TESTED BY: SAD Testing Lab.
LAT.: 30° N	LONG.: 89° W		DATE: 17 July 1952

LAB. SYMBOL NO.: 75/59-(FA) - 60(CA) TYPE OF MATERIAL: Natural Sand & Gravel

LOCATION: 3/4 mi. South of Bogue Chitto River, 300 yds. East of La. Highway No. 7.

PRODUCER: St. Tammany Sand & Gravel Co., Sun, La. (Commercial)

SAMPLED BY: U.S. Engineers

TESTED FOR: Pearl River Sills

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Coastal Estuarine Sands & Gravels of Quaternary Age.

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			98		
¾ IN.			84		
½ IN.			50		
⅜ IN.			28		100
NO. 4			1		96
NO. 8					87
NO. 16					73
NO. 30					56
NO. 50					13
NO. 100					1
NO. 200					
-200[a]					
F.M.[b]					2.74

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.49		2.61
ABSORPTION, PER CENT (CRD-C 107,108):			3.6		0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): Petrographic examination reveals the gravel to consist predominantly of dense and weathered chert. Well-rounded dense quartz particles comprise about 7% of the sample. The sand is essentially quartz with small amounts of chert and miscellaneous materials. In general, the sand is composed of fresh, dense material, whereas the gravel contains a large amount of weathered chert (35%). Chalcedony, which is reactive with the minor alkalies of Portland Cement, is present in some of the chert.

REMARKS:

SOURCE NO. 10

JAHNCKE SERVICES, INC.

BUSH, LA

Issued Sept 1969

STATE: La	INDEX NO.: 8 (Suppl 2)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 89		DATE: October 1968

LAB SYMBOL NO.: NO-28 G-1 (5) C811 TYPE OF MATERIAL: Natural gravel

LOCATION: Approximately 1/2 mi above Lock No. 2 on East side of Pearl River Navigation Canal

PRODUCER: Jahncke Services, Inc., Bush, La., Plant

SAMPLED BY: New Orleans District

TESTED FOR: New Orleans District

USED AT: West Levee Hurricane Protection Floodwall

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				96	
¾ IN.				82	
½ IN.				52	
⅜ IN.				26	
NO. 4				4	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 109)				2.55	
ABSORPTION, % (CRD-C 107, 108):				1.9	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F, (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 6011-R
MAR 1968

SOURCE NO. 11

DIXIE SAND & GRAVEL CO.

AMITE, LA

Issued Sept 1973

STATE: La.	INDEX NO.: 9 (Suppl)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 89		DATE: 31 August 1970

LAB SYMBOL NO.: NO-31 S-1(2), NO-31 G-1(2) TYPE OF MATERIAL: Natural Sand & Chert

LOCATION: Franklinton, La., Pit, 15 miles SE of Franklinton, La., on Highway 16, Washington Parish, T4S, R12E, Sec 16.

PRODUCER: Dixie Sand & Gravel Co., Division of Monroe Sand & Gravel Co. Amite, La.

SAMPLED BY: New Orleans District

TESTED FOR: New Orleans District

USED AT: Lake Pontchartrain and Vicinity; Hurricane Flood Protection

PROCESSING BEFORE TESTING: None.

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				85	
½ IN.				44	
⅜ IN.				27	100
NO. 4				1	96
NO. 8					82
NO. 16					70
NO. 30					57
NO. 50					21
NO. 100					2
NO. 200					–
-200[a]					0.3
F.M.[b]				2.72	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 109)				2.49	2.62
ABSORPTION, % (CRD-C 107, 109):				3.0	0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, (CRD-C 130)					———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING_____					
UNIT WT, LB/CU FT (CRD-C 105):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH: Sc,mM/L:					
(CRD-C 128): Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____ DAYS,_____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F, (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1969 6011-R

SOURCE NO. 12

CARION, INC.

PICAYUNE, MS

Issued Sept 1966

STATE: La.	INDEX NO.: 10	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory		
LAT.: 30	LONG.: 89		DATE: February 1964		
LAB. SYMBOL NO.: 1A575 - 576			TYPE OF MATERIAL: Natural Sand & Gravel		
LOCATION: 500 yds. North of U.S. Highway 11 on the Louisiana side of the Pearl River					
PRODUCER: Carion, Inc., Picayune, Mississippi					
SAMPLED BY:					
TESTED FOR: Mississippi Test Facility - ENG (NASA) - 815					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					97
NO. 8					86
NO. 16					75
NO. 30					61
NO. 50					28
NO. 100					8
NO. 200					
- 200[a]					
F.M.[b]					2.45

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.49	2.62
ABSORPTION, PER CENT (CRD-C 107,108):				3.2	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	OK
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ [(c) ½-1", #4-½] (CRD-C 115)				12.3*	2.4
ABRASION LOSS (L. A.), %, (CRD-C 117): "B" Grading				17	—
UNIT WT., LB/CU FT (CRD-C 108):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

*B_1 Size group used.

WES FORM 726 JAN. 1951

STATE: La.	INDEX NO.: 1	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 30	LONG.: 90		DATE: 8 July 1948

LAB. SYMBOL NO.: NO-1 S-4 TYPE OF MATERIAL: Fine Sand

LOCATION: Bonnet Carre Spillway, 1/4 Mi. Below Upper Guide Wall, Between 100' & 600' Lakeward of Y. & M. V. R. R. Trestle

PRODUCER: Contractor

SAMPLED BY: Contractor's Representative

TESTED FOR: Algiers Lock

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					100.0
NO. 100					52
NO. 200					7
- 200(a)					
F.M.(b)					0.48

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.58
ABSORPTION, PER CENT (CRD-C 107,108):					1.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	4
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					139
Rc, mM/L:					100

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): The sample is composed of quartz, feldspar, chert, chalcedony, calcite and minor amounts of opaque and heavy minerals. The sample is 92.6 per cent acid insoluble.

REMARKS:

SOURCE NO. 14

JAHNCKE SERVICES, INC.

JACKSON, LA

SOURCE NO. 15

GULF SAND & GRAVEL CO.

AMITE, LA

Issued Sept 1961

STATE: La.	INDEX NO.: 3 (Suppl)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: 15 August 1960

LAB. SYMBOL NO.: NO-12 G-1(2) Job 6375 TYPE OF MATERIAL: Natural Gravel

LOCATION: Amite, La.

PRODUCER: Gulf Sand and Gravel Co., Amite, La.

SAMPLED BY: New Orleans District

TESTED FOR: New Orleans District

PROCESSING BEFORE TESTING: Regrading

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	As Recd	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			97	100	
¾ IN.			87	95	
½ IN.			57	73	
⅜ IN.			29	42	
NO. 4			2	2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.52	
ABSORPTION, PER CENT (CRD-C 107,108):				2.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):				1.5	—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):				12.2	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				2.4	
ABRASION LOSS (L. A.), %, (CRD-C 117):				18.6	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):				0.1	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): The sample was made up of blocky, irregular and tabular pale colored chert ranging from light brown to light gray, with minor amounts of dense white and pale quartz that was confined to the sizes passing the 3/4-in. sieve. The light surface colors of the chert resulted from leaching of the outer surfaces, leaving a thin porous skin surrounding a more dense interior. Percentage chert: on 3/4 in., 100; 1/2 in., 98; 3/8 in., 98; No. 4, 82; Average: 91.

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 16

COMITE SAND & GRAVEL CO.

AMITE, LA

STATE: La.	INDEX NO.: 4	AGGREGATE DATA SHEET	TESTED BY: WES		
LAT.: 30	LONG.: 90		DATE: July 1949		
LAB. SYMBOL NO.: NO-2 S-2			TYPE OF MATERIAL: Sand & Gravel		
LOCATION: 10 Mi., North of Amite, Louisiana					
PRODUCER: Comite Sand and Gravel Co., Amite, Louisiana					
SAMPLED BY: Hugh W. Bryant					
TESTED FOR: East and West Calumet Floodgates					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100.0		
1 IN.			95.0		
¾ IN.			78.2		
½ IN.			44.5		
⅜ IN.			18.7		
NO. 4			0.8		98.5
NO. 8					86.0
NO. 16					69.2
NO. 30					50.8
NO. 50					15.9
NO. 100					1.9
NO. 200					0.3
- 200(a)					
F.M.(b)					2.78

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.52		2.60
ABSORPTION, PER CENT (CRD-C 107,108):			2.0		0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	2
SOFT PARTICLES, PER CENT (CRD-C 130):			0.0		—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			6.9		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			4.2		2.8
ABRASION LOSS (L. A.), %, (CRD-C 117):			23.0		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:			453		81
Rc, mM/L:			90		43

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE III CEMENT, RATIO 3 DAYS, 105 %, 7 DAYS, 105 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. NO-12 S-2	COARSE AGG: NO-12 G-2	DFE_{300}	7		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

SOURCE NO. 17

BATON ROUGE SAND CO.

BATON ROUGE, LA

Issued Sept 1958

STATE: La.	INDEX NO.: 5	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: 27 May 1958

LAB. SYMBOL NO.: NO-25 S-3 G-2 Job 6001/370 TYPE OF MATERIAL: Sand and Gravel

LOCATION: East Baton Rouge Parish approximately 16 mi NE of Baton Rouge, on bank of Amite River.

PRODUCER: Baton Rouge Sand Co., Baton Rouge, Louisiana

SAMPLED BY: New Orleans District Personnel

TESTED FOR: Port Allen Lock

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				95	
¾ IN.				84	
½ IN.				50	
⅜ IN.				18	
NO. 4				1	97
NO. 8					84
NO. 16					65
NO. 30					51
NO. 50					21
NO. 100					3
NO. 200					—
- 200(a)					1.7
F.M.(b)					2.78

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.54	2.62
ABSORPTION, PER CENT (CRD-C 107,108):				2.7	0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	2
SOFT PARTICLES, PER CENT (CRD-C 130):				0	—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):				8.7	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				0.6	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				3.2	1.8
ABRASION LOSS (L. A.), %, (CRD-C 117):				15.9	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 134 %, 7 DAYS, 132 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 18

GIFFORD-HILL, INC.

AMITE, LA

Issued Sept 1969

STATE: LA	INDEX NO.: 6(suppl 1)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: Oct 1968

LAB SYMBOL NO.: NO-35 S-1 (3) C811 TYPE OF MATERIAL: Natural Sand

LOCATION: 1 mile North of Fluker, La., on Tangipahoa River

PRODUCER: Jahncke Services, Inc. Mitchell Pit, now Gifford-Hill Inc

SAMPLED BY: New Orleans District

TESTED FOR: New Orleans District

USED AT: West Levee Hurricane Protection Floodwall

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	¾-4"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					97
NO. 8					88
NO. 16					77
NO. 30					62
NO. 50					23
NO. 100					3
NO. 200					--
-200(a)					0.2
F.M.(b)					2.51

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	¾-4"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)					2.64
ABSORPTION, % (CRD-C 107, 108):					0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING _____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1968 6011-R

STATE: La.	INDEX NO.: 6 Rev 1	AGGREGATE DATA SHEET	TESTED BY: usaewes
LAT.: 30	LONG.: 90		DATE: June 1977

LAB SYMBOL NO.: No. 57, G-9 and S-5 TYPE OF MATERIAL: Pit run

LOCATION: On east side of US Hwy. 51 approx. 2.15 mies North of intersection of La. Hwy. 10 in Fluker, La. (Mitchell Plant #29)

PRODUCER: Gifford-Hill Co., Inc. (Mitchell Plant #29), P.O. Box 196, Fluker, La.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING: Separated over the No. 4 sieve before testing.

GEOLOGICAL FORMATION AND AGE: Pleistocene Terrace (Prairie) Deposits and Holloocene Alluvium.

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1½	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			92		
¾ IN.			74		
½ IN.			35		
⅜ IN.			14		
NO. 4			1		100
NO. 8					89
NO. 15					76
NO. 30					55
NO. 50					11
NO. 100					1
NO. 200					
-200(a)					0.5
F.M.(b)					2.69

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4-1½	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.54		2.63
ABSORPTION, % (CRD-C 107, 109):			2.3		0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)			0.2		———
% LIGHTER THAN SP GR_____ (CRD-C 122)			8.6		0.0
% FLAT AND ELONGATED (CRD-C 119, 120)			0.5		--
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)			3.9		4.7
L.A. ABRASION LOSS, % (CRD-C 117, 146) GRADING B			20.5		--
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.2		0.3
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS._____ %, _____DAYS._____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE300			
FINE AGG. COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

TAN-1-1 (Pit run)

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 19

DIXIE SAND & GRAVEL CO.

AMITE, LA

Issued Sept 1971

STATE: La.	INDEX NO.: 7		TESTED BY	USAEWES	
LAT.: 30	LONG.: 90	AGGREGATE DATA SHEET	DATE:	31 August 1970	

LAB SYMBOL NO.: NO-31 S-1(2), NO-31 G-1(2) TYPE OF MATERIAL: Natural Sand & Chert

LOCATION: Franklinton, La., Pit, 15 miles SW of Franklinton, La., on Highway 16, Washington Parish, T4S, R12E, Sec 16.

PRODUCER: Dixie Sand & Gravel Co., Division of Monroe Sand & Gravel Co. Amite, La.

SAMPLED BY: New Orleans District

TESTED FOR: New Orleans District

USED AT: Lake Pontchartrain and Vicinity; Hurricane Flood Protection

PROCESSING BEFORE TESTING: None.

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				85	
½ IN.				44	
⅜ IN.				27	100
NO. 4				1	96
NO. 8					82
NO. 16					70
NO. 30					57
NO. 50					21
NO. 100					2
NO. 200					–
-200[a]					0.3
F.M.[b]				2.72	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.49	2.62
ABSORPTION, % (CRD-C 107, 108):				3.0	0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	CN	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1969 6011-R

SOURCE NO. 20

SMITH SAND & GRAVEL

MT. HERMAN, LA

Issued Sept. 1973

STATE: La.	INDEX NO.: 8	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 90 W		DATE: 21 July 1972

LAB SYMBOL NO.: NO-41 G-1 and S-1 TYPE OF MATERIAL: Sand and gravel

LOCATION: Smith Sand and Gravel Co., Mt. Herman, Washington Parish, La. Township 2, Range 10 E; Franklinton Pit

PRODUCER: Smith Sand and Gravel Co., Bogue Chito River, Hwy 1056

SAMPLED BY: New Orleans District

TESTED FOR: Bayou Bienvenue Control Structure

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				97	
¾ IN.				86	
⅜ IN.				52	
#4				25	
NO. 4				2	98
NO. 8					84
NO. 16					70
NO. 30					53
NO. 50					14
NO. 100					1
NO. 200					0
-200[a]					0.2
F.M.[b]				2.81	6.88

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	2.63
ABSORPTION, % (CRD-C 107, 108):				2.5	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	———
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.00 (CRD-C 122)				*	0.0
% FLAT AND ELONGATED (CRD-C 119) FE				1.0	
WT % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				3.2	2.5
L.A. ABRASION LOSS, % (CRD-C 117) GRADING B				18.1	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					
Organic Impurities (CRD-C 121)				Color lighter th 1.	

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 114):

			FAT	HW-CD	HD-CW
FINE AGG. NO-41 S-1	COARSE AGG: NO-41 G-1	DFE_{300}	9		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): Gravel sample was 94 percent chert; some of the chert was chalcadonic.

Sand sample was 80 percent quartz, 15 percent chert and 5 percent sandstone and heavy minerals. Chalcedonic chert was present in the sand.

Low-alkali cement should be specified if the material is used as concrete aggregate.

REMARKS:

* Coarse aggregate: CRD-C 122, % lighter than sp gr 2.40 = 11.7.

STATE: La.	INDEX NO.: 8 (Suppl)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 90 W		DATE: June 1977

LAB SYMBOL NO.: No. 57 G-12, S-8 TYPE OF MATERIAL: Gravel, sand & pit run

LOCATION: On W. bank of Bogue Chitto River approx. 5 miles NW of Franklinton, La. Just E. of La. Hwy. 1066.

PRODUCER: Smith Sand & Gravel Co., Route 1, Box 348, Mt. Herman, La.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT: Bayou Bienvenue Control Structure

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Holocene alluvial deposits of the Bogue Chito River.

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			89		
¾ IN.			59		
½ IN.			22		
⅜ IN.			12		
NO. 4			5		96
NO. 8					89
NO. 16					82
NO. 30					70
NO. 50					25
NO. 100					4
NO. 200					1
-200(a)					0.8
F.M.(b)					2.44

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
BULK SP. GR, S.S.D. (CRD-C 107, 108)			2.52		2.62
ABSORPTION, % (CRD-C 107, 108):			2.2		0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	2
SOFT PARTICLES, % (CRD-C 130)			0.0		—
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 sand)			12.2		0.1
% FLAT AND ELONGATED (CRD-C 119, 120)			3.7		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)			6.3		4.0
L.A. ABRASION LOSS, % (CRD-C 117, 1~~65~~) GRADING B			18.5		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.3		1.7
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WAS-1-1 (Gravel)
WAS-1-2 (Sand)
WAS-4-1 (Pit run)

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 21

LOUISIANA INDUSTRIES

NEW ORLEANS, LA

Issued Sept 1975

STATE: La	INDEX NO.: 9	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: 9 Jan 74

LAB SYMBOL NO.: NO-47 G-1, S-1 TYPE OF MATERIAL: Natural

LOCATION: Pit located at Price, Washington Parish, La.

PRODUCER: Louisiana Industries, New Orleans, La.

SAMPLED BY: New Orleans District

TESTED FOR: Empire Floodgate

USED AT:

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				82	
½ IN.				36	
⅜ IN.				11	
NO. 4					96
NO. 8					90
NO. 16					82
NO. 30					67
NO. 50					17
NO. 100					1
NO. 200					
-200[a]					0.2
F.M.[b]					2.46

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.51	2.62
ABSORPTION, % (CRD-C 107, 108):				3.1	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE____ CEMENT, RATIO:____ DAYS,____ %,____ DAYS,____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 22

B & B GRAVEL CO.

BATON ROUGE, LA

STATE: LA	INDEX NO.: 11	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: November 1977

LAB SYMBOL NO.: No-59 G-39, S-25 TYPE OF MATERIAL: Natural

LOCATION: In sections 65 & 66, along Amite River, approx 2 miles east-southeast of Hatchersville, LA

PRODUCER: B and B Gravel Co., 3415 Choctaw Dr., Baton Rouge, LA 70806

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Amite River Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):						
SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	2" NE AGG.	
6 IN.						
5 IN.						
4 IN.						
3 IN.						
2½ IN.						
2 IN.						
1½ IN.				100		
1 IN.				95		
¾ IN.				79		
½ IN.				48		
⅜ IN.				29	100	
NO. 4				7	96	
NO. 8					92	
NO. 16					84	
NO. 30					77	
NO. 50					35	
NO. 100					6	
NO. 200					1	
-200[a]					1.1	
F.M.[b]					2.10	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	3-6"	1½-3"	¾-1½"	#4-½"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.53	2.63
ABSORPTION, % (CRD-C 107, 108):				1.9	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	2
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(2.00 Sand)			8.7	0.0
% FLAT AND ELONGATED (CRD-C 119, 129)				2.9	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				4.1	4.8
L.A. ABRASION LOSS, % (CRD-C 117, ~~140~~) GRADING B				19.9	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.3	0.0
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM ----

SOURCE NO. 23

GIFFORD-HILL, INC.

ROSELAND, LA

STATE: LA	INDEX NO.: /2	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: November 1977

LAB SYMBOL NO.: No-57 G-40, S-26 TYPE OF MATERIAL: Natural

LOCATION: 0.1 mile East of U. S. 51, approx 1.0 mile North of the intersection with LA Hwy 10 in Arcola, LA

PRODUCER: Gifford-Hill Co. (Plant No. 33) P. O. Box 263, Roseland, LA 70486

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Tangipahoa River Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):						TEST RESULTS	3-6"	1½-3"	¾-1½"	#4-1/2"	#4-FINE AGG.
SIEVE	3-6"	1½-3"	¾-1½"	#4-1/2"	AGG.						
						BULK SP GR, S.S.D. (CRD-C 107, 108)				2.56	2.63
6 IN.						ABSORPTION, % (CRD-C 107, 108):				1.2	0.4
5 IN.						ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
4 IN.						SOFT PARTICLES, % (CRD-C 130)				0.0	———
3 IN.						% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(2.00 Sand)			5.3	0.0
2½ IN.						% FLAT AND ELONGATED (CRD-C 119, 120)				3.1	
2 IN.						WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				1.9	4.3
1½ IN.				100		L.A. ABRASION LOSS, % (CRD-C 117, ~~445~~) GRADING A				24.4	
1 IN.				92		UNIT WT, LB/CU FT (CRD-C 106):					
¾ IN.				68		FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.0
½ IN.				35		SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
⅜ IN.				16		REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
NO. 4				1	100	Rc, mM/L:					
NO. 8					94						
NO. 16					79	MORTAR-MAKING PROPERTIES (CRD-C 116)					
NO. 30					64	TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %					
NO. 50					16	LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):					
NO. 100					1						
NO. 200											
-200[a]					0.3						
F.M.[b]					2.46						

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

(a) CRD-C 105 (b) CRD-C 104

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM

SOURCE NO. 24

A-1 SAND & GRAVEL CO.

BATON ROUGE, LA

STATE: LA	INDEX NO.: 18	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 90		DATE: November 1977

LAB SYMBOL NO.: No-57 G-41, S-27 TYPE OF MATERIAL: Natural

LOCATION: Southside of LA 64, approx 0.6 miles east of intersection with LA Hwy 37 in Magnolia

PRODUCER: A-1 Sand & Gravel Co., 7460 Industrial Dr., Baton Rouge, LA

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Appregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Amite River Alluvial Deposits (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-1½"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				100	
¾ IN.				94	
½ IN.				62	
⅜ IN.				35	100
NO. 4				6	99
NO. 8					96
NO. 16					91
NO. 30					84
NO. 50					38
NO. 100					6
NO. 200					2
-200[a]					1.4
F.M.[b]					0.94

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-1½"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 109)				2.49	2.63
ABSORPTION, % (CRD-C 107, 109):				3.0	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	2
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(2.00 Sand)			23.3	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				2.7	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				7.1	1.2
L.A. ABRASION LOSS, % (CRD-C 117, ~~M61~~) GRADING B				18.9	
UNIT WT, LB/CU FT (CRD-C 108):					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.2
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE_{300}			
FINE AGG.	COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 25

RED STICK SAND & GRAVEL CO.

BATON ROUGE, LA

STATE: LA	INDEX NO.: 20	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT: 30	LONG: 90		DATE: November 1977		
LAB SYMBOL NO.: No-57 S-28			TYPE OF MATERIAL: Natural		
LOCATION: On LA Hwy 37, approx 3.6 miles south of the intersection with LA 63					
PRODUCER: Red Stick S & G Co., Baton Rouge, LA (Pullam Pit)					
SAMPLED BY: Dames & Moore					
TESTED FOR: New Orleans Dist Aggregate Test					
USED AT:					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE: Amite River Valley Alluvium (Holocene)					

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					99
NO. 8					96
NO. 16					87
NO. 30					74
NO. 50					23
NO. 100					2
NO. 200					1
-200'd'					0.4
F.M.[b]					2.19

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108):					2.63
ABSORPTION, % (CRD-C 107, 108):					0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 21)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130):					———
% LIGHTER THAN SP GR 2.00 (CRD-C 122):					0.0
% FLAT AND ELONGATED (CRD-C 119, 125):					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137):					4.8
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____:					
UNIT WT, LB/CU FT (CRD-C 105):					
FRIABLE PARTICLES, % (CRD-C 142):					0.0
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116):

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	5 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:
EBR-1-1

ENG FORM 1 MAR 1959 6011-R

SOURCE NO. 26

RED STICK SAND & GRAVEL CO.

BATON ROUGE, LA

STATE: LA	INDEX NO.:	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT. 30	LONG.: 90		DATE: November 1977

LAB SYMBOL NO.: No-57 G-42 TYPE OF MATERIAL: Natural

LOCATION: Fedler Pit

PRODUCER: Red Stick S & G Co., Baton Rouge, LA

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Amite River Valley Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	#4-½" FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				98	
¾ IN.				81	
½ IN.				40	
⅜ IN.				15	
NO. 4				1	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	#4-½" FINE AGG.
BULK SP. GR. S.S.D. (CRD-C 107, 109)				2.52	
ABSORPTION, % (CRD-C 107, 108):				2.2	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130):				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)				10.3	
% FLAT AND ELONGATED (CRD-C 119, 120)				1.3	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				5.5	
L.A. ABRASION LOSS, % (CRD-C 117, ~~136~~) GRADING B				19.5	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142):				0.2	
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-C#
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

SOURCE NO. 27

RED STICK SAND & GRAVEL

BATON ROUGE, LA

STATE: LA	INDEX NO.: 20	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT. 30	LONG.: 90		DATE: November 1977

LAB SYMBOL NO.: No-57 G-43 TYPE OF MATERIAL: Natural

LOCATION: Davis Pit

PRODUCER: Red Stick S & G Co., Baton Rouge, LA

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Amite River Valley Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				75	
½ IN.				23	
⅜ IN.				4	
NO. 4				1	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-5"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.52	
ABSORPTION, % (CRD-C 107, 108):				2.1	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)				0.0	—
% LIGHTER THAN SP GR 2.40 (CRD-C 122)				8.1	
% FLAT AND ELONGATED (CRD-C 119, 120)				1.9	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				6.7	
L.A. ABRASION LOSS, % (CRD-C 117, ~~1461~~) GRADING B				18.9	
UNIT WT, LB/CU FT (CRD-C 105):					
FRIABLE PARTICLES, % (CRD-C 142)				0.3	
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 6011-R

SOURCE NO. 28

LAMBERT GRAVEL CO.

ST. FRANCISVILLE, LA

Issued Sept 1965

STATE: La.	INDEX NO.: I (Suppl. #2)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 91		DATE: 5 Nov. 1962

LAB. SYMBOL NO. NO-14 S-1(3), G-1(3) Job 6439 TYPE OF MATERIAL: Sand and gravel

LOCATION: Streambed of Bayou Sara. Plant located on Louisiana State Highway 124, about 2 miles west of Baines, La.

PRODUCER: Lambert Gravel Co., Baines, La. (formerly Afton Villa Gravel Co.)

SAMPLED BY: Vicksburg District

TESTED FOR: Columbia and Jonesville Locks and Dams

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-G 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	COARSE AGG. GRADED	FINE AGG. GRADED	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100	100	
1 IN.			97	97	
¾ IN.			82	82	
½ IN.			30	36	
⅜ IN.			10	15	100
NO. 4			1	2	99
NO. 8					89
NO. 16					76
NO. 30					57
NO. 50					14
NO. 100					1
NO. 200					--
-200 (a)					0.2
F.M. (b)					2.65

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	COARSE AGG. GRADED	FINE AGG. GRADED	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.55	2.54	2.63
ABSORPTION, PER CENT (CRD-C 107,108):			1.6	1.6	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):			0.9	0.4	—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):			10.7*		
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			2.5	2.3	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			4.2*		3.6
ABRASION LOSS (L. A.), % (CRD-C 117):			20.8*		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)			0.04*		0.0
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	0.0
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 110 %, 7 DAYS, 113 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: * Because of the similarity between the grading, specific gravity, absorption, soft particle percentage, and flat and elongated percentage, these two gravels were considered as one material for the remaining tests.

STATE: La.	INDEX NO.: 1 Suppl 44	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 91 W		DATE: June 1977

LAB SYMBOL NO.: NO. G-13, S-9 TYPE OF MATERIAL: Pit run

LOCATION: On Bayou Sara West of La. Hwy. 66 approx. 2.5 miles NW of intersection with US 61

PRODUCER: Lambert Gravel Co., Inc., P.O. Drawer G, St. Francisville, La.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Pleistocene Terrace (Montgomery) deposits and Holocene alluvial deposits of Bayour Sara.

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1[a]	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			96		
¾ IN.			77		
½ IN.			31		
⅜ IN.			15		
NO. 4			5		100
NO. 8					99
NO. 16					97
NO. 30					93
NO. 50					52
NO. 100					12
NO. 200					6
-200[a]					4.2
F.M.[b]					1.51

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4-1"	#4-⅜"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 109)			2.53		2.65
ABSORPTION, % (CRD-C 107, 108):			1.7		.05
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	2
SOFT PARTICLES, % (CRD-C 130)			0.0		———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 sand)			9.2		0.0
% FLAT AND ELONGATED (CRD-C 119, 120)			0.3		0.0
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C ~~137~~ 136)			*		*
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____			*		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.1		5.5
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

		FINE AGGREGATE				COARSE AGGREGATE			
		2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT:	% Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT:	% Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			FAT	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WFL-1-1 (Pit run) (1) Masonry sand
WFL-1-2 (Pit run)
* Insufficient material for test

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 29

HOLLOWAY SAND & GRAVEL CO.

JACKSON, LA

Issued Sept 1966

STATE: La.	INDEX NO.: 2(SUPPL #2)(REV)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 91		DATE: 21 May 1962, March '65

LAB. SYMBOL NO.: NO-1 S-2(4) and G-2(4) Job 6426 TYPE OF MATERIAL: Nat. Sand and Gravel

LOCATION: Pit on Thompson's Creek near Jackson, La., T3S, R1W, East Feliciana Parish

PRODUCER: Holloway Sand and Gravel Co., Jackson, La.

SAMPLED BY: New Orleans District

TESTED FOR: St. Francisville Casting Yard

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	#4 ¾-1½"	#4 ¾-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			98		
¾ IN.			86		
½ IN.			50		
⅜ IN.			24		100
NO. 4			2		98
NO. 8					92
NO. 16					85
NO. 30					73
NO. 50					30
NO. 100					4
NO. 200					–
-200 (a)					1.9
F.M. (b)					2.18

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	#4 ¾-1½" (c)	#4 ¾-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.54		2.62
ABSORPTION, PER CENT (CRD-C 107,108):			2.6		0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 %DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: Tests in March 1965 indicated that the quality of the material was unchanged.

WES FORM 726 JAN. 1951

SOURCE NO. 30

MT. VERNON GRAVEL CO.

MT. VERNON, LA

Issued Sept 1969

STATE: La.	INDEX NO.: 3 (rev.)	AGGREGATE DATA SHEET	TESTED BY: CRD		
LAT.: 30°	LONG.: 91°		DATE: 27 Aug 1952, May 1969		
LAB. SYMBOL NO.: NO-16 G-1, S-1 Job 6001/83			TYPE OF MATERIAL: Natural Sand & Gravel		
LOCATION: 6 Mi. SE of St. Francisville, La., 3 Mi. + from Mississippi River, 3 Mi. + Downstream on Thompson Creek from U. S. Highway 61 & 65.					
PRODUCER: Mt. Vernon Pit of Mt. Vernon Gravel Co.					
SAMPLED BY: Personnel of Baton Rouge Field Office					
TESTED FOR: Concrete Aggregate Evaluation - Bayou Boeuf Lock					
PROCESSING BEFORE TESTING: None					
GEOLOGICAL FORMATION AND AGE: Prairie Terrace - Quaternary					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				99	
¾ IN.				84	
½ IN.				41	
⅜ IN.				8	
NO. 4				1	53
NO. 8					85
NO. 16					76
NO. 30					60
NO. 50					15
NO. 100					2
NO. 200					0.6
- 200[a]					0.5
F.M.[b]					2.71

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-1½" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.50	2.61
ABSORPTION, PER CENT (CRD-C 107,108):				2.7	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):				1.4	—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):				16.2	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				1.6	-
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				-	-
ABRASION LOSS (L. A.), %, (CRD-C 117):				17.5	—
UNIT WT., LB/CU FT (CRD-C 106):				-	-
CLAY LUMPS, % (CRD-C 118):				-	-
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:				573	99
Rc, mM/L:				136	31

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 112 %, 7 DAYS, 113 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: Physical test results on material from this source sampled from the St. Francisville Casting Field stockpile (NO-29-G-4(8), S-4(5)) were similar to those of previously tested samples.

WES FORM 726 JAN. 1951

SOURCE NO. 31

GIROD GRAVEL CO.

WOODVILLE, MS

Issued Sept 1969

STATE: Miss.	INDEX NO.: 4(rev 2)	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 30	LONG.: 91		DATE: 29 November 1956, May 1969

LAB. SYMBOL NO.: NO-24 G-2(S) Job 6001/299 TYPE OF MATERIAL: Pit Run Aggregate Sand

LOCATION: Bayou Sara Creek on Island Plantation, about 15 Miles from Woodville, Mississippi

PRODUCER: Girod Gravel Co.

SAMPLED BY: J. L. Collins

TESTED FOR: Old River Control Structure

PROCESSING BEFORE TESTING: Separated over No. 4 sieve, sand fraction tested.

USED AT: OLD RIVER LOW SILL AND OVERBANK STRUCTURES (1957).

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	(1)	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				98	
¾ IN.				94	
½ IN.				84	
⅜ IN.				75	
NO. 4				58	100
NO. 8				46	80
NO. 16				36	62
NO. 30				25	43
NO. 50				6	11
NO. 100				2	3
NO. 200					
-200[a]					2.4
F.M.[b]				4.58	3.01

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.62
ABSORPTION, PER CENT (CRD-C 107,108):					0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					3.2
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 112 %, 7 DAYS, 114 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

(1) As received.

Physical test results on material from this source sampled from the St. Francisville Casting Field Stockpile in 1969 (NO-29G-4(8), S-4(9)) were similar to those of previously tested samples.

WES FORM 726 JAN. 1951

SOURCE NO. 32

BIG RIVER INDUSTRIES

BATON ROUGE, LA

STATE: La.	INDEX NO.: 5	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 30	LONG.: 91		DATE: 27 Dec. 1956

LAB. SYMBOL NO.: WES-1 G-10, S-11, Job 7624.0 TYPE OF MATERIAL: Gravelite

LOCATION: Baton Rouge, Louisiana

PRODUCER: Big River Industries, Inc.

SAMPLED BY: J.F.J.

TESTED FOR: Construction and Maintenance Section, JSO

PROCESSING BEFORE TESTING: As received from MBM stockpile

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	Coarse Agg. #4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.				100	
⅜ IN.				63	100
NO. 4				20	99
NO. 8				3	89
NO. 16				1	64
NO. 30				1	41
NO. 50					26
NO. 100					18
NO. 200					
-200(a)					12.6
F.M.(b)				6.09	2.63

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	Coarse Agg. #4-¾"	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				1.85	1.90
ABSORPTION, PER CENT (CRD-C 107,108):				17.9	16.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	0	0
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117): Grading C				30.5	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

SOURCE NO. 33

FELICIANA SAND & GRAVEL

JACKSON, LA

Issued Sept 1961

STATE: La.	INDEX NO.: 6 (rev)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 91		DATE: 4 Sep 57, 19 Apr 61

LAB. SYMBOL NO.: NO-25 G-1, G-1(a), G-1(3), S-1(2), S-1(3) TYPE OF MATERIAL: Nat. Sand and Gravel

LOCATION: Approximately 1 mi west of Jackson, La. along the east fork of Feliciana Creek

PRODUCER: Feliciana Sand and Gravel Co., Jackson, La.

SAMPLED BY: New Orleans District

TESTED FOR: Port Allen Lock and St. Francisville Articulated Concrete Mattress

PROCESSING BEFORE TESTING: G-1 and G-1(A) combined for sieve analysis; S-1 and S-1(A) combined for all tests. S-1 & S-1

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING)

SIEVE	Spec Limits	G-1 (3)	G-1 & G-1(A)	S-1 (2)	S-1 (3) FINE AGG.
6 IN.	For	#4 -	#4 -	Fine	
5 IN.	G-1 &	1-1/2"	1-1/2"	Agg.	
4 IN.	G-1(A)				
3 IN.					
2½ IN.					
2 IN.					
1½ IN.	100	100	100		
1 IN.	90-97	95	94		
¾ IN.		83	77		
½ IN.	40-60	53	47		
⅜ IN.		31	25	100	100
NO. 4	0-6	4	3	95	96
NO. 8				83	79
NO. 16				71	63
NO. 30				57	47
NO. 50				20	13
NO. 100				3	1
NO. 200				-	-
- 200(a)				0.6	0.7
F.M.(b)				2.72	3.00

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	#4 - 1-1/2" (c)	#4 - 1½" (c)	Agg. (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.55	2.55	2.62	2.64
ABSORPTION, PER CENT (CRD-C 107,108):		2.8	2.1	0.7	0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	1	
SOFT PARTICLES, PER CENT (CRD-C 130):			0.0		—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):		12.7	6.4*	1.6	
PER CENT FLAT AND ELONGATED 2.00 (CRD-C 119,120):		0.6	0.7 1	0.1	0.0
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			3.3	2.8	
ABRASION LOSS (L. A.), %, (CRD-C 117):			17.6		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 113 %, 7 DAYS, 108 %

LINEAR THERMAL EXPANSION X10 6/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9. MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: * Method CRD-C 122, with 2.40 specific gravity liquid.

WES FORM 726 JAN. 1951

STATE: La.	INDEX NO.: 6 (Rev)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 91 W		DATE: June 1977

LAB SYMBOL NO.: NO. 57 G-14-, S-10 TYPE OF MATERIAL: Pit run

LOCATION: 0.6 miles S. of La. Hwy. 10 on Thompson Creek, approx. 0.5 miles W. of Jackson, La.

PRODUCER: Felicinna Sand & Gravel Co., Jackson, La.

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Pleistocene Terrace (Prairie) deposits and Holocen alluvium

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		
1½ IN.			99		
1 IN.			97		
¾ IN.			84		
½ IN.			50		
⅜ IN.			32		
NO. 4			1		100
NO. 8					81
NO. 16					66
NO. 30					45
NO. 50					9
NO. 100					1
NO. 200					
−200(a)					0.8
F.M.(b)					2.95

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.53		2.62
ABSORPTION, % (CRD-C 107, 108):			2.1		0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)			0.0		———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(2.00 sand)		*		0.1
% FLAT AND ELONGATED (CRD-C 119, 120)			2.5		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C ~~116~~ 137)			*		4.8
L.A. ABRASION LOSS, % (CRD-C 117, ~~116~~) GRADING B			19.8		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			3.5		0.9
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE300			
FINE AGG.	COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WFL 3-1 (Pit run)

*Insufficient material for test.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 34

NEW ORLEANS DISTRICT ENGINEERS

Issued Sept 1958

STATE: La.	INDEX NO.: 7	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 30	LONG.: 91		DATE: 4 Sept 1957		
LAB. SYMBOL NO.: NO-25 S-2 Job 6001/328			TYPE OF MATERIAL: Fine Natural Sand		
LOCATION: Sand bar in Mississippi River at Free Nigger Point, vicinity of mile 234 AHP					
PRODUCER: New Orleans District Engineers					
SAMPLED BY: New Orleans District Personnel					
TESTED FOR Port Allen Lock					
PROCESSING BEFORE TESTING: None					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					100
NO. 50					100
NO. 100					83
NO. 200					
-200[a]					12.2
F.M.[b]					0.17

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):					2.58
ABSORPTION, PER CENT (CRD-C 107,108):					1.9
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	4
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1961

STATE: La.	INDEX NO.: 8	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 91		DATE: 10 April 1961

LAB. SYMBOL NO.: NO-29 S-1, G-1, Job No. 6392 TYPE OF MATERIAL: Nat. Sand and Gravel

LOCATION: Bayou Sara Creek, Plant at St. Francisville, La. Pit east of Weyanoke, La.

PRODUCER: Martin Gravel Co., St. Francisville, La.

SAMPLED BY: New Orleans District

TESTED FOR: St. Francisville Mattress Casting Plant

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				97	
¾ IN.				82	
½ IN.				43	
⅜ IN.				20	100
NO. 4				2	98
NO. 8					89
NO. 16					79
NO. 30					65
NO. 50					18
NO. 100					2
NO. 200					
- 200(a)				0.4	1.3
F.M.(b)					2.49

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.47	2.64
ABSORPTION, PER CENT (CRD-C 107, 108):				1.9	0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR 2.00 (CRD-C 127): 2.40				0.5	0.01
PER CENT FLAT AND ELONGATED (CRD-C 119,120): 122/129				7.1	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 36

RIVER MATERIALS

BAIN, LA

Issued Sept 1965

STATE Louisiana	INDEX NO.: 9	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30	LONG.: 91		DATE: 30 June 1964

LAB. SYMBOL NO.: NO-29S-3G-3 Job No. 6001/693 TYPE OF MATERIAL: Natural sand & gravel

LOCATION: Miss. River Mile 249 AHP, near head of Profit Island

PRODUCER: River Materials, Bains, La.

SAMPLED BY: New Orleans District

TESTED FOR: St. Francisville Casting Field

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				100	
¾ IN.				92	
½ IN.				49	
⅜ IN.				21	
NO. 4				0	95
NO. 8					83
NO. 16					71
NO. 30					56
NO. 50					11
NO. 100					0.2
NO. 200					-
-200[a]					0.1
F.M.[b]					2.84

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.54	2.61
ABSORPTION, PER CENT (CRD-C 107, 108):				1.6	0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	3
SOFT PARTICLES, PER CENT (CRD-C 130):				0.0	—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):				11.1	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				2.5	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				2.4	2.5
ABRASION LOSS (L. A.), %, (CRD-C 117):				17.9	—
UNIT WT., LB/CU FT (CRD-C 106):				95.14	113.9
CLAY LUMPS, % (CRD-C 118)				0.28	0.3
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	0.1
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 116 %, 7 DAYS, 104 %

LINEAR THERMAL EXPANSION X10 6/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 37

BIG RIVER INDUSTRIES

ERWINVILLE, LA

Issued Sept 1966

STATE: LA	INDEX NO.: 10	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory
LAT.: 30	LONG.: 91		DATE: April 1964
LAB. SYMBOL NO.: 1A587 - 588			TYPE OF MATERIAL: Manu. Lt.Wt.Aggregate

LOCATION: Southside U.S. Highway 190, 1/2 mile W. Erwinville, La.

PRODUCER: Big River Industries, Erwinville, La.

SAMPLED BY:

TESTED FOR: Mississippi Test Facility - Eng (NASA) 1573

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Alluvial Deposit - Recent Age

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.				100	
½ IN.				99	
⅜ IN.				68	
NO.4				11	100
NO.8				2	84
NO.16					51
NO.30					29
NO.50					18
NO.100					13
NO.200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107,108):					OK
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP.GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				2.9	15
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106): Loose Dry				36	41.5
CLAY LUMPS, % (CRD-C 118):				0	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T | HW-CD | HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: Additional test results: Loss on ignition: none; staining (Visual method): light; popouts: none; and drying shrinkage @ 100 days: 0.04%

WES FORM 726 JAN. 1951

SOURCE NO. 38

GREAT RIVER CORP.

TUNICA, LA

Issued Sept 1971

STATE: La | INDEX: -11- | AGGREGATE DATA SHEET | TESTED BY: USAEWES

LAT: 30 | LONG: 91 | DATE: 18 March 1971

LAB NO: NO-29 G-5(6) | TYPE OF MATERIAL: Pit Run Sand & Gravel

LOCATION: Mile 292.7 AHP on East bank, Mississippi River

PRODUCER: Great River Corporation, Tunica, La.

SAMPLED BY: USAEWES

TESTED FOR: New Orleans District; evaluation undeveloped

USED AT: Alluvial deposit

PROCESSING BEFORE TESTING: Washed gradation

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	Pit Run	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.	100			100	
1 IN.	100			99	
¾ IN.	96			91	
½ IN.	85			59	
⅜ IN.	77			36	
NO. 4	64			0	100
NO. 8	56				87
NO. 16	50				78
NO. 30	43				67
NO. 50	19				29
NO. 100	13				20
NO. 200	4				6
-200(a)	3.8				
F.M. (b)	3.8			6.7	2.2

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	xxxm	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.56	2.63
ABSORPTION, % (CRD-C 107, 108):				1.0	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	0
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)				11.1	2.0
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115) B1 grading				3.1	3.0
L.A. ABRASION LOSS, % (CRD-C 117, XX) GRADING B				20.7	--
UNIT WT, LB/CU FT (CRD-C 106):					
Clay lumps & FRIABLE PARTICLES, % (CRD-C 118)		8.9			
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 126): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): 95% of each gravel size is chert which is 80-90% dense chert and 5-10% fractured chert and about 5% porous chert. Particle shapes were blocky and pyramidal with subrounded edges and corners. Some of the chert is chalcedonic. The sand is largely chert in sizes retained on No. 8 sieve and largely quartz in sizes smaller than No. 16 sieve.

REMARKS: * Pit run sample separated over No. 4 sieve and physical tests run on coarse and fine fractions.

ENG FORM 1 MAR 1958 6011-R

MEMO 1798

SOURCE NO. 39

FELICIANA SAND & GRAVEL

JACKSON, LA

STATE: La.	INDEX NO.:	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30 N	LONG.: 91 W		DATE: June 1977

LAB SYMBOL NO.: NO. 57, G-15 TYPE OF MATERIAL: Natural Gravel

LOCATION: West bank of Bayou Sara, 1 mile E. of Sligo Road approx. 4.8 miles N. of St. Francisville, La.

PRODUCER: Feliciana Sand & Gravel Co., Jackson, La.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT: Port Allen Lock and St. Francisville Articulated Concrete Mattress Casting

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Pleistocene Terrace (Montgomery) deposits and Holocene alluvium

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			95		
¾ IN.			72		
½ IN.			21		
⅜ IN.			3		
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
−200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4-1"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.53		
ABSORPTION, % (CRD-C 107, 108):			1.7		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)			0.0		—
% LIGHTER THAN SP GR 2.40 (CRD-C 122)			12.0		
% FLAT AND ELONGATED (CRD-C 119, 120)			1.3		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C ~~137~~ 136)			*		
L.A. ABRASION LOSS, % (CRD-C 117, ~~A~~) GRADING A			21.5		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.0		
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: WFL-4-1 (Washed gravel)
* Insufficient material for test.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 40

RADCLIFF GRAVEL CO.

RICHTON, MS

Issued Sept 1962

STATE: Miss.	INDEX NO.: 1 (rev #2)	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 31	LONG.: 88		DATE: 3 Feb 48

LAB. SYMBOL NO.: SAD-1 G-11 TYPE OF MATERIAL: Gravel

LOCATION: Richton, Miss.

PRODUCER: Radcliff Gravel Co., Richton, Miss.

SAMPLED BY: Not Shown

TESTED FOR: Pearl River Lock

PROCESSING BEFORE TESTING:

USED AT: M.I. Const., Brookley AFB, Mobile, Ala. (1955-6); Elgin AFB, Fla. (1961).

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107,108):					
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127): The gravel is composed essentially of chert pebbles, with a minor amount of quartz pebbles. Approximately 25% of the entire sample consists of porous chert. About 22% of the sample is composed of vuggy and slightly porous chert. Most of the chert is fine-grained quartz, but some of the pebbles contain chalcedony. Chalcedony has been shown to be deleteriously reactive with the minor alkalies of portland cement.

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 41

RICHTON SAND & GRAVEL CO.

RICHTON, MS

STATE: Miss.	INDEX NO.: 2	AGGREGATE DATA SHEET	TESTED BY: WES & SAD
LAT.: 31	LONG.: 88		DATE: 1948 & 1953

LAB. SYMBOL NO.: TYPE OF MATERIAL: Gravel

LOCATION: On Thompson Creek, 1 mile South of Richton, Miss. Sec. 6, T 4 N, R 9 W, in Perry County, Miss.

PRODUCER: Richton Sand and Gravel Co., Richton, Miss.
Commercial

SAMPLED BY:

TESTED FOR: Bayou Cocodrie Drainage Structure & Brookley AFB

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Pleistocene Deposits

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½" *	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			97	99	
¾ IN.			82	94	
½ IN.			41	69	
⅜ IN.			17	38	
NO. 4			1	8	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)*	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.58		
ABSORPTION, PER CENT (CRD-C 107,108):			1.4		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			.56		
ABRASION LOSS (L. A.), %, (CRD-C 117): "A" Grading			18.1		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): The sample consisted of 83% chert & 17% quartz. About 25% of the total sample is porous chert, 22% is vuggy chert and 36% is dense chert, polished and non-absorptive. Chalcedony, which has been shown to be reactive with the minor alkalies of portland cement was identified in all three types of chert. Most of the chert pebbles are blocky or irregular with re-entrant curves but a few are flat.

REMARKS: * Tests conducted by the SAD for Brookley AFB during 1953.

SOURCE NO. 42

UNDERWOOD SAND & GRAVEL

RICHTON, MS

STATE: MS	INDEX NO.: 5	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 31	LONG 88		DATE: July 77		

LAB SYMBOL NO.: No-25 G-25, S-19 TYPE OF MATERIAL: Natural

LOCATION: Pit located 0.7 miles East of Highway 15, approximately 2.8 miles North of Intersection with U.S. 98 in Beaumont, Ms.

PRODUCER: Underwood Sand and Gravel Company, Box 370, Richton, Ms.

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Holocene Alluvium

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				99	
¾ IN.				88	
½ IN.				48	
⅜ IN.				15	
NO. 4				1	96
NO. 8					80
NO. 16					66
NO. 30					40
NO. 50					8
NO. 100					1
NO. 200					
-200 (a)					0.1
F.M. (b)					5.10

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.55	2.63
ABSORPTION, % (CRD-C 107, 108)				2.3	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	1
SOFT PARTICLES, % (CRD-C 130)				0.0	—
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				7.4	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				1.2	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				1.6	3.2
L.A. ABRASION LOSS, % (CRD-C 117), GRADING B				17.9	
UNIT WT, LB/CU FT (CRD-C 108)					
FRIABLE PARTICLES, % (CRD-C 142)				0.1	0.1
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

PER-1-1

SOURCE NO. 43

AMERICAN SAND & GRAVEL

HATTIESBURG, MS

Issued Sept 1962

STATE: Miss.	INDEX NO.: 1 (rev.)	AGGREGATE DATA SHEET	TESTED BY: South Atlantic Div. Lab.
LAT.: 31°22' N	LONG.: 89°18' W		DATE: 15 August 1951

LAB. SYMBOL NO.: 122-1 (C. A.) TYPE OF MATERIAL: Natural Gravel

LOCATION: Forrest Co. N½, NW¼, Sec. 33, T5N, R13W, SE¼, NW¼, N&E of Bouie R., Sec. 33, T5N, R13W, S½, SE¼, SW¼, & S½ S½ SW¼, Sec. 8, T5N, R13W

PRODUCER: American Sand & Gravel Co., Hattisburg, Miss.
Commercial

SAMPLED BY: Frank Pigford, Construction Inspector, Keesler AFB, Miss.

TESTED FOR: Keesler AFB, Miss. and Pearl River Lock

PROCESSING BEFORE TESTING:

USED AT: Mil. Const., Keesler AFB, Miss. (1961)

GEOLOGICAL FORMATION AND AGE: Not indicated

GRADING (CRD-G 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			97	100	
¾ IN.			81	79	
½ IN.			44	41	
⅜ IN.			20	15	
NO. 4			1	1	100
NO. 8					94
NO. 16					83
NO. 30					56
NO. 50					9
NO. 100					1
NO. 200					
- 200(a)					
F.M.(b)					2.57

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.57	2.55	2.64
ABSORPTION, PER CENT (CRD-C 107, 108):			1.0	1.3	0.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):				4.1	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. ~~xxsx~~ Na_2SO_4 (c) ½-1", #4-½" (CRD-C 115)			1.72	5.62	2.08
ABRASION LOSS (L. A.), %, (CRD-C 117): "A" Grade			19.4	17.7	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:			125	650	145
Rc, mM/L:			150	144	24

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE — CEMENT, RATIO 28 DAYS, 105 %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127): Petrographic analysis of the natural gravel shows it to be composed of chert (86%), quartz (11%), quartzite (3%), and a trace of sandstone. In general, the pebbles are subangular to subrounded, hard, fresh, and possess smooth surfaces. The chert pebbles are composed of chalcedony which has been shown to be reactive with the minor alkalies in Portland Cement.

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 44

AMERICAN SAND & GRAVEL

HATTIESBURG, MS

Issued Sept 1971

STATE: Miss	INDEX NO.: 2(suppl 3)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 89		DATE: Oct 69 and Jan 70

LAB SYMBOL NO.: WES-1 S-4 (49) and (50) TYPE OF MATERIAL: Natural sand

LOCATION: Sec 13, T4N, R13W, Forrest County, 2.9 mi NE of Hattiesburg, Miss.

PRODUCER: American Sand and Gravel Company, 22nd Ave., Hattiesburg, Miss.

SAMPLED BY: USAEWES

TESTED FOR: USAEWES

USED AT: USAEWES (Laboratory stock sand)

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

S-1(49) S-1(50)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	Fine Agg #4-3/8	FINE AGG.
				S-4 (49)	(50)
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4				98	98
NO. 8				90	88
NO. 16				72	74
NO. 30				50	53
NO. 50				23	26
NO. 100				4	7
NO. 200				-	-
-200[a]				0.5	1.2
F.M.[b]				2.62	2.55

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	Fine Agg #4-3/8	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.63	2.63
ABSORPTION, % (CRD-C 107, 108):				0.5	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING_____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____%, _____DAYS, _____%

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1958 6011-R

SOURCE NO. 45

AMERICAN SAND & GRAVEL

HATTIESBURG, MS

STATE: MS	INDEX NO.: 2	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 31	LONG.: 89		DATE: July 77		
LAB SYMBOL NO.: No-57 G-20, G-21, S-19			TYPE OF MATERIAL: Natural		
LOCATION: Pits located off Glendale Road approximately 1.0 miles North of Ms. Highway 42, NW of Hattiesburg Plants A, B, F					
PRODUCER: American Sand and Gravel Company, Hattiesburg, Ms					
SAMPLED BY: Dames and Moore					
TESTED FOR: New Orleans District					
USED AT:					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE: Holocene Alluvium of Bowie River					

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	G-20 4-1"	¾-1½"	G-21 4-1"	S-15 FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.		100		100	
1 IN.		99		99	
¾ IN.		85		93	
½ IN.		51		64	
⅜ IN.		27		34	
NO. 4		3		7	97
NO. 8					85
NO. 16					74
NO. 30					55
NO. 50					19
NO. 100					2
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	G-20 4-1"	¾-1½"	G-21	S-15 FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 109)		2.52		2.53	2.62
ABSORPTION, % (CRD-C 107, 108):		1.8		1.7	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1.00
SOFT PARTICLES, % (CRD-C 130)		0.0		0.0	———
% LIGHTER THAN SP GR_____ (CRD-C 122)		13.0		14.0	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)		1.2		1.0	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)		4.0		4.6	3.1
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING_____		19.0		18.0	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)		0.1		0.1	0.2
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

* G-20 Plant A FOR-1-1
G-21 Plant B FOR-2-1
S-15 Plant F FOR-3-1

SOURCE NO. 46

UNDERWOOD & BUILDERS

MOBILE, AL

Issued Sept 1958

STATE: Miss.	INDEX NO.: 3	AGGREGATE DATA SHEET	TESTED BY:	SAD Lab	
LAT.: 31°	LONG.: 89°		DATE:	3 June 1957	
LAB. SYMBOL NO.: 147/426, 429			TYPE OF MATERIAL:	Natural Sand & Gravel	

LOCATION: 7 miles west of Beaumont, Miss., on Laurel Road, and 3/4 mile north on graded road to pit.

PRODUCER: Underwood Builders Supply Co., Mobile, Ala.

SAMPLED BY: Mr. Conway, Brookley AFB

TESTED FOR: Brookley AFB

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	#4-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			96		
¾ IN.			84		
½ IN.			39		
⅜ IN.			12		100
NO. 4			3		98
NO. 8					92
NO. 16					82
NO. 30					65
NO. 50					21
NO. 100					3
NO. 200					
- 200[a]					
F.M.[b]					2.4

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	#4-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.56		2.66
ABSORPTION, PER CENT (CRD-C 107,108):			1.5		0.2
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½)(CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 47

HAMMITT & GREEN, INC.

FOXWORTH, MS

Issued Sept 1975

STATE: Miss.	INDEX NO.: 4	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 89		DATE: April 1975

LAB SYMBOL NO.: VICKS-60 G-1, S-1 TYPE OF MATERIAL: Natural

LOCATION: Marion County, Miss., about one mile from Foxworth on the bank of Pearl River. Pit across the river from Columbia, Miss.

PRODUCER: Breland and Sons, Foxworth, Miss.

10-78 Now Known as Hamnitt & Green, Inc

SAMPLED BY: Vicksburg District

TESTED FOR: Muddy Bayou Bridge Structure

USED AT:

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):					
SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				82	
½ IN.				46	
⅜ IN.				20	
NO. 4				1	97
NO. 8					87
NO. 16					74
NO. 30					56
NO. 50					14
NO. 100					5
NO. 200					
-200[a]					1.7
F.M.[b]					2.66

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.51	2.64
ABSORPTION, % (CRD-C 107, 108):				3.3	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR ____ (CRD-C 122) *				18.5	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				5.9	2.7
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____				19.8	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F5T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

* CRD-C 122 (Sp Gr used to float lightweight pieces)
Coarse aggregate = 2.40
Fine aggregate = 2.00

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 48

AMERICAN SAND & GRAVEL

HATTIESBURG, MS

Issued Sept 1975

STATE: Miss.	INDEX NO.: 5	**AGGREGATE DATA SHEET**	TESTED BY: USAEWES
LAT.: 31	LONG.: 89		DATE: Feb. 1975

LAB SYMBOL NO.: CL-2 G-2 TYPE OF MATERIAL:

LOCATION: Hattiesburg, Miss.

PRODUCER: American Sand & Gravel Co.

SAMPLED BY:

TESTED FOR: Laboratory Stock

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.				100	
½ IN.				63	
⅜ IN.				35	
NO. 4				3	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.56	
ABSORPTION, % (CRD-C 107, 108):				1.9	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	—
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____ DAYS,_____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 49

BLAIN SAND & GRAVEL

COLUMBIA, MS

STATE: MS	INDEX NO.: 6	AGGREGATE DATA SHEET	TESTED BY:	USAEWES
LAT.: 31	LONG.: 89		DATE:	July 77
LAB SYMBOL NO.:	No-57 G-24, S-18		TYPE OF MATERIAL:	Natural

LOCATION: Plant located 0.3 miles West of Ms Highway 43 approximately 9 miles South of Intersection with Highway 13, SE of Columbia, Ms (FORD PLANT)

PRODUCER: Blain Sand and Gravel Company, Box 1001, Columbia, Ms.

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				97	
¾ IN.				81	
½ IN.				50	
⅜ IN.				32	
NO. 4				1	100
NO. 8					86
NO. 15					79
NO. 30					70
NO. 50					14
NO. 100					1
NO. 200					
-200[a]					0.3
F.M.[b]					2.51

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.49	2.63
ABSORPTION, % (CRD-C 107, 108):				2.8	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				19.0	0.0
% FLAT AND ELONGATED (CRD-C 119, 129)				1.4	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				*	3.0
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING B				20.3	
UNIT WT, LB/CU FT (CRD-C 105):					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.2
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE330			
FINE AGG.	COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

MAR-1-1

* Insufficient Material for Test

SOURCE NO. 50

BLAIN SAND & GRAVEL, INC.

MT. OLIVE, MS

STATE: MS | INDEX NO.: | AGGREGATE DATA SHEET | TESTED BY: USAEWES

LAT.: 31 | LONG.: 89 | DATE: July 77

LAB SYMBOL NO.: No-57 G-22, S-16 | TYPE OF MATERIAL: Natural

LOCATION: Pit located 2 miles west of Prentiss, Ms

PRODUCER: Blain Sand and Gravel Incorporated, P.O. Box 278
Mount Olive, Ms

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio-Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1	FINE 1/2"
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				75	
¾ IN.				36	
½ IN.				10	
⅜ IN.				2	
NO. 4				1	94
NO. 8					87
NO. 16					78
NO. 30					56
NO. 50					5
NO. 100					1
NO. 200					
-200[a]					2.0
F.M.[b]					2.76

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1 1/2"	FINE Agg.
BULK SP. GR, S.S.D. (CRD-C 107, 103)				2.45	2.62
ABSORPTION, % (CRD-C 107, 108):				4.4	0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				26.6	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				4.2	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				14.5	4.9
L.A. ABRASION LOSS, % (CRD-C 117,) GRADING A				26.8	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.4	1.8
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

JEF-1-1

ENG FORM 6011-R

SOURCE NO. 51

VICKSBURG SAND & GRAVEL

VICKSBURG, MS

Issued Sept. 1963

STATE: Miss.	INDEX NO.: 1(rev.)	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 31	LONG.: 90		DATE: Dec. 1948

LAB. SYMBOL NO.: VICKS-7 S-1 & VICKS-7 G-1 TYPE OF MATERIAL: Sand

LOCATION: On Bayou Pierre about 3 miles NE of Port Gibson, Miss.

PRODUCER: Vicksburg Sand & Gravel Co., Vicksburg, Miss.

SAMPLED BY:

TESTED FOR: Vicksburg Floodwall

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			84		
¾ IN.			64		
⅜ IN.			39		
⅛ IN.			20		
NO. 4			3		94
NO. 8					84
NO. 16					62
NO. 30					21
NO. 50					5
NO. 100					0.6
NO. 200					0.1
-200[a]					
F.M[b]					3.34

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.52		2.60
ABSORPTION, PER CENT (CRD-C 107,108):			1.5		0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	2
SOFT PARTICLES, PER CENT (CRD-C 130):			0.0		—
PER CENT LIGHTER THAN SP. GR ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			9.2		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			4.1		2.2
ABRASION LOSS (L. A.), %, (CRD-C 117):			*24.3		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 126): Sc, mM/L:			555		131
Rc, mM/L:			127		17

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 112 %, 5 DAYS, 94 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

* "A" Grading.

WES FORM 726 JAN. 1951

SOURCE NO. 52

GREEN BROTHERS, INC.

CRYSTAL SPRINGS, MS

STATE: MS	INDEX NO.: 2	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: July 77

LAB SYMBOL NO.: No-57 G-23, S-17 TYPE OF MATERIAL: Natural

LOCATION: Ms pit located off Hencks Retreat Road approximately 5 miles Northeast of Brookhaven, Ms. Plant No. 6

PRODUCER: Green Brothers Inc., Crystal Springs, Ms

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio-Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				96	
¾ IN.				82	
½ IN.				53	
⅜ IN.				26	
NO. 4				2	99
NO. 8					92
NO. 16					84
NO. 30					68
NO. 50					13
NO. 100					1
NO. 200					
-200[a]					0.4
F.M.[b]					2.42

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	2.64
ABSORPTION, % (CRD-C 107, 108):				2.1	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				7.6	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				1.9	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				3.0	5.8
L.A. ABRASION LOSS, % (CRD-C 117,] GRADING A				17.8	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.5	0.3
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

LIN-1-1

ENG FORM 6011 R

SOURCE NO. 53

GREENE BROTHERS SAND & GRAVEL

GEORGETOWN, MS

Issued Sept 1959

STATE: Miss.	INDEX NO.: 2 (Rev)	AGGREGATE DATA SHEET	TESTED BY: USAE WES		
LAT.: 31	LONG.: 90		DATE: 24 June 1958		
LAB. SYMBOL NO.: Job 6508 (See Remarks)			TYPE OF MATERIAL: Natural Sand		
LOCATION: Georgetown, Mississippi					
PRODUCER: Greene Brothers Sand and Gravel Company					
SAMPLED BY: Waterways Experiment Station					
TESTED FOR: Concrete Division Projects					
PROCESSING BEFORE TESTING: None					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					97
NO. 8					89
NO. 16					78
NO. 30					56
NO. 50					16
NO. 100					3
NO. 200					–
-200[a]					0.8
F.M.[b]					2.59

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.62
ABSORPTION, PER CENT (CRD-C 107,108):					0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	2
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					2.5
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					110
CLAY LUMPS, % (CRD-C 118):					0.1
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	0.0
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 111 %, 7 DAYS, 110 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: These results are the averages for tests on several sands from the same source, except for the percentages of clay lumps and coal and lignite which represent only one test each.

WES FORM 726 JAN. 1951

SOURCE NO. 54

GREENE BROTHERS SAND & GRAVEL

GEORGETOWN, MS

Issued Sept 1963

STATE: Miss.	INDEX NO.: 3(rev.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: 8 August 1960

LAB. SYMBOL NO.: CRD S-14 Job No. 6508 TYPE OF MATERIAL: Natural Sand

LOCATION: 7 miles south of Crystal Springs, Miss., on Highway 27

PRODUCER: Greene Brothers Sand and Gravel Co., Georgetown, Miss.

SAMPLED BY: USAEWES

TESTED FOR: USAEWES

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.*
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					98
NO. 8					89
NO. 16					77
NO. 30					61
NO. 50					18
NO. 100					1
NO. 200					-
- 200(a)					0.3
F.M.(b)					2.55

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					2.62**
ABSORPTION, PER CENT (CRD-C 107, 108):					0.5**
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	1
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					3.3
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 126 %, 7 DAYS, 125 %

LINEAR THERMAL EXPANSION X10 %/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): The sample was tan in color and was composed of blocky to irregularly shaped grains with well rounded corners and edges. Many of the quartz grains were fairly heavily stained and partially coated with iron oxide. The dense chert particles were concentrated in the larger sizes and were mostly stain-free with polished surfaces. Porous chert particles were somewhat lighter colored and had rough, porous surfaces. The composition of the sample was as follows: Quartz - 88%; Dense Chert - 7%; Porous Chert - 4%; Miscellaneous - 1%. Chalcedony was present in undetermined amounts.

REMARKS: * Average of results of five sieve analyses.

** Average for two tests each for specific gravity and absorption.

WES FORM 726 JAN. 1951

SOURCE NO. 55

GREENE BROTHERS, INC.

CRYSTAL SPRINGS, MS

STATE: MS	INDEX NO.: 3	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 31	LONG.: 90		DATE: July 77		

LAB SYMBOL NO.: NO-57 G-16, S-11 TYPE OF MATERIAL: Natural Sand and Gravel

LOCATION: Plant No. 1 off Harmony Road approximately 5.4 miles Southeast of Crystal Springs, Ms.

PRODUCER: Green Brothers Inc., Crystal Springs

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):						TEST RESULTS	3-6"	1½-3"	¾-1½"	4-1	1/2" FINE AGG.
SIEVE	3-6"	1½-3"	¾-1½"	4-1	1/2"						
6 IN.						BULK SP. GR. S.S.D. (CRD-C 107, 108)				2.55	2.63
5 IN.						ABSORPTION, % (CRD-C 107, 108):				1.9	0.3
4 IN.						ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	1.0
3 IN.						SOFT PARTICLES, % (CRD-C 130)				0.0	—
2½ IN.						% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				6.5	0.0
2 IN.						% FLAT AND ELONGATED (CRD-C 119, 120)				3.1	
1½ IN.				100		WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				6.8	6.3
1 IN.				77		L.A. ABRASION LOSS, % (CRD-C 117,) GRADING A				22.7	
¾ IN.				44		UNIT WT. LB/CU FT (CRD-C 106):					
½ IN.				23		FRIABLE PARTICLES, % (CRD-C 142)				0.1	0.2
⅜ IN.				15		SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
NO. 4				2	99	REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
NO. 8					90	Rc, mM/L:					
NO. 16					82	MORTAR-MAKING PROPERTIES (CRD-C 116)					
NO. 30					65	TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %					
NO. 50					11	LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):					
NO. 100					1						
NO. 200											
-200(a)					0.5						
F.M.(b)					2.52						

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

(a) CRD-C 105 (b) CRD-C 104

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

COP-1-1

SOURCE NO. 56

TRAXLER GRAVEL CO.

UTICA, MS

Issued Sept 1969

AGGREGATE DATA SHEET

STATE: Miss. | INDEX NO: 4(Suppl. 1) | TESTED BY: USAEWES

LAT.: 31 | LONG.: 90 | DATE: 29 Aug 1968

LAB SYMBOL NO.: CRD-S-13,(2)(3)(5)(6)(7), CRD-G-24(2) | TYPE OF MATERIAL: Natural Sand and Gravel

LOCATION: Crystal Springs, Miss., Approximately 1 mi from city limits on old Highway to Georgetown near Junction with Route 27

PRODUCER: Traxler Gravel Co., Utica, Miss.

SAMPLED BY: USAEWES

TESTED FOR: Blast-load generator and high-compressive-strength concrete

USED AT: USAEWES

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	S-13 (2)	S-13 (3)	S-13 (5)	S-13 (6)	S-13 (7)
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.	100	100	100		100
NO. 4	99	96	98	100	97
NO. 8	91	88	90	89	85
NO. 16	77	77	80	77	70
NO. 30	49	54	60	59	50
NO. 50	7	10	16	12	9
NO. 100	1	1	5	1	1
NO. 200	--	--	--	--	--
-200[a]	0.3	0.4	4.5	0.3	0.7
F.M.[b]	2.76	2.76	2.51	2.64	2.90

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	G-24 (2)	S-13 (2)	S-13 (3)	S-13 (5)	S-13 (6)	S-13 (7)
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.55	2.62	2.62	2.62	2.62	2.62
ABSORPTION, % (CRD-C 107, 108):	2.6	0.6	0.6	0.6	0.4	0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)		———	1	———	———	
SOFT PARTICLES, % (CRD-C 130)						———
% LIGHTER THAN SP GR _____ (CRD-C 122)						
% FLAT AND ELONGATED (CRD-C 119, 120)						
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)			3.4			
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____						
UNIT WT, LB/CU FT (CRD-C 106):						
FRIABLE PARTICLES, % (CRD-C 142)						
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)						
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:						
Rc, mM/L:						

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO: 123 DAYS, 3 %, 134 DAYS, 7 %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: Grading of CRD-S-13(2) - cum % passing.

3/8-in.	100
No. 4	34
No. 8	7

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 57

TRAXLER SAND & GRAVEL CO.

JACKSON, MS

STATE: MS	INDEX NO.: 4 Suppl # 2	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: July 77

LAB SYMBOL NO.: NO-57 G-17 TYPE OF MATERIAL: Natural

LOCATION: Pit located on Belle Road approximately 0.5 miles south of Crystal Springs, Ms

PRODUCER: Traxler Sand and Gravel Co., P.O. Drawer 1292, Jackson, Ms

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1	1½" AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				80	
¾ IN.				52	
½ IN.				29	
⅜ IN.				18	
NO. 4				2	97
NO. 8					83
NO. 15					67
NO. 30					46
NO. 50					8
NO. 100					1
NO. 200					
-200[a]					
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1	1½" 2nd AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	2.63
ABSORPTION, % (CRD-C 107, 108):				2.2	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1.0
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122: (2.00 Sand)				7.7	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				1.4	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				4.6	4.4
L.A. ABRASION LOSS, % (CRD-C 117, GRADING A				21.7	
UNIT WT, LB/CU FT (CRD-C 106).					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.4
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			FBT	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{330}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

COP-2-1

ENG FORM ...

SOURCE NO. 58

GREENE BROTHERS SAND & GRAVEL CO.

CRYSTAL SPRINGS, MS

Issued Sept 1968

STATE: Miss	INDEX NO.: 5	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: 3 Nov 1967

LAB SYMBOL NO.: Vicks - 45 G-1, G-1(2), S-1 TYPE OF MATERIAL: Nat. Sand and Gravel

LOCATION: Bayou Pierre Creek, 5 mi. E. of Carpenter, Miss.
Sec 29, R 5E, T2N

PRODUCER: Green Brothers Sand and Gravel Co., Crystal Springs, Miss.

SAMPLED BY: Vicksburg District

TESTED FOR: USAEWES

USED AT: New Concrete Building

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

G-1(2) G-1 S-1

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	#4-3/4"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100	100	
1 IN.			90	96	
¾ IN.			71	81	
½ IN.			36	51	
⅜ IN.			16	26	
NO. 4			1	1	99
NO. 8					95
NO. 16					87
NO. 30					62
NO. 50					15
NO. 100					2
NO. 200					--
-200[a]					1.0
F.M.[b]					2.42

[a] CRD-C 105 [b] CRD-C 104

G-1(2) G-1 S-1

TEST RESULTS	3-6"	1½-3"		#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.52	2.52	2.60
ABSORPTION, % (CRD-C 107, 108):			3.1	3.0	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)			15.0	15.0	0.1
% FLAT AND ELONGATED (CRD-C 119, 120)				1.5	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				7.2	4.0
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____				19.3	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.2	0.2
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO: 3 DAYS, 120 %, 7 DAYS, 112 %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

FINE AGG.	COARSE AGG:	DFE_{300}	F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The coarse aggregate contained 15.0% material having a specific gravity below 2.40 and 40% porous material by count. The sample was a chert gravel containing 93% chert, 5% quartz, and 2% miscellaneous particles, principally claystone, siltstone, clayey agglomerates, oolitic chert, and sandstone.

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 59

TRAXLER SAND & GRAVEL CO.

UTICA, MS

Issued Sept 1968

STATE: Miss	INDEX NO.: 6	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: 3 Nov. 1967

LAB SYMBOL NO.: Vicks -45 G-2 TYPE OF MATERIAL: Natural Gravel

LOCATION: Bayou Pierre, Approx 4 mi E. of Carpenter, Miss.

PRODUCER: Traxler Sand and Gravel Co., Utica, Miss.

SAMPLED BY: USAEWES

TESTED FOR: USAEWES

USED AT: New Concrete Building

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			86		
¾ IN.			55		
½ IN.			23		
⅜ IN.			12		
NO. 4			3		
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	
ABSORPTION, % (CRD-C 107, 108):				2.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR 2.40 (CRD-C 122)				12.8	
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE_{300}			
FINE AGG.	COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1965 6011-R

SOURCE NO. 60

BLAIN SAND & GRAVEL CO.

MT. OLIVE, MS

STATE: MS	INDEX NO.:	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG. 90		DATE: July 77

LAB SYMBOL NO.: NO-57 G-19, S-14 TYPE OF MATERIAL: Natural

LOCATION: Pit located on Belle Road approximately 1 mile Southeast of Crystal Springs (South Pit)

PRODUCER: Blain Sand and Gravel Co., Mt. Olive, Ms

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio-Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	4-1	1/2" AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.				100	
1½ IN.				99	
1 IN.				77	
¾ IN.				53	
½ IN.				24	
⅜ IN.				12	
NO. 4				1	98
NO. 8					92
NO. 16					84
NO. 30					66
NO. 50					12
NO. 100					1
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1 1/2"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	2.64
ABSORPTION, % (CRD-C 107, 108):				1.9	0.3
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				8.4	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				0.1	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				3.3	5.1
L.A. ABRASION LOSS, % (CRD-C 117,) GRADING A				19.0	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.5	1.0
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mV/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE300			
FINE AGG.	COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

COP-4-1

SOURCE NO. 61

BLAIN SAND & GRAVEL CO.

MT. OLIVE, MS

STATE: MS	INDEX NO.	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 90		DATE: July 77

LAB SYMBOL NO.: NO-57 G-18, S-13 TYPE OF MATERIAL: Natural

LOCATION: Pit located on Belle Road approximately 1 mile Southeast of Crystal Springs (North Pit)

PRODUCER: Blain Sand and Gravel Co., Mount Olive, Ms

SAMPLED BY: Dames and Moore

TESTED FOR: New Orleans District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Citronelle Formation (Plio-Pleistocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½	4-1	FINE 1/2"
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				87	
¾ IN.				42	
½ IN.				18	
⅜ IN.				9	
NO. 4				1	98
NO. 8					85
NO. 16					75
NO. 30					59
NO. 50					12
NO. 100					1
NO. 200					
-200(a)					0.3
F.M.(b)					2.7

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	4-1	1/2" FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.56	2.64
ABSORPTION, % (CRD-C 107, 108)				1.5	0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)				0.2	———
% LIGHTER THAN SP G 2.40 (CRD-C 122) (Sand 2.00)				4.7	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				1.6	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				2.6	3.9
L.A. ABRASION LOSS, % (CRD-C 117,) GRADING A				19.8	
UNIT WT, LB/CU FT (CRD-C 105)					
FRIABLE PARTICLES, % (CRD-C 142)				0.5	0.5
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					

MORTAR-MAKING PROPERTIES CRD-C 116)

TYPE____ CEMENT, RATIO:____ DAYS,____ %, ____ DAYS,____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CO	HD-CW
FINE AGG. COARSE AGG: DFE300			
FINE AGG. COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

COP-3-1

SOURCE NO. 62

ST. CATHERINE GRAVEL CO.

NATCHEZ, MS

STATE: Miss	INDEX NO.: 1	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 91		DATE: June 1977

LAB SYMBOL NO.: No. 57 G-1, S-1 TYPE OF MATERIAL: Pit run

LOCATION: North of US Hwy 61 approx. 4.5 miles NE of Natchez, Ms. on St. Catherine Creek

PRODUCER: St. Catherine Gravel Co., Natchez, Ms.

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans District

USED AT: Old River Low Sill and Overbond Structures (gravel only) 1957-48, Vidalia Mat Casting Field, Bayou Cocodrie Drainage Structure (1949, 51-55)

PROCESSING BEFORE TESTING: Separated over the No. 4 sieve before testing

GEOLOGICAL FORMATION AND AGE: Flood Plain Alluvium (Holocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	4-1½"	¾-4"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		
1½ IN.			98		
1 IN.			86		
¾ IN.			66		
⅜ IN.			44		
⅜ IN.			25		
NO. 4			1		100
NO. 8					83
NO. 16					72
NO. 30					51
NO. 50					11
NO. 100					5
NO. 200					
-200[a]					4.3
F.M.[b]					2.78

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	4 - 1-1/2	¾-1½"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)			2.55		2.62
ABSORPTION, % (CRD-C 107, 108):			1.7		0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)			0.0		———
% LIGHTER THAN SP GR 2.40 (CRD-C 122)	(-2.00	sand)	7.2		0.1
% FLAT AND ELONGATED (CRD-C 119, 120)			0.3		--
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)			3.3		4.9
L.A. ABRASION LOSS, % (CRD-C 117, ~~C 131~~) GRADING A			22.0		
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)			0.2		2.7
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 125):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ADA-3-1 (Pit Run)

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1958

STATE: Miss.	INDEX NO.: 1 (rev)	AGGREGATE DATA SHEET	TESTED BY: CRD, WES
LAT.: 31	LONG.: 91		DATE: 29 July 1949

LAB. SYMBOL NO.: VICKS-7 G-4(3) VICKS-7 S-5 TYPE OF MATERIAL: Gravel & Sand

LOCATION: St. Catherine Creek, NE of Natchez

PRODUCER: St. Catherine Gravel Co., Natchez, Miss.

SAMPLED BY:

TESTED FOR Vidalia Articulated Concrete Mattress Casting Yard, Vidalia, La.

PROCESSING BEFORE TESTING:

USED AT: OLD RIVER LOW SILL AND OVERBANK STRUCTURES (GRAVEL ONLY) (1957-58), VIDALIA MAT CASTING FIELD; BAYOU COCODRIE DRAINAGE STRUCTURE FLOODWALL AND WALKWAY BRIDGE (1949-51, 55).

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		
1½ IN.			94		
1 IN.			69		
¾ IN.			40		
½ IN.			17		
⅜ IN.			7		
NO. 4			1		99
NO. 8					91
NO. 16					82
NO. 30					67
NO. 50					13
NO. 100					1.7
NO. 200					0.8
-200(a)					
F.M.(b)					2.47

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.57		2.62
ABSORPTION, PER CENT (CRD-C 107,108):			1.4		0.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	2
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					2.9
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					262
Rc, mM/L:					63

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 118 %, 7 DAYS, 129 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T HW-CD HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127): The gravel is a clean looking chert gravel made up of brown, red, yellowish brown, and a few white pebbles. A few pebbles of sandstone, quartzite, and quartz were noted. Approximately 80% of the pebbles appear fresh and dense and the remainder are vuggy, porous, and cracked.

REMARKS:

SOURCE NO. 63

UNKNOWN PRODUCER

Issued Sept 1958

STATE: La.	INDEX NO.: 2 (rev.)	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 31	LONG.: 91		DATE: 30 June 1948
LAB. SYMBOL NO.: NO-2 S-2 & NO-2 G-2			TYPE OF MATERIAL: Sand & Gravel
LOCATION: Gilliam Chute near Kempe Bend - Mile 378 A. H. P.			
PRODUCER:			
SAMPLED BY:			
TESTED FOR: Vidalia Articulated Concrete Mattress Casting Yard, Vidalia, La.			
PROCESSING BEFORE TESTING:			
GEOLOGICAL FORMATION AND AGE:			

USED AT: VIDALIA CASTING FIELD (1948-1957)

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			99		
1 IN.			87		
¾ IN			60		
½ IN.			28		
⅜ IN.			11		
NO. 4			1		97
NO. 8					86
NO. 16					68
NO. 30					32
NO. 50					4
NO. 100					0.3
NO. 200					0.1
- 200(a)					
F.M.(b)					3.03

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.64		2.61
ABSORPTION, PER CENT (CRD-C 107,108):			1.4		0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	5+
SOFT PARTICLES, PER CENT (CRD-C 130):			0.0		—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			7.6		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			1.2		2.3
ABRASION LOSS (L. A.), %, (CRD-C 117):			21.6		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 96 %, 7 DAYS, 108 %

LINEAR THERMAL EXPANSION X C % DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

SOURCE NO. 64

ST. CATHERINE SAND & GRAVEL CO.

NATCHEZ, MS

STATE: Miss.	INDEX NO.: 8	AGGREGATE DATA SHEET	TESTED BY: WES
LAT.: 31	LONG.: 91		DATE: 10 May 1957

LAB. SYMBOL NO.: VICKS-16 S-1, G-1 Job 6001/313 TYPE OF MATERIAL: Natural Sand & Gravel

LOCATION: Natchez, Miss. (St. Catherine Bar, Below Natchez)

PRODUCER: St. Catherine Sand and Gravel Co.

SAMPLED BY: Vicksburg District Personnel

TESTED FOR: Tests of Concrete Mixtures Used in Articulated Concrete Mattress (being cast in Memphis and Vicksburg ~~Districts~~)

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-1½"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.				100	
1 IN.				84	
¾ IN.				55	
½ IN.				25	
⅜ IN.				12	
NO. 4				2	96
NO. 8					91
NO. 16					84
NO. 30					58
NO. 50					13
NO. 100					2
NO. 200					
- 200 (a)					0.4
F.M. (b)					2.54

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-1½"	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.57	2.62
ABSORPTION, PER CENT (CRD-C 107, 108):				2.1	0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	3
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. 2.4 (CRD-C ~~139~~ 122):				12.9	2.0
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				3	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):				20.3	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

SOURCE NO. 65

F & C ENGINEERING CO.

(CONTRACTOR)

Issued Sept 1958

STATE: La.	INDEX NO.: 9	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 31	LONG.: 91		DATE: 19 Nov 1957		

LAB. SYMBOL NO.: NO-24 S-1 S-1(2) Job 6001/341 TYPE OF MATERIAL: Bar Sand (Fine)

LOCATION: Mile 306, Rt Bank, Miss. R.

PRODUCER: F&C Engineering Co. - Old River Control Project, Contractor

SAMPLED BY: New Orleans District Personnel

TESTED FOR: Low Sill and Overbank Structures, Old River Control Project

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE: Recent

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	(a)	(b)	(c)	(2)	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30	100	100	100	100	
NO. 50	100	100	100	100	
NO. 100	13	9	24	50	
NO. 200	–	–	–	–	
-200[a]	1.8	0.7	5.0	4.1	
F.M.[b]	0.88	0.99	0.77	0.50	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	(a)	(b)	(c)	(2)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):	2.62	2.63	2.62	2.61	
ABSORPTION, PER CENT (CRD-C 107, 108):	0.9	0.7	1.0	1.1	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	3	2	4	3	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T | HW-CD | HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

Note:
(a) Upper end of pit, Sample No. 1 NO-24 S-1
(b) Middle of pit, Sample No. 2 NO-24 S-1
(c) Lower end of pit, Sample No. 3 NO-24 S-1
(2) 3 additional samples from same pit location combined together, NO-24 S-1(2)

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 66

ST. CATHERINE SAND & GRAVEL CO.

NATCHEZ, MS

Issued Sept 1969

STATE: Miss	INDEX NO.: 10 (suppl 6)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 31	LONG.: 91		DATE: June 1968

LAB SYMBOL NO.: NO-24 G-10 (8) VICKS-33 S-1(3) C700 TYPE OF MATERIAL: Natural gravel

LOCATION: Big Cedar Grove Creek Plant, Near Washington, Miss. R1W, T7N, 3.1 mi from Int. Highways 61 and 84, Adams Co., Miss.

PRODUCER: St. Catherine Sand and Gravel Co., Natchez, Miss.

SAMPLED BY: Vicksburg District

TESTED FOR: Vicksburg District

USED AT: Jonesville Lock and Dam

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				100	
¾ IN.				96	
½ IN.				64	
⅜ IN.				38	
NO. 4				3	96
NO. 8					80
NO. 16					69
NO. 30					54
NO. 50					28
NO. 100					3
NO. 200					--
-200 [a]					1.3
F.M. [b]					2.70

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.57	2.62
ABSORPTION, % (CRD-C 107, 108):				1.7	0.8
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING_____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____DAYS,_____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE300			
FINE AGG.	COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

ENG FORM 1 MAR 1963 6011-R

SOURCE NO. 67

R. L. HENSLEY & SONS

WASHINGTON, MS

STATE: MS | CORE NO.: /2 | AGGREGATE DATA SHEET | TESTED BY: USAEWES

LAT: 31 | LONG: 91 | DATE: November 1977

LAB SYMBOL NO.: No-57 G-44, S-29 | TYPE OF MATERIAL: Natural

LOCATION: South side of US Hwy 84, approx 2.5 miles east of the intersection with US Hwys 61 & 98, Washington, MS

PRODUCER: R. L. Hensley & Sons, Inc., P. O. Box 130, Washington, MS 39190

SAMPLED BY: Dames & Moore

TESTED FOR: New Orleans Dist Aggregate Test

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Pascagoula & Hattiesburg Formations (Miocene)

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-1/2" to #4	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.				100	
1½ IN.				96	
1 IN.				79	
¾ IN.				57	
½ IN.				36	
⅜ IN.				24	
NO. 4				1	100
NO. 8					94
NO. 16					86
NO. 30					74
NO. 50					13
NO. 100					6
NO. 200					5
-200(a)					4.7
F.M.(b)					2.27

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½	#4-1/2" to #4	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)				2.57	2.62
ABSORPTION, % (CRD-C 107, 108):				0.9	0.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	2
SOFT PARTICLES, % (CRD-C 130)				0.0	———
% LIGHTER THAN SP GR 2.40 (CRD-C 122) (2.00 Sand)				3.4	0.0
% FLAT AND ELONGATED (CRD-C 119, 120)				0.7	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)				*	3.9
L.A. ABRASION LOSS, % (CRD-C 117, ~~1400~~) GRADING A				21.4	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)				0.4	0.6
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

		FINE AGGREGATE				COARSE AGGREGATE			
		2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT:	% Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT:	% Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{333}			
FINE AGG.	COARSE AGG:	DFE_{330}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

* Insufficient material for test.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 68

LAKE PEARL SAND & GRAVEL

MARKSVILLE, LA

Issued Sept 1960

STATE: La.	INDEX NO.: 11	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT: 31	LONG.: 92		DATE: 17 December 1959

LAB. SYMBOL NO.: NO-24 S-1, G-5 Job 6358 TYPE OF MATERIAL: Nat. Sand and Gravel

LOCATION: Ward-3, Avoyelles Parish, La., Lot No. 1, Bock A-17, Page 513, approx 9 acres, Bounded N Public Road, S Lake Road, E Joseph Mayeaux, W Felix Ducote

PRODUCER: Lake Pearl Sand and Gravel Co., Marksville, La. halfway between Hesmer and Mansura, La.

SAMPLED BY: New Orleans District

TESTED FOR: Old River Navigation Lock

PROCESSING BEFORE TESTING: Graded by sieve separation

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
		Ungraded			
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.		100			
1 IN.		96			
¾ IN.		66	100		
⅜ IN.		17	26		
#8 IN.		5	7	100	
NO. 4		1	2	99	
NO. 8				94	
NO. 16				88	
NO. 30				66	
NO. 50				11	
NO. 100				4	
NO. 200				-	
- 200(a)				3.0	
F.M.(b)				2.38	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3" (c)	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.55	2.62
ABSORPTION, PER CENT (CRD-C 107, 108):				1.8	0.7
ORGANIC IMPURITIES, F.G. NO. (CRD-C 121):	—	—	—	—	0
SOFT PARTICLES, PER CENT (CRD-C 130):				0.0	—
PER CENT LIGHTER THAN SP. GR. 2.40 (CRD-C 129):				8.2	*
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				0.3	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				2.2	7.8
ABRASION LOSS (L. A.), %, (CRD-C 117):				27.9	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)				0.7	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	0.0

~~SPECIFIC HEAT, BTU/LB/DEG F. (CRD-C 124):~~ (S-1) (G-5)

REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L: 67 557; Rc, mM/L: 49 153

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 91 %, 7 DAYS, 85 %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T HW-CD HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127): Sand is clean, unstained, highly rounded, quartz with some chert, mostly in sizes larger than No. 16. Contains a few igneous and soft brown particles, also some fragile particles of loosely cemented sand grains.

Gravel is about 58% dense, 28% fractured, and 8% porous chert with 6% miscellaneous constituents mostly quartz. Gravel was unstained with a wide range of shapes.

REMARKS: * Lightweight pieces, specific gravity less than 2.00 per cent - 0.0.

WES FORM 726 JAN. 1951

SOURCE NO. 69

RIVER SAND & STONE

GOLCONDA, IL

STATE: Ill.	INDEX NO.: 3	AGGREGATE DATA SHEET	TESTED BY: CRB Laboratories
LAT.: 37° N	LONG.: 88° W		DATE: 7-25-50

LAB. SYMBOL NO.: 61001 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Shetlerville, Ill.

PRODUCER: P. R. Brown Stone Co., Golconda, Ill. Now River Sand & Stone

SAMPLED BY: W. Lawrence, Uniontown Flood Control Office

TESTED FOR: Rosiclare Flood Protection Project.

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Meramec, Mississippian

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.68		
ABSORPTION, PER CENT (CRD-C 107,108):			0.4		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		(1)			
WEIGHTED AV. PER CENT LOSS, 5 CYCLES $MgSO_4$ (CRD-C 115):			5.0	5.0	
ABRASION LOSS (L. A.), %, (CRD-C 117):			0.2	0.8	—
UNIT WT., LB/CU FT (CRD-C 106):			27.3		
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ % ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: ____ % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: ____ % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F & T	HW-CD	HD-CW
FINE AGG. Lab. Natural	COARSE AGG: P.R. Brown	DFE_{300}	61		
FINE AGG. Lab. Natural	COARSE AGG: P.R. Brown	DFE_{300}	55		

PETROGRAPHIC DATA (CRD-C 127):

90% hard medium-grained oolitic limestone, 10% softer medium-grained, somewhat argillaceous oolitic limestone.

REMARKS: (1) ASTM-C88
Stone not graded.

WES FORM JUNE 50 726

Issued Sept 1966

STATE: Illinois	INDEX NO.: 3(SUPPL #1)	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories		
LAT.: 37 N	LONG.: 88 W		DATE: November 1965		
LAB. SYMBOL NO.: 66111-2			TYPE OF MATERIAL: Ledge Rock		
LOCATION: Shetlerville, Illinois					
PRODUCER: Watson Stone Quarry (Formerly E. R. Brown Quarry)					
Now River Sand & Stone					
SAMPLED BY: Louisville District					
TESTED FOR: Uniontown L & D. (101/66.346L)					
PROCESSING BEFORE TESTING: Laboratory Crushed					
GEOLOGICAL FORMATION AND AGE: Ledges 5, 6					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	Ledge No.	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.64	2.66	
ABSORPTION, PER CENT (CRD-C 107,108):				0.8	0.5	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):		—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):						—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):						—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):						
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ([c] ½-1", #4-½) (CRD-C 115)				0.6	0.8	
ABRASION LOSS (L. A.), %, (CRD-C 117):				35	28	—
UNIT WT., LB/CU FT (CRD-C 106):						
CLAY LUMPS, % (CRD-C 118):						
COAL AND LIGNITE, % (CRD-C 122):		—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):						
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:						
Rc, mM/L:						

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 %DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 5	DFE_{300}	70.0		
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 6	DFE_{300}	73.9		

PETROGRAPHIC DATA (CRD-C 127):

Ledge 5: Light brownish gray, medium grained oolitic limestone, even textured, dense, hard, tough with subconchoidal fracture.

Ledge 6: Dark grayish yellowish brown oolitic limestone. Very fine grained dolomitic oolitic. Even textured, dense, hard.

REMARKS:

WES FORM 725 JAN. 1951

Issued Sept 1966

STATE: Illinois	INDEX NO.: 3(Suppl #2)	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories		
LAT.: 37 N	LONG.: 88 W		DATE: November 1965		
LAB. SYMBOL NO.: 66113-4			TYPE OF MATERIAL: Ledge Rock		
LOCATION: Shetlerville, Illinois					
PRODUCER: Watson Stone Quarry Now River Sand & Stone					
SAMPLED BY: Louisville District					
TESTED FOR: Uniontown L & D (101/66.346L)					
PROCESSING BEFORE TESTING: Laboratory Crushed					
GEOLOGICAL FORMATION AND AGE: Ledges 7 & 8					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
			Ledge No. 7	8	
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.73	2.66	
ABSORPTION, PER CENT (CRD-C 107, 108):			0.3	0.5	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			4.2	0.6	
ABRASION LOSS (L. A.), %, (CRD-C 117):			16	27	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. Lab Standard	COARSE AGG: Ledge No. 7	DFE_{300}	74.7		
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 8	DFE_{300}	77.3		

PETROGRAPHIC DATA (CRD-C 127):

Ledge 7: Very dark brown, fine grained dolomitic limestone, slightly argillaceous, lithographic in texture. Dense, hard, tough, 33% acid insoluble residue principally quartz.

Ledge 8: Dark brownish gray fine to medium grained oolitic limestone, dense, hard, tough.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1966

STATE: Illinois	INDEX NO.: 3(Suppl #3)	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories
LAT.: 37 N	LONG.: 88 W		DATE: November 1965

LAB. SYMBOL NO.: 66115-6 TYPE OF MATERIAL: Ledge Rock

LOCATION: Shetlerville, Illinois

PRODUCER: Watson Stone Quarry Now River Sand & Stone

SAMPLED BY: Louisville District

TESTED FOR: Uniontown L & D (101/66.346L)

PROCESSING BEFORE TESTING:

Laboratory Crushed

GEOLOGICAL FORMATION AND AGE: Ledges 9 & 10

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	Ledge No.	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.62	2.67	
ABSORPTION, PER CENT (CRD-C 107,108):				1.0	0.4	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):		—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):						—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):						—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):						
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ([c] ½-1", #4-½) (CRD-C 115)				0.8	1.6	
ABRASION LOSS (L. A.), %, (CRD-C 117):				31	26	—
UNIT WT., LB/CU FT (CRD-C 106):						
CLAY LUMPS, % (CRD-C 118)						
COAL AND LIGNITE, % (CRD-C 122):		—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):						
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:						
Rc, mM/L:						

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 9	DFE_{300}	73.8		
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 10	DFE_{300}	77.2		

PETROGRAPHIC DATA (CRD-C 127):

Ledge 9: a. Light olive gray oolitic limestone. Very dense, hard and tough. Even, sugary texture with fine grained oolites.

b. Brownish olive gray, fine grained oolitic limestone. Dense, hard and tough.

Ledge 10: a. Dark olive brown, coarse grained crystalline limestone with abundant dolomitic seams and occasional thin argillaceous seams. 7% acid insoluble residue. Dense, hard, tough.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1966

AGGREGATE DATA SHEET

STATE: Illinois | INDEX NO.: 3(Suppl #4) | TESTED BY: ORD Laboratories
LAT.: 37 N | LONG.: 88 W | DATE: November 1965
LAB. SYMBOL NO.: 66117 | TYPE OF MATERIAL: Ledge Rock
LOCATION: Shetlerville, Illinois

PRODUCER: Watson Stone Quarry Now River Sand & Stone

SAMPLED BY: Louisville District
TESTED FOR: Uniontown L & D (101/66.346L)
PROCESSING BEFORE TESTING:
Laboratory Crushed

GEOLOGICAL FORMATION AND AGE: Ledge 12

Ledge No. 12

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.70		
ABSORPTION, PER CENT (CRD-C 107, 108):			0.4		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 21):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½") (CRD-C 115)			1.4		
ABRASION LOSS (L. A.), %, (CRD-C 7):			24		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 126): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ^{6}/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. Lab. Standard	COARSE AGG: Ledge No. 12	DFE_{300}	79.8		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

a. Dark, olive gray dolomitic limestone. Dense, fine to medium grained crystalline highly dolomitic limestone.

b. Moderate to dark to dusky yellowish brown oolitic limestone. Medium to coarse grained, dense, hard and tough.

REMARKS:

Issued Sept 1966

STATE: Illinois	INDEX NO.: 3 (suppl #5)	AGGREGATE DATA SHEET	TESTED BY: ORD Labs.		
LAT.: 37N	LONG.: 88W		DATE: May 1966		
LAB. SYMBOL NO.: OR-66194			TYPE OF MATERIAL: Ledge Rock #14		
LOCATION: Shetlerville, Illinois (River Sd & Stone Co)					
PRODUCER: Watson Stone Company					
SAMPLED BY: Louisville District, C of E					
TESTED FOR: Uniontown Locks & Dam — (101/66.389L)					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE: Ledge No. 14					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.69	2.69	2.67	
ABSORPTION, PER CENT (CRD-C 107,108):		0.41	0.46	0.71	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				2.40	
ABRASION LOSS (L. A.), %, (CRD-C 117):		28.3			—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: Ledge #14 DFE 300	63		
FINE AGG. Lab Standard	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

Calcarenite - grayish reddish fine grained hard & tough
Dolomitic Ligthographic Limestone medium light brownish gray, fine graine fairly even textured.
Fossiliferous Limestone - moderate yellowish brownish
Highly Dolomitic Limestone - olive gray very fine grained
Oolitic Limestone yellowish fine grained dense & hard
Oolitic Lithographic Limestone - light olive gray fine grained dense and hard.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1971

STATE ILL	INDEX NO. 3 (Supp 6)	AGGREGATE DATA SHEET	TESTED BY: SWD Lab
LAT 37 °	LONG 88		DATE Sep 69

LAB SYMBOL NO. 10800 TYPE OF MATERIAL

LOCATION Shetlerville, Ill., mile 896 on Ohio River

PRODUCER River Sand and Stone Co., formerly Watson and Brown Quarry

SAMPLED BY.

TESTED FOR Blytheville AFB

USED AT Blytheville, AFB, Contract 69-0186, Paving

PROCESSING BEFORE TESTING

GEOLOGICAL FORMATION AND AGE

GRADING (CRD-C 103) (CUM. % PASSING)

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.		100			
1½ IN.		94			
1 IN.		41	100		
¾ IN.		9	90		
½ IN.		1	59		
⅜ IN.			41		
NO. 4			4		
NO. 8			1		
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)		0.1	0.5		
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)			2.70	2.69	
ABSORPTION, % (CRD-C 107, 108)			0.5	0.7	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	———
SOFT PARTICLES, % (CRD-C 130)			0.1	0.6	———
LIGHTER THAN SP GR 2.0 (CRD-C 122)			0.0	0.0	
FLAT AND ELONGATED (CRD-C 119, 120)			Tr.	2.0	
WT. AV. % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)			5	5.8	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING 3 & B			28.1	25.1	
UNIT WT., LB/CU FT (CRD-C 106)					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC. HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128) Sc, MM/L:					
Rc, MM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG. DFE_{300}			
FINE AGG. COARSE AGG. DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): 72% buff-gray to light gray, moderately hard, lithographic to very fine-grained, slightly fossiliferous, very slightly stylolitic and partly oolitic LIMESTONE.

25% medium gray, moderately hard, fine-grained, partly oolitic and slightly fossiliferous LIMESTONE.

3% medium gray, soft, very fine-grained, argillaceous LIMESTONE.

Seven percent of the particles were partly coated with black, moderately soft, waxy shale to 1/16" thick.

REMARKS

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 70

REED CRUSHED STONE

GILBERTSVILLE, KY

Issued Sept 1960

STATE: Ky.	INDEX NO.: 11(rev)	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 37	LONG.: 88		DATE: 19 Nov 1957		
LAB. SYMBOL NO.: NO-24 G-3 Job 3001/346			TYPE OF MATERIAL: Riprap stone		
LOCATION: Gilbertsville, Ky.					
PRODUCER: Reed Crushed Stone Co.					
SAMPLED BY: Nashville District Personnel					
TESTED FOR: Old River Control Structure					
PROCESSING BEFORE TESTING: None					
USED AT: Memphis General Depot.					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107,108):					
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): Toughness, CRD-C 132

Height of Blow at Failure, cm

Sample	Perpendicular to Plane of Structural Weakness 1	2	3	Avg.	Parallel to Plane of Structural Weakness 1	2	3	Avg.
1	6	5	8	6	7	7	8	7
2	7	7	5	6	3	6	7	5
3	9	10	14	11	10	10	6	9
4	17	9	11	12	7	8	9	8

REMARKS: Sample A - This is represented by test samples 1 and 2, medium to coarse grained, slightly stylolitic limestone.
Sample B - Represented by test samples 3 and 4, fine grained, slightly fossiliferous, shaly, lithographic limestone. Fresh break will produce methane odor.

WES FORM 726 JAN. 1951

Issued Sept 1964

STATE: KY	INDEX NO.: II (Suppl) (rev)	AGGREGATE DATA SHEET	TESTED BY: SWD
LAT.: 37	LONG.: 88		DATE: Jul. 1962, June '64
LAB. SYMBOL NO.: C-18589 - 91 (7650), 8949			TYPE OF MATERIAL: Crushed Stone
LOCATION: Gilbertsville, Kentucky			
PRODUCER: Reed Crushed Stone Co.			
SAMPLED BY: Little Rock District			
TESTED FOR: Arkansas River L&D 1 & 2			
PROCESSING BEFORE TESTING:			
GEOLOGICAL FORMATION AND AGE:			

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.		100			
2½ IN.		72			
2 IN.		24	100		
1½ IN.		3	96		
1 IN.		1	37	100	
¾ IN.			6	91	
½ IN.			1	49	
⅜ IN.			1	24	
NO. 4				2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

		3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.67	2.68	2.67	
ABSORPTION, PER CENT (CRD-C 107,108):			0.6	0.6	0.8	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):		—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):				0.0		—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):						—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				5.3		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					2.5	
ABRASION LOSS (L. A.), %, (CRD-C 117):				27.6		—
UNIT WT., LB/CU FT (CRD-C 106):						
CLAY LUMPS, % (CRD-C 118)						
COAL AND LIGNITE, % (CRD-C 122):		—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):						
REACTIVITY WITH NaOH (CRD-C 128):	Sc, mM/L:		29	14	23	
	Rc, mM/L:		188	125	160	

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	Range	AVERAGE
Limestone			1.6 - 3.3	2.4
Chert			5.6 - 6.3	5.9
		Wtd Avg.		2.5

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG. 35-90-6	COARSE AGG: 37-88-11 (Suppl) (rev) DFE 300	40		
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

Gray, moderately hard, fossiliferous, stylolitic, very fine-grained crushed LIMESTONE. Stylolites ranges in thickness from hairline to 1/32 inch and were composed of black shale. About 40 percent of the limestone had a coarse grained appearance because it was very fossiliferous.

REMARKS: Other tests conducted in 1964 gave results similar to those above.

WES FORM 726 JAN. 1951

Issued Sept. 1973

STATE: Ky.	INDEX NO. 11(suppl.2corr.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 88		DATE: 14 January 1966

LAB SYMBOL NO.: NO-24 G-3(2); Job 6641 TYPE OF MATERIAL: Crushed limestone

LOCATION: Gilbertsville, Ky.

PRODUCER: Reed Crushed Stone Co., Gilbertsville, Ky.

SAMPLED BY: Memphis District

TESTED FOR: St. Francis Pumping Plant and Floodgate, Memphis District

USED AT:

PROCESSING BEFORE TESTING: Separated into sieve sizes and recombined

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.				100	
½ IN.				67	
⅜ IN.				34	
NO. 4				0	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½	#4-¾"	FINE AGG.
BULK SP. GR, S.S.D. (CRD-C 107, 108)				2.68	
ABSORPTION, % (CRD-C 107, 108):				0.7	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WEAR, % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC. HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	CN	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123)	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT, % Na_2O EQUIVALENT								
HIGH-ALK. CEMENT, % Na_2O EQUIVALENT								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CA
FINE AGG. MEM-26 S-1(2) COARSE AGG. combination * DFE300	47		
FINE AGG. COARSE AGG. DFE300			

PETROGRAPHIC DATA (CRD-C 127): Limestone to dolomitic limestone with small amounts of chert. About 14% of the sample was fine-grained carbonate rock, while the remainder was medium-to coarse-grained carbonate rock. Length change-testing of the fine-grained material by CRD-C 146 did not indicate potential reactivity, but it was slowly expansive and therefore should not be permitted to become a major constituent of the material.

REMARKS: * MEM-26 G-1(2) 60%
NO-24 G-3(2) 40%

ENG FORM 1 MAR 1965 6011-R

Issued Sept 1971

STATE: Ky.	INDEX NO.: 11(Supp 3)	AGGREGATE DATA SHEET	TESTED BY: ORD Lab.
LAT.: N37°	LONG.: W88°		DATE: August 1970

LAB. SYMBOL NO.: 70133-4-4A TYPE OF MATERIAL: Crushed Stone

LOCATION: Gilbertsville, Ky.

PRODUCER: Reed Crushed Stone Co.

SAMPLED BY:

TESTED FOR: Uniontown L&D 101/71.301L

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

70133/134/134a

GRADING (CRD-C 103)(CUM. % PASSING)

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN		70133			
5 IN					
4 IN		70134			
3 IN		98.7	7034a		
2½ IN.		---			
2 IN		43.9			
1½ IN		13.2	82.6		
1 IN.		3.0	21.6		
¾ IN		1.9	3.3	83.7	
½ IN				---	
⅜ IN.				8.8	
NO 4				0.5	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)		8.88	8.14	7.07	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.70	2.68	2.66	
ABSORPTION, PER CENT (CRD-C 107, 108):		0.51	0.59	1.03	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				17.0	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

Lab Symbol	70133	134	134A
Limestone-Med. Gray, Hard & tough	81%	83%	83%
Shaly Limestone-Dark Gray, Dense, Mod. Hard	9%	9%	5%
Dol. Limestone-Med. Gray, Dense, Mod. Hard & tough	6%	3%	10%
Chert & Cherty Shaly Limestone Gray, Dense, Hard	4%	5%	2%

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept. 1973

STATE: Ky.	INDEX NO.: 11 (suppl.4)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 88		DATE: 15 April 1973

LAB SYMBOL NO.: MEM-31 G-1, G-1(2), G-1(3), MS-1 TYPE OF MATERIAL: Crushed limestone

LOCATION:

PRODUCER: Reed Crushed Stone Co. Gilbertsville, Kentucky

SAMPLED BY:

TESTED FOR: Huxtable Pumping Plant Memphis District

USED AT:

PROCESSING BEFORE TESTING: none

GEOLOGICAL FORMATION AND AGE:

G-1(2) G-1 G-1(3) MS-1

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		92			
2½ IN.		—			
2 IN.		23	100		
1½ IN.		2	95		
1 IN.		0	33	100	
¾ IN.			5	90	
½ IN.			—	53	
⅜ IN.			1	31	
NO. 4				5	
NO. 8					100
NO. 16					79
NO. 30					56
NO. 50					39
NO. 100					28
NO. 200					—
-200(a)					18.2
F.M.(b)					1.98

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾	FINE AGG.
		G-1(2)	G-1	G-1(3)	MS-1
BULK SP. GR, S.S.D. (CRD-C 107, 108)		2.68	2.69	2.68	2.60
ABSORPTION, % (CRD-C 107, 108):		0.6	0.5	0.8	2.6
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC Na_2SO_4 (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	CN	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

		F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}		
FINE AGG.	COARSE AGG:	DFE_{300}		

PETROGRAPHIC DATA (CRD-C 127):

REMARKS

ENG FORM ____-R
MAR 1965

SOURCE NO. 71

WILLIAMS STONE QUARRY

ROSICLARE, IL

Issued Sept 1965

STATE: Illinois	INDEX NO.: 21	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories
LAT.: 37 N	LONG.: 88 W		DATE: May 1965

LAB. SYMBOL NO.: 65208 TYPE OF MATERIAL: Crushed Stone

LOCATION: Rosiclare, Illinois

PRODUCER: Williams Stone Quarry

SAMPLED BY: Louisville District

TESTED FOR: Uniontown Locks & Dam (101/65.398X)

PROCESSING BEFORE TESTING:

Laboratory crushed for finer sizes

GEOLOGICAL FORMATION AND AGE: Ledges A, B, C represented.

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.		100			
2½ IN.		98			
2 IN.		74			
1½ IN.		36			
1 IN.		5			
¾ IN.		3			
½ IN.		2			
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.68		2.68	
ABSORPTION, PER CENT (CRD-C 107,108):		0.7		0.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				3.3	
ABRASION LOSS (L. A.), %, (CRD-C 117):			27		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG. Laboratory Std.	COARSE AGG: Williams Stone	DFE 300		
FINE AGG.	COARSE AGG:	DFE 300		

PETROGRAPHIC DATA (CRD-C 127):

86% hard, tough, dense limestone, 7% hard, tough, dolomite, 6% shale or shaly limestone, 1% soft, weathered particles.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1968

STATE: Ill.	INDEX NO.: 21(suppl)	AGGREGATE DATA SHEET	TESTED BY: ORDL		
LAT.: 37	LONG.: 88		DATE: June 1968		
LAB. SYMBOL NO.: 68266			TYPE OF MATERIAL: Limestone CA		
LOCATION: Rosiclare, Illinois					
PRODUCER: Williams Quarry - Ledges A' and A"					
SAMPLED BY: Louisville District					
TESTED FOR: Lock & Dam 52					
PROCESSING BEFORE TESTING: 101/68.353 L					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING)

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN					
3 IN.					
2½ IN.		97			
2 IN.		57			
1½ IN.		20			
1 IN.		3			
¾ IN.		2			
½ IN					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)		8.77			

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.68			
ABSORPTION, PER CENT (CRD-C 107, 108):		0.5			
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			2		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			0.4		
ABRASION LOSS (L.A.), %, (CRD-C 117): "A"			29		—
UNIT WT., LB/CU FT (CRD-C 06):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123)	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Hard nonweathered limestone ---- 97%
Moderately weathered limestone 2%
Shaly limestone ---------- 1%

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1971

STATE: Ill	INDEX NO.: 21 (Supp 2)	**AGGREGATE DATA SHEET**	TESTED BY: ORD Lab
LAT.: 37°	LONG.: 88°		DATE: November 1970

LAB SYMBOL NO.: 71123-71126 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Rosiclare

PRODUCER: Williams Quarries

SAMPLED BY: Nashville District C of E Personnel

TESTED FOR: Smithland L&D

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
~~7 in.~~	~~69.4~~				
6 IN.	39.1				
5 IN.	26.0				
4 IN.	2.3				
3 IN.					
2½ IN.					
2 IN.		95.0			
1½ IN.		57.1	91.4		
1 IN.		11.4	20.2		
¾ IN.		1.2	2.5	89.7	
½ IN.			1.4	45.2	
⅜ IN.				18.3	95.6
NO. 4				3.6	29.7
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.70	2.72	2.71	2.74	2.69
ABSORPTION, % (CRD-C 107, 108):	0.28	0.53	0.41	0.49	1.29
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				8.21	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING B				27.9	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG. Newtown	COARSE AGG: Williams	DFE_{300}	72.1		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The samples consist of varying amounts of dense, hard, oolitic limestone, fossiliferous limestone, and dolomitic limestone. These samples contain up to 9% argillaceous limestone and up to 2% potentially reactive chert.

REMARKS:

SOURCE NO. 72

RIGBY-BARNARD STONE QUARRY

CAVE-IN-ROCK, IL

Issued Sept 1965

STATE: Illinois	INDEX NO.: 22	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories
LAT.: 37 N	LONG.: 88 W		DATE: May 1965

LAB. SYMBOL NO.: 65203-4-5 TYPE OF MATERIAL: Crushed Stone

LOCATION: Cave-in-Rock, Illinois

PRODUCER: Rigsby-Barnard Stone Quarry

SAMPLED BY: Louisville District

TESTED FOR: Uniontown Locks & Dam (101/65.398X)

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Ledges H & I represented

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.		100			
2½ IN.		96			
2 IN.		66			
1½ IN.		28	100		
1 IN.		4	49	100	
¾ IN.		2	11	91	
½ IN.			3	43	
⅜ IN.			2	16	
NO. 4				4	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.61	2.66	2.69	
ABSORPTION, PER CENT (CRD-C 107, 108):		1.6	0.9	0.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			20		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				5.8	
ABRASION LOSS (L. A.), %, (CRD-C 117):			29		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 116):					
COAL AND LIGHTNIT, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. Laboratory Std. COARSE AGG: Rigsby-Barnard DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

#4-3/4": 94% dense, hard, tough, limestone, 4% shale or shaly limestone, 2% soft weathered particles.

3/4"-1 1/2": 52% moderately hard & tough calcareous sandstone, 46% shaly calcareous sandstone or shale, 1% hard, tough limestone, 1% weathered.

1 1/2"-3": 72% hard, tough, limestone, 26% hard, tough, dolomite, 1% hard, tough limestone with internal argillaceous seams, 1% weathered limestone.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1971

STATE: Ill.	INDEX NO 22(Supp)	AGGREGATE DATA SHEET	TESTED BY: ORD Lab.	
LAT 370	LONG. 886		DATE: November 1970	

LAB. SYMBOL NO.: 71129-71133 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Cave-in-Rock

PRODUCER: Rigsby-Barnard Quarry

SAMPLED BY: Nashville District C of E Personnel

TESTED FOR: Smithland L&D

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	½-3"	¾-1½"	#4-¾"	FINE AGG.
7 in.	36.1				
6 IN.	9.0				
5 IN	1.0				
4 IN					
3 IN					
2½ IN					
2 IN		63.8			
1½ IN		14,798.0			
1 IN.		1,374.2			
¾ IN.		46.7	83.5		
½ IN		15.7	27.4		
⅜ IN		5.2	5.7	96.7	
NO. 4		2.1	0.9	28.3	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP GR, SAT SURF DRY (CRD-C 107, 108):	2.66	2.67	2.63	2.66	2.58
ABSORPTION, PER CENT (CRD-C 107, 108)	0.78	0.66	1.26	0.95	3.05
ORGANIC IMPURITIES, FIG. NO (CRD-C 21)	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130)					—
PER CENT LIGHTER THAN SP GR (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		1	11	11	9
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½", #4-½") (CRD-C 115)				6.3	
ABRASION LOSS (L.A.), %, (CRD-C 131)				24.7	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 142)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128) S, mM/L					
R, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X 10⁻⁶/DEG F (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F & T	HW-CD	HD-CW
FINE AGG. Newtown	COARSE AGG: Rigsby-Barnard	DFE 300	71.4		
FINE AGG.	COARSE AGG:	DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

The samples consist of varying amounts of dense, hard particles of Oolitic Limestone, Fossiliferous Limestone, Dolomitic Limestone and Sandstone. About 1% to 10% of each sample consists of moderately hard to moderately soft silty to Argillaceous Limestone.

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 73

DENNY & SIMPSON STONE CO.

CAVE-IN-ROCK, IL

Issued Sept 1965

STATE: Illinois	INDEX NO.: 23	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories
LAT.: 37 N	LONG.: 88 W		DATE: April 1965
LAB. SYMBOL NO.: 65199-200-201			TYPE OF MATERIAL: Crushed Stone
LOCATION: Elizabethtown, Illinois			
PRODUCER: Denny & Simpson Stone Company			
SAMPLED BY: Louisville District			
TESTED FOR: Uniontown Locks & Dam		(101/65.392X)	
PROCESSING BEFORE TESTING:			
GEOLOGICAL FORMATION AND AGE:			

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.		100			
2½ IN.		88			
2 IN.		44			
1½ IN.		5	100		
1 IN.		1	44	100	
¾ IN.			6	84	
½ IN.			1	40	
⅜ IN.				15	
NO. 4				1	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.71	2.70	2.70	
ABSORPTION, PER CENT (CRD-C 107,108):			0.6	0.4	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		3	6	11	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				0.5	
ABRASION LOSS (L. A.), %, (CRD-C 117):			22		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:			8		
Rc, mM/L:			260		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T | HW-CD | HD-CW

FINE AGG. Laboratory Std. COARSE AGG: Denny & Simpson DFE 300

FINE AGG. COARSE AGG: DFE 300

PETROGRAPHIC DATA (CRD-C 127):

	#4-3/4"	3/4"-1 1/2"	1 1/2"-3"
Medium to coarse crystalline limestone	84%	80%	94%
Fine crystalline, lithographic, highly dolomitic limestone	15%	19%	5%
Surface weathered limestone	1%	1%	1%

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1968

STATE: Ill.	INDEX NO.: 28	AGGREGATE DATA SHEET	TESTED BY: ORDL
LAT.: 37	LONG.: 88		DATE: June, 1968

LAB. SYMBOL NO.: 68264-265 TYPE OF MATERIAL: Limestone CA

LOCATION: Cave - in - Rock, Illinois

PRODUCER: Denny & Simpson # 2 Quarry

SAMPLED BY: Louisville District

TESTED FOR: Lock & Dam 52

PROCESSING BEFORE TESTING:

101/68.353 L

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			99		
1 IN.			36		
¾ IN.			3	87	
½ IN.			1	31	
⅜ IN.				8	
NO. 4				1	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)			7.99	7.05	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT. SURF. DRY (CRD-C 107, 108):			2.69	2.71	
ABSORPTION, PER CENT (CRD-C 107, 108):			0.5	0.3	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 29):					—
PER CENT FLAT AND ELONGATED (CRD-C 119, 120):			2	4	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½") (CRD-C 15)				0.4	
ABRASION LOSS (L. A.), %, (CRD-C 117): "A"			25		—
UNIT WT., LB/CU FT (CRD-C 06):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125, '26):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

Both samples: Gray to tan nonweathered limestone - 99%
yellow to brown mod. weath. limestone - 1%

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1971

STATE: Ill	INDEX NO.: 28 (Supp)	**AGGREGATE DATA SHEET**	TESTED BY: ORD Lab
LAT.: 37°	LONG.: 88°		DATE: November 1970

LAB SYMBOL NO.: 71117-71121 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Cave-In-Rock

PRODUCER: Denny & Simpson Quarry

SAMPLED BY: Nashville District C of E Personnel

TESTED FOR: Smithland L&D

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.	79.8	89.4			
5 IN.	46.5	58.2			
4 IN.	13.9	13.6			
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			98.8		
1 IN.			54.9	96.3	
¾ IN.			10.1	66.4	
½ IN.			2.1	23.2	
⅜ IN.			1.3	5.4	96.2
NO. 4				1.3	24.2
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.71	2.71	2.71	2.73	2.68
ABSORPTION, % (CRD-C 107, 108):	0.14	0.42	0.54	0.48	0.88
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				5.95	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING A				21.6	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG. Newtown	COARSE AGG: Denny-Simpson	DFE_{300}	85.4		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

About 96% to 98% of each sample consists of varying amounts of dense, hard, tough particles of oolitic limestone, fossiliferous limestone and dolomitic limestone. Moderately soft particles of argillaceous limestone make up 1% to 2% of each sample. Potentially reactive chert makes up the remaining 1% to 3%.

REMARKS:

ENG FORM 6011-R
1 MAR 1968

SOURCE NO. 74

THREE RIVERS ROCK CO.

SMITHLAND, KY

Issued Sept 1971

STATE: Ky.	INDEX NO: 29	AGGREGATE DATA SHEET	TESTED BY: ORD Lab.
LAT.: 270	LONG.: 880		DATE: November 1970
LAB. SYMBOL NO: 7196-71100			TYPE OF MATERIAL: Crushed Limestone
LOCATION: Smithland			
PRODUCER: Three Rivers Rock Co.			
SAMPLED BY: Nashville District C. of E. Personnel			
TESTED FOR: Smithland L&D			
PROCESSING BEFORE TESTING:			
GEOLOGICAL FORMATION AND AGE:			

GRADING (CRD-C 03) (CUM. % PASSING):

SIEVE	3-6"	½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.	84.6				
4 IN.	41.5				
3 IN.	4.6	51.4			
2½ IN.					
2 IN.		12.5			
1½ IN.		1.4			
1 IN.			58.1		
¾ IN.			14.2		
½ IN.			4.2	69.8	
⅜ IN.			2.7	40.8	
NO. 4			1.3	14.8	
NO. 8					82.6
NO. 16					71.6
NO. 30					46.4
NO. 50					29.5
NO. 100					17.9
NO. 200					
- 200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107, 108):	2.66	2.70	2.67	2.72	2.61
ABSORPTION, PER CENT (CRD-C 107, 108):	0.80	0.77	1.22	0.28	1.99
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119, 120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			3.03		26.9
ABRASION LOSS (L. A.), %, (CRD-C 117): 8				21.5	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGHTNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW

FINE AGG. Newtown	COARSE AGG: Three Rivers	DFE_{300}	79.0
FINE AGG. Three Rivers	COARSE AGG: Melvin	DFE_{300}	81.9

PETROGRAPHIC DATA (CRD-C 127):

Sample consist of varying amounts of dense, hard, particles of Oolitic Limestone, Fossiliferous Limestone, and Dolomitic Limestone. About 1% to 2% of each sample consists of moderately hard to moderately soft, moderately tough Argillaceous Dolomitic Limestone. A trace amount of the 3" max. size aggregate consists of potentially reactive Chert.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1975

STATE Ky.	INDEX NO 29 (supp)	AGGREGATE DATA SHEET	TESTED BY: ORDED-FL
LAT 37°	LONG 88°		DATE
LAB SYMBOL NO. 75071			TYPE OF MATERIAL Crushed Coarse Aggregate (1½"-3")
LOCATION. Smithland, Ky.			
PRODUCER Three Rivers Quarry			
SAMPLED BY Nashville District CofE personnel			
TESTED FOR Elementary Acceptance Tests for Smithland Locks & Dam Proj.			
USED AT:			
PROCESSING BEFORE TESTING			
GEOLOGICAL FORMATION AND AGE			

GRADING (CRD-C 105) (CUM. % PASSING)

SIEVE	3-6"	1½-3	¾-1½	#4-¾	FINE AGG
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200'(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3	¾-1½	#4-¾	FINE AGG
BULK SP. GR. S.S.D. (CRD-C 107, 108)				2.62	
ABSORPTION, % (CRD-C 107, 108)				2.33	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR 2.0 (CRD-C 122)				-0-	
% FLAT AND ELONGATED (CRD-C 119, 125)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				16.4*	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING A				35.7	
UNIT WT, LB/CU FT (CRD-C 106)					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128) Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126)

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR

MORTAR-BAR EXPANSION AT 100F % (CRD-C 123)	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT % Na_2O EQUIVALENT								
HIGH-ALK. CEMENT % Na_2O EQUIVALENT								

SOUNDNESS IN CONCRETE (CRD-C 40, 114) (#4-3/4")			F&T	HW-CD
FINE AGG. Lab. Std. COARSE AGG 3 Rivers Quarry	DFE 300		73%	
FINE AGG. COARSE AGG	DFE 300			

PETROGRAPHIC DATA (CRD-C 127)

Material consists of a composite of stone from Ledges 7A, 7B, and 7C of this quarry.

REMARKS

*$MgSo_4$ grading as per CRD C-3 100% passing 1½" agg.

ENG FORM 6011-R
1 MAR 1968

SOURCE NO. 75

WESTLAKE QUARRY

NEELY'S LANDING, MO

Issued Sept 1969

STATE: Mo.	INDEX NO.: 17	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: July & Sept 1968

LAB SYMBOL NO.: VICKS-48 G-1(A-F), G-1(2) C793 TYPE OF MATERIAL: Limestone Ledge Rock

LOCATION: Miss. River Mile 71.5 - 71.6 above mouth of Ohio River, NE 1/4, SW 1/4, Sec 28, T33N, R14E

PRODUCER: West Lake Quarry, Neely's Landing, Mo., (Old Barrett Quarry)

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Revetment, Regulating Works, Mississippi River, and Stone Dike Construction in Mississippi River

PROCESSING BEFORE TESTING: As required for Riprap tests

GEOLOGICAL FORMATION AND AGE: Bailey Formation, Middle Devonian Age

GRADING (CRD-C 103) (CUM. % PASSING):					
SIEVE	3-6"	1½-3	¾-1½	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 [a]					
F.M. [b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS	3-6"	1½-3	G-1 (A-F)	G-1 (2)	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107,			2.63	2.74	
ABSORPTION, % (CRD-C 107, 108):			1.1	0.3	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 12	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 1					
% FLAT AND ELONGATED (CRD-C 119, 12					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137			3.8	3.7	
L.A. ABRASION LOSS, % (CRD-C 14 GRADING ____				31.7	
UNIT WT, LB CU FT (CRD-C 107			163	170.7	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB DEG F, CRD-C 124					
REACTIVITY WITH NaOH (CRD-C 128): Sc,m ___					
Rc,mV ___					

MORTAR-MAKING PROPERTIES (CRD-C 11

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F, (CRD-C 125, 126

ROCK TYPE	PARALLEL	ACROSS	OR	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	2 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			FST	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{330}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: G-1 (A-F) meets project specifications: 2.0% maximum ABS, 5.0% maximum $MgSO_4$ loss, 140 lb/cu ft min. unit wt. G-1(2) CRD-C 144 resistance to freezing and thawing, loss - 5.3% of original weight.

ENG FORM MAR 1958 6011-R

Issued Sept 1975

STATE: Mo.	INDEX NO.: 17 (Suppl.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: Nov. 73

LAB SYMBOL NO.: STL-31 G-1 TYPE OF MATERIAL: Limestone Ledge Rock

LOCATION: Miss. River mile 71.5 above mouth of Ohio River, NE 1/4, SW 1/4 Sec. 28, T33, R14

PRODUCER: West Lake Quarry & Materials Co., Neeley's Landing, Mo.

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District, Repair to Revetments & dykes Lower Miss. River.

USED AT:

PROCESSING BEFORE TESTING: As required for riprap test

GEOLOGICAL FORMATION AND AGE: Bailey Formation, Middle Devonian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 15					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	Rip-rap	FINE AGG.
BULK SP. GR. S.S.D. (CRD-C 107, 108)				2.65	
ABSORPTION, % (CRD-C 107, 108):				0.4	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):				165.1	
FRIABLE PARTICLES, % (CRD-C 142					
SPEC HEAT, BTU/LB DEG F. (CRD-C 124					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					
*Freeze-Thaw, (CRD-C 144) % Loss				6.07	

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	[illegible]
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: *There were 7 slabs tested for freeze-thaw. One slab was completely disintergrated after 15 cyles and this slab was not included in the 6.07 % loss for the other six slabs.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 76

WESTLAKE QUARRY

GRAY'S POINT, MO

Issued Sept 1969

STATE: Mo.	INDEX NO.: 18	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37N	LONG.: 89W		DATE: 16 Sept & 13 Dec 1968

LAB SYMBOL NO.: STL-23 G-1, G-1(3) C793 TYPE OF MATERIAL: Limestone Riprap Stone

LOCATION: Miss. River Mile 46.5 above mouth of Ohio, NE 1/4, SW 1/4 Sec 22, T30N, R14E

PRODUCER: West Lake Quarry, Gray's Point, Mo.

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Revetment, Regulating Works, Mississippi River

PROCESSING BEFORE TESTING: As required for tests

GEOLOGICAL FORMATION AND AGE: Plattin Formation, Ordovician Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 [a]					
F.M. [b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS	3-6"	1½-3	¾-1½	G-1	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107,				2.76	
ABSORPTION, % (CRD-C 107,				0.3	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130					—
% LIGHTER THAN SP GR ____ CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137				0.4	
L.A. ABRASION LOSS, % (CRD-C 145) GRADING ____				30.8	
UNIT WT, LB/CU FT (CRD-C 107				172.0	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HC-CA
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Constituent	Composition, Percent G-1	G-1(3)
Dark Gray, Very Fine-Grained	3	5
Olive Gray, Fine-Grained	2	1*
Olive Gray, Medium-Grained	2	2**
Olive Gray, Medium Grained with Chert Nodules	1	0***

* More gray colored than in STL-23 G-1.

** One piece similar to olive gray medium grained STL-23 G-1 limestone except fine grained in STL-23 G-1(3)

***Chert nodules not characteristic in STL-23 G-1(3) as they were in one piece of STL-23 G-1.

REMARKS

CRD-C 144. Resistance to freezing and thawing percent loss for material ≤ 25 percent of original with 40.6 (G-1), 0.9 (G-1(3)).

ENG FORM ... MAR 1965 ...

Issued Sept 1969

STATE: MO	INDEX NO.: 18 (Suppl 1)	**AGGREGATE DATA SHEET**	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: 7 January 1968

LAB SYMBOL NO.: STL-23 G-1(2) C810 TYPE OF MATERIAL: Crushed Limestone

LOCATION: River Mile 46.5 above the mouth of the Ohio River West Side of Mississippi River. NE 1/4, SW 1/4 projected sec 22, T30N, R14E

PRODUCER: West Lake Quarry

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Kaskaskia Navigation Lock and Dam

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE: Plattin Formation

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		85			
2½ IN.		--			
2 IN.		35	100		
1½ IN.		6	97		
1 IN.		2	41	100	
¾ IN.		2	6	93	
½ IN.		1	1	56	
⅜ IN.		1		34	
NO. 4				8	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)		2.70	2.69	2.70	
ABSORPTION, % (CRD-C 107, 108):		0.3	0.5	0.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)		1.1	0.3	0.0	———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)		1.1	5.6	4.2	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				1.4	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING____		31.5	29.6	23.3	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____DAYS,_____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

			F&T	HW-CD	HD-CW
FINE AGG. STL-5 S-3(5) 90%	COARSE AGG: STL-23 G-1(2)	DFE_{300}	64		
FINE AGG. STL-19 S-1(2) 10%	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Constituent	Composition, Percent 1-1/2 3 in.	3/4 1-1/2 in.	No. 4- 3/4 in.
Limestone	64	53	35
Mottled Dense Dolomite	16	31	49
Dense Dolomite with Weathered Chert	9	3	2
Cherty	2	3	1
Coarsely Crystalline	5	6	5
Light Gray Thin Bedded	4	4	7
Weathered, Soft	TR	TR	1

REMARKS: This crushed limestone is potentially reactive, and should be either tested in concrete or have a satisfactory service record to demonstrate satisfactory performance.

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1969

STATE: Mo.	INDEX NO.: 18 (Suppl. 2)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: 7 March 1969

LAB SYMBOL NO.: STL-23 G-1(4) C810 TYPE OF MATERIAL: Crushed Limestone

LOCATION: 46.5 miles above mouth of Ohio River, W. Side Miss. River NE 1/4, SW 1/4 projected section 22, T30N, R14E, Kinswick Ledge

PRODUCER: Westlake Quarry, Gray's Point, Mo.

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Keskaskia Navigation Lock and Dam

PROCESSING BEFORE TESTING: Recombined

GEOLOGICAL FORMATION AND AGE: Kinswick Formation

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.67	
ABSORPTION, % (CRD-C 107, 108):				0.8	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG. STL-J 3-3(6)	COARSE AGG: STS-22 G-1(4)	DFE_{300}	63		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Constituents	Composition, No. Particles, %
Limestone	
Yellowish gray, dense	85
Light gray, dense	11
Grayish orange, dense	3
Dark gray, shaly	TR
Miscellaneous and weathered rocks	1
Total	100

REMARKS:

ENG FORM 6011-R 1 MAR 1968

Issued Sept 1969

STATE: Mo.	INDEX NO.: 18 (Suppl. 3	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 37	LONG.: 89		DATE: 11 April 1969		

LAB SYMBOL NO.: STL-23 G-1(5); C810 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Mississippi River, 46.5 miles above the mouth of the Ohio, NE 1/4, SW 1/4, Projected Sec 22, T30N, R14E

PRODUCER: West Lake Quarry and Materials Co., Gray's Point, Mo.

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Kaskaskia Navigation Lock and Dam

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE: Kimmswick Ledge

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		86			
2½ IN.		-			
2 IN.		33	100		
1½ IN.		5	96		
1 IN.		1	51	100	
¾ IN.		1	8	95	
½ IN.			2	58	
⅜ IN.			1	34	
NO. 4			1	2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 [a]					
F.M. [b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR. S.S.D. (CRD-C 107, 108)		2.58	2.58	2.58	
ABSORPTION, % (CRD-C 107, 109):		0.5	0.6	0.7	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING B				39.0	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128) Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION MILLIONTHS DEG F, (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1971

STATE MO	INDEX NO. 19	**AGGREGATE DATA SHEET**	TESTED BY: SWD Lab
LAT. 37	LONG. 89		DATE Sep 69
LAB SYMBOL NO.: 10800			TYPE OF MATERIAL: Crushed Limestone
LOCATION: West Lake Quarry, Illmo, Mo., old Hwy 61 and Miss. River			
PRODUCER: West Lake Quarry, Gray's Point			
SAMPLED BY:			
TESTED FOR:			
USED AT: Blytheville AFB			
PROCESSING BEFORE TESTING:			
GEOLOGICAL FORMATION AND AGE			

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		
1½ IN.			91		
1 IN.			25	100	
¾ IN.			3	93	
½ IN.			1	52	
⅜ IN.			1	27	
NO. 4			1	2	
NO. 8				1	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]			0.5	0.7	
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)			2.71	2.70	
ABSORPTION, % (CRD-C 107, 108):			0.3	0.4	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)			0.0	0.0	—
% LIGHTER THAN SP GR 2.0 (CRD-C 122)			0.0	0.0	
% FLAT AND ELONGATED (CRD-C 119, 120)			2.2	3.6	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING B			29.2	23.8	
UNIT WT. LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

		FINE AGGREGATE				COARSE AGGREGATE			
		2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT:	% Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT:	% Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

85% medium to dark gray, predominantly hard, lithographic to very fine-grained, partly fossiliferous and slightly fractured LIMESTONE.

15% light gray, hard, lithographic and slightly fossiliferous LIMESTONE.

17% of the No. 4 - 3/4" and 39% of the 3/4" - 1-1/2" were partly coated with black, moderately soft, waxy shale to 1/16" thick. Some calcite coatings were noted.

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 77

SOUTHERN RIVER ROCK

PERRYVILLE, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 20 (Suppl. 2)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG. 89		DATE: March 1973

LAB SYMBOL NO.: STL-28 G-3(A) and G-3(B) TYPE OF MATERIAL: Ledge Rock

LOCATION: Sec. 11, R 12 E, T 35 N, Perry County, Mo. (near Red Rock, Mo.)
Gibbar Quarry No.4, Mile 94.5, Miss. River

PRODUCER: Gibbar Bros., Perryville, Mo. *A= 6 pieces
Southern River Rock B= 3 pieces

SAMPLED BY: St. Louis District

TESTED FOR: Regulating Works, Lower Miss. River, St. Louis District

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Plattin Formation, Middle Ordovician Age

Ledge Rock

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	Group A	Group B		B	
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.78	2.80		2.74	
ABSORPTION, % (CRD-C 107, 108):	0.6	0.5		0.6	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 107)	173.2	174.4		170.7	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
CRD-C 144		See Below			

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HC-CW
FINE AGG. COARSE AGG: DFE300			
FINE AGG. COARSE AGG: DFE300			

Dolomitic limestone and dolomite

Tests conducted in accordance with CRD-C144 Method of Testing Stone for Resistance to Freezing and Thawing gave the following results:

	Av. % Wt. Loss After 20 Cycles
2 pieces (group A) STL-28 G-3(A)	14.2
3 pieces (group B) STL-28 G-3(A)	50.4
Grand Av.: All 5 pieces STL-28 G-3(A)	35.9
2 pieces STL-28 G-3(B)	0.3

REMARKS * A- STL-28 G-3(A)- Represents lower ledge of Gibbar Quarry #4, marked GRL1-6

B- STL-28 G-3(B)- Represents upper ledge of Gibbar Quarry #4, marked GRV1-3

ENG FORM 1 MAR 1958 6011-R

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 20 (Suppl.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: May 1965

LAB SYMBOL NO.: STL-19 G-1 TYPE OF MATERIAL: 6" Rock Core

LOCATION: Sec. 11, R 12 E, T 35 N, Perry County, Missouri, near Red Rock, Missouri (Gibbar Quarry # 4)

PRODUCER: Southern River Rock Co., Box 33, Perryville, Missouri

SAMPLED BY: St. Louis District

TESTED FOR: Kaskaskia River, Illinois, Navigation Improvement

USED AT:

Processing Before Testing: Selected pieces sawed, crushed & processed to meet test requirements for riprap -- (6" Rock Core)

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

			Lime-stone	Dolo-mite	
BULK SP. GR, S.S.D. (CRD-C 107, 108)			2.69	2.68	
ABSORPTION, % (CRD-C 107, 108):			0.4	1.7	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	—
SOFT PARTICLES, % (CRD-C 130)					
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____			28.5	30.9	
UNIT WT. LB/CU FT (CRD-C 107)			167.6	167.0	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
CRD C-144		see	below		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HC-CA
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

CRD C-144

Tests conducted in accordance with CRD C-144, Method of Testing Stone for Resistance to Freezing and Thawing gave the following results:

	No. Pieces	Av. % Wt. Loss After 20 Cycles
Limestone	3	35.4
Dolomite	3	12.7

REMARKS:

ENG FORM 1 MAR 1968 6011-R

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 20	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 37	LONG.: 89		DATE: May 1965
LAB SYMBOL NO.: STL-19 G-1			TYPE OF MATERIAL: Crushed limestone

LOCATION: Sec. 11, R 12 E, T 35 N., Perry County, Missouri, near Red Rock, Missouri Gibbar Quarry #4

PRODUCER: Southern River Rock Co., Box 33, Perryville, Missouri

SAMPLED BY: St. Louis District

TESTED FOR: Kaskaskia River, Illinois, Navigation Improvement

USED AT:

Processing Before Testing: Crushing and separation into sizes for use as Concrete Aggregate at WES

GEOLOGICAL FORMATION AND AGE: Plattin limestone, Middle Ordovician Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		95			
2½ IN.		---			
2 IN.		38	100		
1½ IN.		5	95		
1 IN.		2	32	100	
¾ IN.			5	95	
½ IN.			--	--	
⅜ IN.			2	38	
NO. 4				2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR, S.S.D. (CRD-C 107, 108)		2.70	2.71	2.71	
ABSORPTION, % (CRD-C 107, 108):		1.4	1.5	1.2	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)		0.0	0.0	0.0	———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)		3.0	6.1	5.3	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				6.6	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____		30.8	34.6	24.8	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Dolomite and dolomitic limestone

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 78

BUSSEN QUARRIES

ST. LOUIS, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 4 (suppl.3)	**AGGREGATE DATA SHEET**	TESTED BY: USAEWES
LAT.: 38°	LONG.: 90W		DATE: September 1972

LAB SYMBOL NO.: STL-26 G-2(A)+(B)+(C) TYPE OF MATERIAL: Ledge Rock

LOCATION: Near Jefferson Barracks, ½ d/s of J.B. Bridge, Sec. 12, T43N, R6E, St. Louis Co., Missouri

PRODUCER: Bussen Quarries, Inc., 5000 Bussen Rd., St. Louis Co., Missouri

SAMPLED BY: St. Louis District — A 7 pieces (Ledge 1)

TESTED FOR: Lock and Dam 26 (Replacement) — B 7 pieces (Ledge 3)

USED AT: — C 8 pieces (Ledge 4)

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Ledge 1- St. Genevieve Formation, Mississippian Age
Ledges 3 and 4- St. Louis Formation, Mississippian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	Ledge Rock			
BULK SP GR, S.S.D. (CRD-C 107)	2.69	2.65	2.68	
ABSORPTION, % (CRD-C 107)	0.3	0.8	0.5	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—
SOFT PARTICLES, % (CRD-C 130)				
% LIGHTER THAN SP GR ____ (CRD-C 122)				
% FLAT AND ELONGATED (CRD-C 119, 120)				
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				
L.A. ABRASION LOSS, % (CRD-C 117, 148) GRADING ____				
UNIT WT, LB/CU FT (CRD-C 107)	167.6	165.1	166.1	
FRIABLE PARTICLES, % (CRD-C 142)				
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)				
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L				
Rc, mM/L				
CRD-C 144	see below			

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): All seven samples from Ledge 1 were dense, chert-free, lithographic limestone with a few thin shale seams. Four samples from Ledge 3 were chert-free, shale-free lithographic limestone; the other three samples from Ledge 3 were cherty, lithographic limestone. The samples from Ledge 4 were made up of six pieces of medium-grained chert-free limestone and two pieces of lithographic limestone with 2 in. thick layers of medium-grained limestone

Remarks: Tests conducted in accordance with CRD-C 144 Method of Testing Stone for resistance to freezing and thawing gave the following results:

	Av. Percent Weight Loss
7 pieces STL-26 G-2(A)	1.1
7 pieces STL-26 G-2(B)	26.2
7 pieces STL-26 G-2(C)	30.9

ENG FORM MAR 1966 6011-R

SOURCE NO. 79

COLUMBIA QUARRY CO.

DUPO, IL

Issued Sept 1966

STATE: Ill.	INDEX NO: 10(REV.#2)	AGGREGATE DATA SHEET	TESTED BY: ORD Laboratories
LAT.: 38° N	LONG.: 90° W		DATE: 9-2-47

LAB. SYMBOL NO.: 4814 TYPE OF MATERIAL: Limestone

LOCATION: Plant at Krause, Ill. 2.5 mi. N.E. of Columbia, Ill. (Columbia Quarry No.1)

PRODUCER: Columbia Quarry Co., St. Louis, Mo. Commercial Quarry

SAMPLED BY: R. B. Lorch, Corps of Engineers Paducah, Ky.

TESTED FOR: Cache River Diversion, Cache, Illinois

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

USED AT: CHAIN-OF-ROCKS LOCK No. 27 (6947-So)

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			45	100	
¾ IN.			10	92	
½ IN.			5	60	
⅜ IN.				34	
NO. 4				5	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)			7.90	6.69	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.61		
ABSORPTION, PER CENT (CRD-C 107,108):			1.9		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP.GR.____(CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. PER CENT LOSS, 5 CYCLES $MgSO_4$ (CRD-C 115): (1)			4.2	9.4	
ABRASION LOSS (L.A.), %, (CRD-C 117):			27		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,____%_____DAYS,____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT:____% Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT:____% Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

	F & T	HW-CD	HD-CW
FINE AGG._____ COARSE AGG:_____ DFE_{300}			
FINE AGG._____ COARSE AGG:_____ DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): 68% med.-hard, gray, fine-grain, crystalline limestone, 9% hard, buff, semilithographic limestone, 2% med.-hard, gray, slightly porous limestone, 8% med.-hard, fine-grain, crystalline limestone with thin shaly partings, 10% thinly bedded argillaceous limestone, 3% thinly bedded c cherty limestone.

REMARKS: (1) ASTM-C88
Sample may not be representative. Missouri State Highway Dept. log of quarry indicates a higher % of poor stone.

WES FORM 726
JUNE 50

Issued Sept 1966

STATE: Ill.	INDEX NO.: 10 (SUPPL #1) (REV)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG.: 90		DATE: 1947-48

LAB. SYMBOL NO.: STL-2 G-2 TYPE OF MATERIAL: Limestone

LOCATION: Krause, Illinois (Columbia Quarry No. 1; also referred to as "Columbia, Ill. Quarry"), 2.5 mi. N.E. of Columbia, Ill.

PRODUCER: Columbia Quarries Co., St. Louis, Mo.

SAMPLED BY: St. Louis District

TESTED FOR: Chain-of-Rocks Lock No. 27

PROCESSING BEFORE TESTING:

Used at: Chain-of-Rocks Lock No. 27 (1947-50)

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		97			
2½ IN.		44			
2 IN.		3			
1½ IN.		1	100		
1 IN.		0	47	100	
¾ IN.			3	76	
⅜ IN.			0.4	51	
⅜ IN.			0	31	
NO. 4				3	100
NO. 8					94.5
NO. 16					76.2
NO. 30					43.8
NO. 50					20.5
NO. 100					5.0
NO. 200					0.9
-200(a)					
F.M.(b)					2.60

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):			2.62	2.62	2.63
ABSORPTION, PER CENT (CRD-C 107,108):			1.7	1.6	1.8
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):			0.4	0.0	—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			7-26	12-21	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ¾-1½", #4-¾") (CRD-C 115)			1.7	6-14	5.0
ABRASION LOSS (L. A.), %, (CRD-C 117): "B"			27	22-43	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE III CEMENT, RATIO 3 DAYS, 115 %, 7 DAYS, 121 %

LINEAR THERMAL EXPANSION X10 ^{6}/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE
Dense	2.0-2.4	1.9-2.3	1.6-1.8	1.8-2.2
Argillaceous	3.7-5.4	4.1-5.2	2.7-5.0	3.5-5.2

MORTAR: 4.4

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):

				F & T	HW-CD	HD-CW
FINE AGG. Limestone	COARSE AGG: Limestone	DFE_{300}	55	(Av of	7 tests)	
FINE AGG. Siliceous sand	COARSE AGG: Limestone	DFE_{300}	23.31			

PETROGRAPHIC DATA (CRD-C 127):

Oolitic fossiliferous limestone: 65%; porous or weathered argillaceous limestone: 21%; cherty argillaceous limestone: 14%; clay in insoluble residue is montmorillonoid. Core (STL-2 G-2(3)): Dense partly shaly: 84%; porous argillaceous: 5%; stylolitic cherty: 2%; dense mottled: 9%; shale: less than 1%.

REMARKS: Samples tested included STL-2 G-2, G-2(2), G-2(3), G-2(4), G-2(5); commercial crushed stone; laboratory crushed stone and manufactured sand, and core samples. See WES TM 6-371 for detailed data.

WES FORM 726 JAN. 1951

Issued Sept 1966

STATE: Ill.	INDEX NO.: 10(SUPPL#2)(REV.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG.: 90		DATE: June 1959
LAB. SYMBOL NO.: STL-2 G-2(7) Job 6353			TYPE OF MATERIAL: Limestone Core
LOCATION: Krause, Illinois, 2.5 mi. N.E. of Columbia, Ill.			
PRODUCER: Columbia Quarry No. 1, Columbia, Ill.			
SAMPLED BY: St. Louis District			
TESTED FOR: East Side Levee			
PROCESSING BEFORE TESTING: Crushed and separated into size groups			
GEOLOGICAL FORMATION AND AGE:			

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			53	100	
¾ IN.			10	99	
½ IN.			0	64	
⅜ IN.				34	
NO. 4				5	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.6	2.63	
ABSORPTION, PER CENT (CRD-C 107,108):			1.3	1.7	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):			5.1	3.8	—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			5	17	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			3.4	3.8	
ABRASION LOSS (L. A.), %, (CRD-C 117):			30.1	47.5	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL.	ACROSS	CN	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG: DFE 300			
FINE AGG.	COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1966

AGGREGATE DATA SHEET

STATE: Illinois | INDEX NO.: 10(SUPPL #3) | TESTED BY: USAEWES
LAT.: 38 | LONG.: 90 | DATE: 8 April 1966
LAB. SYMBOL NO.: STL-2 G-2(8)A & B(1-1/2-in.-3-in.) | TYPE OF MATERIAL: Limestone
LOCATION: 2.5 mi. NE of Columbia, Ill. at Krause, Ill.

PRODUCER: Columbia Quarry No. 1, Columbia, Illinois

SAMPLED BY:

TESTED FOR: Shelbyville Reservoir, Aggregate and Rip Rap Tests

PROCESSING BEFORE TESTING: All tests run on a combination of 50 percent STL-2 G-2(A) "upper ledge" and 50% STL-2 G-2(B)- "lower ledge"

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.		100			
2½ IN.		-			
2 IN.		59			
1½ IN.		9			
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):		2.66			
ABSORPTION, PER CENT (CRD-C 107,108):		0.9			
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):		0.0			—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		4.3			
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):		28.0			—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 %/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C ~~XX~~ 114):			F & T	HW-CD	HD-CW
FINE AGG., Combination*	COARSE AGG: 50% G-2(A), 50% G-2(B)	DFE_{100}	85		
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: * Fine aggregate was blended in the combination of 85% STL-15 S-1 (2)(A) 9% STL-15 S-1(B)(2), and 6% STL-15 S-3. STL-15 S-1 (B)(2) is "buckshot" from Hanfland Sand Co. that was received for another project. It was necessary to use a portion of this material in order to get the required gradation.

WES FORM 726 JAN. 1951

Issued Sept 1968

STATE: Illinois	INDEX NO.: 10 (Suppl #4)	AGGREGATE DATA SHEET	TESTED BY: ORDL
LAT.: 38°N	LONG.: 90°W		DATE: August 1967

LAB. SYMBOL NO.: 68117 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Krause, Illinois

PRODUCER: Columbia Limestone Company

101/68.311Z

SAMPLED BY:

TESTED FOR: SCOTT AFB, Illinois

PROCESSING BEFORE TESTING: None

Contract DACA 23-68-C-0013, Chicago District

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.				86	
½ IN.				42	
⅜ IN.				19	
NO. 4				2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)				6.93	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.65	
ABSORPTION, PER CENT (CRD-C 107, 108):				1.1	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR.____(CRD-C 129):				0	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				10	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):				0	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L: Rc, Mv					
Material Passing 200 Sieve				0.4	

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): coarse aggregate % by weight

Dense, hard, crystalline limestone	98.5
Shaly Limestone	0.9
Shale	0.1
Chert	0.5

REMARKS: Tesded in accordance with CE-806.01, 15 May 64. D. J. Keller

WES FORM 726 JAN. 1951

Issued Sept 1971

STATE: Ill.	INDEX NO.: 10(Suppl. 5	AGGREGATE DATA SHEET	TESTED BY: MRD Laboratory
LAT.: 38°N	LONG.: 90°W		DATE: August 1970

LAB. SYMBOL NO.: 70/211 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Sec. 10, T1S, R10W, St. Clair County

PRODUCER: Columbia Quarry; East St. Louis, Ill.

SAMPLED BY Omaha District

TESTED FOR Scott AFB, Aircraft apron repair

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-1"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				100	
¾ IN.				95	
½ IN.				52	
⅜ IN.				23	
NO. 4				5	
NO. 8				1	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]				0.5	
F.M.[b]				6.76	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-1" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.64	
ABSORPTION, PER CENT (CRD-C 107,108):				1.3	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):				0.6	—
PER CENT LIGHTER THAN SP. GR 2.0 (CRD-C 129):				0.0	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				1.4	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			(1)	0.4	
ABRASION LOSS (L. A.), %, (CRD-C 117):	(2)			24.8	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):				0.0	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE 300			
FINE AGG. COARSE AGG: DFE 300			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: (1) ASTM C 88
(2) Grading "B"

WES FORM 726 JAN. 1951

Issued Sept 1975

STATE: ILL	INDEX NO.: 10 (supp 6)	AGGREGATE DATA SHEET	TESTED BY: MRD Laboratory		
LAT.: 38°N	LONG.: 90°W		DATE: August 1974		
LAB. SYMBOL NO.: 74/167A&B			TYPE OF MATERIAL: Crushed limestone		
LOCATION: Quarry No. 1 (Krause) quarry, 2.5 mi. NE of Columbia Illinois; Sec. 10, T1S, R10W, St. Clair, County					
PRODUCER: Columbia Quarry Co.; Dupo, Illinois					
SAMPLED BY: Omaha District					
TESTED FOR: Scott AFB					
PROCESSING BEFORE TESTING:					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			67	100	
¾ IN.			8	91	
½ IN.			1	51	
⅜ IN.			1	28	
NO. 4				4	
NO. 8				1	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
			A	B	
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107, 108):					
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):			0.0	0.0	—
PER CENT LIGHTER THAN SP. GR. 2.0 (CRD-C 129):			0.0	0.0	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			2.8	2.0	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ([c] ½-1", #4-½") (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):			0.2	0.2	
COAL AND LIGHTE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Deleterious Materials	74/167A	74/167B
Shale	0.2	0.2
Material finer than No. 200	0.1	0.6
Clay-ironstone	None	None
Chert, sp. gr. less than 2.40	None	0.1
Claystone, mudstone and/or siltstone	None	None
Shaly and/or argillaceous limestone	0.7	0.4

REMARKS:

Tested in accordance with CE 806.01 Guide Spec.

WES FORM 726 JAN. 1951

SOURCE NO. 80

RIVERVIEW STONE & MATERIALS

ST. LOUIS, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 24 (suppl.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38N	LONG.: 90W		DATE: September 1972

LAB SYMBOL NO.: STL-26 G-1 TYPE OF MATERIAL: Ledge Rock

LOCATION: New Halls Ferry Road at Missouri River, St. Louis County, Mo., NE ¼, Sec. 33, T48N, R6E

PRODUCER: Riverview Stone and Materials Co.

SAMPLED BY: St. Louis District

TESTED FOR: Locks and Dam 26 (Replacement)

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: St. Louis Formation, Mississippian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-5"	1½-3	¾-1½	#4-¾	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS			Ledge Rock		
BULK SP. GR. S.S.D. (CRD-C 107)			2.62		
ABSORPTION, % (CRD-C 107)			1.8		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	———
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC Na_2SO_4 (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 107)			163.2		
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					
CRD-C 144			see below		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA:

Fine-grained and lithographic limestone; some pieces contained a few thin shale seams, no chert was seen.

REMARKS: Ten pieces received marked R.Q.5-5 from Ledge 5. Seven pieces were tested in accordance with CRD-C144 Method of Testing Stone for Resistance to Freezing and Thawing; after 20 cycles of test, average percent loss was 5.1.

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1959

STATE: Mo.	INDEX NO.: 24	AGGREGATE DATA SHEET	TESTED BY: USAEWES		
LAT.: 38	LONG.: 90		DATE: 5 January 1959		
LAB. SYMBOL NO.: STL-10 G-4 Job 6344			TYPE OF MATERIAL: Limestone Ledge Rock		
LOCATION: Foot of New Halls Ferry Road and at the Mo. River; St. Louis County, Mo., NE 1/4, Sec 33, T48N, R6E					
PRODUCER: Riverview Stone and Materials Co.					
SAMPLED BY: St. Louis District					
TESTED FOR: St. Louis Flood Protection Project					
PROCESSING BEFORE TESTING: G-4(a) (Bench 1) and G-4(B) (Bench 2) combined and crushed to pass 1-1/2-in. sieve, then separated into sizes No. 4 - 3/4 in. and 3/4 - 1-1/2 in.					
GEOLOGICAL FORMATION AND AGE:					

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.			100		
1 IN.			40		
¾ IN.			8	100	
½ IN.			1	69	
⅜ IN.			1	39	
NO. 4			0	3	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):		2.67	2.67		
ABSORPTION, PER CENT (CRD-C 107,108):		0.8	0.9		
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—		
SOFT PARTICLES, PER CENT (CRD-C 130):		2.7	1.3		—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		4.4	10.7		
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)		2.9	5.3		
ABRASION LOSS (L. A.), %, (CRD-C 117):		28.9	24.1		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. STL-10 S-1 and	COARSE AGG: STL-10 G-4	DFE_{300}	79		
FINE AGG. STL-2 S-2(12)	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

	Approximate Per Cent
Dense Limestone	96
Shaly Limestone	4

REMARKS:

WES FORM 726 JAN. 1951

SOURCE NO. 81

SOUTHERN RIVER ROCK CO.

PERRYVILLE, MO

Issued Sept 1971

STATE Mo.	INDEX NO.: 29 (Suppl.)	Rip Rap DATA SHEET	TESTED BY: USAEWES
LAT.: 38 N	LONG.: 90 W		DATE: 30 June 1970

LAB SYMBOL NO.: VICKS-35 G-1(3) A + B — TYPE OF MATERIAL: Ledge Rock

LOCATION: Menefee Quarry, Brickeys, Missouri, Sec 24, R7E, T39N, Ste. Genevieve County, Mo., 1/2 mi SW of Brickeys, Mo.

PRODUCER: Gibbar Brothers, Inc. (Southern River Rock) A - 3 pcs Weathered
Perryville, Mo. B - 5 pcs Unweathered

SAMPLED BY: St. Louis District

TESTED FOR: Riprap and dikestone

USED AT: Lower Mississippi River O&M

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Kimmswick limestone, Middle Ordovician

Ledge Rock

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	A	B
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.55	2.63
ABSORPTION, % (CRD-C 107, 108):	2.4	0.9
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—
SOFT PARTICLES, % (CRD-C 130)		
% LIGHTER THAN SP GR ____ (CRD-C 122)		
% FLAT AND ELONGATED (CRD-C 119, 120)		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)	1.5	0.4
L.A. ABRASION LOSS, % (CRD-C 145) GRADING 1	38.6	35.5
UNIT WT, LB/CU FT (CRD-C 107)	158.9	163.8
FRIABLE PARTICLES, % (CRD-C 142)		
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)		
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:		
Rc, mM/L:		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F&T HW-CD HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

A - represents upper pit, weathered sample, ME-1
B - represents lower pit, unweathered sample, ME-2

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1971

STATE: Missouri	INDEX NO: 29(REV.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT: 38	LONG: 90		DATE: May 1965

LAB SYMBOL NO: Vicks-35 G-1(2) TYPE OF MATERIAL: Crushed limestone

LOCATION: Sec 24, R 7 E, T 39 N, Ste. Genevieve County, Missouri, 1/2 mile SW of Brickeys, Missouri

PRODUCER: Menefee Crushed Stone Co., Inc., P. O. Box 387, Nashville, Tenn. (Southern River Rock Co.)

SAMPLED BY: St. Louis District

TESTED FOR: Kaskaskia River, Illinois, Navigation Improvement

PROCESSING BEFORE TESTING: Crushing and separating into sizes.

GEOLOGICAL FORMATION AND AGE: Kinmswick limestone, Middle Ordovician Age

GRADING (CRD-C 103)(CUM. % PASSING)

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		95			
2½ IN.		-			
2 IN.		38	100		
1½ IN.		5	95		
1 IN.		2	32	100	
¾ IN.			5	95	
⅜ IN.			-	-	
No 4			2	38	
No 8				2	
No 16					
No 30					
No 50					
No 100					
No 200					
-200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT. SURF. DRY (CRD-C 107,108):		2.62	2.62	2.61	
ABSORPTION, PER CENT (CRD-C 107,108):		1.0	1.2	1.7	
ORGANIC IMPURITIES, FIG. NO (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):		7.1	7.2	9.8	—
PER CENT LIGHTER THAN SP. GR ____ (CRD-C 120):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):		1.9	4.7	0.8	
WEIGHTED AV. % LOSS, 5 CYC $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				6.8	
ABRASION LOSS (L. A.), %, (CRD-C 117):		43.8	51.2	44.0	—
UNIT WT., LB/CU FT (CRD-C 108):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):		F & T	HW-CD	HD-CW
FINE AGG. SEL-7-S-3(4)	COARSE AGG: VICKS-35 G-1(2)	DFE 300 81		
FINE AGG. SEL-7-S-1	COARSE AGG:	DFE 300		

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

WES FORM 725 JAN. 1951

SOURCE NO. 82

STOLLE QUARRY, INC.

DUPO, IL

Issued Sept 1971

STATE: ILL	INDEX NO.: 35	AGGREGATE DATA SHEET	TESTED BY: MRD Laboratory
LAT.: 38°N	LONG.: 90°W		DATE: August 1970

LAB. SYMBOL NO.: 70/184 TYPE OF MATERIAL: Crushed Limestone

LOCATION: Sec. 13 & 14, T1N, R10W, St. Clair County

PRODUCER: Stolle Quarry, Inc.; Dupo, Ill.

SAMPLED BY: Omaha District

TESTED FOR: Scott AFB, Aircraft apron repair

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.				100	
¾ IN.				93	
⅜ IN.				42	
⅜ IN.				17	
NO. 4				2	
NO. 8				1	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)				0.5	
F.M.(b)				6.87	

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.68	
ABSORPTION, PER CENT (CRD-C 107,108):				0.8	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):				0.0	—
PER CENT LIGHTER THAN SP. GR. 2.0 (CRD-C 129):				0.0	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):				6.3	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½") (CRD-C 115)			(1)	4.4	
ABRASION LOSS (L. A.), %, (CRD-C 117):	(2)			27.5	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):				0.0	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	3 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F & T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS: (1) ASTM C 88
(2) Grading "B"

WES FORM 726 JAN. 1951

Issued Sept 1975

STATE: ILL	INDEX NO.: 35 (Suppl)	AGGREGATE DATA SHEET	TESTED BY: MRD Laboratory
LAT.: 38°N	LONG.: 90°W		DATE: August 1974

LAB. SYMBOL NO.: 74/148A&B TYPE OF MATERIAL: Crushed limestone

LOCATION: Sec. 13 & 14, T1N, R10W; St. Clair County, Ill.

PRODUCER: Casper-Stolle Quarry; Dupo, Illinois

SAMPLED BY: Omaha District

TESTED FOR: Scott AFB

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		
1½ IN.			99		
1 IN.			34	100	
¾ IN.			3	82	
⅜ IN.			1	29	
#8 IN.			1	9	
NO. 4			1	2	
NO. 8			1	2	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	A ¾-1½" (c)	B #4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):					
ABSORPTION, PER CENT (CRD-C 107,108):					
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):			0.1	0.9	—
PER CENT LIGHTER THAN SP. GR. 2.0 (CRD-C 129):			None	None	—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):			4.5	7.8	
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)					
ABRASION LOSS (L. A.), %, (CRD-C 117):					—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):			0.1	0.1	
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE_____CEMENT, RATIO_____DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F & T | HW-CD | HD-CW

FINE AGG. COARSE AGG: DFE_{300}

FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

Deleterious Materials	74/148A	74/148B
Shale	None	None
Material finer than No. 200	0.5	0.7
Clay-ironstone	None	None
Chert, less than 2.4 sp. gr.	None	None
Claystone, mudstone and/or siltstone	None	None
Shaly and/or argillaceous limestone	2.3	1.7

REMARKS:

Tested in accordance with CE 806.01 Guide Spec.

SOURCE NO. 83

MARKHAM & BROWN, INC.

DALLAS, TX

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 37 (suppl.)	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38N	LONG.: 90W		DATE: 4 August 1972
LAB SYMBOL NO.: STL- 28 G-1(A) * (B)			TYPE OF MATERIAL: Ledge Rock

LOCATION: Mo. River Constructors Quarry, Mile 139 Miss. River 3 miles upstream Brickeys, Mo., NE ¼ Sec. 9 and NW ¼ Sec. 10, T39N, R7E, Ste. Genevieve Co., Mo.

PRODUCER: Markham & Brown, Inc.
Dallas, Texas

SAMPLED BY: St. Louis District — A- 7 pieces, B- 7 pieces

TESTED FOR: Regulating Works Lower Mississippi River

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Plattin Formation, Ordovician Age
Ledge Rock

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)					
F.M. (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS		A		B	
BULK SP GR, S.S.D. (CRD-C 107)		2.57		2.71	
ABSORPTION, % (CRD-C 107)		3.0		0.3	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	
SOFT PARTICLES, % (CRD-C 130)					—
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 107)		160.1		168.8	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
CRD - C 144		see below			

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

Test conducted in accordance with CRD-C 144 Method of Testing Stone for Resistance to freezing and thawing gave the following results:

	Av. Percent Wt. Loss After 20 Cycles
7 pieces- STL-28 G-1(A)	34.0
7 pieces- STL-28 G-1(B)	5.8

REMARKS:
A- Represents Ledge 3, Pit 2, marked MB-1
B- Represents Ledge 4, Pit 2, marked MB-2

ENG FORM 1 MAR 1968 6011-R

Issued Sept 1971

STATE: Mo.	INDEX NO.: 37	Rip Rap DATA SHEET	TESTED BY: USAEWES
LAT.: 38N	LONG.: 90W		DATE: 30 JUNE 1970

LAB SYMBOL NO.: STL-24-G-1(A) + (B) TYPE OF MATERIAL: Ledge Rock

LOCATION: Mo. River Constructors Quarry, mile 139 Miss. River, 3 miles upstream Brickeys, Mo., NE 1/4 Sec 9 and NW 1/4 Sec 10, T39N, R7E, Ste. Genevieve Co. Mo.

PRODUCER: Markham & Brown, Inc.
Dallas, Texas

A - 7pcs Weathered
B - 7 pcs Unweathered

SAMPLED BY: St. Louis District

TESTED FOR: Riprap and dikestone

USED AT: Lower Mississippi River O&M

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Reattin formation, Ordovician

Ledge Rock

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	A	B
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.52	2.59
ABSORPTION, % (CRD-C 107, 108):	3.9	2.4
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—
SOFT PARTICLES, % (CRD-C 130)		
% LIGHTER THAN SP GR ____ (CRD-C 122)		
% FLAT AND ELONGATED (CRD-C 119, 120)		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137	9.1	5.6
L.A. ABRASION LOSS, % (CRD-C 145) GRADING 1	41.7	31.6
UNIT WT, LB/CU FT (CRD-C 107	157.0	161.4
FRIABLE PARTICLES, % (CRD-C 142)		
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)		
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:		
Rc,mM/L:		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

A - Represents upper ledge, marked M-1.
B - Represents lower ledge, marked M-2.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 84

WESTLAKE QUARRY

BRIDGETON, MO

Issued Sept 1971

AGGREGATE DATA SHEET

STATE: Missouri | INDEX NO.: 38 | TESTED BY: USAEWES
LAT.: 38 | LONG.: 90 | DATE: May 1965
LAB SYMBOL NO.: STL-19 G-2 | TYPE OF MATERIAL: Crushed Limestone
LOCATION: Sec 17, R 9 E, T 38 N, Ste. Genevieve County, Missouri, at Little Rock, Missouri
PRODUCER: West Lake Quarry and Materials Co., Box 206, Taussig Road, Bridgeton, Missouri
SAMPLED BY: St. Louis District
TESTED FOR: Kaskaskia River Navigation Improvement
USED AT:

PROCESSING BEFORE TESTING: Crushing and separating into sizes
GEOLOGICAL FORMATION AND AGE: Ste. Genevieve limestone and St. Louis limestone, Meramec group, Middle Mississippian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		95			
2½ IN.		---			
2 IN.		38	100		
1½ IN.		5	95		
1 IN.		2	32	100	
¾ IN.			5	95	
½ IN.			---	---	
⅜ IN.			2	38	
NO. 4				2	
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)		2.68	2.67	2.67	
ABSORPTION, % (CRD-C 107, 108):		0.6	0.8	1.0	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)		2.9	3.6	2.8	———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)		*9.3	*14.0	*4.7	
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)				13.4	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING____		30.2	38.1	29.8	
UNIT WT, LB/CU FT (CRD-C 106):					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
REACTIVITY WITH NaOH (CRD-C 128): Rc,mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE_____ CEMENT, RATIO:_____ DAYS,_____ %, _____DAYS,_____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): F&T | HW-CD | HD-CW
FINE AGG. STL-5 S-3(4) STL-19 S-1 COARSE AGG: STL-19 G-2 DFE_{300} 80
FINE AGG. COARSE AGG: DFE_{300}

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:
* Poor particle shape resulted from testing crushed cores.

ENG FORM 1 MAR 1968 6011-R

Issued Sept. 1973

STATE Mo. INDEX NO. 38 (suppl.) | AGGREGATE DATA SHEET | TESTED BY USAEWES

LAT. 38 LONG. 90 | DATE May 1965

LAB SYMBOLING STL-19 G-2 | TYPE OF MATERIAL Limestone core

LOCATION Sec. 19, R 9 E, T 38 N, Ste. Genevieve County, Missouri at Little Rock, Missouri

PRODUCER West Lake Quarry and Materials Co., Box 206, Taussig Road, Bridgeton, Missouri Quarry #5

SAMPLED BY St. Louis District

TESTED AT Kaskaskia River, Illinois, Navigation Improvement

USED AT

PROCESSING BEFORE TESTING 6" rock cores sawed, crushed & processed

GEOLOGICAL FORMATION AND AGE: Ste. Genevieve limestone and St. Louis limestone, Meramec group, Middle Mississippian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS	Dense	Shaly	Soft weathered	Oolite	Fine agg.
BULK SP. GR. S.S.D. (CRD-C 107, 108)	2.66	2.67	2.52	2.65	
ABSORPTION, % (CRD-C 107, 108)	0.3	0.2	2.2	0.2	
ORGANIC IMPURITIES, FIG. NO. CRD-C 121	—	—	—	—	—
SOFT PARTICLES, % (CRD-C 130)					
% LIGHTER THAN SP GR ____ CRD-C 122					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ CRD-C 115					
L.A. ABRASION LOSS, % (CRD-C 117, 148) GRADING	33.4	31.0	30.1	24.9	
UNIT WT. LB/CU FT (CRD-C 107	167.7	166.3	157.0	165.1	
Toughness (CRD-C 132):	7/4*	11/9*	5/5*	9/6*	
SPEC HEAT, BTU/LB/DEG F. CRD-C 124					
CRD C-144		see below			

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, PATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{330}			
FINE AGG.	COARSE AGG:	DFE_{330}			

Tests conducted in accordance with CRDC 144 method of Testing Stone for Resistance to freezing and thawing gave the following results:

	No. Pieces	Av. Percent Wt. Loss After 20 Cycles
Dense Limestone	3	6.8
Shaly Limestone	3	9.0
Soft Weathered Limestone	3	2.8
Oolite Limestone	3	0.2

REMARKS: * The number to the left is the height of the blow at failure in cm., perpendicular to the structural weakness and the number to the right is the height of the blow parallel to the structural weakness of the sample.

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 85

WESTLAKE QUARRY

ST. LOUIS, MO

Issued Sept 1971

STATE: Mo.	INDEX NO.: 39	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG.: 90		DATE: Sep and Oct 69

LAB SYMBOL NO.: STL-23 G-2 and G-2(2) CHOL and C852 TYPE OF MATERIAL: Ledge Rock

LOCATION: Miss. R. Mile 144 Above Mouth of Ohio, SW¼, Sec 25, T40N, R6E

PRODUCER: West Lake Quarry and Materials Co., St. Louis, Missouri

SAMPLED BY: St. Louis District

TESTED FOR: St. Louis District

USED AT: Regulating Works, St. Louis District

PROCESSING BEFORE TESTING: As required for tests

GEOLOGICAL FORMATION AND AGE: Plattin Formation, Ordovician Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	G-2 Ledge Rock	G-2(2) Ledge Rock	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)			2.68	2.70	
ABSORPTION, % (CRD-C 107, 108):			0.5	0.8	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C ~~XX~~) 137*			2.4	3.3	
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING 1**			32.3	34.4	
UNIT WT, LB/CU FT (CRD-C ~~XX~~): 107			167.0	168.2	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG. DFE_{300}			
FINE AGG. COARSE AGG. DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

REMARKS:

* Samples broken with hammer to pass a 3-in. sieve and be retained on a 2-in. sieve sample weights G-2 3022g G-2(2) 4100 g. Amounts of splitting, crumbling, cracking, or flaking during tests not above normal.

** Samples prepared by breaking with a hammer.

ENG FORM 1 MAR 1958 6011-R

SOURCE NO. 86

CHARLIE BUSSEN QUARRY

STE. GENEVIEVE, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 40	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG.: 90		DATE: May 1965

LAB SYMBOL NO.: STL - 19 G-4(A), 4(B), 4(C), 4(D) TYPE OF MATERIAL: Ledge Rock

LOCATION: Sec. 12, R 8 E, T 38 N. Ste. Genevieve County, Missouri

PRODUCER: Charlie Bussen Quarry, Ste. Genevieve, Missouri
New Tower Rock Stone Co.

SAMPLED BY: St. Louis District

TESTED FOR: Kaskaskia River, Illinois, Navigation Improvement

USED AT:

PROCESSING BEFORE TESTING: Quarry stone- selected pieces sawed, crushed & processed

GEOLOGICAL FORMATION AND AGE: Salem Limestone, Meramec group, Middle Mississippian

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS	G-3A Ledge 1	G-3B Ledge 2	G-3C Ledge 3 Shaly Ls.	G-3C Ledge 3 Dense Ls.	G-3D Ledge 4
BULK SP GR, S.S.D. (CRD-C 107, 108)	2.61	2.64	2.61	2.61	2.62
ABSORPTION, % (CRD-C 107, 108):	1.6	0.7	1.5	1.1	0.7
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)					
SOFT PARTICLES, % CRD-C 130)					
% LIGHTER THAN SP GR ____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % CRD-C 117, 145) GRADING	26.6	21.7	28.5	28.4	28.9
UNIT WT. LB/CU FT (CRD-C 107	162.6	164.5	162.6	162.6	163.2
Toughness (CRD-C 132) :	7/9*	9/9*	7/7*	9/8*	7/8*
SPEC HEAT, BTU/LB DEG F. (CRD-C 124)					
CRD C-144		see	below		

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

Tests conducted in accordance with CRD C-144 Method of testing stone for Resistance to freezing and thawing gave the following results:

Ledge	Limestone	No. Pieces	Av. Percent Wt. Loss After 20 Cycles
1	Dense	3	0.4
2	Dense	3	0.2
3	Shaly	3	1.5
3	Dense	3	0.8
4	Dense	3	0.2

REMARKS: * The number to the left is the height of the blow at failure in cm, perpendicular to the structural weakness and the number to the right is the height of the blow parallel to the structural weakness of the samples.

ENG FORM 1 MAR 1965 6211-R

SOURCE NO. 87

SOUTHERN RIVER ROCK

PERRYVILLE, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 41	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 30°	LONG.: 90W		DATE: 3 October 1972
LAB SYMBOL NO.: STL-26 G-2			TYPE OF MATERIAL: Ledge Rock

LOCATION: Miss. River Mile 128.1, SE¼, SW¼, Sec., T38N, R8E, Ste. Genevieve Co., Missouri

PRODUCER: Gibbar Bros., Perryville, Mo.
Southern River Rock Co

SAMPLED BY: St. Louis District

TESTED FOR: Regulating Works, Lower Miss. River

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Salem Formation, Mississippian Age

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	¼-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS		Ledge Rock				
BULK SP GR, S.S.D. (CRD-C 107, 108):			2.63			
ABSORPTION, % (CRD-C 107, 108):			1.3			
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	———	———	———	———	———	———
SOFT PARTICLES, % (CRD-C 130):						
% LIGHTER THAN SP GR _____ (CRD-C 122):						
% FLAT AND ELONGATED (CRD-C 119, 125):						
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115):						
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING _____						
UNIT WT, LB/CU FT (CRD-C 105): 107			163.8			
FRIABLE PARTICLES, % (CRD-C 142):						
SPEC HEAT, BTU/LB/DEG F, (CRD-C 124):						
REACTIVITY WITH NaOH (CRD-C 129): Sc, mM/L:						
Rc, mM/L:						
CRD-C 144		see below				

MORTAR-MAKING PROPERTIES (CRD-C 116):
TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F, CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 YO.	6 YO.	9 YO.	12 YO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 YO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CH
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

Tests conducted in accordance with CRD-C144 Method of Testing Stone for Resistance to freezing and thawing gave the following:

	Av. Percent of Loss After 20 Cycles
7 pieces STL-28 G-2	7.2

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 88

BUSSEN QUARRY

GLEN PARK, MO

Issued Sept 1975

STATE: MO	INDEX NO.: 43	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG.: 90		DATE: July 1975

LAB SYMBOL NO.: STL-37 G-1 TYPE OF MATERIAL: Riprap Stone

LOCATION: One mile from Mississippi River near Glen Park, Mo.

PRODUCER: Bussen's "Glen Park" Quarry

SAMPLED BY: St. Louis District

TESTED FOR: Regulating Works - Mississippi River

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Kimmswick Formation

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
⅜ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	Rip-rap	FINE AGG.
BULK SP GR, S.S.D. (CRD-C 107, 108)				2.54	
ABSORPTION, % (CRD-C 107, 108):				1.9	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR _____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING _____					
UNIT WT, LB/CU FT (CRD-C 107				158.2	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					
Freeze & Thaw 20 cycles, avg % loss				1.2	

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO: _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127):

The rock was slightly porous medium- to coarse-grained pale yellowish brown fossiliferous limestone. The pores were due to void space in some of fossils in the rock. Calcite is the most abundant constituent with a minor amount of quartz. A bedding thickness of $\geq$0.5 ft, absence of shaly parting planes and general homogeneity of the material suggest that it will perform well as riprap.

REMARKS: Test conducted in accordance with CRD-C 144, Method of Testing Stone for Resistance to Freezing and Thawing

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 89

WESTLAKE QUARRY

ST. LOUIS, MO

Issued Sept 1975

STATE: Ill.	INDEX NO.: 45	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 38	LONG. 90		DATE: 12 December 1973

LAB SYMBOL NO.: STL-26 G-4(A), G-4(B) TYPE OF MATERIAL: Limestone Ledgerock

LOCATION: Golden Eagle Landing, Calhoun Co., Ill., NE 1/4, Sec 1, T14S, R3E

PRODUCER: West Lake Quarry and Materials Co., Inc.

SAMPLED BY: St. Louis District

TESTED FOR: Lock and Dam No. 26 (Replacement) for Riprap

USED AT:

PROCESSING BEFORE TESTING: Sawed and broken down to meet test requirements.

GEOLOGICAL FORMATION AND AGE: St. Louis Formation, Mississippian Age

GRADING (CRD-C 123) (CUM. % PASSING):

SIEVE	5-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

			G-4A	G-4B	
BULK SP GR, S.S.D. (CRD-C 107)			2.67	2.65	
ABSORPTION, % (CRD-C 107)			0.5	0.4	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—	—	—	—
SOFT PARTICLES, % (CRD-C 130)					
% LIGHTER THAN SP GR____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING____					
UNIT WT, LB/CU FT (CRD-C 107):			166.4	165.1	
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc,mM/L:					
Rc,mM/L:					
Freeze and Thaw: See Note.					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE____ CEMENT, RATIO:____ DAYS,____ %, ____ DAYS,____ %

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

		FINE AGGREGATE				COARSE AGGREGATE			
		2 MO.	6 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT:	% Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT:	% Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F&T	HW-CD	HD-CW
FINE AGG.	COARSE AGG:	DFE_{300}			
FINE AGG.	COARSE AGG:	DFE_{300}			

NOTE: Tests conducted in accordance with CRD-C 144, Method of Testing Stone for Resistance to Freezing and Thawing, gave the following results.

	Avg Percent Wt Loss After 20 Cycles
6 pieces (GE-1) STL-26 G-4(A)	9.0
6 pieces (GE-2) STL-26 G-4(B)	24.8

REMARKS:

G-4(A) Ledge GE-1 - Selected pieces from six rock (marked GE-1)
G-4(B) Ledge GE-2 - Selected pieces from six rock (marked GE-2)

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 90

WAYNE B. SMITH

LOUISIANA, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 4	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 39	LONG.: 91		DATE: 24 March 1972

LAB SYMBOL NO.: STL-20 S-4 TYPE OF MATERIAL: Coarse concrete sand

LOCATION: On Mississippi River, SW 1/4, SW 1/4, Sec 17, R6W, T54N, Pike County, Missouri

PRODUCER: Wayne B. Smith (Smith Sand Co.)

SAMPLED BY: St. Louis District

TESTED FOR: Clarence Cannon Dam

USED AT:

PROCESSING BEFORE TESTING: None

GEOLOGICAL FORMATION AND AGE: Dredged from Mississippi River

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					100
NO. 4					98
NO. 8					94
NO. 16					83
NO. 30					54
NO. 50					8
NO. 100					1
NO. 200					--
-200[a]					0.9
F.M.[b]					0.62

[a] CRD-C 105 [b] CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 107, 108)					2.65
ABSORPTION, % (CRD-C 107, 108)					0.5
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	———	———	———	———	1
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR 2.0 (CRD-C 122)					0.0
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 137)					3.6
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____					
UNIT WT, LB/CU FT (CRD-C 109)					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116) *

TYPE II CEMENT, RATIO: 7 DAYS, 115 %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA (CRD-C 127): The sand consisted of the following components:

Quartz	50%	Partly chalcedonic chert was present
Acid Igneous rocks and sandstone	26%	in each sieve fraction
Feldspar	15%	
Chert	5%	
Basaltic rocks	2%	
Misc	2%	

REMARKS: * Blend of STL-20 S-4 and STL-13 S-1 to meet F&T specifications (CRD-C 114)

ENG FORM 6011 R

SOURCE NO. 91

WAYNE B. SMITH

LOUISIANA, MO

Issued Sept. 1973

STATE: Mo.	INDEX NO.: 6	AGGREGATE DATA SHEET	TESTED BY: USAEWES
LAT.: 39N	LONG.: 91W		DATE: September, 1972

LAB SYMBOL NO.: STL-26 G-3(A) + (B) TYPE OF MATERIAL: Ledge Rock

LOCATION: SW¼, Sec. 20, T54N, R1W, Pike County, Missouri

PRODUCER: Wayne B. Smith

SAMPLED BY: St. Louis District

TESTED FOR: Regulating Works, Mississippi River

USED AT:

PROCESSING BEFORE TESTING:

GEOLOGICAL FORMATION AND AGE: Burlington Formation, Mississippian Age

Ledge Rock

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	¾-4"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
−200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	A	B
BULK SP GR, S.S.D. (CRD-C 107,	2.63	2.64
ABSORPTION, % (CRD-C 107,	0.9	0.8
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121)	—	—
SOFT PARTICLES, % (CRD-C 130)		
% LIGHTER THAN SP GR ____ (CRD-C 122)		
% FLAT AND ELONGATED (CRD-C 119, 120)		
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)		
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING ____		
UNIT WT, LB/CU FT (CRD-C 107	163.8	164.5
FRIABLE PARTICLES, % (CRD-C 142)		
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)		
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:		
Rc, mM/L:		
CRD-C 144	see	below

MORTAR-WAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO: ____ DAYS, ____ %, ____ DAYS, ____

LINEAR THERMAL EXPANSION, MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 2 WO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE_{300}			
FINE AGG. COARSE AGG: DFE_{300}			

PETROGRAPHIC DATA Dense, medium-grained, chert-free limestone.

Remarks: The seven pieces were tested in accordance with CRD-C 144 Method of Testing Stone for Resistance to freezing and thawing; after 20 cycles of test, average percent loss was 1.7.

A- Represents Ledge 1, marked Smith Quarry, upper ledge

B- Represents Ledge 2, marked Smith Quarry, lower ledge

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 92

FLORIDA ROCK CORP.

NAPLES, FL

Issued Sept 1975

STATE: FLA	INDEX NO.: 4	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory
LAT: 26	LONG.: 81		DATE: May 1974

LAB SYMBOL NO.: 220/228 TYPE OF MATERIAL: Riprap

LOCATION: Golden Gate Parkway to Santa Barbary, North to 22nd & left to canal
Golden Gate Blvd. to Everglades Blvd. South to 66th and left to canal

PRODUCER: Golden Gate Estates, Florida Rock Corp., Naples, Fla. (Commercial)
3mi N. of Hwy 84

SAMPLED BY: Florida Rock Corp.

TESTED FOR: Four River Basins

USED AT:

PROCESSING BEFORE TESTING: Some material crushed for L. A. Abrasion Test.

GEOLOGICAL FORMATION AND AGE: Limerock, 25,000,000 years

GRADING (CRD-C 103) (CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.					
½ IN.					
⅜ IN.					
NO. 4					
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
BULK SP. GR., S.S.D. (CRD-C 127, 128)	2.54				
ABSORPTION, % (CRD-C 127, 128)	1.9				
ORGANIC IMPURITIES, F.G. NO. (CRD-C 121)	———	———	———	———	
SOFT PARTICLES, % (CRD-C 130)					———
% LIGHTER THAN SP GR_____ (CRD-C 122)					
% FLAT AND ELONGATED (CRD-C 119, 120)					
WT AV % LOSS, 5 CYC $MgSO_4$ (CRD-C 115)					
L.A. ABRASION LOSS, % (CRD-C 117, 145) GRADING A-24					
UNIT WT, LB/CU FT (CRD-C 126)					
FRIABLE PARTICLES, % (CRD-C 142)					
SPEC HEAT, BTU/LB/DEG F. (CRD-C 124)					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)
TYPE_____ CEMENT, RATIO:_____ DAYS,_____%,_____DAYS,_____%

LINEAR THERMAL EXPANSION MILLIONTHS/DEG F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE				COARSE AGGREGATE			
	2 MO.	5 MO.	9 MO.	12 MO.	3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):	F&T	HW-CD	HD-CW
FINE AGG. COARSE AGG: DFE300			
FINE AGG. COARSE AGG: DFE300			

PETROGRAPHIC DATA (CRD-C 127):
220/228 - Riprap - Tan, fine grained, massive bedded, fossiliferous limestone. Wet Dry percent loss = 0.3.

REMARKS:

ENG FORM 1 MAR 1968 6011-R

SOURCE NO. 93

FLORIDA CRUSHED STONE

BROOKSVILLE, FL

Issued Sept 1969

STATE: Fla.	INDEX NO: (Suppl., rev 3) AGGREGATE	TESTED BY:	SAD Laboratory
LAT.: 28	LONG.: 82 DATA SHEET	DATE:	January 1965
LAB. SYMBOL NO.: LA706-708		TYPE OF MATERIAL:	Crushed Limestone

LOCATION: Gay Pit. Take State Road 50 West from Brooksville, Fla., turn right on State Road 485 (Cobb Road) to Plant, S-1/2 of N-1/2, Sec. 8, T22S, R19E

PRODUCER: Fla. Crushed Stone Co., Camp Concrete Products, Brooksville, Florida - Commercial — 2 mi N. of Brooksville

SAMPLED BY:

TESTED FOR: Cross Florida Barge Canal

PROCESSING BEFORE TESTING:

USED AT: 2" size - Inglis Lock (1966 -); C&S Fla. (1967 -); Rodman Dam, CFBC (1967-); SR 316 Bridge, CFBC (1967), Moss Bluff Lock, CFBC (1968 -)

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103) (CUM % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.		100			
3 IN.		98			
2½ IN.					
2 IN.		46			
1½ IN.		10	100		
1 IN.		1	36	100	
¾ IN.			4	99	
½ IN.			2	76	
⅜ IN.				43	
NO. 4				6	
NO. 8				3	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
-200 (a)					
F.M (b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107, 108):		2.58	2.49	2.55	
ABSORPTION, PER CENT (CRD-C 107, 108)		1.8	2.5	1.9	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 21):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 30):					—
PER CENT LIGHTER THAN SP. GR ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119, 120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ¾-1", #4-½) (CRD-C 115) "A" Grading		13			—
ABRASION LOSS (L.A.), %, (CRD-C 117) "A" Grading		34			—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L					
Rc, mM/L					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ^{6}/DEG. F. (CRD-C 125, 126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	2 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

F.A. Locations

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	XXXXXXXXXX
FINE AGG. Diamond Sand	COARSE AGG: Gay Pit L.S.	DFE 300	64	(29-81-1)
FINE AGG. Lake Wales	COARSE AGG: " " "	DFE 300	66	(27-81-2)
XXXXXXXXXXXXXXXXXX				
" " Mammoth Plant	" " " " "	"	42	(27-81-)
" " Mammoth Sandland	" " " " "	"	57	(27-81-4)
" " Keuka Sand	" " " " "	"	64	(29-81-)
" " Orange Sand	" " " " "	"	53	(28-81-6)
" " Grandin Sand	" " " " "	"	45	(29-81-)
" " New Smyrna	" " " " "	"	40	(29-80-)
" " Putnam Hall	" " " " "	"	40	(29-81-)

Petrographic Data (CRD-C 127): The quarry rock is comprised of 39% light tan, tough, dense, fine grained limestone, 46% white, dense, fossiliferous limestone, 10% white, porous, vuggy limestone, 5% mottled, conglomeritic, cherty limestone, and trace amounts of discrete chert particles.

REMARKS:

WES FORM 726 JAN. 1951

Issued Sept 1973 ✓

STATE: Fla.	INDEX NO.: 1 (Rev.3)	AGGREGATE DATA SHEET	TESTED BY: SAD Testing Lab.
LAT.: 28° N	LONG.: 82° W		DATE: 18 June 1952, 1971

LAB. SYMBOL NO.: 10/1356 (CA) TYPE OF MATERIAL: Crushed Limestone

LOCATION: Sec. 6 & 7, T. 22S., R. 19E., Hermando Co., Brooksville, Fla.
7 mi N. of Brooksville on US Hwy 98

PRODUCER: Florida Crushed Stone Co., Brooksville, Fla. Plant Owner: Camp Concrete Rock Co. Commercial

SAMPLED BY: —

TESTED FOR: MacDill AFB

PROCESSING BEFORE TESTING: Crushing and sizing by producer

USED AT: M.I. Const., McDill AFB, Fla. (1951-2); M.I. Const., Pinecastle AFB, Fla., (1951-5); McDill AFB, Fla. (1959), Four Rivers Basin (1971)

GEOLOGICAL FORMATION AND AGE: Tampa Fm., Miocene Age

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	* comb. grad.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.			100		100
1½ IN.			76		88
1 IN.			18	100	59
¾ IN.			2	93	48
½ IN.			1	55	28
⅜ IN.				32	16
NO. 4				6	3
NO. 8					
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200[a]					
F.M.[b]					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR, SAT SURF DRY (CRD-C 107,108):			2.57	2.55	
ABSORPTION, PER CENT (CRD-C 107,108):			1.2	2.1	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)			12.38		
ABRASION LOSS (L. A.), %, (CRD-C 117): "A" grade			35.0		—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118)					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE _____ CEMENT, RATIO _____ DAYS, _____ %, _____ DAYS, _____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

** ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE
Limestone				2.8

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114): **

					F & T	HW-CD	HD-CW
FINE AGG.	84/1	COARSE AGG:	84/5	DFE_{300}	74		
FINE AGG.	84/2	COARSE AGG:	84/5	DFE_{300}	77		

PETROGRAPHIC DATA (CRD-C 127): Petrographic examination of the rock shows it to be a limestone. The limestone is white, fossiliferous, and fine-grained. The major mineral constituent is calcite with very minor amounts of quartz and kaolin.

In general, the rock is fresh, dense, moderately hard, and appears to be durable. Less than 1% of the sample is composed of chalcedonic chert.

REMARKS: * Grading as used in concrete mixes.
** Tests conducted in November 1948 for Canaveral Harbor Project

WES FORM 726 JAN. 1951

SOURCE NO. 94

FLORIDA ROCK INDUSTRIES, INC.

JACKSONVILLE, FL

Issued Sept 1963

STATE: Fla.	INDEX NO.: 2 (rev. #3)	AGGREGATE DATA SHEET	TESTED BY: SAD Laboratory
LAT.: 28	LONG.: 82		DATE: 27 May 1949
LAB. SYMBOL NO.: 8L/4			TYPE OF MATERIAL: Crushed limestone

LOCATION: 5 mi. North of Brooksville, Florida, Sec. 22, T21S, R19E, Hernando County

PRODUCER: Florida Rock Products Corporation, Brooksville, Florida
Commercial

SAMPLED BY: ---

TESTED FOR: Canaveral Harbor, Florida & MacDill AFB

PROCESSING BEFORE TESTING:

USED AT: M.I. Const., Mc Dill AFB, Mc Dill AFB, Fla. (1953-6); Patrick AFB, Fla. (1954-6); Imeson Airport, Fla. (1957); McCoy AFB, Fla. (1958); Mc Dill AFB, Fla. (1959), Imeson Airport (1962), C&S Fla. (1962)

GEOLOGICAL FORMATION AND AGE:

GRADING (CRD-C 103)(CUM. % PASSING):

SIEVE	3-6"	1½-3"	¾-1½"	#4-¾"	FINE AGG.
6 IN.					
5 IN.					
4 IN.					
3 IN.					
2½ IN.					
2 IN.					
1½ IN.					
1 IN.					
¾ IN.				100	
½ IN.				84	
⅜ IN.				52	
NO. 4				32	
NO. 8				8	
NO. 16					
NO. 30					
NO. 50					
NO. 100					
NO. 200					
- 200(a)					
F.M.(b)					

(a) CRD-C 105 (b) CRD-C 104

TEST RESULTS

	3-6"	1½-3"	¾-1½" (c)	#4-¾" (c)	FINE AGG.
BULK SP. GR., SAT SURF DRY (CRD-C 107,108):				2.48	
ABSORPTION, PER CENT (CRD-C 107,108):				2.5	
ORGANIC IMPURITIES, FIG. NO. (CRD-C 121):	—	—	—	—	
SOFT PARTICLES, PER CENT (CRD-C 130):					—
PER CENT LIGHTER THAN SP. GR. ____ (CRD-C 129):					—
PER CENT FLAT AND ELONGATED (CRD-C 119,120):					
WEIGHTED AV. % LOSS, 5 CYC. $MgSO_4$ ((c) ½-1", #4-½) (CRD-C 115)				10.89	
ABRASION LOSS (L. A.), %, (CRD-C 117):				36.2	—
UNIT WT., LB/CU FT (CRD-C 106):					
CLAY LUMPS, % (CRD-C 118):					
COAL AND LIGNITE, % (CRD-C 122):	—	—	—	—	
SPECIFIC HEAT, BTU/LB/DEG. F. (CRD-C 124):					
REACTIVITY WITH NaOH (CRD-C 128): Sc, mM/L:					
Rc, mM/L:					

MORTAR-MAKING PROPERTIES (CRD-C 116)

TYPE ____ CEMENT, RATIO ____ DAYS, ____ %, ____ DAYS, ____ %

LINEAR THERMAL EXPANSION X10 ⁶/DEG. F. (CRD-C 125,126):

ROCK TYPE	PARALLEL	ACROSS	ON	AVERAGE

MORTAR:

MORTAR-BAR EXPANSION AT 100F, % (CRD-C 123):

	FINE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.	COARSE AGGREGATE 3 MO.	6 MO.	9 MO.	12 MO.
LOW-ALK. CEMENT: % Na_2O EQUIVALENT:								
HIGH-ALK. CEMENT: % Na_2O EQUIVALENT:								

SOUNDNESS IN CONCRETE (CRD-C 40, 114):			F & T	HW-CD	HD-CW
FINE AGG. 8L/1	COARSE AGG: 8L/4	DFE_{300}	65		
FINE AGG. 8L/2	COARSE AGG: 8L/4	DFE_{300}	79		

PETROGRAPHIC DATA (CRD-C 127):

The sample consists of a white fairly hard, dense, fossiliferous, crystalline limestone. Most of the sample is well cemented by secondary calcite, however, there are a few areas which are soft and chalky. Iron oxide stains are present on portions of the sample. The material in general is strong and appears to be rather durable.

REMARKS:

WES FORM 726 JAN. 1951

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT D

PHOTOGRAPHS OF CONCRETE AGGREGATE SOURCES

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

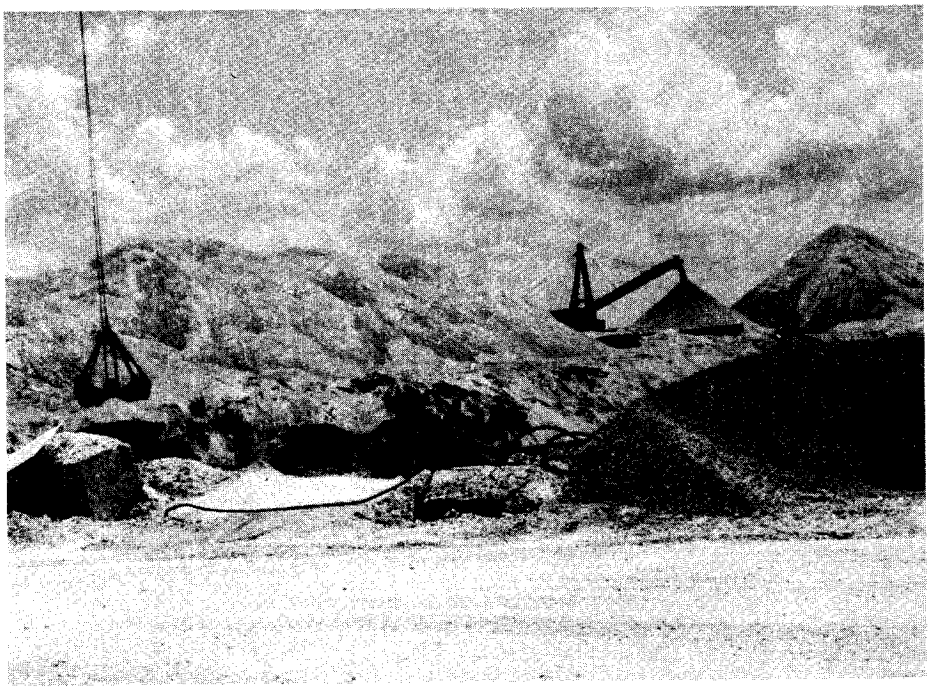
EXHIBIT D

PHOTOGRAPHS OF CONCRETE AGGREGATE SOURCES

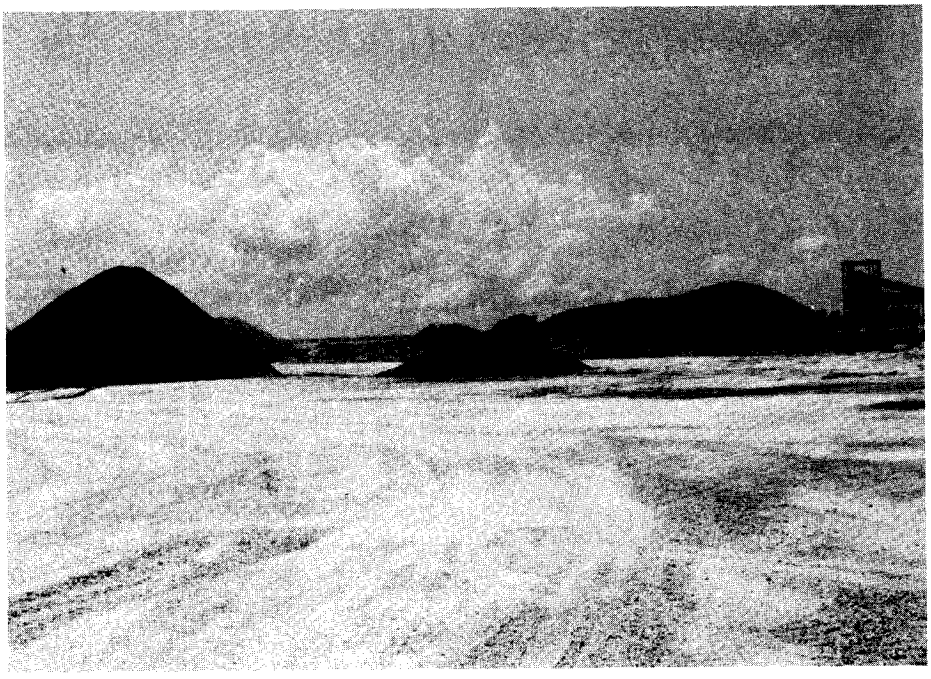
General Index

1. General. Photographs of the working faces and quarrying operations of a number of producers in the vicinity of the construction site of the Seabrook Lock Complex are presented in Exhibit D.

2. Table of Contents

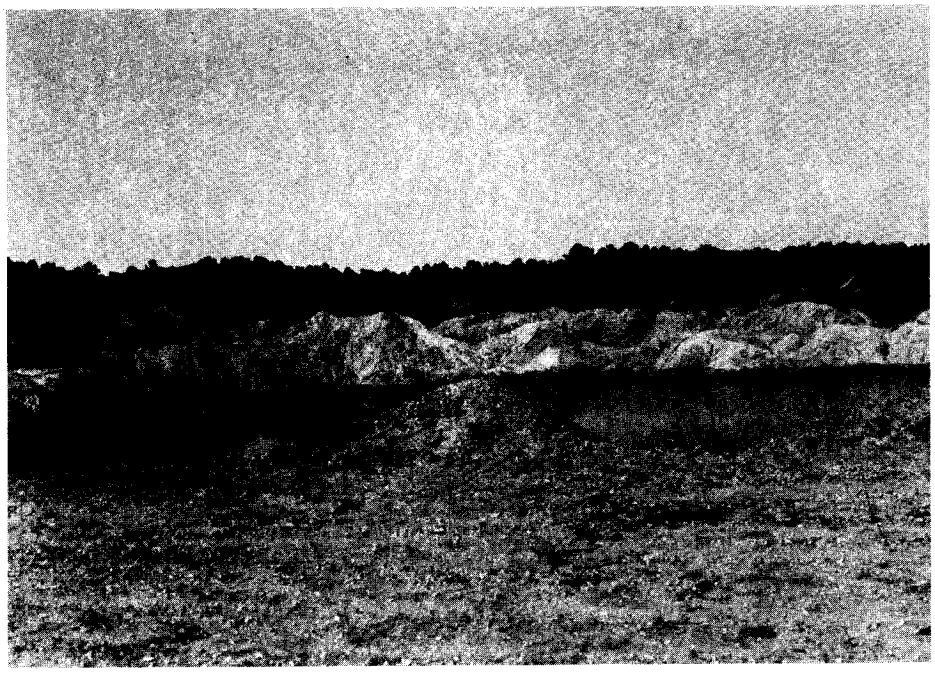


Dredging Operation



Concrete Aggregate Stockpiles

Source No. 1, Ratcliff Sand Co.
Mobile, AL

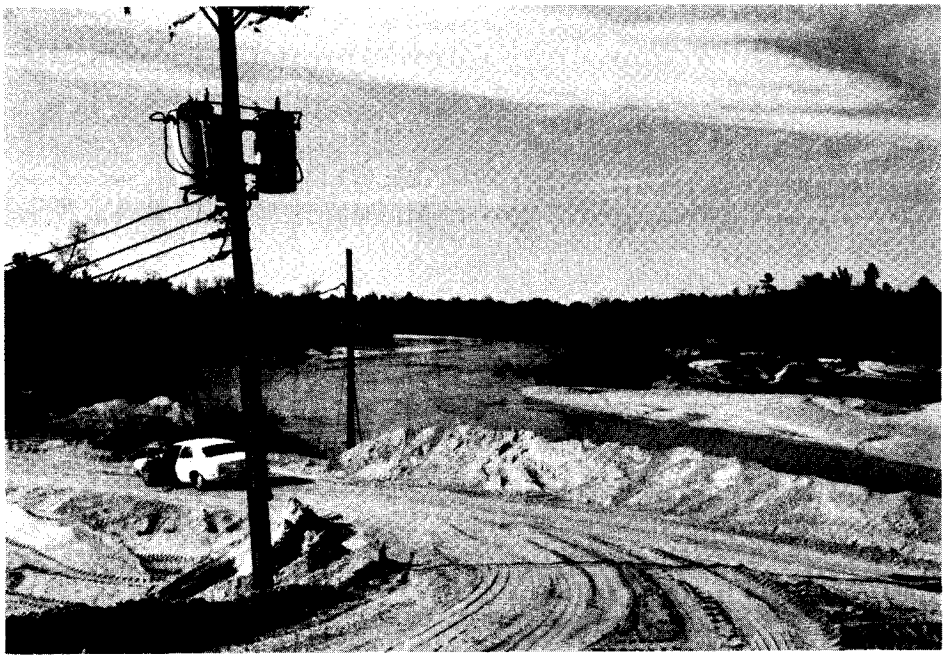


Strip Mining Operation

Close-Up of Working Face

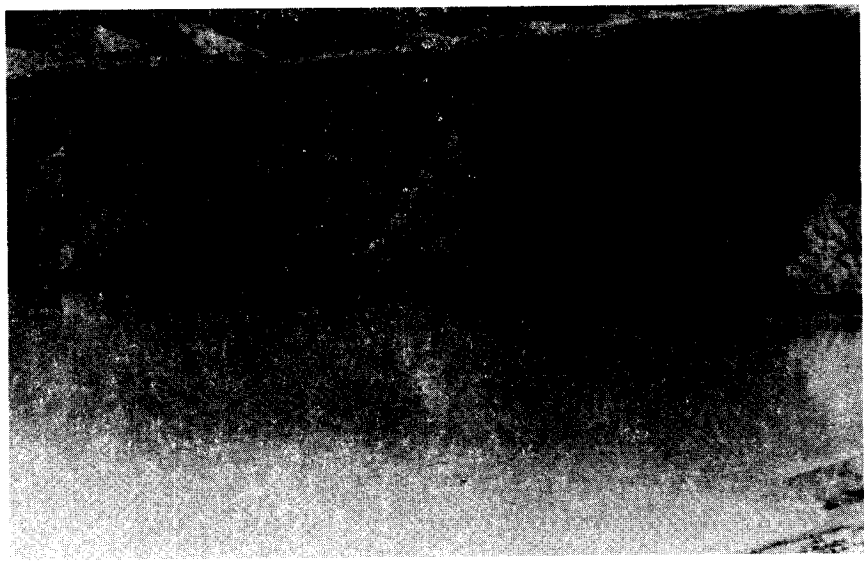
Source No. 18, Gifford-Hill, Inc.
Fluker, LA

Dredging Operation



Working Area

Source No. 20, Smith Sand and Gravel Co.
Mt. Herman, LA

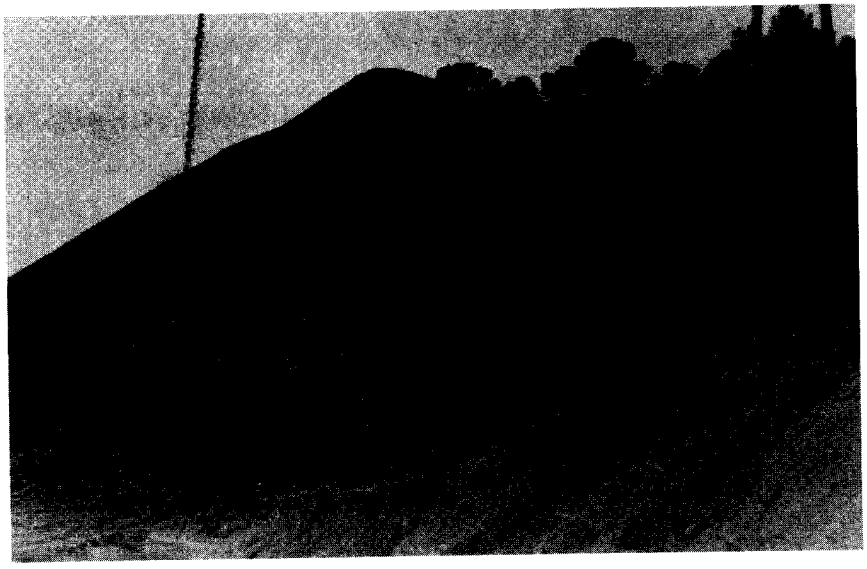


Dredging Operation

Coarse Aggregate Stockpile

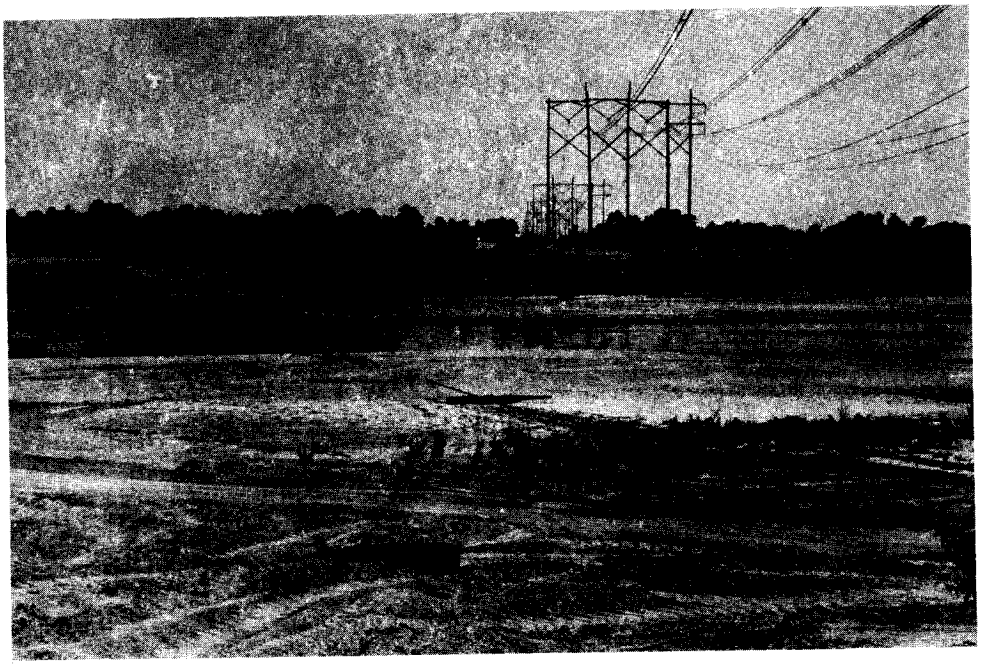
Source No. 22, B and B Gravel Co.
Bluff Creek, LA

Fine Aggregate Stockpile



Coarse Aggregate Stockpile

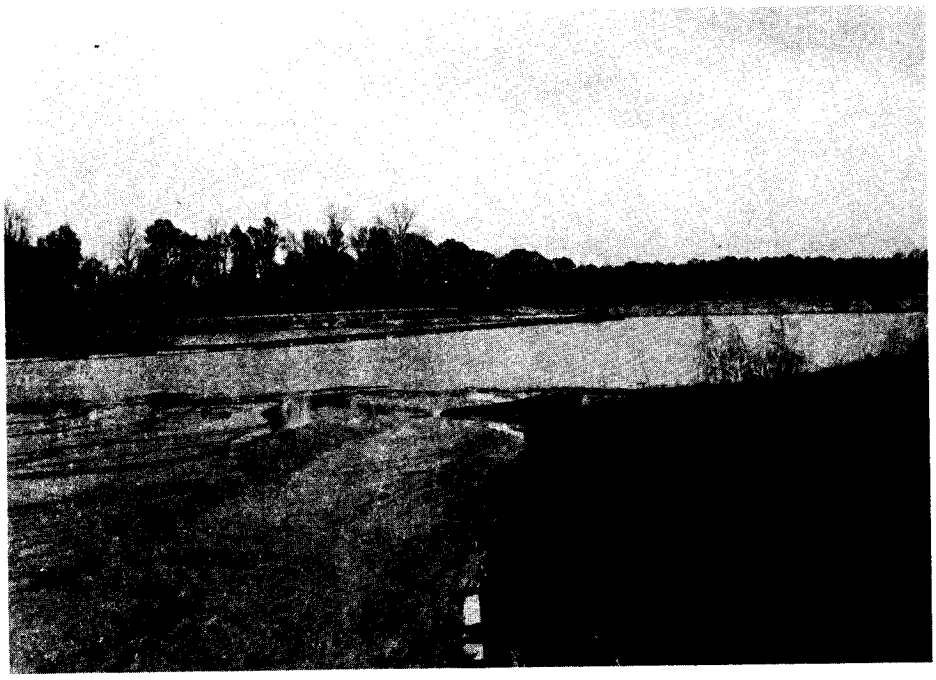
Source No. 23, Gifford-Hill, Inc.
Arcola, MS



Dredging Operation

Coarse Aggregate Stockpile

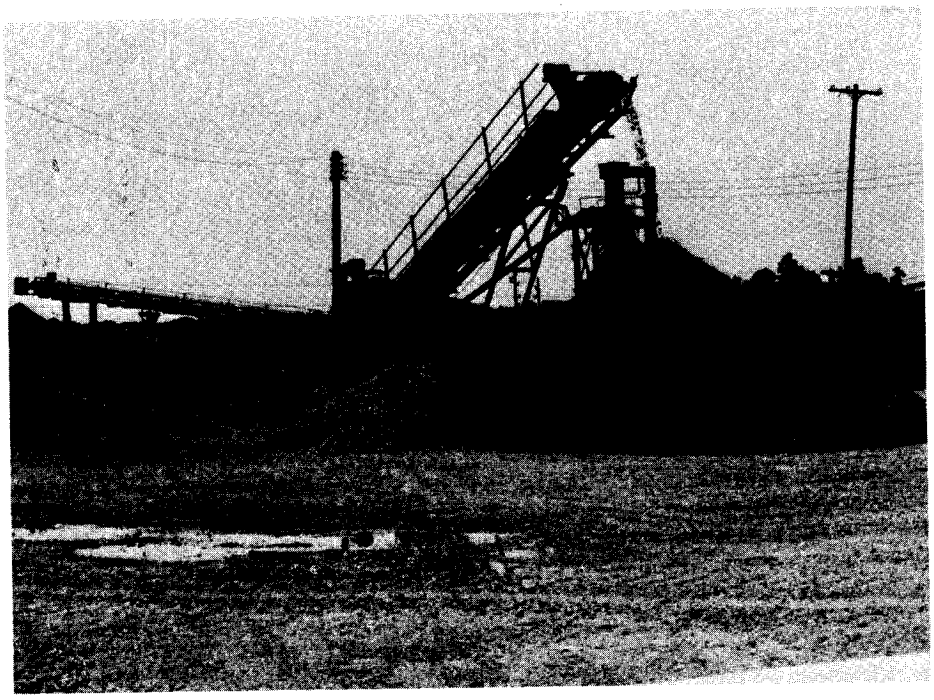
Source No. 25, Red Stick Gravel Co.
Baywood, LA



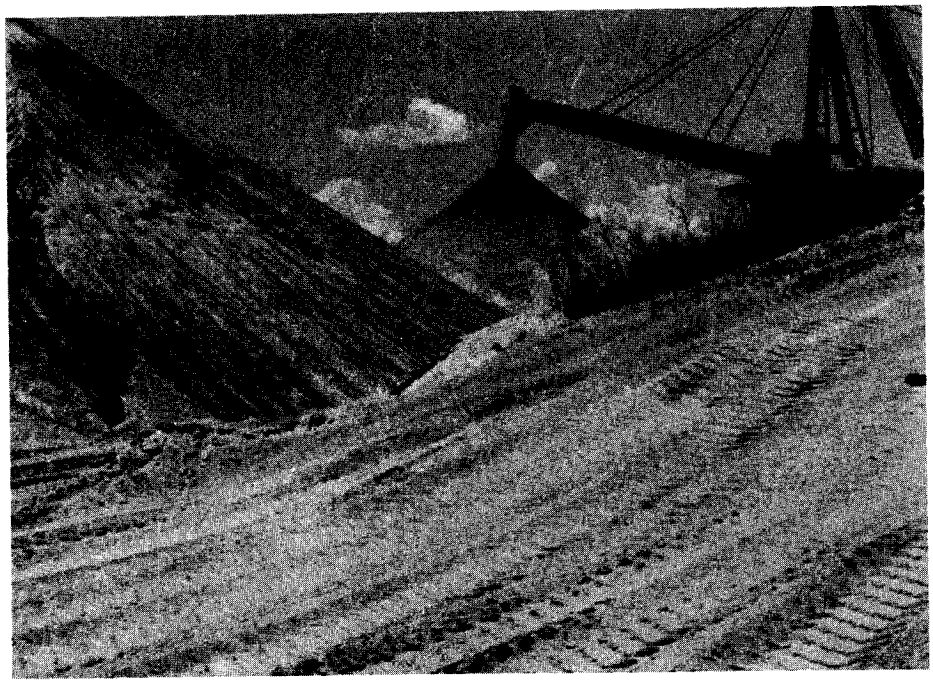
Dredging Operation

Stockpiles

Source No. 28, Lambert Sand and Gravel Co.
Baines, LA

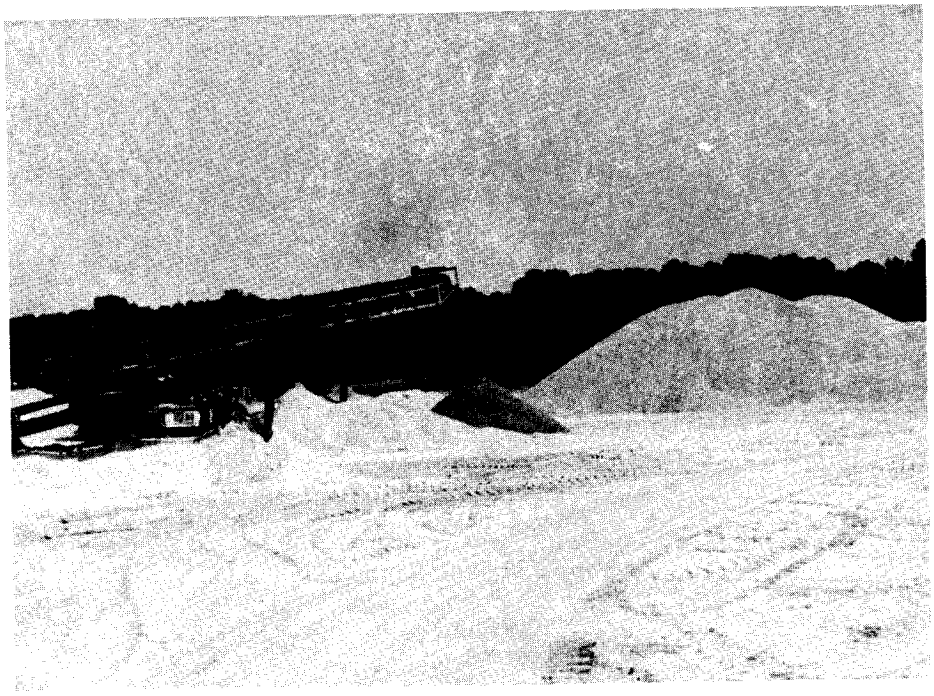


Pit Area



Concrete Aggregate Stockpiles

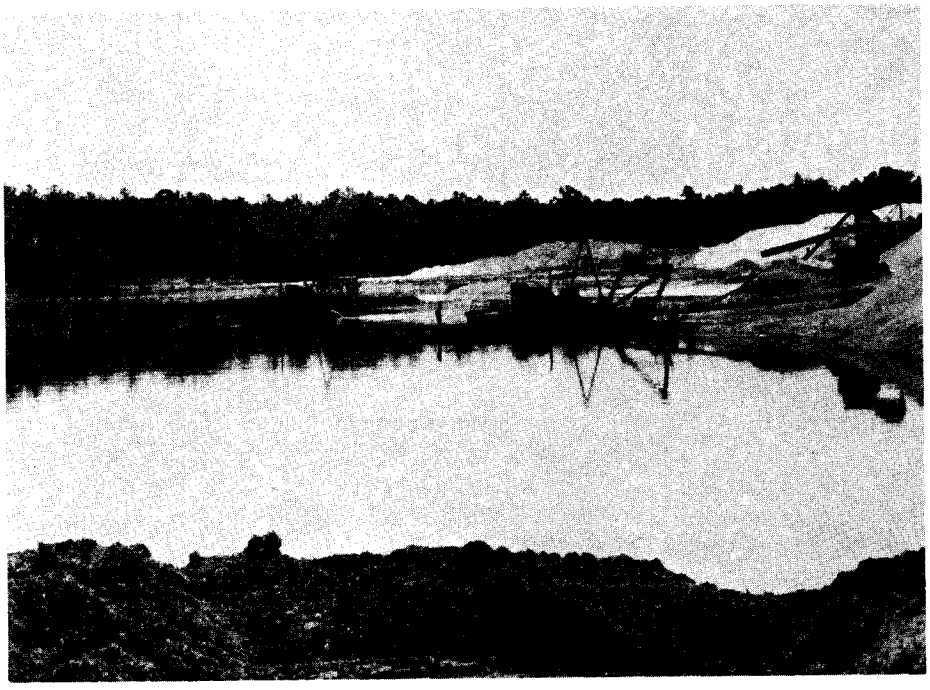
Source Nos. 43 and 45, American Sand and Gravel Co.
Hattiesburg, MS



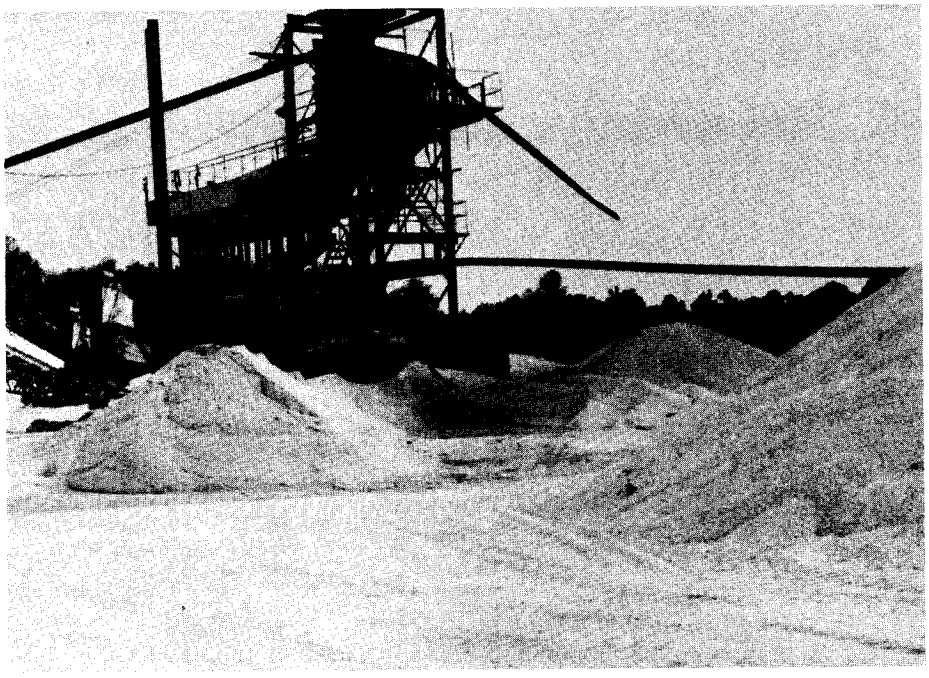
Pit Area

Concrete Aggregate Stockpiles

Source No. 47, Hammitt and Green Inc.
Columbia, MS

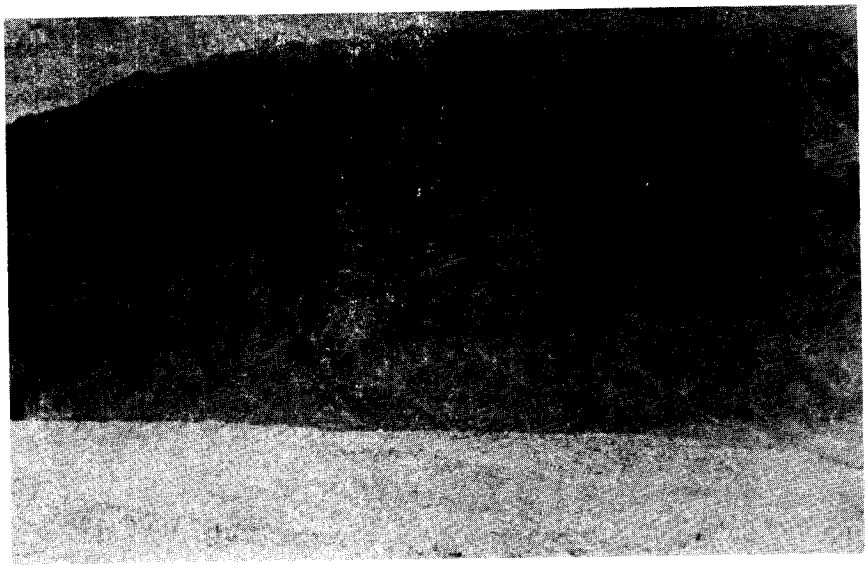


Dredging Operation



Concrete Aggregate Stockpiles

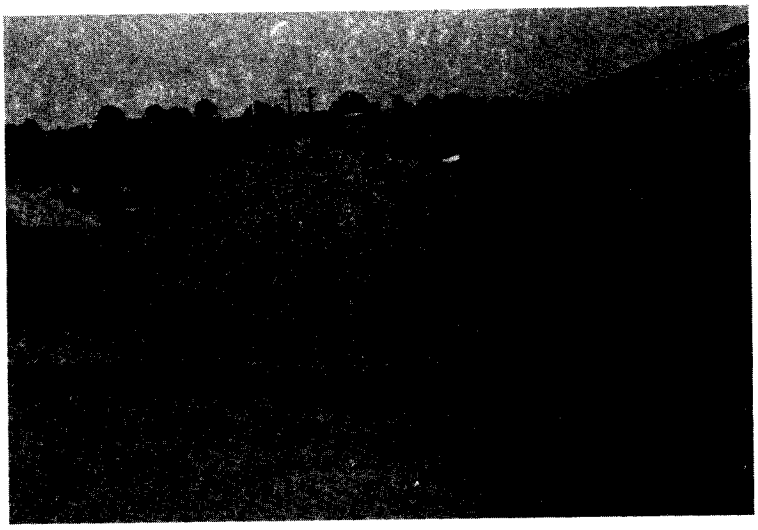
Source No. 49, Blain Sand and Gravel
Columbia, MS



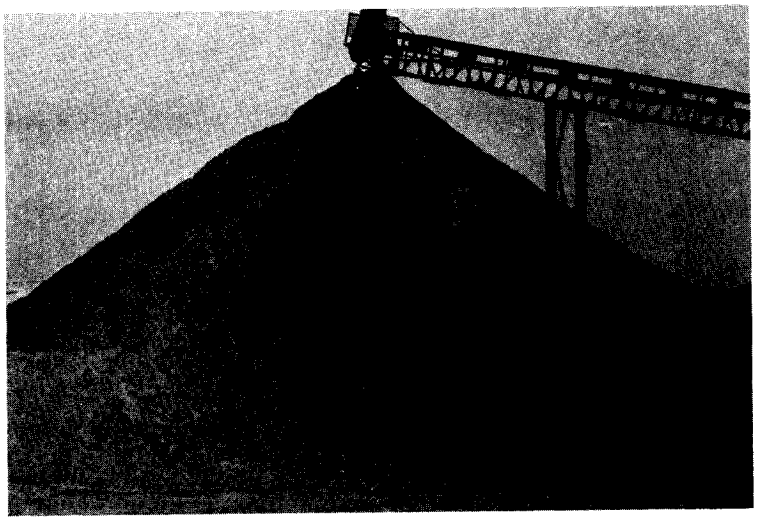
Pit Area

Concrete Aggregate Stockpile

Source No. 52, Green Brothers, Inc.
Brookhaven, MS

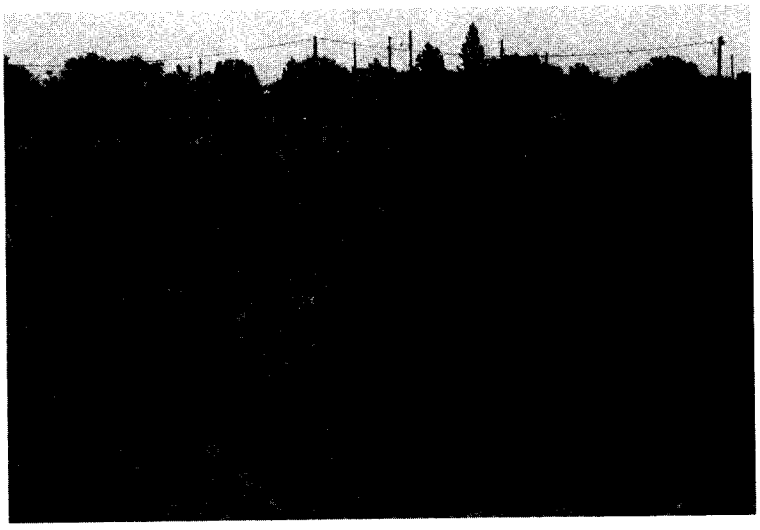


Coarse Aggregate

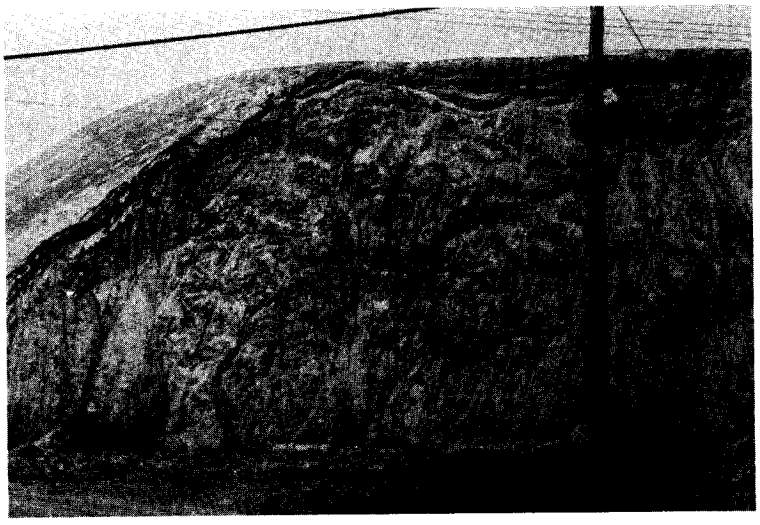


Fine Aggregate

Source No. 55, Green Brothers
Crystal Springs, MS

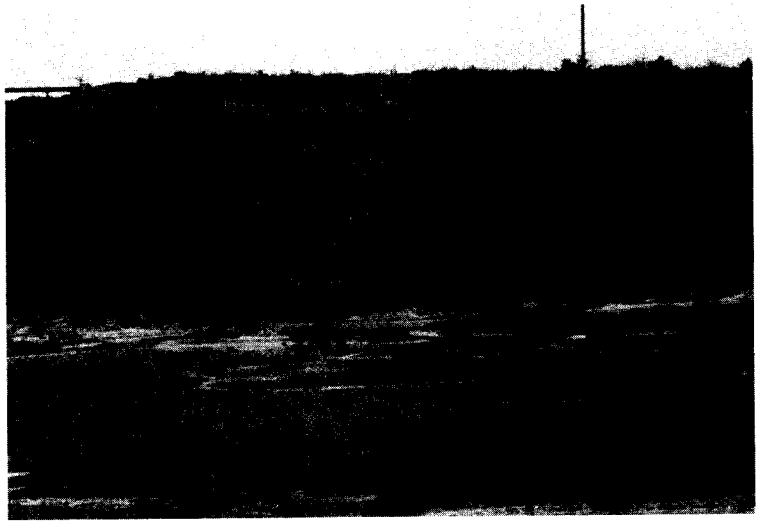


Working Face

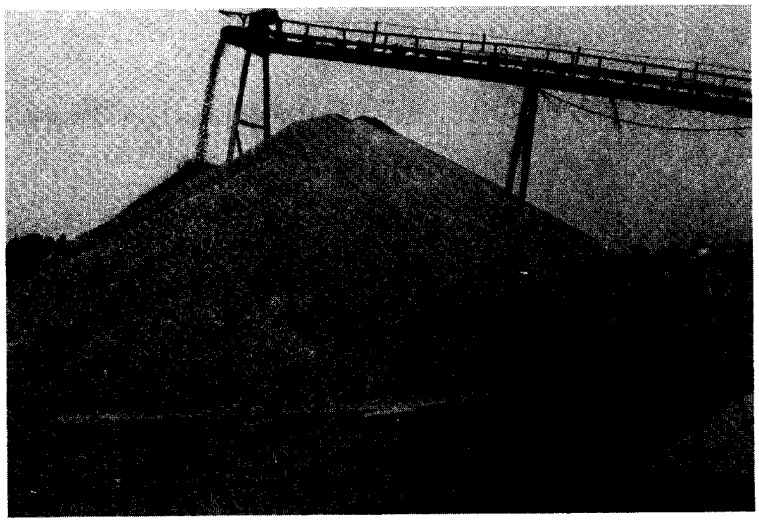


Aggregate Stockpile

Source No. 57, Traxler Sand and Gravel
Crystal Springs, MS

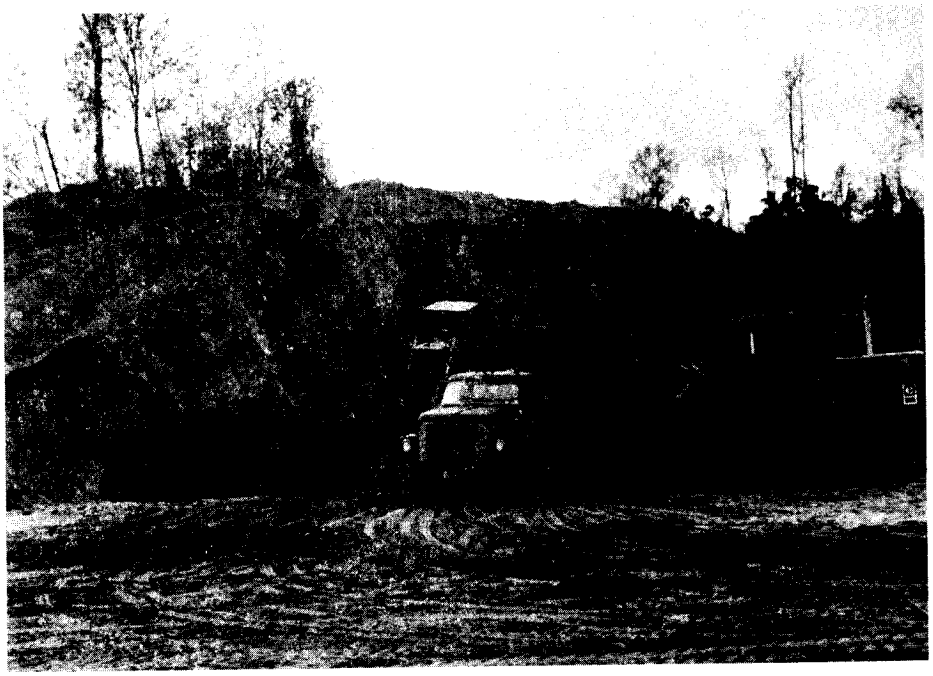


Working Face

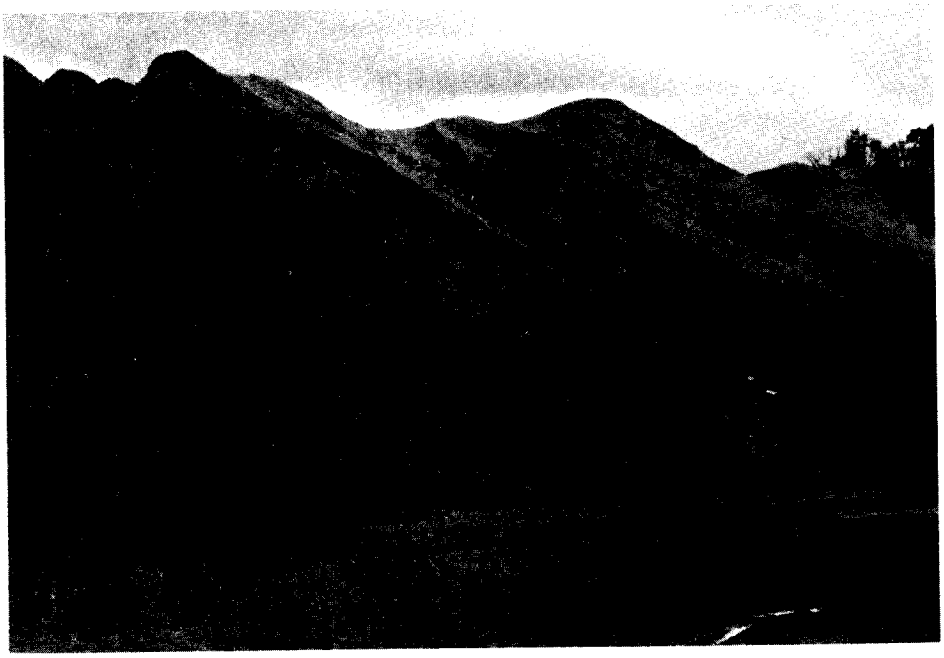


Aggregate Stockpile

Source Nos. 60 and 61, Blain Sand and Gravel
Crystal Springs, MS



Strip Mining Operation



Working Face

Source No. 66, St. Catherine Sand and Gravel Co.
Natchez, MS

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT E

PHOTOGRAPHS OF AGGREGATE SERVICE RECORDS

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT E

PHOTOGRAPHS OF AGGREGATE SERVICE RECORDS

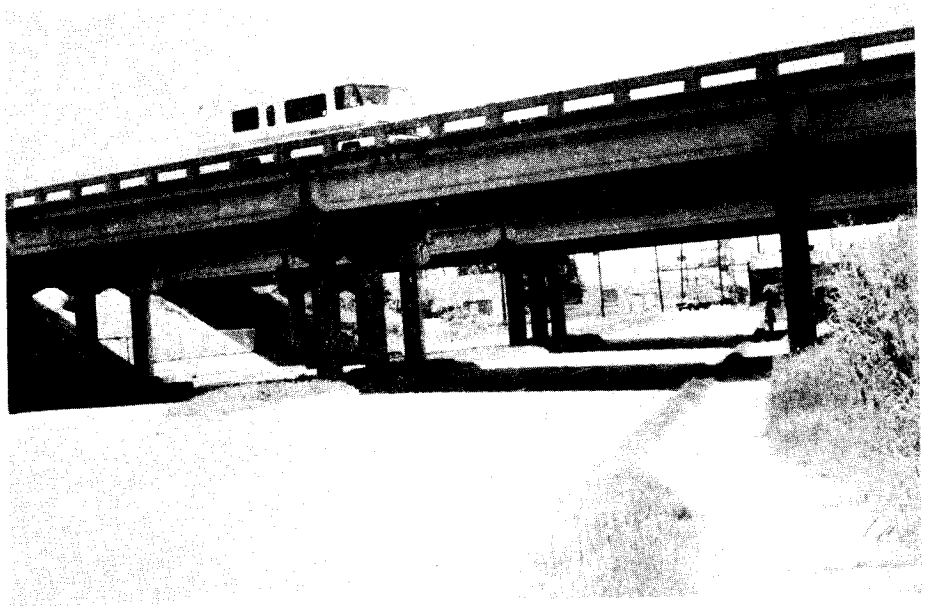
General Index

1. General. Photographs are presented of concrete structures containing aggregate from a number of the aggregate sources being considered as suppliers of concrete aggregates for use in the construction of the Seabrook Lock Complex.

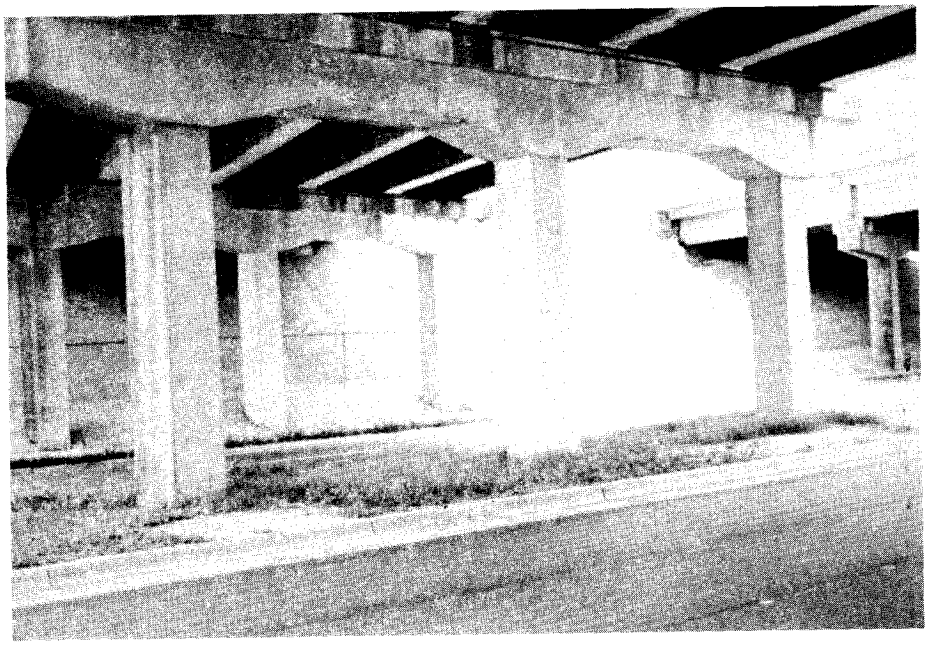
2. Table of Contents

SOURCE NOS. 1 AND 2

Ratcliff Sand Co. furnished the aggregate used in constructing the Virginia Street Overpass of Interstate 10, Mobile, AL. In service approximately 10 years, the aggregate shows no sign of deleterious reactions or chert popouts.



Service Record of Ratcliff Sand Co.

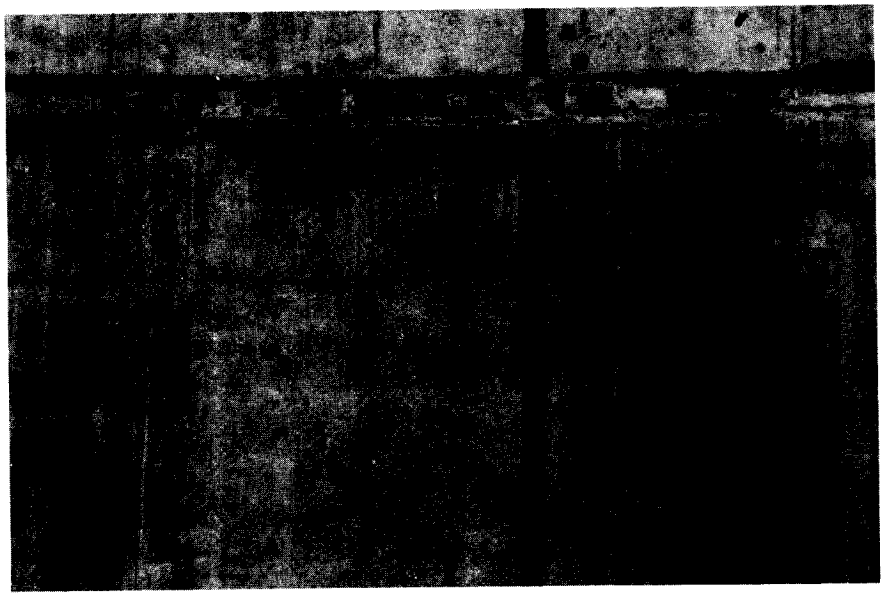


I-10 Virginia Street Overpass, Mobile, AL

SOURCE NO. 21

Louisiana Industries has furnished concrete aggregate to several large projects in southern Mississippi and Louisiana. These include the Nuclear Power Station at Grand Gulf, MS, now under construction.

Service Record of Louisiana Industries



Close-Up of the Reactor Wall
Grand Gulf Nuclear Power Plant

SOURCE NO. 23

Gifford-Hill, Inc. has furnished concrete aggregate used in the construction of I-55 near Manchac, LA. The roadway is still under construction at the present and thus for reveals no sign of deleterious reaction or chert popouts.

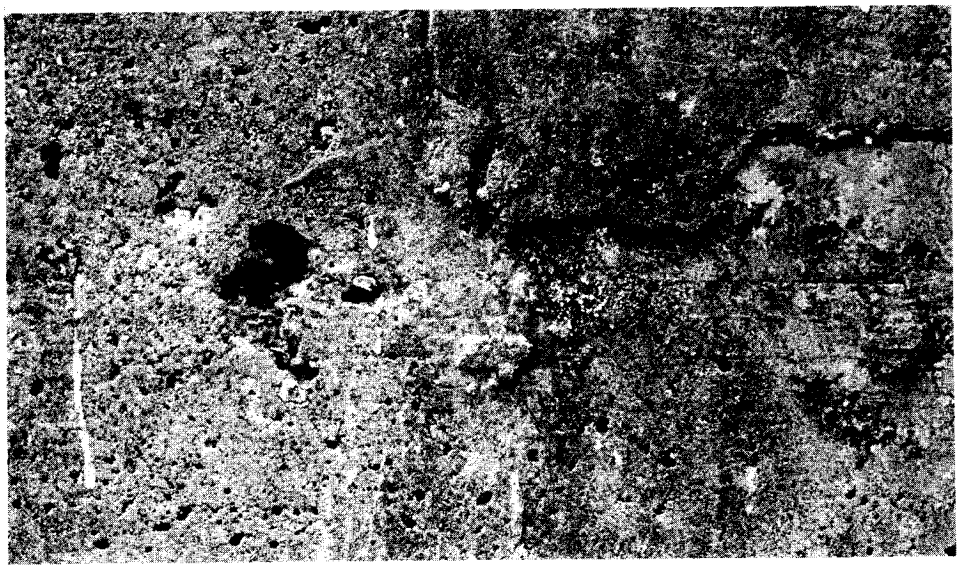
Service Record of Gifford-Hill, Inc.

I-55, Manchac, LA

SOURCE NO. 26

Red Stick Gravel Co. in Baywood, LA has furnished aggregate to various projects including portions of the Corps of Engineers' Morganza Control Structure. The concrete revealed weathered surfaces and worn surfaces due to the velocities of the water. The concrete appeared to be still in good condition.

Service Record of Red Stick Gravel Co., Baywood, LA



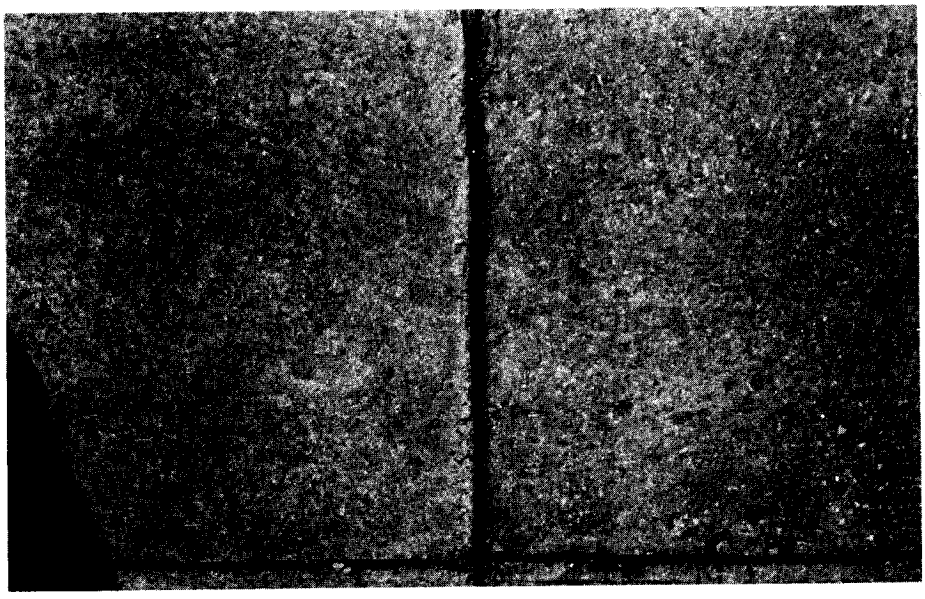
Close-Up of Concrete Wall

Morganza Control Structure, Morganza, LA

SOURCE NO. 28

Lambert Sand and Gravel Co. furnished the aggregate used in the construction of the Louisiana Highway 1 Bridge over the Atchafalaya River at Simmesport, LA. The aggregate shows no sign of deleterious reaction or other undesirable properties.

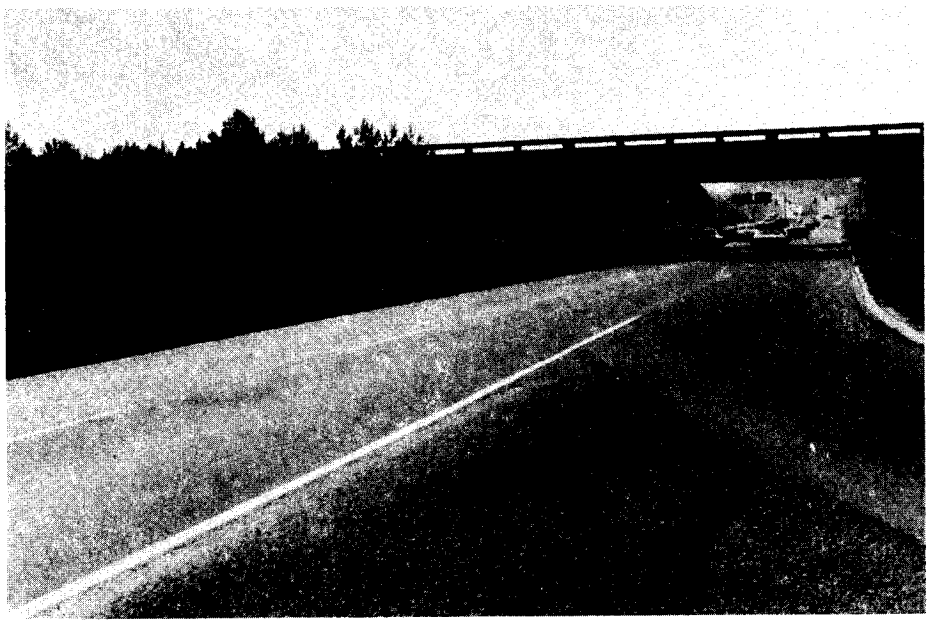
Service Record of Lambert Sand and Gravel Co.



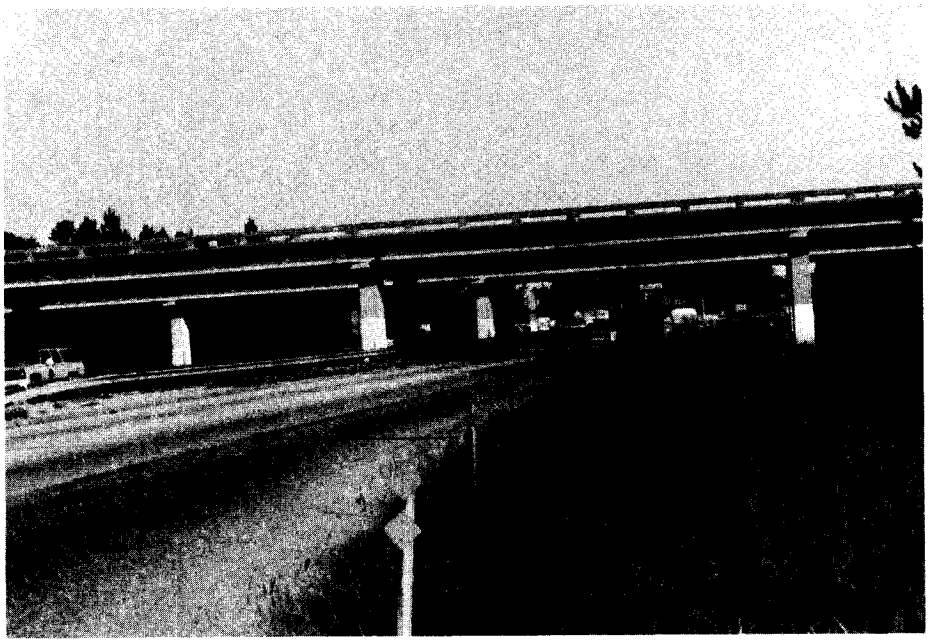
Close-Up of the Substructure
Atchafalaya River Bridge
Simmesport, LA

SOURCE NOS. 43 AND 45

American Sand and Gravel furnished the concrete aggregate used in the construction of the I-59 Overpass over Highway 49. In service approximately 15 years, the aggregate shows no sign of deleterious reaction or other undesirable properties.



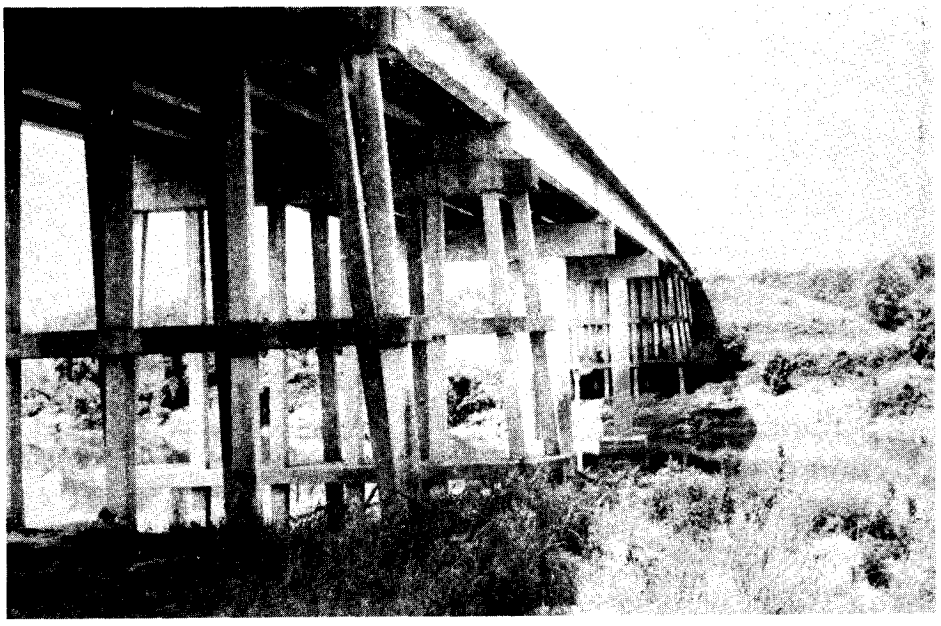
Service Record of American Sand and Gravel



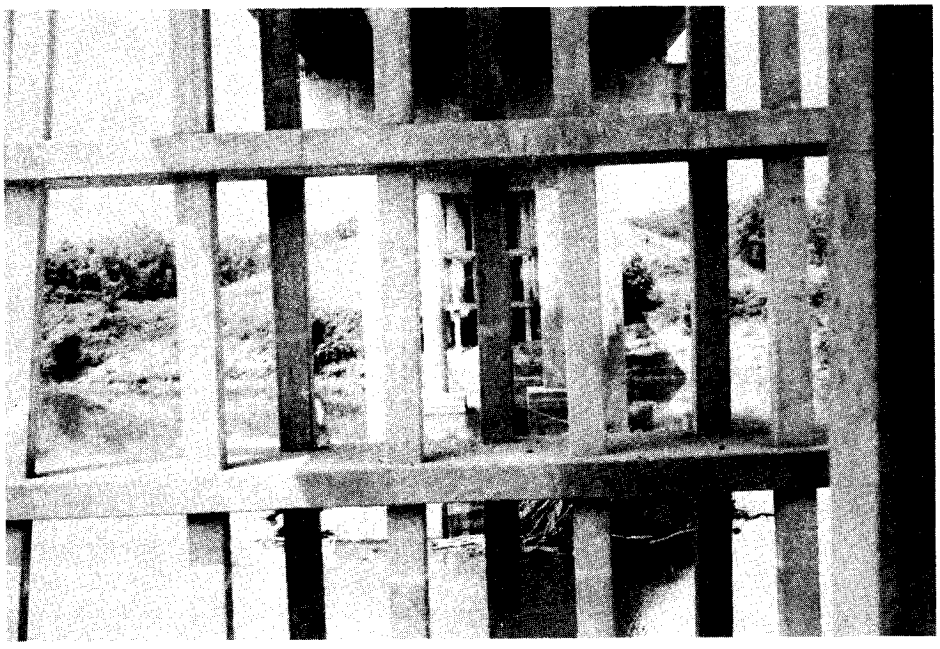
I-59, Highway 49 Overpass, Hattiesburg, MS

SOURCE NO. 47

Hammitt and Green, Inc., furnished the concrete aggregate used in the construction of the Highway 35 Bypass Bridge over the Pearl River. After approximately 8 years in service the aggregate shows no sign of deleterious reactions or other undesirable properties.



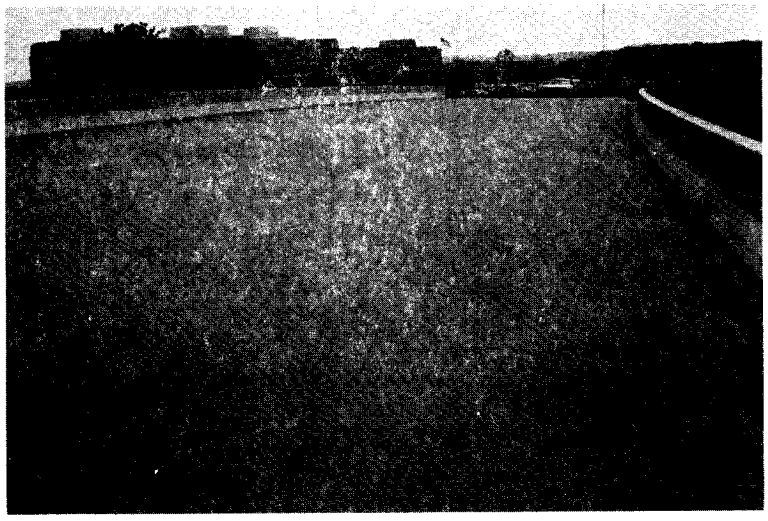
Service Record of Hammitt and Green, Inc.



Highway 35 Bridge Over Pearl River, Columbia, MS

SOURCE NO. 55

Green Brothers has provided concrete aggregate to the Mississippi State Highway Department in their construction of several bridges and highways in central Mississippi. The I-20 - I-220 Bridge was constructed in 1969 as a bypass north of Jackson, MS. To this date, it has not been open to public traffic and therefore shows no visible signs of wear on the pavements or on the guide walls. But what is significant is the number of porous chert popouts that occurred all along the surfaces of both pavements and walls, most of which possibly occurred during the winter of 1976-77.



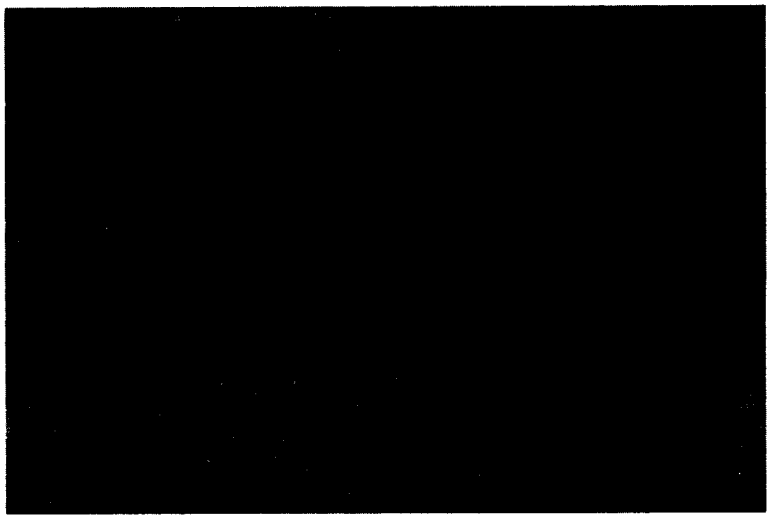
Service Record of Green Brothers

Close-Up of a Porous Chert Popout
I-20 - I-220 Bypass Bridge

SOURCE NOS. 60 AND 61

Blain Sand and Gravel has supplied concrete aggregate to many bridges of the Mississippi Highway Department in the Jackson, MS, area. Among these were the recently constructed I-220 Bypass and the four laneing of U. S. Highway 49 from Jackson to the Big Black River. The bridges on the new U. S. Highway 49 have not been open to the public and therefore show no wear or weathering.

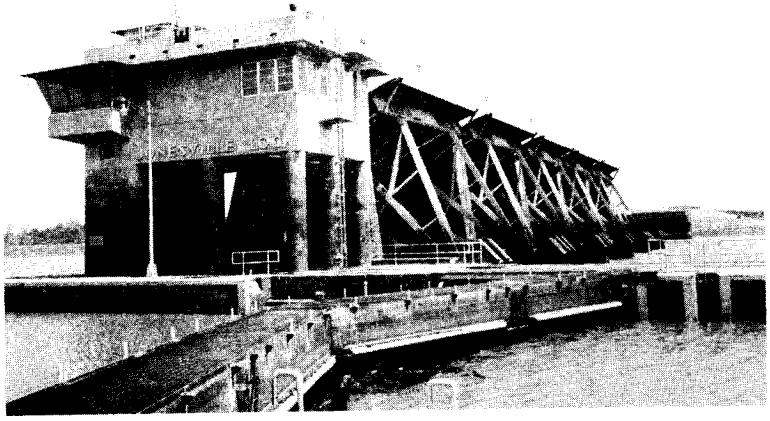
Service Record of Blain Sand and Gravel



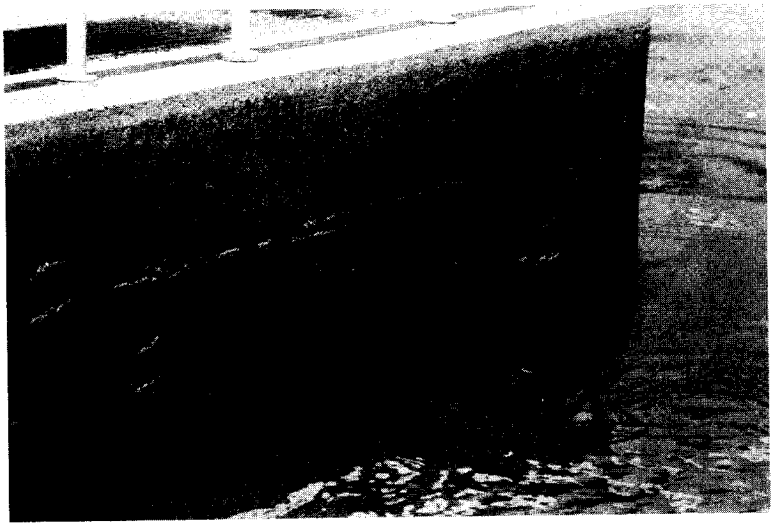
Close-Up of Substructure
U. S. Highway 49, North of Jackson, MS

SOURCE NO. 66

St. Catherine Gravel Co. has furnished concrete aggregate to several Corps of Engineers projects such as the Jonesville and Columbia Locks and Dams, and the Old River Lock. The concrete at the Jonesville Lock and Dam showed signs of weathering and of the effects of water velocities on the guide walls. There was some minor surface cracks but none due to the aggregate.



Service Record of St. Catherine Gravel Co., Natchez, MS



Interior Lock Guide Wall

Jonesville Lock and Dam, Vicksburg District

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT F

PHOTOGRAPHS OF STONE SOURCES

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT F

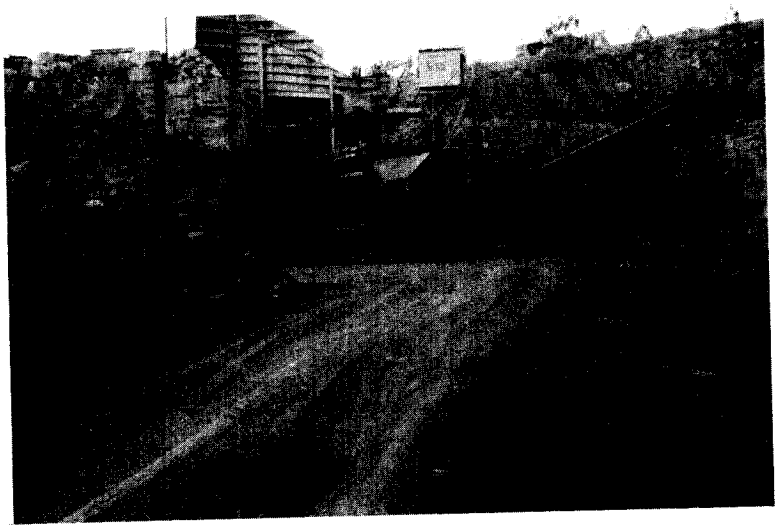
PHOTOGRAPHS OF STONE SOURCES

General Index

1. General. Photographs are presented of the working faces and quarrying operations of a number of the stone sources being considered as suppliers of large aggregate and riprap for use in the construction of the Seabrook Lock Complex.

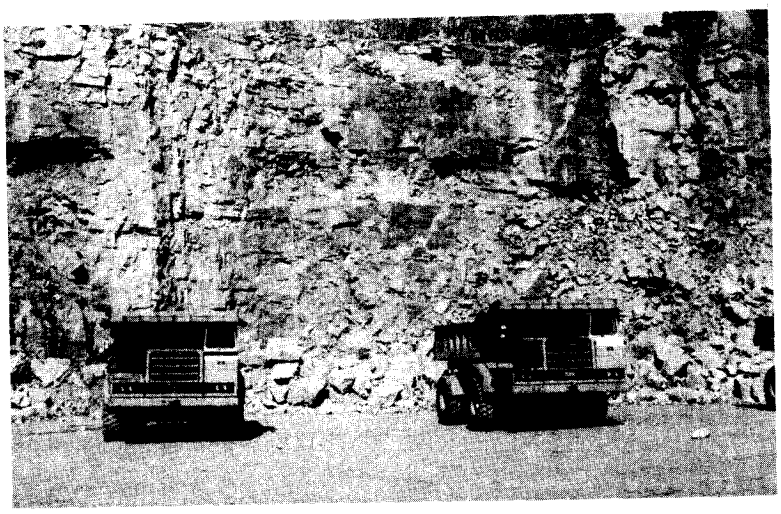
2. Table of Contents

Working Face

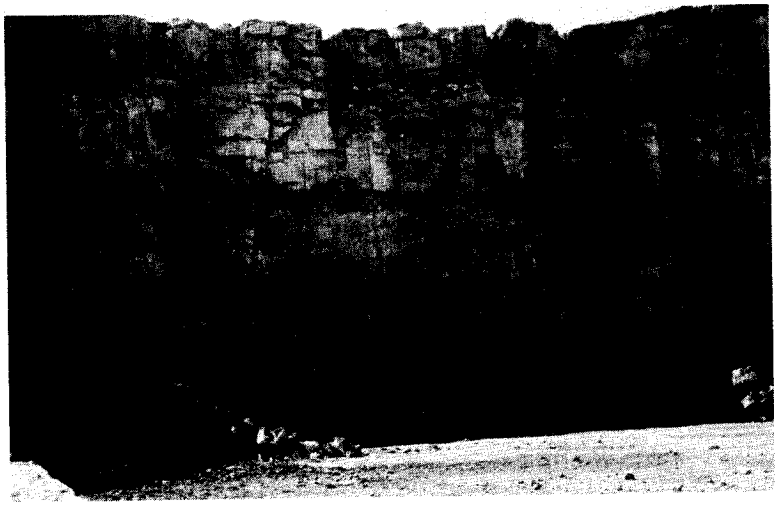


Screening Plant

Source No. 74, Three River Rock Co.
Smithland, KY

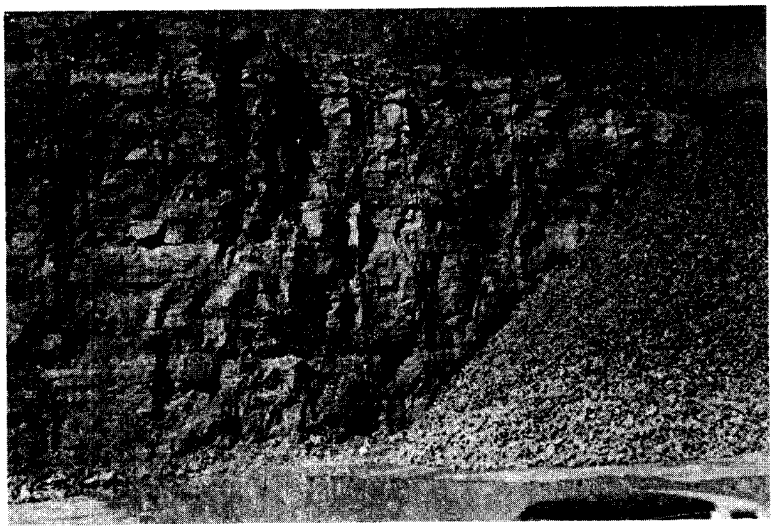


Working Face

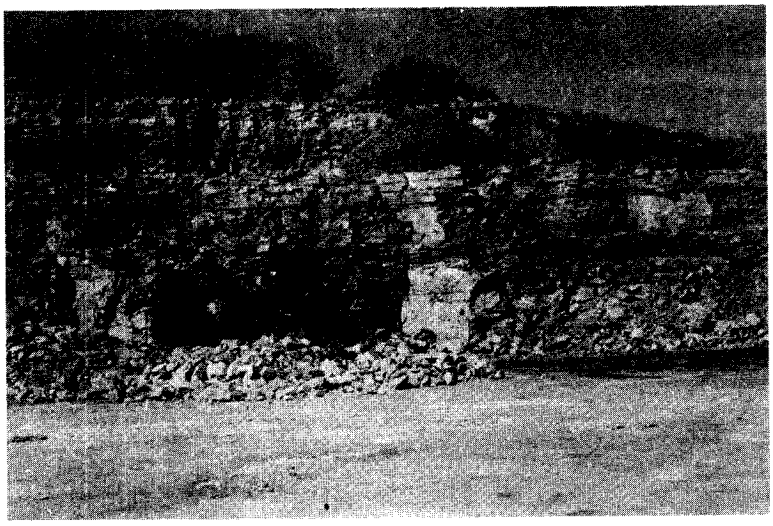


Working Face

Source No. 87, Southern River Rock Co.
Perryville, MO

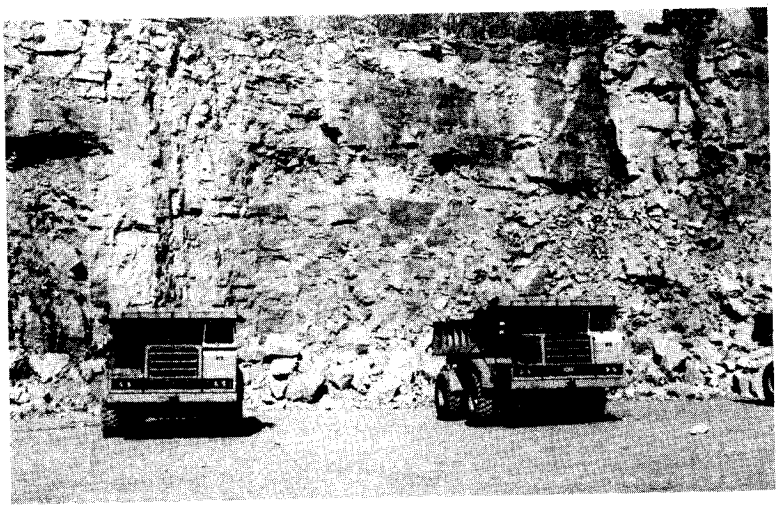


Working Face - Clipper Ledge

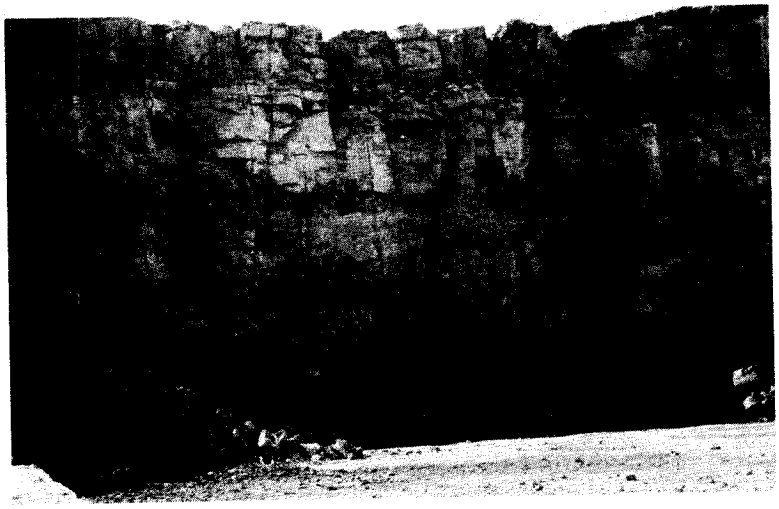


Working Faces - Three Ledges

Source No. 78, Bussen Quarries Inc.
Jefferson Barracks, MO



Working Face



Working Face

Source No. 87, Southern River Rock Co.
Perryville, MO

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT G

PHOTOGRAPHS OF STONE SERVICE RECORDS

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT G

PHOTOGRAPHS OF STONE SERVICE RECORDS

General Index

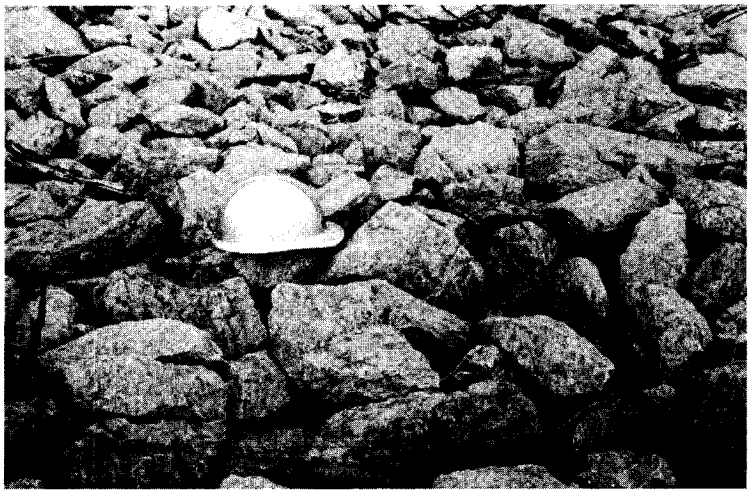
1. General. Photographs are presented of stone in service as riprap for riverbank stabilization for a number of the sources being considered as suppliers of large aggregate and riprap for use in the construction of the Seabrook Lock Complex.

2. Table of Contents

SOURCE NO. 74

Riprap from this source was used for bank protection at Kentucky Dam. The material has been in service for 10-15 years and very little damage from freezing and thawing is evident.

Service Record of Three Rivers Rock Company

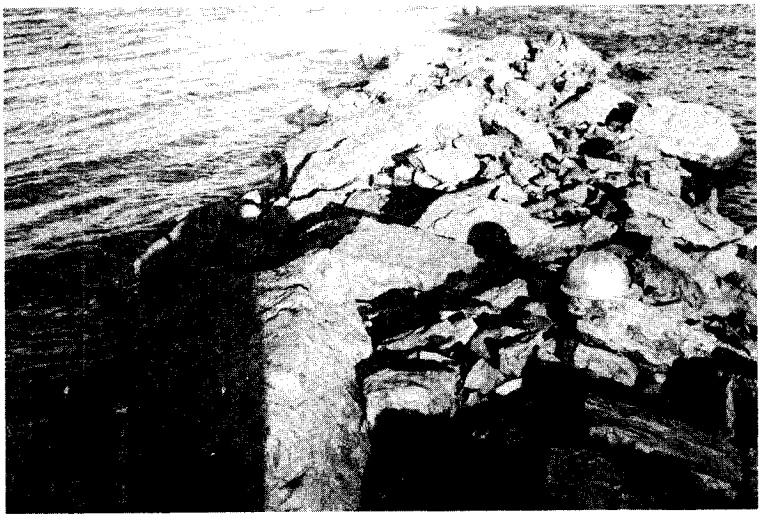


Close-Up of Bank Protection Stone

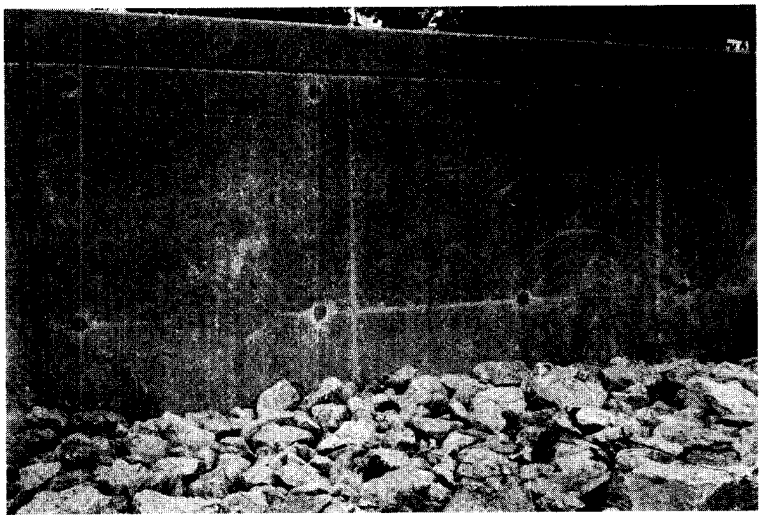
Kentucky Dam, KY

SOURCE NO. 75

Riprap from this source has been in service as shown below for 10-20 years. There is evidence of moderate freezing and thawing damage but the material is still providing adequate protection.



Service Record of Westlake Quarry
(Neely's Landing, MO)



In Service Aggregate and Riprap Stone
Miss. River Dike and Floodwall

SOURCE NO. 78

Riprap from this source has been in service on the west of the Mississippi River near Cliff Cave, MO, for approximately 20 years. There is some damage from freezing and thawing evident but the material is still affording adequate erosion protection.

Service Record of Bussen Quarries

Miss. River Slope Protection, West Bank
Cliff Cave, MO

SOURCE NO. 87

Riprap from this source has been utilized for bank protection in the Mississippi River near Chester, IL, for approximately 20 years. Only minimal damage from freezing and thawing is evident.

Service Record of Southern River Rock Co.
Perryville, MO

Close-Up of Riprap Stone

Dikes - Mississippi River Bank Protection
Chester, IL

LAKE PONTCHARTRAIN, LA, AND VICINITY

AND MISSISSIPPI RIVER - GULF OUTLET, LA

SEABROOK LOCK

EXHIBIT H

CONSTRUCTION PLANT INVESTIGATION

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI

FOR

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

EXHIBIT H

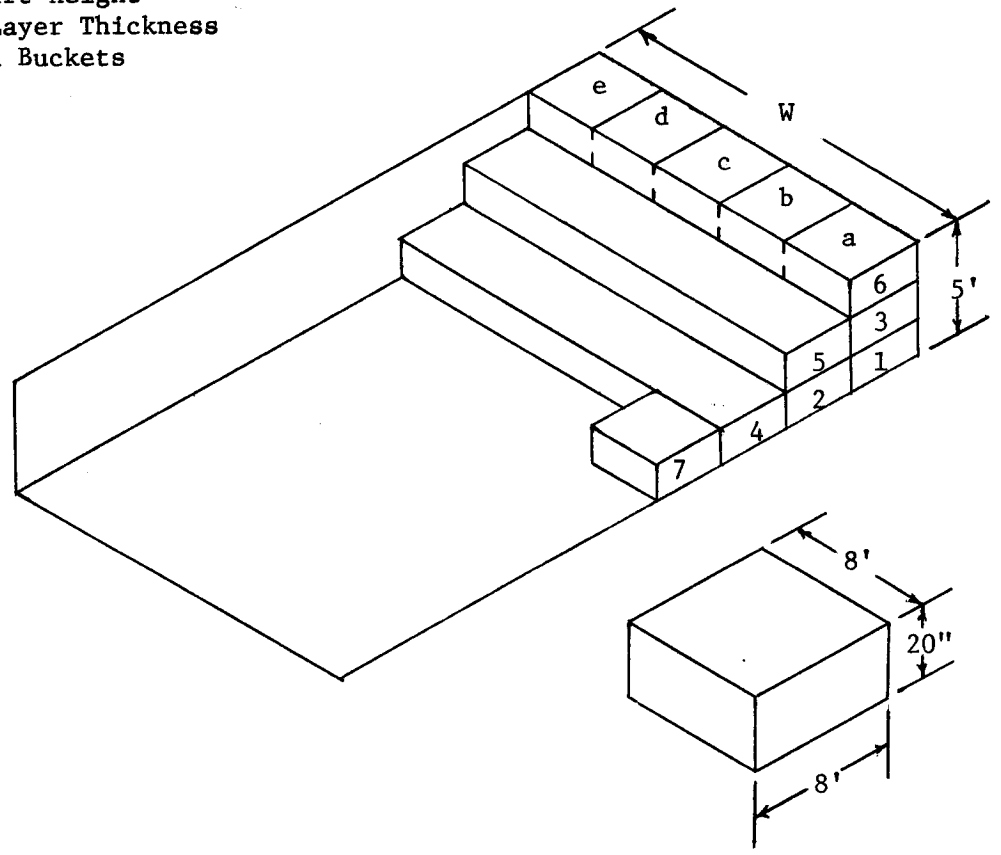
CONSTRUCTION PLANT INVESTIGATION

General Index

General. Production requirement for the concrete is determined by the size of the largest block taking into consideration the criteria that no uncooled concrete is to be left uncovered for more than 1 hr. The largest block(s) requiring continuous placement are located in the lock gate bay slabs. However, the concrete placed in this portion of structure represents 15 percent of the total concrete volume in the project. The concrete placed in the lock walls represents approximately 40 percent of the total estimated concrete in the project. Therefore, the plant capacity, based on the largest block size (approximately 54- by 48- by 12-ft) in the lock chamber walls, should be 96 cu yd/hr. The lift height for the uncooled concrete shall be 5 ft.

STEPPED PLACEMENT SEQUENCE

5-ft Lift Height
20-in. Layer Thickness
4-cu yd Buckets



Consolidated 4-cu yd pile

PLANT CAPACITY

Lift Height - 5 ft
Layer Thickness - 20 in.

Bucket Size - 4 cu yd

Width of Placement, ft	Required Plant Capacity, cu yd/hr	
	Cooled Concrete	Uncooled Concrete
8	8	16
16	16	32
24	24	48
32	32	64
40	40	80
48	48	96
56	56	112
64	64	128
72	72	144
80	80	160
88	88	176