Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

J. E. MYERS
MANAGER
W. H. CAMPEN
J. R. SMITH
J. J. REMAR
ASSOCIATES
LICENSED PROFESSIONAL ENGINEERS

REPORT OF TEST

MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

Test Made for: Lock Joint Pipe Co.
P.O. Box 137
Colwich , Kansas

Date: 23 April 1956

Lab. Number: 904228
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector Date Received At Lab.: 4-17-56 Time: 11:30 A.M.

Material Tested:

SUBJECT: CHANGE IN MIX

No. of Samples:
Sample Designations:

RESULTS OF TEST

Effective 16 April 1956 the Mix for All pouring operations at the Lock Joint Colwich Plant will be as follows:

FORMERLY 55% Rock 45% Sand

	One (1) Yard Batch	Two (2) Yard Batch	Three (3) Yard Batch
Cement	686	1372	2058
Rock	1661	3324	5480
Sand	1385	2771	3660
Water	29 Gal	58 Gal.	87 Gal

EFFECTIVE 4-16-56 60% Rock 40% Sand

Cement	680	1370	2060
Rock	1830	5030	5480
Sand	1220	2440	3660
Water	29 Gal	58 Gal	87 Gal

The above mixes were based on a 3% F.M. in Sand and 1% F.M. in Rock. The 60% Rock, 40% Sand mix was calculated by Mr. J.P. Makowski of Lock Joint, has been approved by Mr. J.J. Knoll of Black & Veatch, Cons. Engrs., and has been accepted by this Laboratory.

CC: 2-Lock Joint @ Colwich
2-Weller
1-Knoll

Reference:

WICHITA CHEMICAL & TESTING LABORATORIES

File: 1

By: R. L. PHILLIPS

FORM 501

Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
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REPORT OF TEST

MEMBERS OF:
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AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

Test Made for: Lock Joint Pipe Co.
P.O. Box 127
Colwich, Kansas

Date: March 27, 1956

Lab. Number: 903330-D
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector **Date Received At Lab.:** 3/21/56 **Time:** 3:00 PM

Material Tested: HARDENED CONCRETE
66" Water Transmission Lines
Project 2155
Black & Veatch, Consu. Engrs.

No. of Samples: As Shown
Sample Designations:
Samples taken from Outside Coating of Pipe
Serial No. 6213. Age of Pipe Coating 12 Days

RESULTS OF TEST

Specimen No.	Specific Grav.	Density lb./cu.ft.	Absorption	% Moisture Content (As Rec'd.)
D-1	2.12	132.2	10.02%	9.08
D-2	2.17	135.5	8.73%	7.77
D-3	2.182	136.3	7.77%	6.85
D-4	2.182	136.3	8.02%	7.06
D-5	2.162	135.0	8.54%	7.29
Averages:	2.165	135.0	8.62%	7.60%

MOISTURE ABSORPTION RATIO 88.2%

CC: 2 Lock Joint N Colwich
2 Weller
1 Knoll
1 Hess

Reference:

File: 1

FORM 501

WICHITA CHEMICAL & TESTING LABORATORIES

By:

Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
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AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for:
Lock Joint Pipe Co.
P.O. Box 137
Colwich, Kansas

Date: March 21, 1956

Lab. Number: 903267
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector **Date Received At Lab.:** 3/20/56 **Time:** 9:00 AM

Material Tested: HARDENED CONCRETE
66" Water Transmission Lines
Project 2155
Black & Veatch, Cons. Engrs.

No. of Samples: As Given

Sample Designations:
Core Specimens from Inside Core of pipe Serial No. 6151. This core was discarded because of numerous cracks and the steel cylinder was stripped and repoured.

RESULTS OF TEST

AGE OF HARDENED CONCRETE SPECIMENS, 91 DAY, APPROX.

Specimen No.	Specific Gravity	Density lb./cu.ft.	Absorption %	Averages
I-1	2.190	136.7	8.20	Average Specific Gravity 2.224
I-2	2.220	138.5	7.06	
I-3	2.298	143.4	5.48	
I-4	2.180	136.0	6.02	Average Density lb./cu.ft. 138.8
I-5	2.200	137.2	7.10	
I-6	2.250	140.5	5.24	Average Absorption 6.609%
I-7	2.252	140.6	5.65	
I-8	2.218	138.4	7.16	
I-9	2.208	137.8	7.55	

CC: 2 Lock Joint @ Colwich
2 Keller
1 Knoll
1 Hess

Reference:

File:

FORM 501

WICHITA CHEMICAL & TESTING LABORATORIES

By: R. L. Phillips

JAMES E. MYERS LICENSED 1162 ENGINEER KANSAS

Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
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AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for:
Lock Joint Pipe Co.
P.O. Box 137
Colwich, Kansas

Date: March 21, 1956

Lab. Number: 903267-B
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector Date Received At Lab.: 3/20/56 Time: 9:00 AM

Material Tested: HARDENED CONCRETE
66" Water Transmission Lines
Project 2155
Black & Veatch, Cons. Engrs.

No. of Samples: As Shown
Sample Designations:
Sample Specimens taken from outside coating of pipe No. 5057, which was dropped and damaged beyond repair. A new pipe was poured with this serial number.

RESULTS OF TEST

AGE OF HARDENED CONCRETE SPECIMENS: 63 DAYS APPROX.

Specimen No.	Specific Gravity	Density lb./cu.ft.	Absorption %	Averages
C-1	2.202	137.6	7.97	Average Specific Gravity 2.170
C-2	2.170	135.5	8.27	
C-3	2.170	135.5	8.38	
C-4	2.190	136.5	8.22	Average Density lb./cu.ft. 135.4
C-5	2.162	135.0	8.58	
C-6	2.162	135.0	8.08	
C-7	2.132	133.0	9.24	Average Absorption 8.39%
C-8	2.168	135.2	8.53	
C-9	2.180	136.0	8.36	
C-10	2.161	134.7	8.29	

CC: 2 Lock Joint - Colwich
2 Keller
1 Knoll
1 Case

Reference:

WICHITA CHEMICAL & TESTING LABORATORIES

File: 1

By: R.L.Phillips

FORM 501

Wichita CHEMICAL AND TESTING Laboratories

ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

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MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for:

Lock Joint Pipe Co.
P.O. Box 137
Colwich, Kansas

Date: March 21, 1956

Lab. Number: 90364-C
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector Date Received At Lab.: 3/20/56 Time: 9:00 AM

Material Tested: HARDENED CONCRETE
66" Water Transmission Lines
Project 2155
Black & Veatch, Cons. Engrs.

No. of Samples: As Shown

Sample Designations:
Core specimens from outside core of pipe serial No. 6151. This core was discarded because of numerous cracks and the steel cylinder stripped and recoured.

RESULTS OF TEST

AGE OF HARDENED CONCRETE, APPROX. 21 DAYS

Specimens No.	Specific Gravity	Density lb./cu.ft.	Absorption %	Averages
C-1	2.219	138.3	7.81	Average Specific Gravity 2.222
C-2	2.228	139.0	7.47	
C-3	2.218	138.4	7.08	
C-4	2.213	138.2	7.79	Average Density 138.6 lb./cu.ft.
C-5	2.222	138.7	7.67	
C-6	2.222	138.7	7.67	Average Absorption 7.48%
C-7	2.212	138.1	7.89	
C-8	2.222	138.7	7.43	
C-9*	2.235	139.5	7.04	
C-10*	2.249	140.3	6.39	
C-11*	2.210	137.9	7.94	
C-12*	2.218	138.4	7.60	

* Specimens marked this were [illegible] largest crack .050 wide.

CC: 2 Lock Joint @ Colwich
2 Weller
1 Knoll
1 Engr.

Reference:

WICHITA CHEMICAL & TESTING LABORATORIES

File: 1

By: R. Phillips

JAMES E. MYERS LICENSED 1162 ENGINEER KANSAS

FORM 501

LOCK JOINT PIPE COMPANY

ESTABLISHED 1905

GENERAL OFFICES: P.O. BOX 269, EAST ORANGE, N. J., TEL. ORANGE 5-8900

REINFORCED CONCRETE PIPE

PRESSURE, WATER, SEWER, CULVERT AND SUBAQUEOUS

P. O. Box 137
Colwich, Kansas

March 3, 1956

Black and Veatch Co., Engineers
Attention: Mr. John Knoll, Resident Engineer
1617 Briggs
Wichita, Kansas

Dear John:

Several weeks ago, a request was made of the Wichita Chemical and Testing Laboratories to substantiate a change in the concrete formula used at the Colwich Plant in the manufacture of 66" Prestressed Pipe for the City of Wichita. You may recall several discussions of the subject at our plant office.

Since the start of concreting operations in June, 1955, we have used, and are currently using, a 7.6 sack/yd., 5 gal./sack concrete mix. This cement factor exceeds Specification requirements by 0.6 sack/yd. (Re: Section B-4.01, Part a.)

Recently, we made several concrete test cylinders using the 7.3 sack/yd., 5 gal./sack mix prepared by the Wichita Laboratories, with the Job Inspector in attendance. A report describing the results of 48 hr. 3 day, and 7 day tests have been attached for your review. You will notice that the results for 7 day concrete strengths are considerably above specification requirements; ie, 3,000 psi. We feel the results substantiate a change to the subject design.

We hope to introduce the modified mix in our pouring operations on Wednesday, March 7, 1956. If there are any objection to our plan, we would appreciate being notified prior to this date.

Sincerely,

LOCK JOINT PIPE COMPANY

J. P. Makowski

J. P. Makowski
Job Manager

JPM:mb

cc: Mr. J. Meyers, Wichita, Kansas
cc: Mr. E. R. Miller, Turner, Kansas

FORM G 506 REV

AVOID VERBAL MEMORANDA

NO. _____

TO John Knoll, Black & Veatch FROM J. P. Makowski DATE March 3,1956

cc: J. Meyers, Wichita Lab.

SUBJECT: Concrete Test Cylinders

At the time of this writing, formal reports, describing the results of 3 and 7 day concrete strengths (2nd trial), were in route, via mail. So as to not delay a notice of our intentions, this note, containing subject information, has been attached. The formal reports will be forwarded when received, if same is requested.

Date Made	Compressive Strength, psi	Age at Test
2/24/56	4500	3 Day
"	4400	3 Day
"	4500	3 Day
"	4550	7 Day
"	4800	7 Day
"	4500	7 Day

WE TEST EVERYTHING — UNDER THE SUN

CC: 2 Lock Joint @ Colwich
2 Weller
1 Knoll
1 Hess

Wichita CHEMICAL AND TESTING Laboratories

Principals Are
MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASS'N OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

ANALYTICAL CHEMISTS – BACTERIOLOGISTS – TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

File:

RECEIVED
1 FEB 23 1956
Lock Joint Pipe Co.
PER

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Lines
Location: Colwich, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner: City of Wichita
Date Submitted at Lab: 2/17/56

Lab. No. 902214-B (Refer to This Number)

THIS IS A TRIAL BATCH OF 7.3 SACK; 55% ROCK 45% SAND MIX TO DETERMINE STRENGTH OF CALCULATED MIX MADE BY WICHITA CHEMICAL & TESTING LAB.

Date February 22, 1956
Report No. LJC 143
Specimens Made by: Laboratory
Structure Water Line

SPECIMEN NUMBER	DATE MADE	SLUMP INCHES	MIXTURE / 3 yard: Fine Aggregate	Coarse Aggregate	Cement	Total Water	Compressive Strength P.S.I.	Type Fracture	Age In Days	Days Lab. Cured, Standard Conditions	Remarks and Location of Pour
No.1104	2/15	5"	4140 3.3%FM	5000 1.5% FM	2060	87Gal	4450	RC-AF	48Hr.	0	66" Line Pipe Core @ 11:00 AM
No.1105	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4400	RC-AF	48Hr.	0	66" Line Pipe Core @ 11:00 AM
No.1106	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4700	RC-AF	48Hr.	0	66" Line Pipe Core @ 11:00 AM
TESTS CONDUCTED AT FIELD LABORATORY											
No.1107	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4412	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
No.1108	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4394	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
No.1109	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4359	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
TESTS CONDUCTED AT WICHITA											
No.1110	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	5000	RC-AF	7	0	66" Line Pipe Core @ 11:00 AM
No.1111	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	4950	DS-AF	7	0	66" Line Pipe Core @ 11:00 AM
No.1112	2/15	5"	4140 3.3%FM	5000 1.5%FM	2060	87Gal	5400	DS-AF	7	0	66" Line Pipe Core @ 11:00 AM
			Green Concrete 66° @ 33° Outside. No evidence of bleeding. Required 28 day strength: 4500 P. S. I.								
TESTS CONDUCTED AT FIELD LABORATORY											

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MB—mortar bond failure; AF—aggregate failure.

Brand of Cement: Consolidated Victor
Admixture: None
Fine Aggregate: Dolese Concrete Sand
Coarse Aggregate: Moline 3/4" Stone
Mixed Aggregate: None

WICHITA CHEMICAL & TESTING LABORATORIES

By J. E. Myers
J. E. Myers

JAMES E. MYERS 1162 REGISTERED PROFESSIONAL ENGINEER

Form 601

WE TEST EVERYTHING UNDER THE SUN

CC: 2 Lock Joint Pipe Co.
File 1

Wichita Chemical and Testing Laboratories

ANALYTICAL CHEMISTS — BACTERIOLOGISTS — TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS
1428 N. MOSLEY AVE. PHONE HObart 4-3948
WICHITA 4, KANSAS

Principals Are Members of: American Chemical Society; American Society for Testing Materials; American Society of Civil Engineers; Ass'n of Asphalt Paving Technologists; Licensed Professional Engineers

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Line
Lab. No. 30221-R (Refer to This Number)
Date: February 23, 1954
Report No. 1103
Location: Colwich, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner: City of Wichita
Date Submitted at Lab: 2/17/54
Specimens Made by: Laboratory
Source: Water Line

THIS IS A TRIAL BATCH OF 7.3 SACK/ PER CU YD SAND MIX TO DETERMINE THE STRENGTH OF CALCULATED MIX MADE BY WICHITA CHEMICAL & TESTING LAB.

Specimen Number	Date Made	Slump Inches	Mixture 1/3 yard: Fine Aggregate	Coarse Aggregate	Cement	Total Water	Compressive Strength P.S.I.	Type Fracture	Age in Days	Days Lab. Cured Standard Conditions	Remarks and Location of Pour
No. 1104	2/15	5"	4240 3.25FM	5000 1.69FM	2060	87Gal	4450	RC-AF	48 Hr.	0	66" Line Pipe Core @ 11:00 AM
No. 1105	2/15	5"	4240 3.25FM	5000 1.59FM	2060	87Gal	4400	RC-AF	48 Hr.	0	66" Line Pipe Core @ 11:00 AM
No. 1106	2/15	5"	4240 3.25FM	5000 1.59FM	2060	87Gal	4700	RC-AF	48 Hr.	0	66" Line Pipe Core @ 11:00 AM
No. 1107	2/15	5"	4240 3.38FM	5000 1.59FM	2060	87Gal	4412	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
No. 1108	2/15	5"	4240 3.3FM	5000 1.58FM	2060	87Gal	4394	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
No. 1109	2/15	5"	4240 3.38FM	5000 1.57FM	2060	87Gal	4359	RC-AF	3	0	66" Line Pipe Core @ 11:00 AM
No. 1110	2/15	5"	4240 3.34FM	5000 1.54FM	2060	87Gal	5000	DS-AF	7	0	66" Line Pipe Core @ 11:00 AM
No. 1111	2/15	5"	4240 3.37FM	5000 1.57FM	2060	87Gal	4950	DS-AF	7	0	66" Line Pipe Core @ 11:00 AM
No. 1112	2/15	5"	4240 3.38FM	5000 1.59FM	2060	87Gal	5440	VS-AF	7	0	66" Line Pipe Core @ 11:00 AM

TESTS CONDUCTED AT FIELD LABORATORY

TESTS CONDUCTED AT WICHITA

Green Concrete 66° & 30° Outside. No evidence of Bleeding.
Required 28 day strength: 4500 P.S.I.

TESTS CONDUCTED AT FIELD LABORATORY

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MF—mortar bond failure; AF—aggregate failure

Brand of Cement: Consolidated Victor
Admixture: None
Fine Aggregate: Dolese Concrete Sand
Coarse Aggregate: Dolese 3/4" Stone
Mixed Aggregate: None

WICHITA CHEMICAL & TESTING LABORATORIES
By J. E. Myers
J. E. Myers

Wichita CHEMICAL AND TESTING Laboratories
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AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for: Lock Joint Pipe Co.
P.O. Box 137
Colwich, Kansas

Date: September 13, 1955

Lab. Number: 809117
(REFER TO THIS NUMBER)

Submitted By: J. J. Knoll Date Received At Lab.: 8-30-55 Time: 2:30 P.M.

Material Tested: REINFORCED CONCRETE PIPE

A.S.T.M. 3-Edge Bearing Test
for Proof of Design

No. of Samples: One
Sample Designations:
66" Prestressed Concrete Embedded
Cylinder Pipe with Rubber & Steel Joint

RESULTS OF TEST

CERTIFICATION OF PIPE
FOR PROOF OF DESIGN

Internal Pipe Diameter	Specimen No.	Strength lb./lin. Foot	
		Load Producing 0.01 in Crack	Ultimate Load
66"	1	16,000 lbs.	20,000 lbs.

Design Conditions: 6,600 lbs.

NOTE: The above tests indicate that the Designed strength has been met.

CERTIFIED
We certify the above test was conducted by us in accordance with accepted procedures and that this material meets specification requirements.

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Hess

Reference: A.S.T.M. C-75

File: 1

WICHITA CHEMICAL & TESTING LABORATORIES

By: H. L. Phillips

JAMES E. MYERS LICENSED PROFESSIONAL ENGINEER KANSAS

FORM 301

Wichita, Kansas
August 31, 1955

Subject: Wichita, Kansas
Waterworks Improvements
Project No. 2155, G-1.1

Black & Veatch
4706 Broadway
Kansas City 12, Missouri

Attention: Mr. Ray Lawrence & Mr. Lloyd Weller

Gentlemen:

A 3-edge bearing test was performed on a 3 ft. length of Lock Joint Pressure pipe which is being used on the 66" Transmission Line.

The results or this test were as follows:

	Total lbs.	lbs. per Ft.
1st Crack	30,000	10,000
1st .01" Crack	48,000	16,000
Failure	60,000	20,000

Failure was due to breaking of the tension steel at the 3 O'clock position. Breaking of the steel was uniform and across the entire length of the test section.

This test was performed on Aug. 30, 1955 and the following were witnesses: Mr. Ray Lawrence, Paul Haney, & J. Knoll of Black & Veatch; Mr. R. H. Hess & O. K. Brandon, City of Wichita; Mr. Jim Meyers, Wichita Testing Laboratory and Mr. Joe Makowsky and Jack Miller of Lock Joint Pipe Co.

Very truly yours,

Black & Veatch
By:

John J. Knoll
Resident Engineer

cc: R. H. Hess
Lock Joint Pipe Co.

Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
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AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for: Lock Joint Pipe Co.
P.O. Box 137
Colwich,
Kansas

Date: September 7, 1955

Lab. Number: 809026
(REFER TO THIS NUMBER)

Submitted By: Lab Inspector Date Received At Lab.: 8/31/55 Time: 8:00 A.M.

Material Tested: CONCRETE SAMPLES
66" Water Transmission Lines
Project 2155
Black & Veatch, Sons. Engrs.

No. of Samples: 2- One Core Mix One Coating Mix
Sample Designations:
Two Fragment Samples Of Concrete From Pipe
S.O. No. 6

RESULTS OF TEST

Sample No.	Specific Gravity	Density lb/cu.Ft.	Absorption	Average Absorption
Core Mix No. 1	2.239	142.3	4.52%	4.52%
Coating Mix No.1	2.082	130.2	8.92%	
No.2	2.082	130.2	8.53%	8.93%
No.3	2.076	129.5	9.24%	

The above samples were taken from the pipe that was given the 3 edge load bearing test--8-30-55. The pouring date was (6-11-55) Pre-stress date 7-7-55. The coating mix using 3/8" Moline Stone has been discontinued effective. 8-22-55.

CC: 2- Lock Joint @ Colwich
~~A~~ Knoll

Reference:

File: 1 1

FORM 501

JAMES E. MYERS LICENSED 1162 PROFESSIONAL ENGINEER

WICHITA CHEMICAL & TESTING LABORATORIES

By: W. H. Phillips

WE TEST EVERYTHING — UNDER THE SUN

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Hess

Wichita CHEMICAL AND TESTING Laboratories

Principals Are
MEMBERS OF:
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AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASS'N OF ASPHALT PAVING TECHNOLOGISTS
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ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

File: 1

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Lines
Location: Goliath, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner: T. T. T.
Date Submitted at Lab: Made @ Lab.

Lab. No. 907287 (Refer to This Number)

PRELIMINARY DESIGN SPECIMENS
5% Rock - 8 SACKS

Date July 23, 1955
Report No. LJDS #2
Specimens
Made by: Laboratory
Structure Design Specimens

SPECIMEN NUMBER	DATE MADE	SLUMP INCHES	MIXTURE				Compressive Strength P. S. I.	Type Fracture	Age In Days	Days Lab. Cured, Standard Conditions	Remarks and Location of Pour
			Fine Aggregate	Coarse Aggregate	Cement	Total Water					
No.4911	6-23	6"	1458	1459	752	38.3	5083	RC-AF	28	27	Design Specimens
No.4912	6-23	6"	1458	1459	752	38.3	4888	RC-AF	28	27	Design Specimens
No.4913	6-23	6"	1458	1459	752	38.3	4659	RC-AF	28	27	Design Specimens

No Required Strength: Casting Mix

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MB—mortar bond failure; AF—aggregate failure.

Brand of Cement: Lehigh Portland
Admixture: None
Fine Aggregate: Delano
Coarse Aggregate: Moline 3/8" Stone
Mixed Aggregate: None

WICHITA CHEMICAL & TESTING LABORATORIES

By: L. J. Phillips

Form 601

WE TEST EVERYTHING — UNDER THE SUN

Prelim Design File

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Ness

Wichita CHEMICAL AND TESTING Laboratories

ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

Principals Are
MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASS'N OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

File: 1

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Lines
Location: Colwich, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner: - - -
Date Submitted at Lab: Made at Lab.

Lab. No. 807161 (Refer to This Number)

PRELIMINARY DESIGN SPECIMENS
55% Rock - 7.61 SACK-CORE MIX

Date July 14, 1955
Report No. LJDS #2
Specimens
Made by: Laboratory
Structure Water Lines

SPECIMEN NUMBER	DATE MADE	SLUMP INCHES	MIXTURE				Compressive Strength P. S. I.	Type Fracture	Age In Days	Days Lab. Cured, Standard Conditions	Remarks and Location of Pour
			Fine Aggregate	Coarse Aggregate	Cement	Total Water					
No. 4716 (4)	6-15	4"	1330	1626	715	303	5505	RC-AF	28	27	Design Specimens
No. 4717 (5)	6-15	4"	1330	1626	715	303	5170	RC-AF	28	27	Design Specimens
No. 4718 (6)	6-15	4"	1330	1626	715	303	4870	DS-AF	28	27	Design Specimens

Required 28 day strength: 4500 P.S.I.

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MB—mortar bond failure; AF—aggregate failure.

Brand of Cement: LaFlgh Portland
Admixture: None
Fine Aggregate: Doless
Coarse Aggregate: Molline 3/4"
Mixed Aggregate: None

WICHITA CHEMICAL & TESTING LABORATORIES

By P. L. Phillips

JAMES E. MYERS LIC. NO. 5262 STATE OF KANSAS PROFESSIONAL ENGINEER

Form 601

File in Preliminary Design

Wichita CHEMICAL AND TESTING Laboratories

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WICHITA 4, KANSAS

J. E. MYERS
MANAGER

W. H. CAMPEN
J. R. SMITH
J. J. REMAR
ASSOCIATES

LICENSED PROFESSIONAL ENGINEERS

MEMBERS OF:

AMERICAN CHEMICAL SOCIETY

AMERICAN SOCIETY FOR TESTING MATERIALS

AMERICAN SOCIETY OF CIVIL ENGINEERS

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

REPORT OF TEST

Test Made for: Lock Joint Pipe Co.
Box 137
Colwich, Kansas

Date: July 11, 1955

Lab. Number: 005296-a
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector Date Received At Lab.: 5-31-55 Time: 3:00P.M.

Material Tested: CONCRETE SAND

No. of Samples: One -100 lbs.

Sample Designations:
PRELIMINARY CERTIFICATION
Dolese Bros. Co. - Concrete Sand

66" Water Transmission Lines
Project #2155
Black & Veatch, Cons. Engrs.

RESULTS OF TEST (Date Molded: 6-7-55)

A.S.T.M. MORTAR STRENGTH TESTS

A. Dolese Concrete Sand				
Specimen No.	LCP-4	LCP-5	LCP-6	
28-Day Strength P.S.I.	5940	4835	5452	
Average P.S.I.				5409
% of Standard				96.8 %
B. Standard Ottawa Sand				
Specimen No.	LCSP-4	LCSP-5	LCSP-6	
28-Day Strength P.S.I.	5500	5700	5575	
Average P.S.I.				5592
% of Standard				100.0 %

To meet A.S.T.M. C-33-52T "Not less than 95% of Standard"

CC: 2-Lock Joint @ Colwich
2-Weller
1-Knoll
1-Haas

Reference: ASTM C-87

File: 1

FORM 501

JAMES E. MYERS LICENSED 1162 KANSAS PROFESSIONAL ENGINEER

WICHITA CHEMICAL & TESTING LABORATORIES

By: _____

WE TEST EVERYTHING — UNDER THE SUN

Design File

Wichita CHEMICAL AND TESTING Laboratories

CC: 2-Lock Joint
2-Miller
1-Knoll
1-Hess

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AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASS'N OF ASPHALT PAVING TECHNOLOGISTS
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RESEARCH ON MANUFACTURING PROBLEMS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

File: 1

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Line
Location: Goshen, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner:
Date Submitted at Lab: Same

Lab. No. 600305 (Refer to This Number)

PRELIMINARY DESIGN SPECIMENS
50% Rock-8 SACKS

Date July 2, 1959
Report No. LJDS #1
Specimens
Made by: Laboratory
Structure Design Specimens

SPECIMEN NUMBER	DATE MADE	SLUMP INCHES	MIXTURE				Compressive Strength P. S. I.	Type Fracture	Age In Days	Days Lab. Cured, Standard Conditions	Remarks and Location of Pour
			Fine Aggregate	Coarse Aggregate	Cement	Total Water					
No.4911	6-23	6"	1458	1459	752	38.3	3953	RC-AF	7	6	Design Specimens
No.4912	6-23	6"	1458	1459	752	38.3	3900	DS-AF	7	6	Design Specimens
No.4913	6-23	6"	1458	1459	752	38.3	3775	RC-AF	7	6	Design Specimens
			Required 28 day strength:				None				

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MB—mortar bond failure; AF—aggregate failure.

Brand of Cement: LeHigh Portland
Admixture: None
Fine Aggregate: Toleso
Coarse Aggregate: Moline 3/8" Stone
Mixed Aggregate:

WICHITA CHEMICAL & TESTING LABORATORIES

By W. L. Phillips

JAMES E. KNOLL — LICENSED — KANSAS — PROFESSIONAL ENGINEER

Form 601

WE TEST EVERYTHING — UNDER THE SUN

REQUEST FOR APPROVAL

We hereby submit this report for an approval of these materials and/or mixtures intended for use on this project.

LAB NUMBER 806223-b
(Refer to this Number)

Original File Design Data

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Hess

Wichita CHEMICAL AND TESTING Laboratories

WICHITA 4, KANSAS

File: 1

PRELIMINARY DESIGN DATA

Actual Lab. Batch Mix

COATING DESIGN

DAILY LOG OF CONCRETING OPERATION

Project: 66" water Transmission Lines, Colwich, Kansas
Contractor: Lock Joint Pipe Co.
Structure: Pre-Stressed Pipe Coating, Black & Veatch, Project 2155
Fine Aggregate (FA): Delano Sand
Coarse Aggregate (CA): Moline 3/8" Stone

Type Mix: 50% Rock - 8 sks.
Date: June 23, 1955
Weather: ——
Class of Concrete: None P.S.I. @ 28 da
Slump Ordered: 3 - 6 inches
Nominal Mix: 1: 3.84 : 1.94
Maximum Water: 5.0 gal./sk. cmt.
Batch Wts., Lbs.
Dry Basis: Cmt. 752 FA 1458 CA 1459

COMPUTATION FOR ACTUAL BATCH PROPORTIONS—WEIGHTS MOIST AS USED

TIME MOISTURE TEST MADE

	No. 1 per ONE YARD			No. 2 per 3 YARD BATCH		
	% Moisture	Free Water	Actual Batch Wts.	% Moisture	Free Water	Actual
FA	0	None lb.	1458 lb.	0	None lb.	4370 lb.
CA	0	None lb.	1459 lb.	0	None lb.	4373 lb.
Total Free water		None lb.	—— gal.		None lb.	—— gal.
Added at Mixer		319 lb.	38.3 gal.		957 lb.	114.9 gal.
Total Water		319 lb.	38.3 gal.		957 lb.	114.9 gal.
Gal./sk. cement		4.78				4.78
Slump		5-1/2"				5-1/2"
Entrained air: (Trapped)		None				None

YIELD CALCULATIONS

Test Cylinder Nos:	Wt./cu. ft.	Wt./cu. yd.	Vol.	Yield	Actual Cement Content
For 7-day tests 4911-4912-4913					
For 28-day tests 4914-4915-4916	145.9 lb.	3936 lb.	27.18 cf.	100.6%	7.95 sks/cu. yd.

Sieve Analysis of Aggregates

Sieve	Coarse	Fine
Opening	# Ret.	# Ret.
2 inch		
1½ inch		
1 inch		
¾ inch	0	0
½ inch	3.5	0
3/8 inch	6.3	0.4
No. 4	71.8	3.6
No. 8	95.2	14.0
No. 10	——	——
No. 16	96.9	35.0
No. 20	——	——
No. 30	97.2	60.6
No. 40	——	——
No. 50	97.5	87.0
No. 100	97.9	97.2
F M	5.63	2.99

Concreting Started ____ Finished ____

No. Batches Delivered ____ CERTIFIED ____ Batch Vol. ____

Ticket Nos. ____

We certify the above test was conducted by us in accordance with accepted procedures and that this material MEETS specification requirements.

Concrete laid ____ cu. yds.

Cement Used 8 sks. Brand Lehigh Portland

NO ADMIX sks. Brand ____

Remarks: Compression Tests will follow when due.

Aggregate Ratio, # by Wt.: 50% Rock, 50% Sand

WICHITA CHEMICAL & TESTING LABORATORIES
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% P200 WASH

Coarse: 2.0

Fine: 1.6

FORM 505

By R. L. Phillips

CERTIFIED

We certify the above test was conducted by us in accordance with accepted procedures and that this material specification requirements.

File in

Original Design Data.

WE TEST EVERYTHING — UNDER THE SUN

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Hess

LAB NUMBER 806223-a
(Refer to this Number)

Wichita CHEMICAL AND TESTING Laboratories

WICHITA 4, KANSAS

File:

PRELIMINARY DESIGN DATA

Actual Lab. Batch Mix

CORE DESIGN

DAILY LOG OF CONCRETING OPERATION

Project 66" Water Transmission Lines
Goliath, Kansas

Contractor Lock Joint Pipe Co.

Structure Pre-Stressed Pipe Core
Black & Veatch Project 2155

Fine Aggregate (FA) Delose Sand

Coarse Aggregate (CA) Moline 3/4" Stone

Type Mix: 55% Rock - 7.61 SACK

Date June 15, 1955

Weather —

Class of Concrete 4500 P.S.I. @ 28 da

Slump Ordered 3 - 6 inches

Nominal Mix 1: 1.86 : 2.27

Maximum Water 5.5 gal./sk. cmt.

Batch Wts., Lbs.

Dry Basis: Cmt. 715 FA 1330 CA 1626

COMPUTATION FOR ACTUAL BATCH PROPORTIONS—WEIGHTS MOIST AS USED

TIME MOISTURE TEST MADE

	No. 1 per ONE YARD			No. 2 per 3 YD. BATCH		
	% Moisture	Free Water	Actual Batch Wts.	% Moisture	Free Water	Actual
FA	0	None lb.	1330 lb.	0	None lb.	3990 lb.
CA	0	None lb.	1626 lb.	0	None lb.	4880 lb.
Total Free water		None lb.	— gal.		None lb.	— gal.
Added at Mixer		303 lb.	36.3 gal.		909 lb.	108.9 gal.
Total Water		303 lb.	36.3 gal.		909 lb.	108.9 gal.
Gal./sk. cement			4.77			4.77
Slump			4 inch			4 inch
Entrained air: (Trapped)			None			None

YIELD CALCULATIONS

Test Cylinder Nos:	Wt./cu. ft.	Wt./cu. yd.	Vol.	Yield	Actual Cement Content
For 7-day tests 4713-4714-4715					
For 28-day tests 4716-4717-4718	147.2 lb.	3974 lb.	27.0 cf.	100.0 %	7.61 sks/yd.

Sieve Analysis of Aggregates

Sieve	Coarse	Fine
Opening	% Ret.	% Ret.
2 inch		
1½ inch		
1 inch	0	
¾ inch	0	0
½ inch	22.9	0
3/8 inch	58.2	0.4
No. 4	88.9	3.6
No. 8	95.4	14.8
No. 10		
No. 16	96.1	35.0
No. 20		
No. 30		
No. 40	96.5	60.6
No. 50		
No. 100	96.7	87.0
F M	97.1 / 6.29	97.2 / 2.99

Concreting Started — Finished

No. Batches Delivered — Batch Vol.

Ticket Nos.

Concrete laid — cu. yds.

Cement Used 7.61 sks. Brand Lehigh Portland

NO ADMIX sks. Brand

Remarks: Compression Tests will follow when due. Aggregate Ratio, % by Wt., 55% Rock, 45% Sand.

JAMES E. MYERS CERTIFIED PROFESSIONAL ENGINEER

WICHITA CHEMICAL & TESTING LABORATORIES
1428 N. MOSLEY AVE. PHONE HOBART 4-3948

% P200 WASH

Coarse: 2.6

Fine: 1.6

FORM 505

By R. L. Phillips

LAB NUMBER _____ (Refer to this Number)

Project _____

Contractor _____

Structure _____

Time Aggregate (TA) _____

Coarse Aggregate (CA) _____

DAILY LOG OF CONCRETING OPERATION

Type Mix: _____

Date _____

Weather _____

Class of Concrete _____ P.S.I. @ 28 da.

Slump Ordered _____

Normal Mix _____

Maximum Water _____ gal./sk. cmt.

Batch Wgt. Lbs.

Dry Basis: CmtCA

File:

COMPUTATION FOR ACTUAL BATCH PROPORTIONS—WEIGHTS MOIST AS USED

TIME) MOISTURE
TEST MADE

	No. 1			No. 2		
	% Moisture	Free Water	Actual Batch Wts.	% Moisture	Free Water	Actual
FA		lb.	lb.		lb.	lb.
CA		lb.	lb.		lb.	lb.
Total Free water		lb.	gal.		lb.	gal.
Added at Mixer		lb.	gal.		lb.	gal.
Total Water		lb.	gal.		lb.	gal.
Gal./sk. cement						
Slump						
Entrained air:						
Test Cylinder Nos:						
For 7-day tests						
For 28-day tests						

YIELD CALCULATIONS

	Wt./cu. yd.	Vol.	Yield	Actual Cement Content

Sieve Analysis of Aggregates

Sieve	Coarse	Fine
Opening		
2 inch		
1½ inch		
1 inch		
¾ inch		
½ inch		
3/8 inch		
No. 4		
No. 8		
No. 10		
No. 16		
No. 20		
No. 30		
No. 40		
No. 50		
No. 100		
No. 200		
P.M.		

Concreting Started _____ Finished _____

No. Bat. Hrs Delivered _____ Batch Vol. _____

Ticket Nos. _____

Concrete laid _____ cu. yds.

Cement Used _____ sks. Brand _____

sks. Brand _____

Remarks: _____

WICHITA CHEMICAL & TESTING LABORATORIES
1429 N. MOSLEY AVE. PHONE HOBART 4-3946

% PASS WASH

Copies: _____

File: _____ FORM 505

TEST EVERYTHING — UNDER THE SUN

REQUEST FOR APPROVAL
We hereby submit this report for an approval of these materials and/or mixtures intended for use on this project.

CC: 2-Lock Joint @ Colwich
2-Weller
1-Knoll 1-Hess
File: 1

Wichita CHEMICAL AND TESTING Laboratories

ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS

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WICHITA 4, KANSAS

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ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

Date June 20, 1955

PRELIMINARY CERTIFICATION

Aggr. Report No. LJC - 1

REPORT ON 3/4" COARSE AGGREGATE

LAB NUMBER 806021-a
(Refer to this Number)

Contractor: Lock Joint Pipe Co.
P.O. Box 137 - Colwich, Kansas

Project: 66" Water Transmission Lines
Project 2155

Engineer: Black & Veatch, Consulting Engrs.

Location: Colwich, Kansas

Sample taken by: Lab. Inspector Co. Stockpile Time: 2:00 P.M. Date: 6-2-55

Car or sample number	GRADING, Percent Retained sieve number (ASTM D75 & C136) 1"	3/4"	1/2"	3/8"	#4	#8	#16	#50	% Ret. #100	IMPURITIES: Organic Matter ASTM C40	% Silt P200 ASTM C117	Clay Lumps, Shale ASTM C142 AASHO T10	Unsound Particles ASTM C235 C88 C131 *	Coal Sticks, Etc. ASTM C123 C129 C227
COARSE AGGREGATE (For Core Mix)														
Moline Stone 3/4"	0	0	(F.M. 6.29) 22.9	58.2	88.9	95.4	96.1	96.7	97.1	—	2.6	0	0	0
Specifications: Par. B-2.03, Pg. B-7; B-4.05; Pg. B-12 (ASTM C33)	0	0-10	—	45-80	90-100	95-100	—	—		—	1.5	0.25	5	1.0

F.M. Variation ± 0.15 (as approved by the Engineer)

ADDITIONAL AGGREGATE DATA

	Bulk Spec. Grav.	Sat'd. Spec. Grav.	Apparent Spec. Grav.	Absorption % (ASTM C-127)
Moline 3/4" Stone	2.44	2.52	2.65	3.27 %

Remarks: SOURCE: Crushed Limestone, Concrete Materials & Construction Co.; Moline, Kansas, Producer.

*-to be reported later

CERTIFIED
We certify the above test was conducted by us in accordance with accepted procedures and that this material meets specification requirements.

WICHITA CHEMICAL & TESTING LABORATORIES
By R. L. Phillips

CHEMICAL AND TESTING

ANALYTICAL CHEMISTS · BACTERIOLOGISTS · TESTING ENGINEERS

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WICHITA 4, KANSAS

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Date _____

Aggr. Report No. _____

LAB NUMBER _____
(Refer to this Number)

REPORT ON _____

Contractor _____ Project _____

Engineer _____

Sample taken by _____ Time _____ Date _____

Car or Sample Number	GRADING, Percent passing sieve number or size										IMPURITIES				
											Organic Matter	Silt P200	Clay Lumps, Shale	Unsound Particles	Coal Sticks Etc.
											ASTM C40	ASTM C117	ASTM C142 AASHO T10	ASTM (C235 C88 C131	ASTM C123 C123 C127

WE TEST EVERYTHING — UNDER THE SUN

CC: 2-Lock Joint @ Colwich
2-Weller
1-Knoll
1-Hess
File: 1

REQUEST FOR APPROVAL
We hereby submit this report for an approval of these materials and/or mixtures for use on this project.

Wichita CHEMICAL AND TESTING Laboratories

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LICENSED PROFESSIONAL ENGINEERS

PRELIMINARY CERTIFICATION

Date June 20, 1955

Aggr. Report No. LJC -2

REPORT ON 3/8" COARSE AGGREGATE

LAB NUMBER 806021-b
(Refer to this Number)

Contractor: Lock Joint Pipe Co., Box 137 - Colwich, Ks.
Project: 66" Water Transmission Lines, Project 2155
Engineer: Black & Veatch, Cons. Engrs.
Location: Colwich, Kansas

Sample taken by: Lab. Inspector, Co. Stockpile Time: 2:00 P.M. Date: 6-8-55

Car or sample number	GRADING, Percent Retained — ASTM D75 & C136 — sieve number								% Ret.	IMPURITIES				
	1"	3/4"	1/2"	3/8"	#4	#8	#16	#50	#100	Organic Matter ASTM C40	% Silt P200 ASTM C117	Clay Lumps, Shale ASTM C142 AASHO T10	Unsound Particles ASTM C235 C88 C131	Coal Sticks, Etc. ASTM C123 C129 C227
COARSE AGGREGATE (For Coating Mix)														
Moline Stone 3/8" (F.M. 5.63)	0	0	3.5	6.3	71.8	95.2	96.9	97.5	97.9	—	2.0	0	0	0
Specifications Par. B-2.03, Pg. B-7: (Also B-4.05, B-5001) (ASTM C33) - No Gradation limits this size. F.M. Variation ± 0.15 (as approved by the Engineer)														

ADDITIONAL AGGREGATE DATA — ASTM C-127

	Bulk Spec. Grav.	Sat'd. Spec. Grav.	Apparent Spec. Grav.	Absorption %
Moline 3/4" Stone	2.45	2.54	2.66	3.16 %

Remarks: SOURCE: Crushed Limestone, Concrete Materials & Construction Co., Moline, Ks. Producer

* - To be reported later.

CERTIFIED
We certify the above test was conducted by us in accordance with accepted procedures and that this material meets specification requirements.

JAMES E. M... LICENSED 1162 ... PROFESSIONAL ENGINEER

WICHITA CHEMICAL & TESTING LABORATORIES
By R. L. Phillips

WE TEST EVERYTHING

UNDER THE SUN

CHEMICAL
AND
TESTING

Wichita Laboratories

ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS

RESEARCH ON MANUFACTURING PROBLEMS

1429 N. MOSLEY AVE. PHONE HOBART 4-3948

WICHITA 4, KANSAS

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AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

Date _____

Agcy. Report No. _____

REPORT ON _____ LAB NUMBER _____
(Refer to this Number)

Contractor: _____ Project: _____

Engineer: _____ Location: _____

Sample taken by: _____ Time: _____ Date: _____

Car or sample number	GRADING, Percent ASTM Designation C136 Sieve number								IMPURITIES				
									Organic Matter	Silt Passing #200	Clay Lumps, Shale	Unsound Particles	Coal Shales Etc.
									ASTM C40	ASTM C117	ASTM C142 AASHO T10	ASTM C123 C88 C131	ASTM C142 C29 C127

Remarks: _____

UNITED LABORATORIES — WICHITA, KANSAS

WE TEST EVERYTHING — UNDER THE SUN

REQUEST FOR APPROVAL
We hereby submit this report for an approval of these materials and/or mixtures intended for use on this project.

CC: 2-Lock Joint Pipe @ Colwich
2-Weller
1-Knoll
File: Wess
1-File

Wichita CHEMICAL AND TESTING Laboratories

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WICHITA 4, KANSAS

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AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

PRELIMINARY CERTIFICATION

Date June 20, 1955

Aggr. Report No. LJC -3

LAB NUMBER 305296-A (Refer to this Number)

REPORT ON FINE AGGREGATE

Contractor: Lock Joint Pipe Co.
Box 137 - Colwich, Ks.
Engineer: Black & Veatch.

Project: 66" Water Transmission Lines
Project 2155
Location: Colwich, Kansas

Sample taken by: Lab. Inspector Co. Stockpile Time: 3:00 P.M. Date: 5-31-55

Car or sample number	GRADING, Percent Retained — ASTM D75 & C136 sieve number								% Ret.	IMPURITIES				
	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	Organic Matter ASTM C40	% Silt P200 ASTM C117	Clay Lumps, Shale ASTM C142 AASHO T10	Unsound Particles ASTM C235 C88 C131	Coal Sticks, Etc. ASTM C123 C129 C227
FINE AGGREGATE (For Core & Coating Mixes)														
Dolese Concrete Sand (F.M. 2.99)	0	0	0.4	3.6	14.8	35.0	60.6	87.0	97.2	O.K. Type I	1.6	None	None	None
Specifications: Par. B-2.02, Pg. B-6; B-4.05, Pg. B-12; B-5002, Pg. B-14. (ASTM C33)	—	—	0	0-5	0-20	15-50	40-75	70-90	90-98	Type I	3.0	1.0	—	0.5
Black & Veatch Grad.: F.M. 2.50 to 3.00 Variation ± 0.15 (as approved by Engineer)				0-5	—	20-40	—	70-80	92-98					

ADDITIONAL AGGREGATE DATA — ASTM C128

	Bulk Spec. Grav.	Sat'd. Spec. Grav.	Apparent Spec. Grav.	Absorption %
Dolese Sand	2.56	2.58	2.60	0.88 %

Remarks: SOURCE: Washed and Graded Sand, Arkansas River Deposit, N. Wichita, Dolese Bros. Co., Wichita, Kansas

*Mortar Cubes on Separate Report.

CERTIFIED
We certify the above test was conducted by us in accordance with accepted procedures and that this material meets specification requirements.

WICHITA CHEMICAL & TESTING LABORATORIES
By R. L. Phillips

Wichita Chemical and Testing Laboratories

ANALYTICAL CHEMISTS · BACTERIOLOGISTS · TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS
1429 N. MOSLEY AVE. PHONE HOBART 4-2949
WICHITA 4, KANSAS

PRINCIPALS ARE
MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

Date _____

Agm. Report No. _____

LAB NUMBER _____
(Refer To This Number)

REPORT ON _____

Contractor _____ Project _____

Engineer _____ Location _____

Sample taken by: _____ Time _____ Date _____

Car or sample number	GRADING, Percent _____ Sieve number _____										IMPURITIES				
											Organic Matter	Silt P200	Clay Lumps, Shale	Unsound Particles	Coal Sticks, Etc.
											ASTM C40	ASTM C117	ASTM C142 AASHO T112	ASTM C123 C88 C142	ASTM C123 C127

Wichita CHEMICAL AND TESTING Laboratories
ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
1428 N. MOSLEY AVE. PHONE HOBART 4-3948
WICHITA 4, KANSAS

J. E. MYERS
MANAGER
W. H. CAMPEN
J. R. SMITH
J. J. REMAR
ASSOCIATES
LICENSED PROFESSIONAL ENGINEERS

REPORT OF TEST

MEMBERS OF:
AMERICAN CHEMICAL SOCIETY
AMERICAN SOCIETY FOR TESTING MATERIALS
AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS

Test Made for: Lock Joint Pipe Co.
P.O. Box 137
Colwich, Kansas

Date: June 20, 1955

Lab. Number: 805296-b
(REFER TO THIS NUMBER)

Submitted By: Lab. Inspector Date Received At Lab.: 5-31-55 Time: 3:00 P.M.

Material Tested: CONCRETE SAND
66" Water Transmission Lines
Project No. 2155
Black & Veatch, Consulting Engrs.

No. of Samples: One - 100 lbs.
Sample Designations:
PRELIMINARY CERTIFICATION
Dolese Bros. Co. - Concrete Sand

REQUEST FOR APPROVAL
We hereby submit this report for an approval of these materials and/or mixtures intended for use on this project.

RESULTS OF TEST (Date Molded: 6-7-55)

A.S.T.M. MORTAR STRENGTH TESTS
(7-Day Results)

A. Dolese Concrete Sand				
Specimen No.:	LCP-1	LCP-2	LCP-3	
7-Day Strength, PSI:	3650	3775	3625	
Average P.S.I.:				3683
% of Standard:				105.4 %
B. Standard Ottawa Sand				
Specimen No.:	LCSP-1	LCSP-2	LCSP-3	
7-Day Strength, P.S.I.:	3250	3775	3460	
Average PSI:				3495
% of Standard:				100.0 %

To meet A.S.T.M. C-33-52T "Not less than 95% of Standard."

CERTIFIED
We certify the above test was conducted by us in accordance with accepted procedures and that this material **meets.** specification requirements.

JAMES E. MYERS LICENSED 116 KANSAS PROFESSIONAL ENGINEER

CC: 2-Lock Joint @ Colwich
2-Feller
1-Kroll
1-Hess

Reference: A.S.T.M. C87

File: 1

WICHITA CHEMICAL & TESTING LABORATORIES

By: _____

FORM 501

WE TEST EVERYTHING — UNDER THE SUN

CC: 2-Lock Joint
2-Weller
1-Knoll
1-Hess

Wichita CHEMICAL AND TESTING Laboratories

ANALYTICAL CHEMISTS - BACTERIOLOGISTS - TESTING ENGINEERS
RESEARCH ON MANUFACTURING PROBLEMS

File: 1

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ASS'N OF ASPHALT PAVING TECHNOLOGISTS
LICENSED PROFESSIONAL ENGINEERS

FLEXURE AND COMPRESSION TEST REPORT

Project: 66" Water Transmission Line
Lab. No. 806263 (Refer to This Number)
Location: Colwich, Kansas
Contractor: Lock Joint Pipe Co.
Architect: Black & Veatch
Owner:
Date Submitted at Lab: Made @ Lab.

PRELIMINARY DESIGN SPECIMENS
55% Rock - 7.61 Sack

Date June 22, 1955
Report No. LJDS-#1
Specimens
Made by: Laboratory
Structure Water Lines

SPECIMEN NUMBER	DATE MADE	SLUMP INCHES	MIXTURE				Compressive Strength P. S. I.	Type Fracture	Age In Days	Days Lab. Cured, Standard Conditions	Remarks and Location of Pour
			Fine Aggregate	Coarse Aggregate	Cement	Total Water					
No.4713	6-15	4"	1330	1626	715	303	4359	DS-AF	7	6	Design Specimens
No.4714	6-15	4"	1330	1626	715	303	4518	RC-AF	7	6	Design Specimens
No.4715	6-15	4"	1330	1626	715	303	4341	RC-AF	7	6	Design Specimens
			Required 28 day strength:				4500 P.S.I.				

TYPE FRACTURE: RC—regular cone; VS—vertical shear; DS—diagonal shear; HS—horizontal rupture; MB—mortar bond failure; AF—aggregate failure.

Brand of Cement: Lehigh Portland
Admixture: None
Fine Aggregate: Delano
Coarse Aggregate: Moline 3/4"
Mixed Aggregate: None

WICHITA CHEMICAL & TESTING LABORATORIES

By R. L. Phillips

Form 601

SPECIMEN NUMBER	DATE TAKEN	SUBMITTED BY	MIXTURE								
			Kind & Source of Aggregate	Coarse Aggregate	Cement	Total Water	Compressive Strength lbs. per sq. in.	Type Proportion	Age at Test Days	Lab. Number & Condition	Remarks and Location of Test