

Wendy K. Tatro, MO Bar #60261
Director & Assistant General Counsel
Ameren Missouri
1901 Chouteau Ave.
P. O. Box 149 (MC 1310)
St. Louis, MO 63166
(314) 554-2623 (telephone)(314) 554-4014
(facsimile) AmerenMOService@ameren.com

Jermaine Grubbs, MO Bar #68970
Corporate Counsel
Ameren Missouri
P.O. Box 66149, MC 1310
St. Louis, MO 63166-6149
(314) 554-3484 (phone)
(314) 554-4014 (fax)
AmerenMOService@ameren.com

/s/ Jennifer Moore _____

Jennifer Moore
Senior Corporate Counsel
Ameren Missouri
1901 Chouteau Ave.
P. O. Box 149 (MC 1310)
St. Louis, MO 63166
(314) 554-2623 (telephone)
(314) 554-4014 (facsimile)
AmerenMOService@ameren.com

James B. Lowery, MO Bar #40503
JBL Law, LLC
3406 Whitney Ct.
Columbia, MO 65203-6734
(573) 476-0050 (phone)
lowery@jbllawllc.com

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing was served on the Staff of the Commission and the Office of the Public Counsel via electronic mail (e-mail) on this 8th day of June, 2022.

/s/ Wendy K. Tatro

Wendy K. Tatro

OSAGE ENERGY CENTER TOUR

Wednesday, May 25, 2022

2:00 – 4:30

On Wednesday, May 25th a tour of the Osage Energy Center (Bagnell) was given to members of the Missouri Public Service Commission. Marc Poston from OPC was scheduled to attend but had a conflict prior to the event. Warren Witt, Director of Hydro Operations gave a presentation (attached) followed by a tour of the plant.

Missouri Public Service Commission Attendees:

Commissioner Glen Kolkmeier
Mark Johnson

Ameren Missouri Attendees:

Regulatory & Legislative Vice President Warren Wood
Director Hydro Operations Warren Witt
Manager Regulatory Affairs Gaye Suggett

Osage Energy Center

Warren A. Witt

Director of Hydro Operations

Ameren Missouri

Ameren Hydro Generation

- **Keokuk Energy Center**
 - 15 units, 140 MW, 109 years old
- **Osage Energy Center**
 - 8 units, 250 MW, 91 years old
- **Taum Sauk Pumped Storage Energy Center**
 - 2 units, 440 MW, 59 years old
- **~3% of Ameren generation**

Osage Energy Center Basics

- Built in 1931
- 250 MW, ~700,000 MWhr/yr
- 8 main units, 2 house units
- 12 spill gates
- Staff of 25 people
- Lake:
 - Over 1100 miles of shoreline
 - 100 feet deep
 - 93 miles long
 - Drainage basin is Springfield to just south of KC, 150 miles into Kansas

FERC License

- **Original license from 1926-1976**
 - 16 pages
- **Second license from 1976- 2006**
 - 30 pages
- **Third license from 2007- 2047**
 - 91 pages plus half a dozen required management plans

Recent Plant Upgrades

- Automated plant in 1990's
 - Operate all three hydro plants (27 units) from Osage
- Turbine/generator upgrades
 - 2 units in 2002
 - 4 aerating units in 2008 and 2009
 - 2 completely new house units in 2010
- New automated turbine loading and venting system in 2008

Recent Plant Upgrades

- ~20% increase (120,000 MWhrs) in plant generation capability for the same water flow rates
- > \$50 Million for upgrades
- ~ \$25 Million in federal tax credits/incentives for upgrades
- First three gas insulated step-up transformers in the Western Hemisphere

Recent Environmental Upgrades

- **Aerating turbines and automated venting system**
- **Fish net upstream of powerhouse**
- **Spill gate operational changes**
- **New minimum flow and flood ramp rate restrictions**
- **Management Plans:**
 - **Shoreline, Historical Property, Lower Osage River Enhancement, Fish Protection, Dissolved Oxygen Enhancement, Recreation Enhancement**

DAM STABILIZATION ENHANCEMENT/ ANCHORING

- Anchored Bagnell Dam in 1980's
- 1980's anchors have an end of life due to minimal corrosion protection
- 2018 Project consisted of:
 - Hydroblasting/removal of surface concrete
 - Adding new anchors
 - Adding mass concrete
 - Adding new drains
- Project impacted:
 - West retaining section
 - Spillway section
 - East retaining section

WEST RETAINING SECTION



HYDROBLASTING/HYDRODEMOLITION



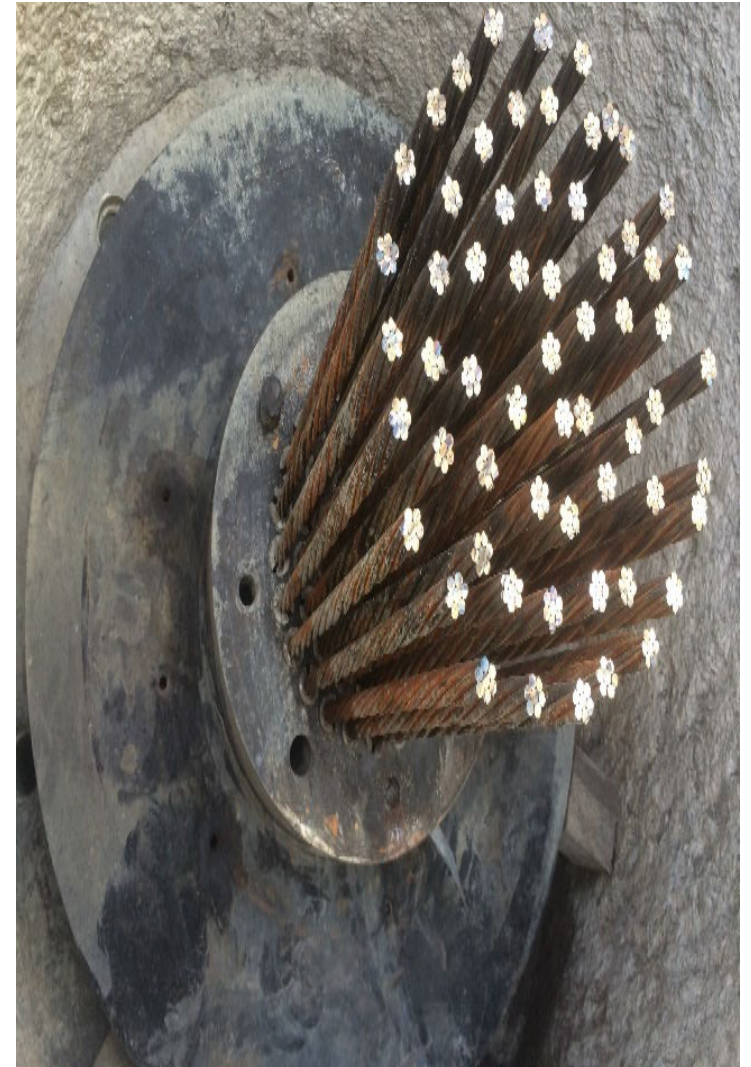


48" RECESS ANCHOR DRILL HEAD



05/10/2017

ANCHORS



SPILLWAY PLATFORM AND BARGE

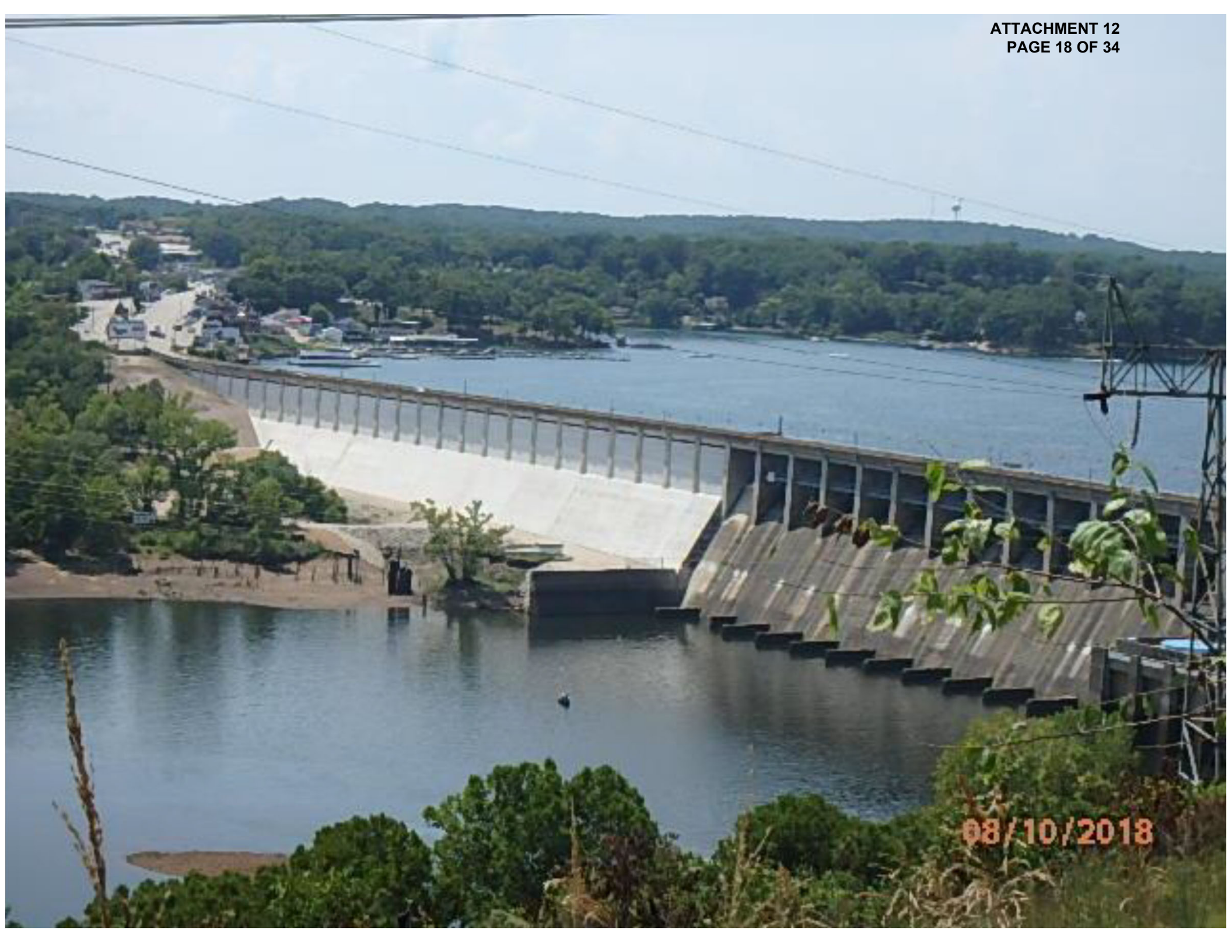


SITE PROGRESS





04/18/2018



08/10/2018

The Construction of Bagnell Dam

- In August of 1929, men and women from all over the world came to a little-known place on the Osage River, just upstream of the town of Bagnell, Missouri.
- Barely over two years later, they had completed what is now known as Bagnell Dam... and the Lake of the Ozarks was born.

Construction Begins August 6, 1929



UNION ELECTRIC LIGHT & POWER CO. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Bldrs.
J.O. 5461 #2 8-19-29 Looking SW of Dam Site

N 988

September 24, 1929



UNION ELECTRIC LIGHT & POWER CO. - HYDROELECTRIC STATION, OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders.
J.O. 5461 # 26 9-24-29 Looking West over dam site. N1182

December 13, 1929 Job Hospital



UNION ELECTRIC LIGHT & POWER Co. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, CHICAGO
J.O. 5461 #70 12-13-29 Job Hospital NJ558

October 25, 1929

ATTACHMENT 12
PAGE 23 OF 34



UNION ELECTRIC LIGHT & POWER CO. HYDROELECTRIC STATION, OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, ENGRS.
J.O. 5461 #48-10-25-29 Looking East over Dam Site from West
end of Dam

N1320

March 28, 1930 Cofferdam



UNION ELECTRIC LIGHT & POWER CO. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders

10.5461 * 133 3-28-30 General View of Job from East Hillside (taken with Wide Angle lens for comparison with * 132)

N 2003

December 1, 1930 Grand Glaize Bridge



62

UNION ELECTRIC LIGHT AND POWER CO - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
J.C. 5461 #416, 12-1-30 Aerial View of Grand Glaize Creek Bridge - Looking North N 2255

August 29, 1930 Willmore Lodge

ATTACHMENT 12
PAGE 26 OF 34



UNION ELECTRIC LIGHT & POWER CO. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
View of Administration Lodge

J.D. 5461 #284

8-29-30

N 2140

August 29, 1930 Powerhouse Begins



UNION ELECTRIC LIGHT & POWER CO. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
J.O. 5461 #282, 8-29-30 General View from East Hillside N 2138

September 29, 1930

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UNION ELECTRIC LIGHT & POWER CO. HYDROELECTRIC STATION-OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
J.O. 5461 # 328, 9-29-30
General View from East Hillside
N 2176

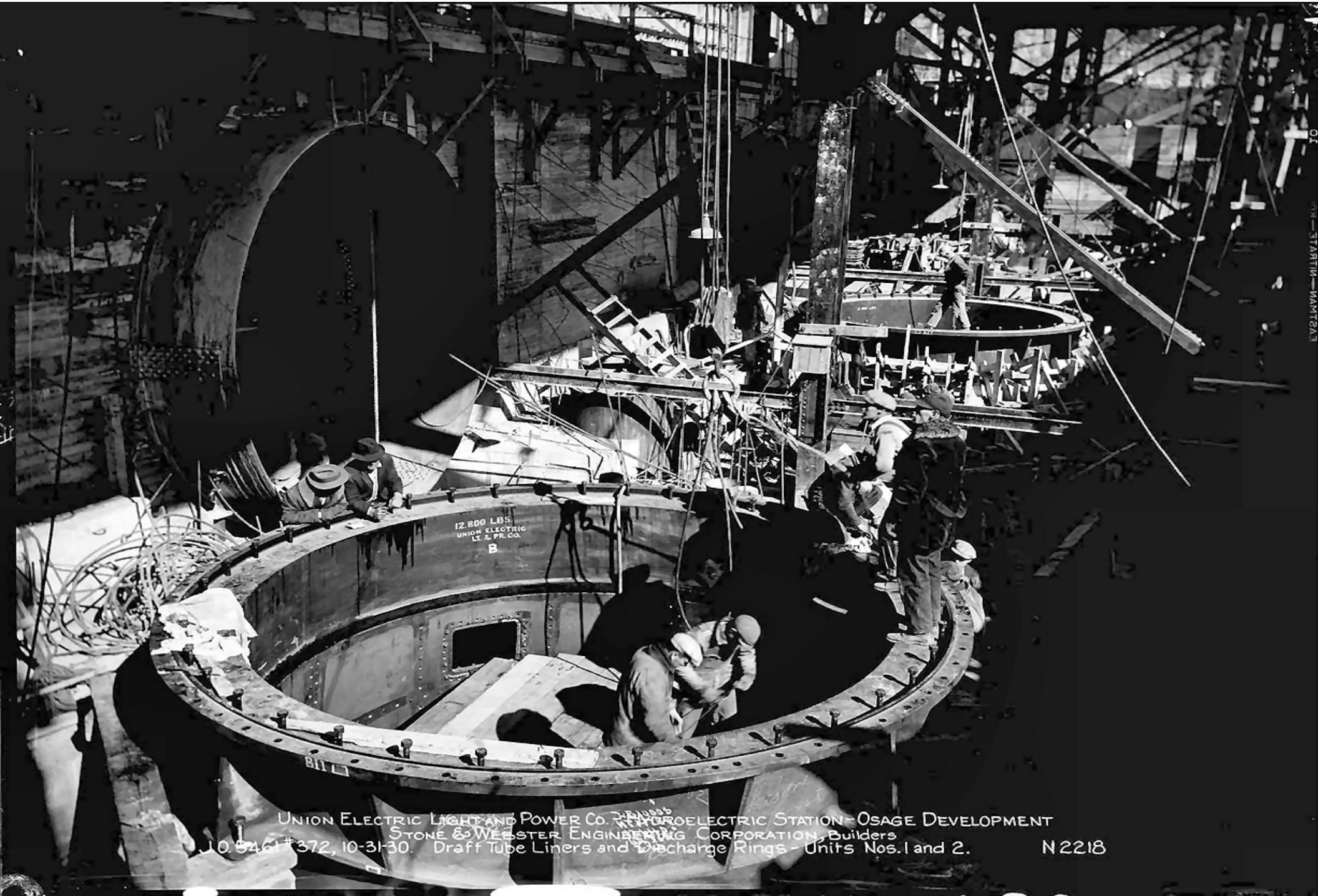
December 22, 1930

ATTACHMENT 12
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UNION ELECTRIC LIGHT AND POWER CO.-HYDROELECTRIC STATION-OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
JO 5461-444-12-22-30 Upstream View From East Hillside N2262

October 31, 1930



May 29, 1931



UNION ELECTRIC LIGHT AND POWER CO.-HYDROELECTRIC STATION-OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
Main Control Room
J.O. 5461 No 544, 5-29-31. N 2382

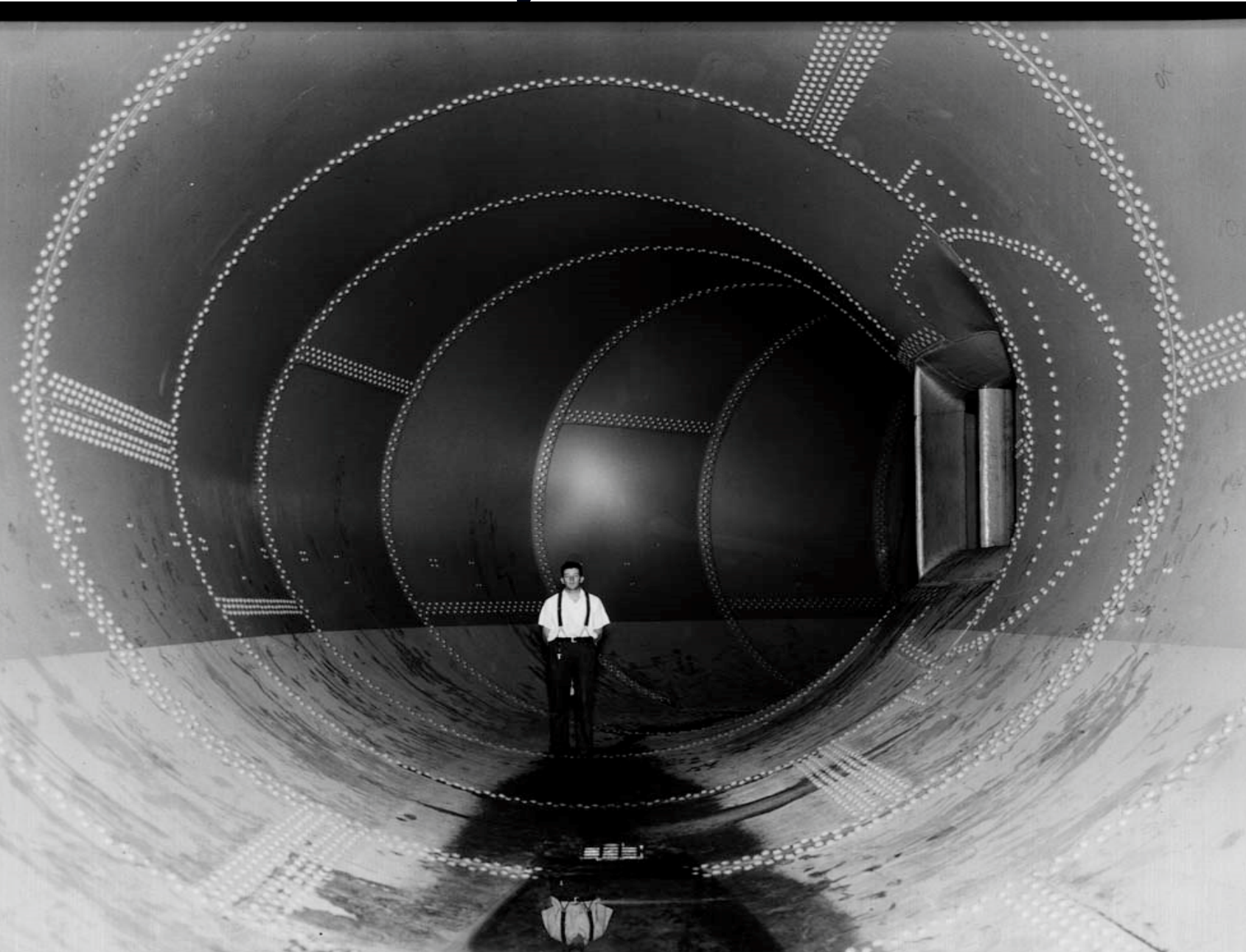
May 29, 1931



UNION ELECTRIC LIGHT AND POWER CO.-HYDROELECTRIC STATION-OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
J.O.5461 No 538, 5-29-31. 150 Ton Crane Handling Rotor for Generator No4 N 2376

May 29, 1931

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UNION ELECTRIC LIGHT AND POWER Co. - HYDROELECTRIC STATION - OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
View Inside Scroll Case - Unit No 3.

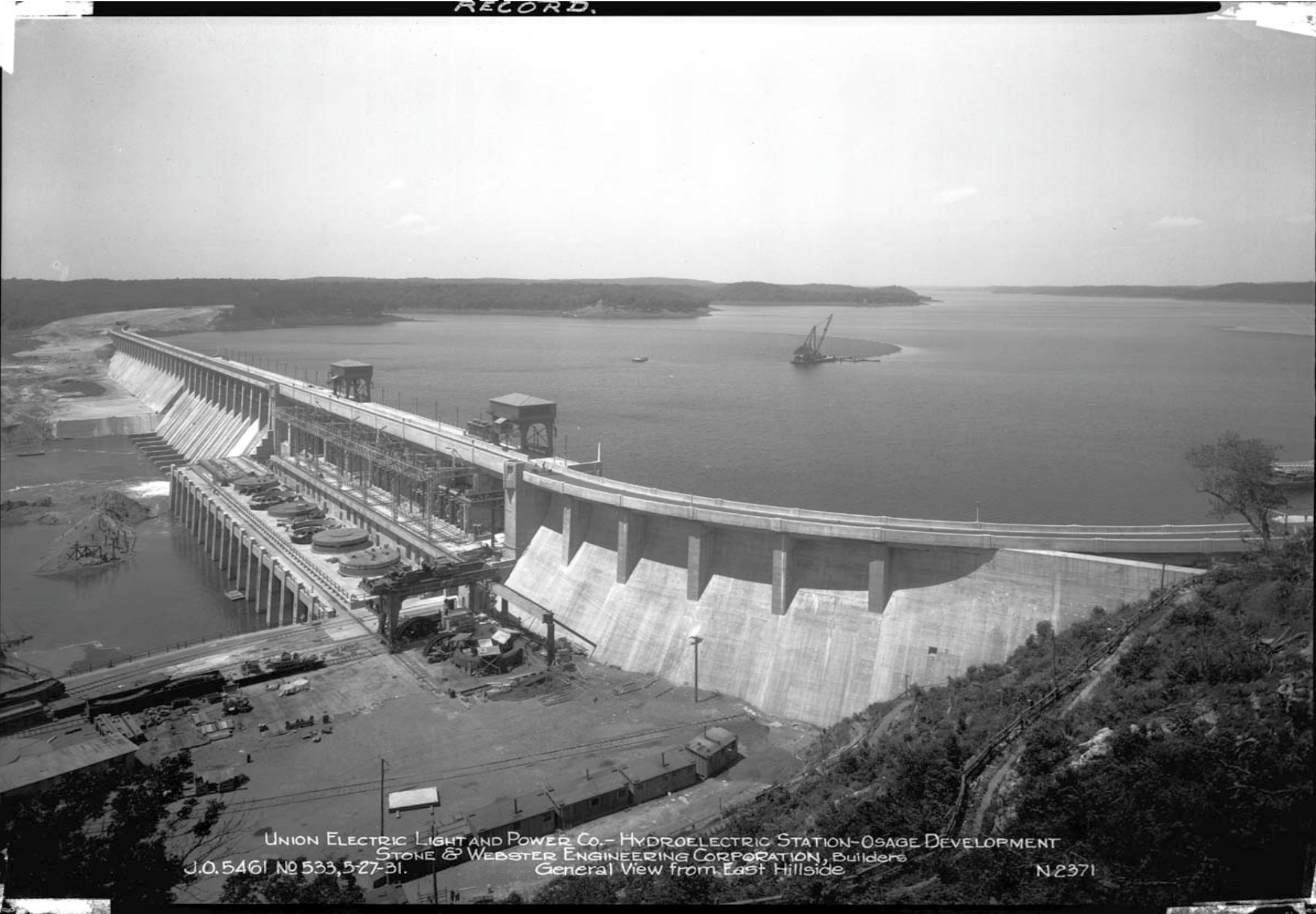
N 2378

Lake Filling in Less Than 2 Years

ATTACHMENT 12

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RECORD.



UNION ELECTRIC LIGHT AND POWER Co. - HYDROELECTRIC STATION-OSAGE DEVELOPMENT
STONE & WEBSTER ENGINEERING CORPORATION, Builders
J.O. 5461 NO 533, 5-27-31. General View from East Hillside

N2371