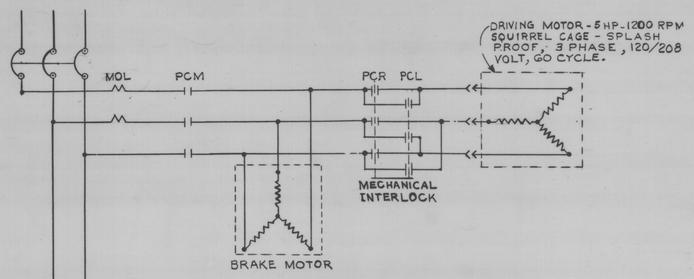
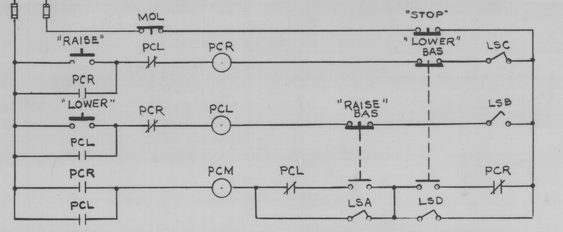
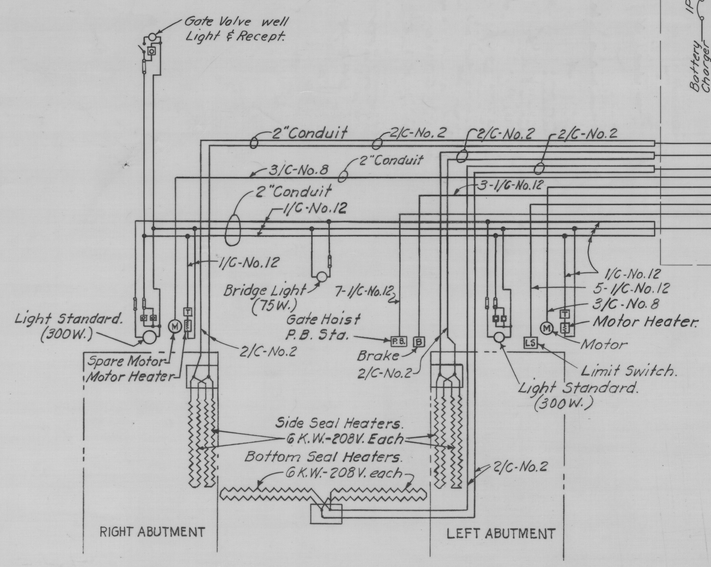
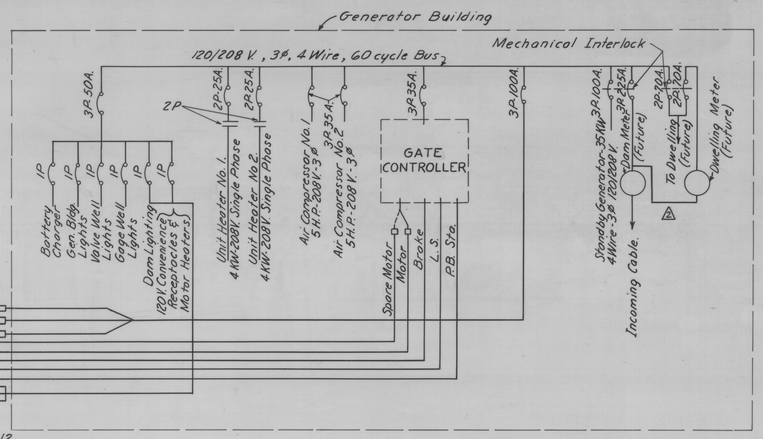




ELEMENTARY GATE CONTROL WIRING DIAGRAM





WIRING DIAGRAM

SEQUENCE OF LIMIT SWITCH OPERATION

CONTACT DESIGNATION	CIRCUIT DUTY	REVOLUTIONS OF SHAFT: OVER-TRAVEL LOWERED	LOWERED	RAISED	OVER-TRAVEL RAISED	DIRECTION OF GATE TRAVEL FOR SWITCH TO OPERATE AT POSITION SHOWN
LSA	STOP MOTOR OVERTRAVEL LOWERED					LOWERING
LSB	STOP MOTOR GATE LOWERED					LOWERING
LSC	STOP MOTOR GATE RAISED					RAISING
LSD	STOP MOTOR OVERTRAVEL RAISED					RAISING

CONTACT CLOSED ▬ CONTACT OPEN ▭

LEGEND OF DEVICE SYMBOLS

- Air Circuit Breaker
- Fuse
- MOL Magnetic Overload Relay
- MOL Magnetic Overload Relay Contact
- Contactor Coil
- Contact Normally Open
- Contact Normally Closed
- Disconnecting Device
- PCR Power Contactor-Raise
- PCL Power Contactor-Lower
- PCM Power Contactor-Main
- BAS Backout Switch
- Control Switch Normally Open, Closed When Pushed In.
- Control Switch Normally Closed, Open When Pushed In.
- LS Double Pole Single Throw Switch Limit Switch Contact- A, B, C, and D are Contact Designations.
- T Thermoswitch Control.

SCHEME OF CONTROL

1. GENERAL. a. *The Scheme of Control* for the tainter gate shall be as indicated on the elementary control wiring diagram and as specified below.

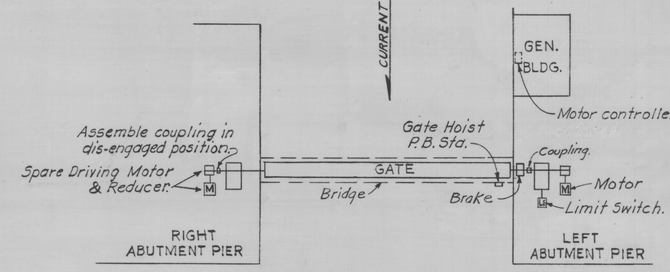
b. *Control Points*: The operation at the gate shall be controlled from a push button station with control switches, marked "Raise", "Lower," and "Stop" and backout switches marked "Raise" and "Lower."

c. *Emergency Operation with Spare Driving Motor*. For operation of gate with the spare driving motor, the driving motor power plug in the generator building shall be inserted in the spare motor receptacle. It will also be necessary to disconnect the disabled motor shaft coupling and engage the spare motor coupling.

2. SEQUENCE OF OPERATION. a. *Raising Operation*: To raise the tainter gate the "Raise" button shall be pushed, held momentarily and then released. The gate motor shall start and run until the gate reaches the raised position where the limit switch shall stop the motor and set the brake. The gate may be stopped at any position during the raising operation by pushing the "Stop" button.

b. *Lowering Operation*: To lower the tainter gate, the "Lower" button shall be pushed, held momentarily and then released. The gate motor shall start and run until the gate reaches the lowered position where the limit switch shall stop the motor and set the brake. The gate may be stopped at any position during the lowering operation by pushing the "Stop" button.

c. *Back out Operation*: If during normal operation, the gate motor should fail to stop when the gate reaches the raised or lowered positions, the over travel limit switch contacts shall stop the motor after a slight over travel. To operate the gate after an overtravel. the backout switch button which indicates travel away from the overtravel position shall be pressed and held in. At the same time proper button - either "Raise" or "Lower" shall be momentarily pressed. When the gate has backed sufficiently to clear both of the limit switch contacts, releasing the backout switch button will then result in no change in operation or motion of the gate and it will continue its movement in the backout direction until the "Stop" button is pressed.



ARRANGEMENT OF ELECTRICAL EQUIPMENT
FOR CONTROL SCHEME ILLUSTRATED

A gate driving motor is provided on each of the piers as shown above. (One a standby motor.)

The gate machinery is provided with a brake, controller, and travel-nut limit switch.

General note:
Items on this dwg. are paid for under payment item No. (55)

SYMBOL	DESCRIPTION	DATE	APPROVAL
	FINISHED STRUCTURE AS OF DEC. 1952		SCN
2	Revised wiring for Dwelling Meter.	June 51	
1	General revisions.	Apr. 51	

CORPS OF ENGINEERS, U.S. ARMY
OFFICE OF THE DISTRICT ENGINEER
ST. PAUL, MINNESOTA

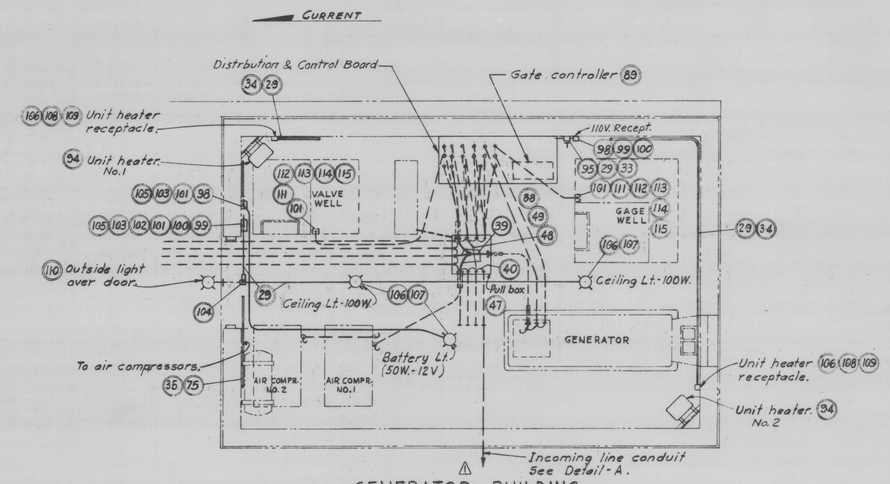
DRAWN BY: C.B.C.
TRACED BY:
CHECKED BY: H.A.T.
SUBMITTED BY: (ACTING) CHIEF DESIGN BRANCH E. Marquiss
APPROVED: (ACTING) CHIEF ENGINEERING DIVISION
APPROVED: CHIEF TECH. ASST. (ACTING)
APPROVED: COL. CORPS OF ENGINEERS

OTTER TAIL RIVER, MINNESOTA
ORWELL DAM
ELECTRICAL
WIRING DIAGRAMS

DATE: APRIL 1951
SCALE: NOT TO SCALE
SPEC. NO. CIVENG 21-018-51-46
DRAWING NUMBER R28-L-56/5,2-FS
SHEET 54 OF 61

57

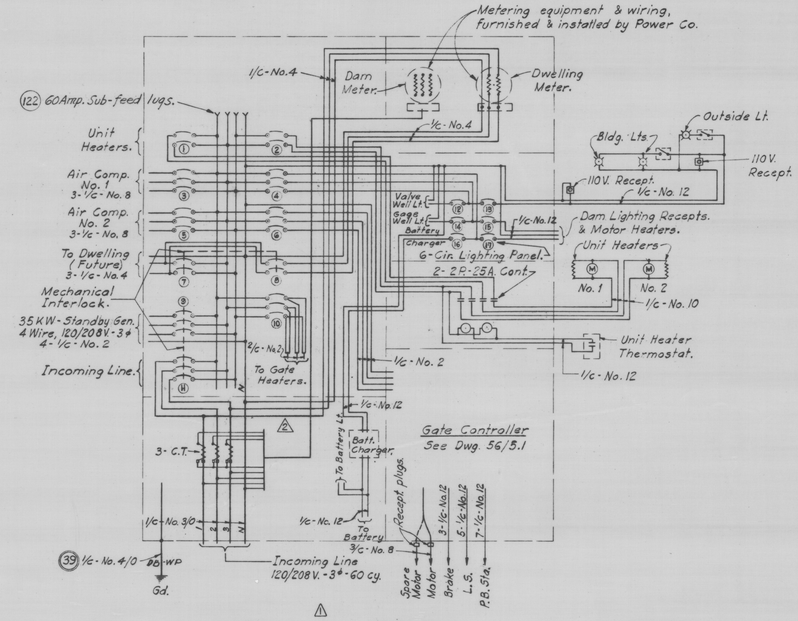
(164)P



GENERATOR BUILDING

SHOWING ARRANGEMENT OF EQUIPMENT

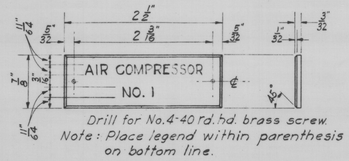
SCALE: 3/8" = 1'-0"



WIRING DIAGRAM

FOR DISTRIBUTION & CONTROL BOARD

C.B. NO.	NAME PLATE LEGEND	NO. POLES	FRAME AMPS.	TRIP AMPS.	CIRC. VOLTS
1	UNIT HEATER (NO.1)	2	50	25	208
2	UNIT HEATER (NO.2)	2	50	25	208
3	AIR COMPRESSOR (NO.1)	3	50	35	208
4	LIGHTING PANEL	3	50	50	120/208
5	AIR COMPRESSOR (NO. 2)	3	50	35	208
6	GATE CONTROLLER	3	50	35	120/208
7	SPARE	2	100	70	120/208
8	SPARE	2	100	70	120/208
9	TAINTER GATE (HEATERS)	3	100	100	208
10	STANDBY (GENERATOR)	3	100	100	120/208
11	INCOMING LINE	3	225	225	208
12	VALVE WELL (LIGHT)	1	50	15	120
13	BUILDING LIGHTS	1	50	15	120
14	GAGE WELL (LIGHT)	1	50	15	120
15	DAM LIGHTS	1	50	15	120
16	BATTERY CHARGER	1	50	15	120
17	MOTOR HEATERS(& DAM RECEPTS.)	1	50	15	120

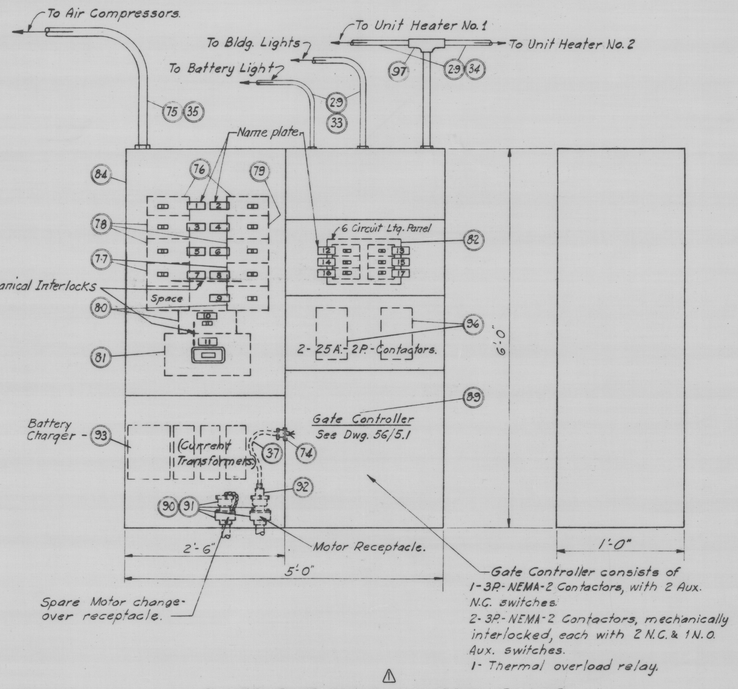


Drill for No.4-40 rd.hd. brass screw.
Note: Place legend within parenthesis on bottom line.

NAME PLATE

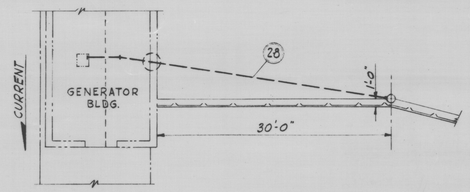
MATERIAL: HOT MOULDED POLISHED BLACK AND WHITE LAMINATED PHENOLIC COMPOUND

Note: Letters and figures on name plates shall be engraved with standard gothic letters cut through black surface into white layer of name plate with .025" dia. cutter.

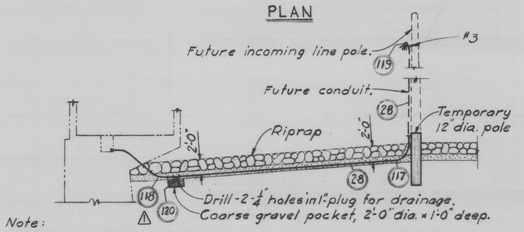


DISTRIBUTION & CONTROL BOARD

SCALE: 1" = 1'-0"



PLAN



Note: Remove sharp edges on the inside of tee fitting (120)

SECTION

DETAIL-A

SHOWING INCOMING LINE CONDUIT

SCALE: 1/8" = 1'-0"

General notes:
(34) Indicates item in List of Parts Not Detailed shown on dwg. 56/7.1.
Items on this dwg. are paid for under payment item No. (55)

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1	General revisions.	Apr. 51	

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OFFICE OF THE DISTRICT ENGINEER
ST. PAUL, MINNESOTA

DRAWN BY: A.J.J.
TRACED BY:
CHECKED BY: H.A.T.
SUBMITTED BY: L. Margulies, CHIEF DESIGN BRANCH
APPROVED: [signature], CHIEF ENGINEERING DIVISION
APPROVED: [signature], COL. CORPS OF ENGINEERS

OTTER TAIL RIVER, MINNESOTA
ORWELL DAM
ELECTRICAL
GENERATOR BUILDING
WIRING & EQUIPMENT

APPROVED: [signature], CHIEF TECH. ASST.
DATE: APRIL 1951
SCALE: AS SHOWN
SPEC. NO. CIVENG 21-018-51-46
DRAWING NUMBER R28-L-56/6.2-FS
SHEET 55 OF 61

SEE STATES ELECTRIC MFG. CO. DWG. NO. 3633 FOR SWITCHBOARD