FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
DIVISION OF DAM SAFETY AND INSPECTIONS
NEW YORK REGIONAL OFFICE
19 West 34th Street - Suite 400
New York, New York 10001

Office No. (212) 273-5900 **FAX No. (212) 631-8124**

In reply refer to:

P-10675-MA
NATDAM No MA00721
Dwight

Plan and Schedule to Repair
Penstocks Nos. 2, 3, &4

May 5, 2014

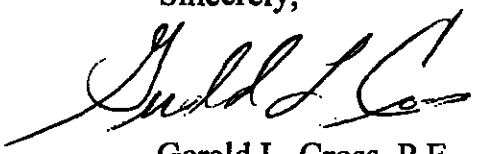
Mr. Kim C. Marsili
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

By letter dated April 11, 2014, in response to our February 12, 2014 letter, you provided a plan and schedule to repair or replace the existing penstocks, rehabilitate the gate operator for penstock No. 2, and investigate and grout, if necessary, any voids around the penstocks. A preliminary design report is to be submitted by May 12, 2014. We find your plan and schedule acceptable as submitted. Please notify us if there are any changes or delays with respect to the time line provided.

Your continue cooperation to these matter is appreciated. If you have any question please contact Mr. John Spain, P.E., at 212-273-5954.

Sincerely,



Gerald L. Cross, P.E.
Regional Engineer

Document Content(s)

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
Division of Dam Safety and Inspections - New York Regional Office
19 West 34th Street – Suite 400
New York, New York 10001

Office No. (212) 273-5900 **FAX No. (212) 631-8124**

In reply refer to:
P-10675-MA
NATDAM ID No. MA00721

Dwight
Void Investigation

May 9, 2014

Mr. Kim Marsili
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili,

By letter dated February 12, 2014, you were asked to investigate the extent of voids created by the penstocks and evaluate if any remediation is necessary to assure the integrity of the mill building.

By letter dated April 11, 2014, you provided a plan and schedule that included a geophysical survey to investigate the voids around the penstock. Your attached plan was to complete the void investigation by May 12, 2014.

By email dated May 8, 2014, you notified us that the void investigation had not yet commenced due to a financial analysis to replace the penstocks and that it would be an additional 45 days before any action would be taken.

While we understand that a cost analysis is necessary to choose your course of action for repairing or replacing the penstocks, the void investigation must be prioritized to ensure public safety. If not immediately addressed, the existence of any voids would risk the structural integrity of the mill building and would present an unacceptable risk to the lives of its inhabitants. Please complete the investigation within 30 days of this letter.

If you have any questions, please contact Mr. John Spain at (212) 273–5954

Sincerely,

Gerald L. Cross, P.E.
Regional Engineer

Document Content(s)

May 13, 2014

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Dwight Hydroelectric Project – FERC No. 10675-MA
NATDAM ID No. MA00721
Dwight Project – Plan and Schedule to Repair Penstocks Nos. 2, 3, &4

Dear Mr. Cross:

Essential Power Massachusetts, LLC (EP) submits this letter in response to your May 5, 2014 letter finding our plan and schedule acceptable to repair or replace the existing penstocks, rehabilitate the gate operator for penstock No. 2 and investigate and grout, if necessary, any voids around the penstocks. In your response you ask to be notified of any change or delay in the schedule. We are unable to provide the preliminary design report, Task 4, as shown in the tentative schedule at this time. EP has received the Penstock Options Report and is currently in the process of performing a financial analysis. We estimate approximately 30 days to complete a thorough economic analysis of the facility. Until the analysis is complete, all the other tasks are on hold with the exception of Task 7, Void Investigation. The void investigation has not yet been completed, however, we are currently making arrangements to hopefully have this completed within the next 30 days.

REVISED PROPOSED REPAIR SCHEDULE

We have revised the anticipated schedule for the tasks previously outlined and submitted to you. This is a preliminary and tentative schedule (Table 1 below) that will need to be updated once a final repair/replacement scheme is chosen.

Table 1: Preliminary Schedule (Revised May 2014)

TASK	ANTICIPATED	
	START DATE	END DATE
Preliminary Design Phase:		
Task 1 – Preliminary Design Site Visit	Completed	
Task 2 – Survey	Completed	
Task 3 – Penstock Options Report	Completed	Completed
Task 3a- Economic Analysis	Ongoing	1st week of June
Task 4 – FERC Preliminary Design Submittal	Week of June 13, 2014	
Final Design Phase:		
Task 5 – Penstock Final Design and Technical Documents	TBD	TBD
Task 6 – Gate Final Design and Technical Documents	TBD	TBD
Task 7 – Void Investigation	June 13, 2014	June 13, 2014
Construction Phase:		
Task 8 – Contractor Bidding	TBD	TBD
Task 9 – Construction	TBD	TBD

If you have any questions or require additional information regarding this filing, please contact me at 413.730.4271 (email: kim.marsili@essentialpowerllc.com). This letter was prepared in accordance with the requirements of 18 CFR 12.10(a).

Sincerely,

Kim Marsili
Station Manager
Essential Power Massachusetts, LLC

cc: John Bahrs VP Power Generation Services

Document Content(s)

ESSENTIAL POWER

September 15, 2014

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

18 CFR 12.10(a) Report – FERC No. P-10675-MA
RE: Oral Notification Follow Up

Dear Mr. Cross:

Essential Power Massachusetts, LLC (EP) submits this letter to follow up on the oral notification made on 11/14/14 to John Spain that a section of the Dwight Station canal was dug out during a project to demo a burned out coal storage building adjacent to the canal. The City of Chicopee was the party responsible for the demo of the coal storage building. Essential Power was not informed about this work which was done while the canal was dewatered for grouting work around the unit penstocks, but saw the affected section of canal wall after it was altered.

The picture was taken with the canal drawn down approximately two feet below typical elevation, which can be seen on the water line. The town has been contacted about repairing the damage in a manner that will prevent erosion when the station is eventually

returned to service. The canal currently has standing water in it to keep water pipes in the canal from freezing. We see no immediate issues with leaving the canal in this state while plans are made for a repair.

If you have any questions or require additional information regarding this filing, please contact me at 413.730.4271 (email: kim.marsili@essentialpowerllc.com).

Sincerely,

Kim Marsili
Station Manager

cc: John Bahrs, VP. PGS. Essential Power LLC™
Jillian Davis, P.E. Structural Engineer Kleinschmidt Associates

Document Content(s)

ESSENTIAL POWER

November 12, 2014

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Dwight Hydroelectric Project – FERC No. 10675-MA
NATDAM ID No. MA00721
Dwight Project – Dwight Penstock Void Grout Injection Program Completed

Dear Mr. Cross:

Essential Power Massachusetts, LLC (EP) submits this letter to update you on the status of the investigation into the extent of voids beneath the penstocks at our Dwight Hydroelectric Project.

EP retained Kleinschmidt Associates (Kleinschmidt) in April 2014 to coordinate investigation of the extent of the voids and determine an appropriate grout injection program based on the investigation results. The void investigation was completed on June 23, 2014 by Hager GeoScience, Inc. (HGI). Based on the results of HGI's report, Kleinschmidt developed a Grout Injection Program which was completed by Knowles Industrial Services Corporation (Knowles) on November 5, 2014.

Grout was injected into the surrounding soil through taps in the penstock walls spaced at approximately 6 feet on center for the length of all 3 buried penstocks. The grout pumped had a water cement ratio of approximately 0.70. Knowles recorded grout takes, overflows, and spillage in their observation notes of the grout program. The total grout placed throughout this project was close to 22 cubic yards. The powerhouse crawl space was inspected during grouting and no more than ¼ cubic yard was lost into this space from exterior voids due to seepage through the powerhouse foundation wall.

If you have any questions or require additional information regarding this filing, please contact me at 413.730.4271 (email: kim.marsili@essentialpowerllc.com).

Sincerely,

Kim Marsili
Station Manager

cc: John Bahrs, VP. PGS. Essential Power LLC™
Gerald Adamski Director of Compliance Essential Power LLC
Jillian Davis, P.E. Structural Engineer Kleinschmidt Associates

Document Content(s)

Kleinschmidt

December 23, 2014

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Dwight Hydroelectric Project – FERC No. 10675-MA
NATDAM ID No. MA00721
Dwight Project – Dwight Penstock Void Grout Injection Program Results

Dear Mr. Cross:

Kleinschmidt Associates (Kleinschmidt) submits this letter report in response to your letter to Mr. Kim Marsili of Essential Power Massachusetts, LLC (EP) dated November 25, 2014 (Attachment A) which requested the results of the grout injection program to fill the voids beneath the penstocks at the Dwight Hydroelectric Project. The November 25, 2014 letter requested additional information regarding the grout injection program not contained in EP's November 12, 2014 letter to you.

TIMELINE OF PROJECT

EP retained Kleinschmidt Associates (Kleinschmidt) in April 2014 to coordinate investigation into the extent of the voids for all three penstocks. Kleinschmidt recommended a grout injection program based on the results of the investigation that was completed by Hager GeoScience, Inc. (HGI) on June 23, 2014. The grout injection program was completed by Knowles Industrial Services Corporation (Knowles) on November 5, 2014.

GROUT INJECTION PROGRAM RESULTS

The grout injection program consisted of two phases. Phase I included grouting of the voids between the entrance to each of the three penstocks (Sta. 0+00) and where the penstocks meet the courtyard between the Cabotville Mill building and the powerhouse (Sta. 0+90). Phase II included the grouting along the portions of the three penstocks buried below the courtyard (Sta. 0+90 - Sta. 1+40). Drawings prepared by Kleinschmidt detailing the grout injection program are included with this report as Attachment B.

A post-construction letter from Knowles to Kleinschmidt dated November 5, 2014, summarizing the grouting work as well as information detailing locations of the grout injections and grout takes, is included in this report as Attachment C. Ports for injection were placed by Knowles based on initial sounding of the penstocks after the penstocks had been dewatered and cleaned. The locations of the

grout injections are included in Knowles' letter as hand-drawn sketches including stationing. The sketch stationing corresponds to the stationing on the drawings included in Attachment B.

Grout was injected into the surrounding soil through taps in the penstock walls spaced at approximately 6 feet on center for the length of all three buried penstocks. The grout pumped had a water cement ratio of approximately 0.70. Knowles recorded hole locations and conditions, grout takes, overflows, spillage, and observations in their notes of the grout program. This information is organized in a table included in Attachment C. Along each penstock, Knowles observed grout exiting multiple holes during pumping. The multiple exit points confirm that a number of void holes were interconnected and sufficiently filled with grout. Knowles noted pressures ranging from a minimum of 1 psi to a maximum of 10 psi at each hole location. A review of the notes and tabulated grout takes provided by Knowles indicates that grout was either pumped into or observed flowing out of most of the ports where voids were noted. A few holes were noted as having voids, but no grout take was measured.

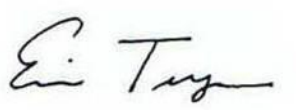
The total grout placed throughout this project was close to 22 cubic yards. The powerhouse crawl space was inspected during grouting and no more than ¼ cubic yard was lost into this space from exterior voids due to seepage through the powerhouse foundation wall.

CONCLUSION

Based on the information provided by Knowles, it is Kleinschmidt's opinion that the grouting injection program was completed successfully in accordance with the plans and specifications. Based on the volume and pressure of grout injected and the grout return through adjacent holes, it is likely that the majority of void spaces around the three buried penstocks were substantially filled. It is also Kleinschmidt's opinion that the injected grout provides additional support to and along the penstocks, as well as improves the structural support of the Cabotville Mill building.

If you have any questions or require additional information regarding this filing, please contact me at 207.487.3328 (email: eric.turgeon@kleinschmidtgroup.com).

Sincerely,



Eric Turgeon
Project Manager

Attachments: A - FERC Correspondence (11-25-2014)
B - Dwight Penstock Void Grouting Plan Drawings
C - Knowles Post-Construction Letter, Sketches & Notes

cc: John Spain, FERC
Kim Marsili, EP
Nicholas Hollister, EP

ATTACHMENT A

FERC CORRESPONDENCE (11-25-2014)

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
DIVISION OF DAM SAFETY AND INSPECTIONS
NEW YORK REGIONAL OFFICE
19 West 34th Street - Suite 400
New York, New York 10001

Office No. (212) 273-5900 **FAX No. (212) 631-8124**

In reply refer to:
P-10675-MA Dwight Station
NATDAM ID No. MA00721

Penstock Void Grout Injection

November 25, 2014

Mr. Kim C. Marsili
Essential Power, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

By letter dated November 12, 2014 you notified us that a grout injection program was completed to fill voids around the project's penstocks. Within 45 days from the date of this letter please submit a report providing locations of grout injections and grout takes along with any noteworthy items observed during the injection program. In addition, please have your consultant who developed the grouting program review and provide comment as to the effectiveness of the program to fill the void spaces.

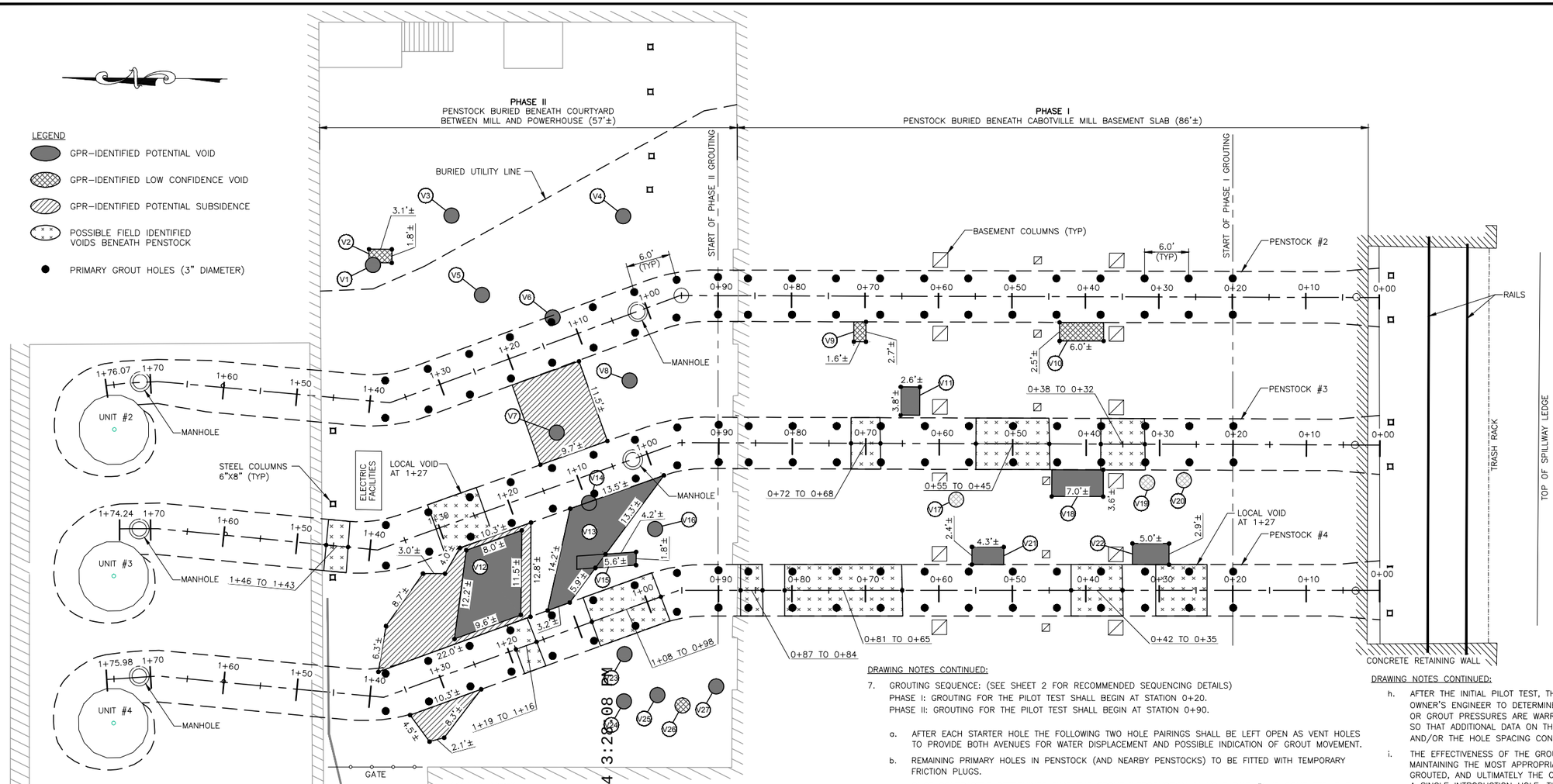
If you have any questions, please contact Mr. John Spain, P.E. at (212) 273-5954. Your cooperation in this matter is appreciated.

Sincerely,

Gerald L. Cross, P.E.
Regional Engineer

ATTACHMENT B

DWIGHT PENSTOCK VOID GROUTING PLAN DRAWINGS



VOID TABLE	
V#	DEPTH
V1	4.0'
V2	1.0'–1.5'
V3	4.0'
V4	??
V5	3.5'
V6	3.5'
V7	2.5'
V8	1.0'
V9	3.0'
V10	??
V11	0.5'
V12	3.5'–4.0'
V13	2.5'–3.0'
V14	2.5'–3.0'
V15	3.0'
V16	5.5'
V17	4.0'
V18	1.0'–2.0'
V19	2.5'
V20	2.5'
V21	0.5'
V22	3.5'
V23	3.0'
V24	2.5'
V25	4.5'
V26	4.0'
V27	3.5'

NOTES:
1. DEPTHS ARE IN FEET FROM GROUND LEVEL TO APPROXIMATE TOP OF VOID.
2. TOP OF PENSTOCK APPROXIMATELY 1' BELOW GRADE.

DRAWING NOTES:

1. VOID LOCATIONS SHOWN BENEATH PENSTOCKS PER NOVEMBER/DECEMBER 2013 KLEINSCHMIDT FIELD OBSERVATIONS.
2. GPR IDENTIFIED VOID LOCATIONS PER HAGER GEOSCIENCE, INC. JUNE 2014 REPORT "GEOPHYSICAL INVESTIGATION – VOID INSPECTION – DWIGHT HYDROELECTRIC STATION".
3. PENSTOCK LAYOUT AND STATIONING PER NORTH BY NORTHEAST SURVEY AND MAPPING CONSULTANTS, APRIL 2014.

WORK PHASING:

1. PHASE I – GROUTING BENEATH CABOTVILLE MILL BUILDING BETWEEN STA. 0+20 AND 0+90 OF EACH PENSTOCK.
2. PHASE II – GROUTING BENEATH COURTYARD BETWEEN STA. 0+90 AND 1+45 OF EACH PENSTOCK.

GROUTING:

1. INITIAL PILOT TEST SHALL BE PERFORMED USING THE SUGGESTED GROUT MIX SHOWN BELOW AND THE PRIMARY GROUT HOLE SPACING NOTED. GROUT TAKES SHALL BE MEASURED AND THE RESULTS EVALUATED BY THE CONTRACTOR SO THAT ADJUSTMENTS TO THE GROUTING PROGRAM CAN BE MADE.
2. ANY ADJUSTMENTS TO THE GROUTING PROGRAM AS SUGGESTED BY THE CONTRACTOR SHALL BE APPROVED BY THE OWNER OR THE OWNERS ENGINEER.
3. INITIAL GROUT MIX: ASTM C150 TYPE 1 PORTLAND CEMENT, AND WATER.
   WATER/CEMENT: 0.70 TO BE FIELD ADJUSTED SEE NOTES 8e AND 8f.
   INITIAL TARGET MARSH FUNNEL TEST (ASTM D6910) SHALL BE 45 TO 55 SECONDS.
4. PRIMARY GROUT HOLE SPACING: PAIRED PRIMARY GROUT HOLES (2" DIAMETER) SHALL BE INITIALLY DRILLED ON A 6'–0" SPACING FROM THE 4 AND 8 O'CLOCK POSITIONING FROM THE INTERIOR OF THE PENSTOCKS.
5. SECONDARY GROUT HOLES MAY BE NECESSARY IN BETWEEN THE PRIMARY HOLES, DEPENDING ON FIELD CONDITIONS OBSERVED.
6. GROUT PRESSURES: GROUT SHALL BE PUMPED TO THE PRIMARY GROUT HOLES AND ALLOWED TO FLOW UNDER MINIMUM OF 5 FEET OF GRAVITY PRESSURE INTO THE DOWNSTREAM VOIDS. IF FLOW UNDER GRAVITY DOES NOT APPEAR EFFECTIVE, IT MAY BE NECESSARY TO SWITCH TO PUMPING THE GROUT UNDER LOW PRESSURE. THIS DETERMINATION WILL BE MADE BY THE CONTRACTOR DURING THE PILOT TEST BASED ON OBSERVATIONS AT THE VENT HOLES AND OTHER INDICATIONS OF GROUT MOVEMENT AND DISTRIBUTION OUTWARD FROM THE INTRODUCTION HOLE (E.G. VOLUME OF TAKE, RATE OF MOVEMENT, ETC.).

DRAWING NOTES CONTINUED:

7. GROUTING SEQUENCE: (SEE SHEET 2 FOR RECOMMENDED SEQUENCING DETAILS)
   PHASE I: GROUTING FOR THE PILOT TEST SHALL BEGIN AT STATION 0+20.
   PHASE II: GROUTING FOR THE PILOT TEST SHALL BEGIN AT STATION 0+90.
   a. AFTER EACH STARTER HOLE THE FOLLOWING TWO HOLE PAIRINGS SHALL BE LEFT OPEN AS VENT HOLES TO PROVIDE BOTH AVENUES FOR WATER DISPLACEMENT AND POSSIBLE INDICATION OF GROUT MOVEMENT.
   b. REMAINING PRIMARY HOLES IN PENSTOCK (AND NEARBY PENSTOCKS) TO BE FITTED WITH TEMPORARY FRICTION PLUGS.
   c. ONCE CONTRACTOR DETERMINES THAT THE GROUT INTRODUCTION IN HOLE PAIR #1 IS COMPLETE, THE OBSERVATIONS AT THE REMAINING OPEN PRIMARY AND VENT HOLES SHALL BE USED TO DETERMINE MOST APPROPRIATE PRIMARY GROUT HOLE TO USE FOR THE NEXT INTRODUCTION EFFORT AND/OR WHETHER MODIFICATIONS TO THE GROUT HOLE PATTERNS AND SPACING OR OTHER PROCEDURES ARE WARRANTED.
8. MEASUREMENT AND ASSESSMENT CRITERIA:
   a. ALL DOCUMENTATION TO BE SUBMITTED TO OWNER AND OWNERS ENGINEER.
   b. CONTRACTOR SHALL RECORD ALL OBSERVATIONS MADE REGARDING AMOUNT OF WATER AND GROUT EFFLUENT AT VENT HOLE LOCATIONS.
   c. IF A CONSISTENT STREAM OF FRESH GROUT IS OBSERVED FLOWING OUT OF THE VENT HOLES THE GROUTING IN THE PRIMARY HOLES WILL BE TERMINATED AND THE NEXT DOWNSTREAM HOLE PAIRING WILL SERVE AS THE NEXT INJECTION POINT AND THE PROCESS REPEATS.
   d. IF THERE IS A MEASURABLE VOID IN THE HOLE BEING GROUTED AND THE GROUT FLOW STOPS (I.E. NO LONGER FREELY FLOWING INTO THE INTRODUCTION HOLE) THE GROUTING SHALL BE TERMINATED AT THAT HOLE AND A FRICTION PLUG SHALL BE FITTED IN THE HOLE. GROUTING SHALL THEN PROCEED TO THE NEXT HOLE IN THE SEQUENCE.
   e. IF THERE ARE STILL MEASURABLE VOIDS AT EACH OF THE INITIAL PILOT HOLES AFTER GROUTING THEM, IT MAY BE NECESSARY TO ADJUST THE CONSISTENCY OF THE GROUT MIX TO MAKE IT THINNER, BY SLIGHTLY INCREASING THE WATER CEMENT RATIO.
   f. CONVERSELY, IF THE GROUT IS READILY FLOWING TO ADJACENT PENSTOCK HOLES IT MAY BE DESIRABLE TO MAKE THE MIX SLIGHTLY THICKER.
   g. ANY ADJUSTMENTS TO THE MIX DESIGN AND MARSH FUNNEL TEST RESULTS SHALL BE DOCUMENTED BY THE CONTRACTOR.

DRAWING NOTES CONTINUED:

   h. AFTER THE INITIAL PILOT TEST, THE DATA SHALL BE REVIEWED BY CONTRACTOR AND OWNER OR OWNER'S ENGINEER TO DETERMINE IF ADJUSTMENTS TO THE MIX DESIGN, PRIMARY HOLE SPACING OR GROUT PRESSURES ARE WARRANTED. IT MAY BE NECESSARY TO EXPAND THE INITIAL PILOT TEST SO THAT ADDITIONAL DATA ON THE REACH OF GROUT OUTWARD FROM THE INTRODUCTION HOLES AND/OR THE HOLE SPACING CONFIGURATION CAN BE FURTHER EVALUATED.
   i. THE EFFECTIVENESS OF THE GROUT INJECTION METHOD WILL DEPEND ON DETERMINING AND MAINTAINING THE MOST APPROPRIATE VISCOSITY OF THE GROUT, THE SIZE OF THE VOID BEING GROUTED, AND ULTIMATELY THE OVERALL EXTENT THAT GROUT IS BEING PUSHED OUTWARDS FROM A SINGLE INTRODUCTION HOLE. THE PLAN WILL HAVE TO REMAIN FLEXIBLE AND WILL LIKELY REQUIRE CONTRACTOR ADJUSTMENTS IN THE FIELD TO BEST SUIT CONDITIONS ENCOUNTERED.
   j. VISUAL OBSERVATIONS OF THE POWERHOUSE BASEMENT AND EXTERIOR COVER SHALL BE MADE ON A REGULAR BASIS DURING THE GROUTING PROCESS, ALONG WITH ANY OTHER DRAINS OR OTHER AVENUES OF POTENTIAL WATER OR GROUT MOVEMENT AND THESE OBSERVATIONS RECORDED.
9. PERMANENT PATCHING OF GROUT HOLES – NONE REQUIRED

PRELIMINARY
NOT FOR
CONSTRUCTION

8 0 8 16
SCALE IN FEET

No.	Revision	Date	Drawn	Checked
-	FOR CLIENT REVIEW	-	-	-

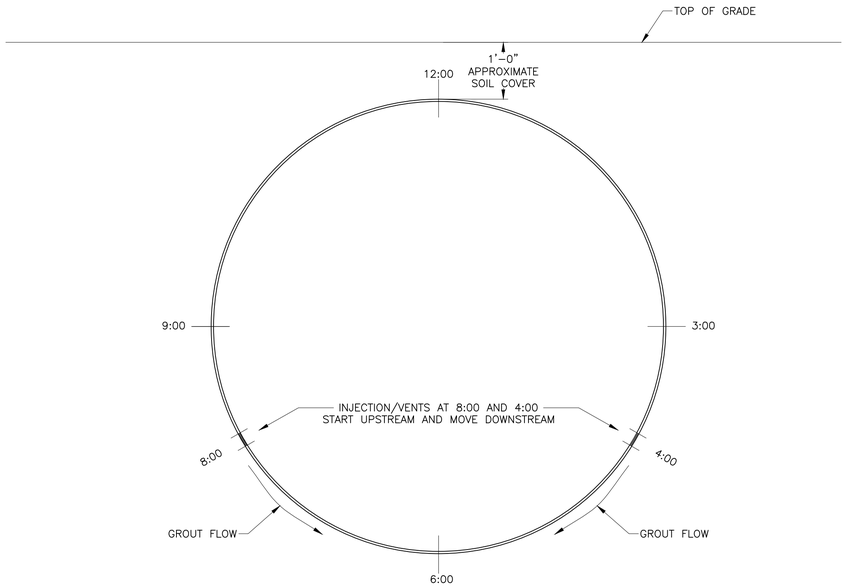
ESSENTIAL POWER MASSACHUSETTS, LLC
CHICOPEE, MA

DWIGHT STATION
PENSTOCK VOID GROUTING PROGRAM

DWIGHT PENSTOCK
VOID GROUTING PLAN

Kleinschmidt 888-224-5942 KleinschmidtGroup.com

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
JLD	RMD	TLK	803-031	8-29-14	1



TYPICAL PENSTOCK SECTION LOOKING DOWNSTREAM

3/4"= 1'-0"

GROUTING SEQUENCE

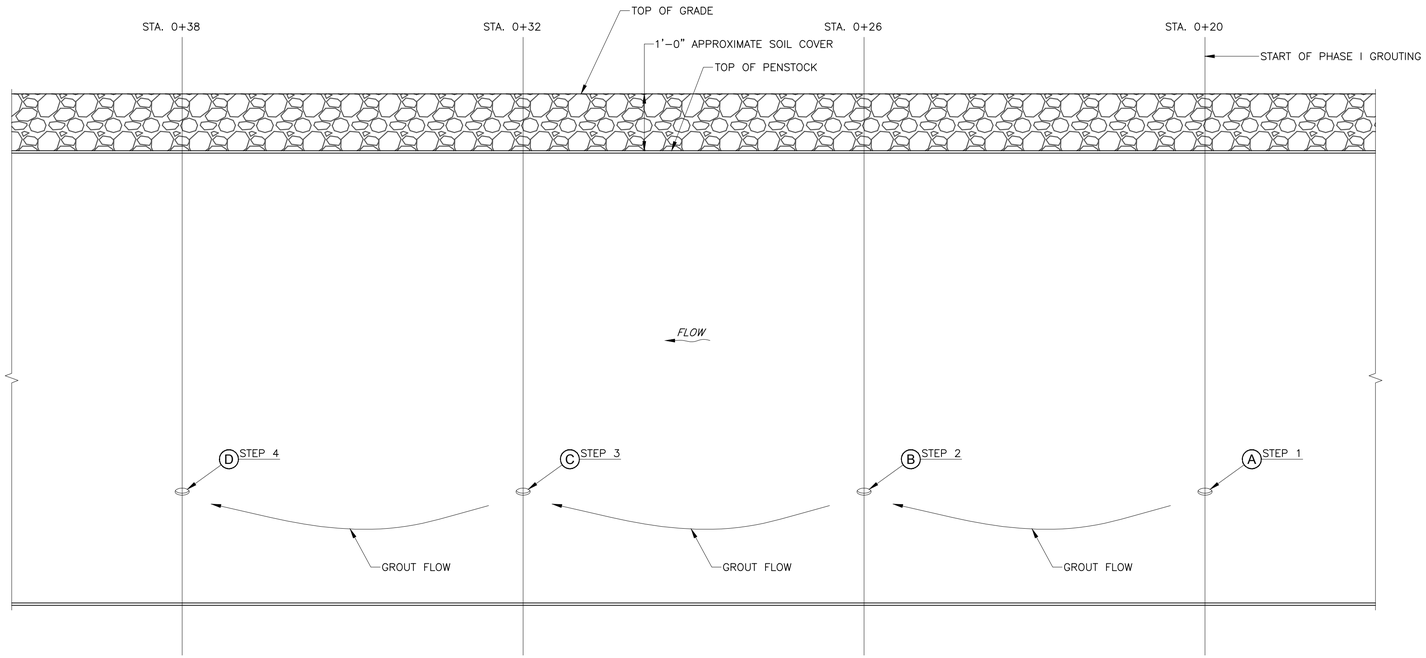
STEP 1 – INJECT AT (A) WAIT FOR FLOW OUT (B) TEMPORARY PLUG ON (A)

STEP 2 – INJECT AT (B) WAIT FOR FLOW OUT (C) TEMPORARY PLUG ON (B)

STEP 3 – INJECT AT (C) WAIT FOR FLOW OUT (D) TEMPORARY PLUG ON (C)

STEP 4 – CONTINUE GROUTING SEQUENCE FROM (D) ONWARD

CONTINUE SEQUENCE AS NECESSARY FOR **PHASE I** AND **PHASE II**



RECOMMENDED PENSTOCK GROUTING SEQUENCE DETAIL

3/4"= 1'-0"

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	Revision	Date	Drawn	Checked
-	FOR CLIENT REVIEW	-	-	-

ESSENTIAL POWER MASSACHUSETTS, LLC
CHICOPEE, MA

DWIGHT STATION
PENSTOCK VOID GROUTING PROGRAM

DWIGHT PENSTOCK
RECOMMENDED GROUTING SEQUENCE DETAIL

Kleinschmidt
888-224-5942
KleinschmidtGroup.com

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
JLD	RMD	TLK	803-031	8-29-14	2

ATTACHMENT C

KNOWLES POST-CONSTRUCTION LETTER, SKETCHES & NOTES

KNOWLES INDUSTRIAL SERVICES CORPORATION

295 NEW PORTLAND ROAD
GORHAM, MAINE 04038
(207) 854-1900
(207) 854-4996 FAX
www.knowlesindustrial.com

November 5, 2014

Jillian Davis, P.E.
Structural Engineer
Kleinschmidt Associates
P.O. Box 650
141 Main Street
Pittsfield, ME 04967

RE: Dwight Penstock Void Grouting Plan – KISC Post-Construction Information

Mrs. Davis:

Please find an enclosed CD ROM containing videos, photographs, and field data I've compiled throughout the duration of the EP Dwight Penstock Void Grouting Project in Chicopee, MA. The videos and photographs depict various stages throughout construction and are evidence of the grouting program carried out by Knowles Industrial Services. The CD ROM has information pertaining to grout port placement and grout takes throughout the job.

Ports were placed based upon initial sounding of the penstock after dewatering and cleaning was performed. Port placement can be found in both the grout program and the attached hand-drawn plans. These plans are graphically to scale in the longitudinal dimension. You can extract the approximate stationing of each port based upon graphical interpretation of the plan.

The grout pumped had a water cement ratio of approximately 0.70. Detailed grouting information can be found in this report. Grout takes, overflows, spillage was recorded in the observation notes of the grout program. The total grout placed throughout this project was close to 22 CY. The basement was inspected during grouting and no more than ¼ CY was lost into the basement floor due to seepage between the penstock and foundation wall.

These documents can be part of your construction record and will undoubtedly help with any reports FERC will require as a post-construction follow-up. Please do not hesitate to contact

Andrew Lawson or myself with any questions or additional information you may require from us at this time. It has been great to work with you on this project. Much of the success of this project is attributed to the teamwork displayed by your men. Thank you.

Respectfully,

Billy P. Roy, EIT, A.C.
Project Manager

Unit #2 Penstock

Hole Number	Station	Location	Hole Condition & Soil Notes	Grout Port? (Y/N)	Grout Take (gal)	Grout Take Observations
92	0+21.5	3:00	Apparent Void 1" - 2"	Y	180	Came out on H93, then H94, then H95, Built pressure to 1 psi/penstock steel seemingly soft from severe corrosion
93	0+24.5	3:00	Apparent Void 1" - 2"	Y	0	
94	0+30	4:00	Apparent Void 1" - 2"	Y	0	
95	0+35	4:00	Apparent Void 1" - 2"	Y	0	
96	0+42	3:30	Apparent Void 1" - 2"	Y	0	
97	0+46	4:30	Probe Refusal @ Surface / Dense Clay	N	0	
98	0+55	4:30	Apparent Void 1" - 2"	Y	0	
99	0+61	4:00	Apparent Void 1" - 2"	Y	153	Came out on H101, then H100, then H102, then H124
100	0+65	3:30	Apparent Void 1" - 2"	Y	0	
101	0+69	4:00	Apparent Void 1" - 2"	Y	0	
102	0+75	4:00	Apparent Void 1" - 2"	Y	0	
103	0+79	4:00	Apparent Void 1" - 2"	Y	0	
104	0+83.5	4:00	Probe Refusal @ Surface / Dense Clay	N	0	
105	0+90	4:00	Apparent Void 1" - 2"	Y	0	
106	0+96	4:30	Probe Refusal @ Surface / Dense Clay	N	0	
107	1+06	4:30	Probe Refusal @ Surface / Dense Clay	N	0	
108	1+13	4:00	Apparent Void 1" - 2"	Y	25	
109	1+16	5:00	Probe Refusal @ Surface / Dense Clay	N	0	
110	1+27	4:30	Apparent Void 1" - 2"	Y	51	Came out on H134
111	1+31	4:30	Apparent Void 1" - 2"	Y	0	
112	1+34	4:30	Apparent Void 1" - 2"	Y	0	
113	0+21	8:30	Apparent Void 1" - 2"	Y	77	Came out on H114, then H115, then H116 Built pressure to 4 psi
114	0+24.5	7:30	Apparent Void 1" - 2"	Y	0	

115	0+29	7:30	Apparent Void 1" - 2"	Y	0	
116	0+31.5	8:00	Apparent Void 1" - 2"	Y	0	
117	0+36	9:00	Probe Refusal @ Surface / Dense Clay	N	0	seemed to have green grout @ surface
118	0+40	8:00	Probe Refusal @ Surface / Dense Clay	N	0	seemed to have green grout @ surface
119	0+52.5	7:30	Probe Refusal @ Surface / Dense Clay	N	0	
120	0+60	8:30	Probe Refusal @ Surface / Dense Clay	N	0	
121	0+64	8:00	Apparent Void 1" - 2"	Y	51	Came out on H123, then H122, then H125, then H126, then H103
122	0+68	8:00	Apparent Void 1" - 2"	Y	0	
123	0+71	7:30	Apparent Void 1" - 2"	Y	0	
124	0+74	7:30	Apparent Void 1" - 2"	Y	0	
125	0+77	7:30	Apparent Void 1" - 2"	Y	0	
126	0+81	8:00	Apparent Void 1" - 2"	Y	0	
127	0+84	8:30	Apparent Void 1" - 2"	Y	102	Came out on H104
128	0+90	8:00	Apparent Void 1" - 2"	Y	0	
129	0+91.5	8:30	Apparent Void 1" - 2"	Y	51	Came out on H128, H130, H131
130	1+07	8:00	Apparent Void 1" - 2"	Y	0	
131	1+09	8:00	Apparent Void 1" - 2"	Y	0	
132	1+14	7:30	Apparent Void 1" - 2"	Y	25	
133	1+19	7:30	Apparent Void 1" - 2"	Y	0	
134	1+27	7:00	Apparent Void 1" - 2"	Y	51	Came out on H133
135	1+33	8:00	Apparent Void 1" - 2"	Y	510	Came out H111, then H112, then H137
136	1+36	7:30	Apparent Void 1" - 2"	Y	0	
137	1+40	8:00	Apparent Void 1" - 2"	Y	0	
			Total Grout (Gallons):		1276	
			Total Grout (CY):		6.3	

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DWIGHT STATION

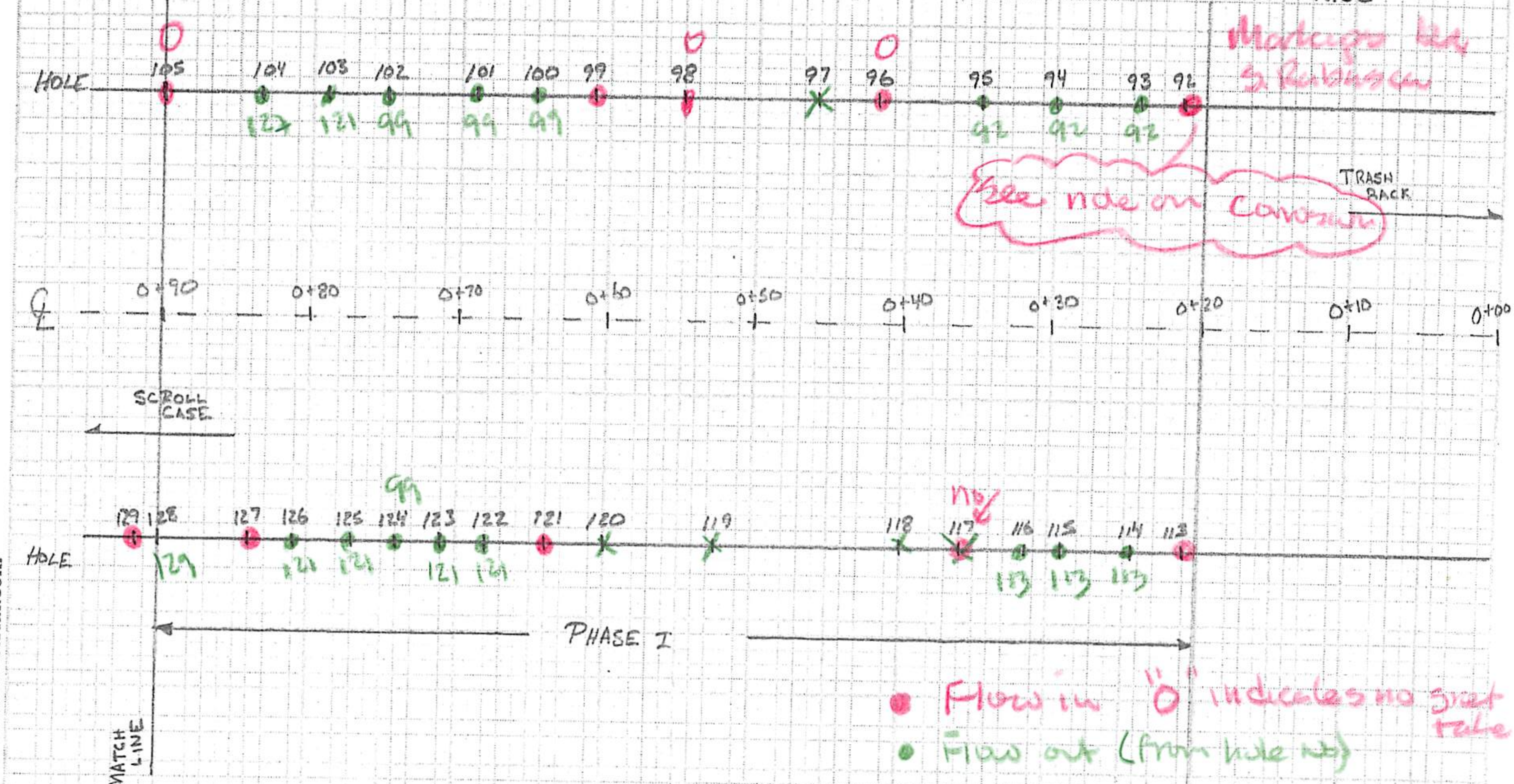
PENSTOCK VOID GROUTING PROGRAM UNIT #2

STATIONS 0+00 to 0+90 (PHASE I)

10/30/14

B. Roy

KISC



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DWIGHT STATION

PENSTOCK VOID GROUTING PROGRAM UNIT # 2

STATIONS 0+90 to 1+50 (PHASE II)

10/30/14

B. Roy

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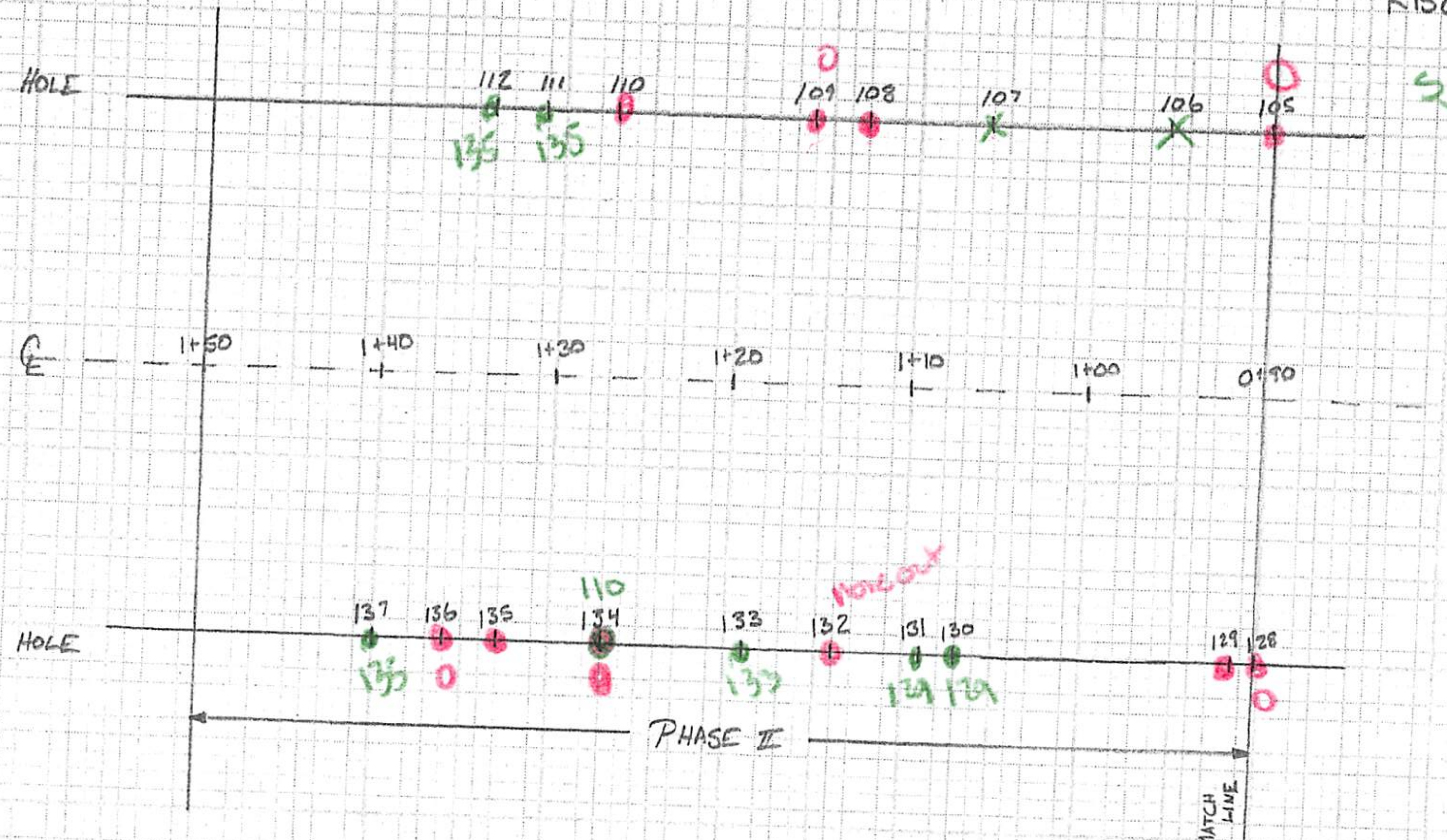

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Unit #3 Penstock

Hole Number	Station	Location	Hole Condition & Soil Notes	Grout Port? (Y/N)	Grout Take (CY)	Grout Take Observations
45	0+22	4:00	Apparent Void 1" - 2"	Y	0.30	Came out @ H46, then H47, then H48, built pressure to 4 psi
46	0+24	4:00	Apparent Void 1" - 2"	Y	0.00	
47	0+26.5	4:00	Apparent Void 1" - 2"	Y	0.00	
48	0+36.5	4:00	Apparent Void 1" - 2"	Y	0.00	
49	0+44	4:00	Apparent Void 1" - 2"	Y	0.50	Built Pressure to 4 psi
50	0+50	4:30	Apparent Void 1" - 2"	Y	0.20	Came out @ H51, then H70, then H71, then H52, built pressure to 4 psi
51	0+56	4:30	Apparent Void 1" - 2"	Y	0.00	
52	0+60.5	4:30	Apparent Void 1" - 2"	Y	0.00	
53	0+67	4:30	Apparent Void 1" - 2"	Y	0.00	
54	0+71.5	4:00	Apparent Void 1" - 2"	Y	0.00	
55	0+76.5	4:00	Apparent Void 1" - 2"	Y	0.00	
56	0+82	4:30	Apparent Void 1" - 2"	Y	0.00	
57	0+91	4:00	Apparent Void 1" - 2"	Y	0.00	
58	0+94	4:30	Probe Refusal @ Surface / Dense Clay	N	0.00	
59	1+06.5	4:30	Apparent Void 1" - 2"	Y	1.00	Came out @ H63, H88, H89, built pressure to 4 psi
60	1+11	4:30	Probe Refusal @ Surface / Dense Clay	N	0.00	
61	1+17	4:30	Apparent Void 1" - 2"	Y	0.00	
62	1+20	4:30	Apparent Void 1" - 2"	Y	1.00	Built pressure to 5 psi
63	1+28	4:30	Probe Refusal @ Surface / Dense Clay	N	0.00	
64	1+36	4:30	Apparent Void 1" - 2"	Y	0.00	
65	0+22	8:00	Apparent Void 1" - 2"	Y	0.50	Came out @ H66, then H67, then H68, built pressure to 4 psi
66	0+25	8:00	Probe Refusal @ Surface / Dense Clay	N	0.00	

67	0+30	7:30	Visible green grout from Unit #4 program	N	0.00	
68	0+35	7:30	Probe Refusal @ Surface / Dense Clay	N	0.00	
69	0+44	8:00	Apparent Void 1" - 2"	Y	0.00	
70	0+50	7:30	Apparent Void 1" - 2"	Y	0.00	
71	0+55.5	8:00	Apparent Void 1" - 2"	Y	0.00	
72	0+61	7:30	Probe Refusal @ Surface / Dense Clay	N	0.00	
73	0+63	8:00	Apparent Void 1" - 2"	Y	0.30	Came out @ H53, then H54, then H78, then H56, then H77, then H55, then H54, then H75, then, H79, then H73, built pressure to 10 psi
74	0+66.5	7:30	Apparent Void 1" - 2"	Y	1.30	Built Pressure to 3 psi
75	0+68	8:00	Apparent Void 1" - 2"	Y	0.00	
76	0+71	7:30	Apparent Void 1" - 2"	Y	0.00	
77	0+75	7:30	Apparent Void 1" - 2"	Y	0.00	
78	0+79	7:30	Apparent Void 1" - 2"	Y	0.00	
79	0+83	8:00	Apparent Void 1" - 2"	Y	0.00	
80	0+91	7:30	Apparent Void 1" - 2"	Y	2.50	Came out @ H82, H81, H60, H59, H83, H84, H61, H62, H85, H86, H58, H57, H87, built pressure to 2 psi
81	0+94	8:00	Apparent Void 1" - 2"	Y	0.00	
82	0+98.5	7:30	Apparent Void 1" - 2"	Y	0.00	
83	1+02	8:00	Apparent Void 1" - 2"	Y	0.00	
84	1+05	8:00	Apparent Void 1" - 2"	Y	0.00	
85	1+13	8:00	Apparent Void 1" - 2"	Y	0.00	
86	1+17	7:30	Apparent Void 1" - 2"	Y	0.00	
87	1+21.5	7:30	Apparent Void 1" - 2"	Y	0.00	
88	1+27	7:30	Probe Refusal / old conc. or grout	N	0.00	
89	1+33	7:30	Probe Refusal / old conc. or grout	N	0.00	
90	1+36	7:30	Probe Refusal / old conc. or grout	N	0.00	
91	1+37.5	7:30	Apparent Void 1" - 2"	Y	0.00	
			Total Grout (Gallons):		N/A	
			Total Grout (CY):		7.6	

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DWIGHT STATION

PENSTOCK VOID GROUTING PROGRAM UNIT #3

STATIONS 0+00 to 0+90 (PHASE I)

10/23/14
B. Roy
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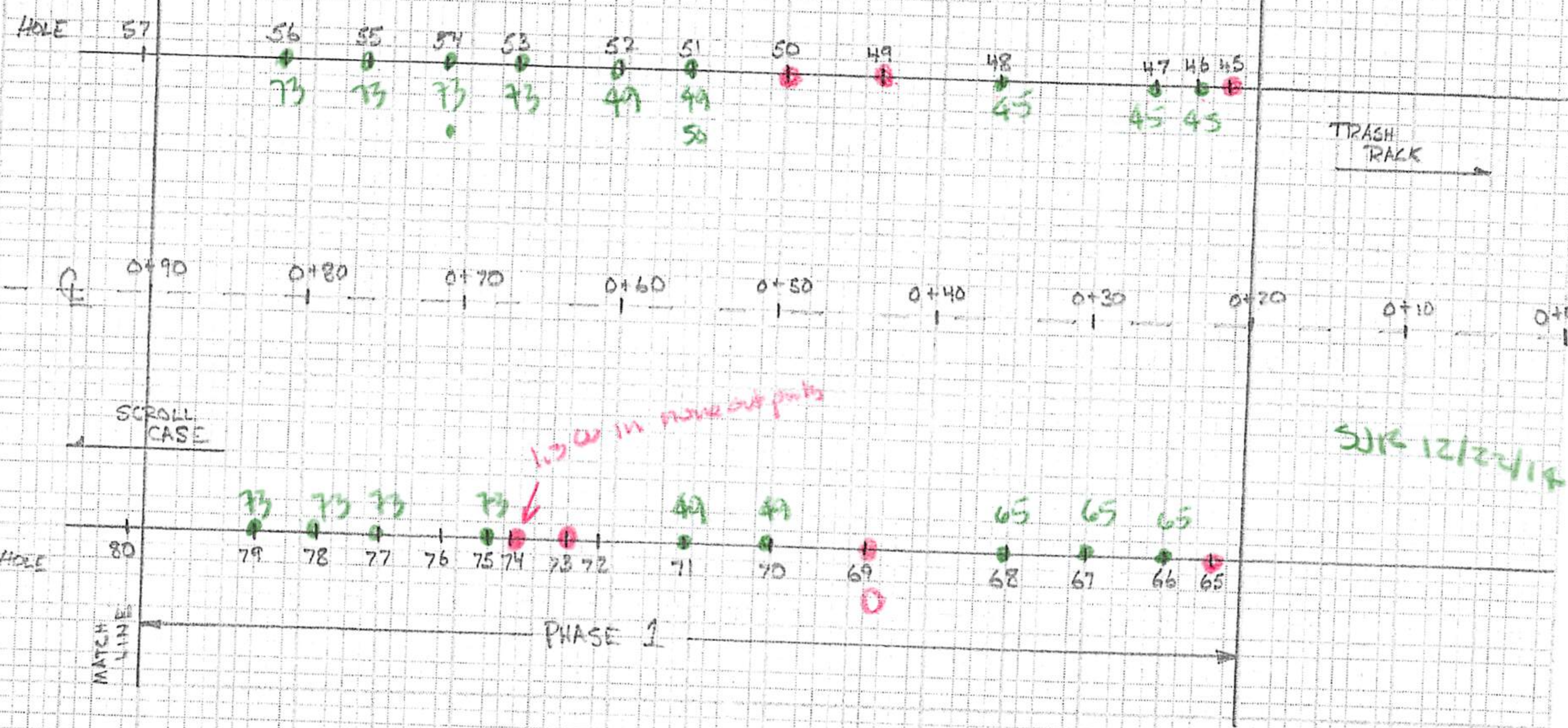

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DWIGHT STATION

PENSTOCK VOID GROUTING PROGRAM UNIT #3

STATIONS 0+90 to 1+50 (PHASE II)

10/23/14
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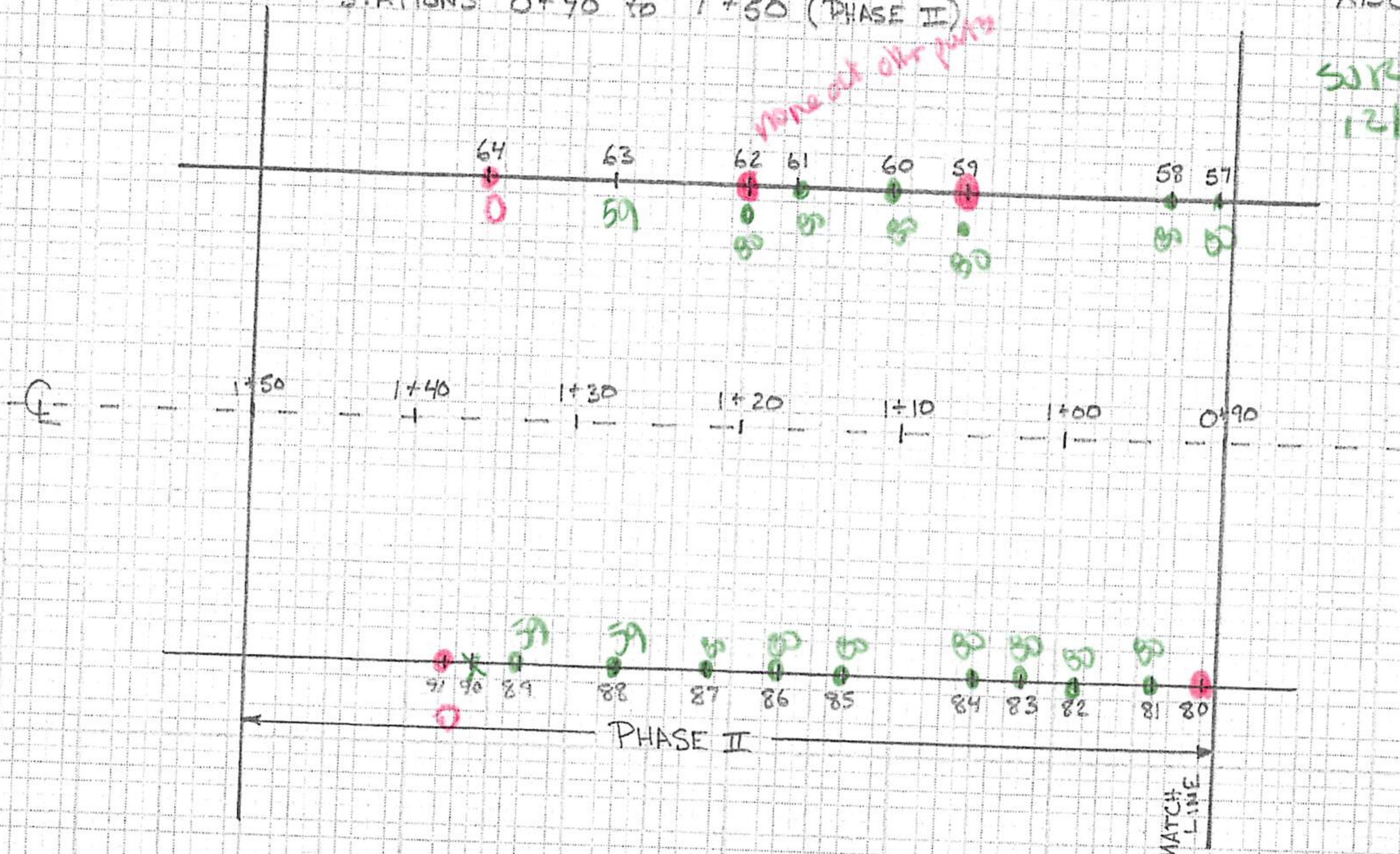
SJR
12/22/14



Unit #4 Penstock

Hole Number	Station	Location	Hole Condition & Soil Notes	Grout Port? (Y/N)	Grout Take (gal.)	Grout Take Observations
1	0+25	4:00	Refusal @ Surface / Dense Clay	N	0	
2	0+29	4:00	Refusal @ Surface / Dense Till	N	0	
3	0+35	4:00	Refusal @ Surface / Dense Till	N	0	
4	0+36.5	5:00	Potential Void 1/2" / Will Grout	Y	306	Came out on H25
5	0+45	4:30	Probe @ 2" / Dense Clay	N	0	
6	0+51	4:30	Probe @ 1" / Dense Clay	N	0	
7	0+56	4:00	Large Void 7" / Will Grout	Y	0	
8	0+60	4:00	Potential Void 1/2" / Will Grout	Y	102	Came out @ H31, then H11, then H10, then H34, then H12, then H33
9	0+69	5:00	Refusal @ Surface / Dense Till	N	0	
10	0+74	4:00	Potential Void 1" / Will Grout	Y	0	
11	0+80	4:00	Apparent Void 1/2" / Will Grout	Y	0	
12	0+83	3:30	Refusal @ Surface / Dense Till	N	0	
13	0+90	4:30	Potential Void / Will Grout	Y	357	Came out @ H15, then H14, then H36, then H16
14	0+94	4:30	Potential Void / Will Grout	Y	0	
15	1+02	4:30	Apparent Void 1/2" / Will Grout	Y	0	
16	1+09	4:00	Apparent Void 1/2" / Will Grout	Y	102	No grout exhausted, built pressure to 4 psi
17	1+13	4:00	Apparent Void 1" / Will Grout	Y	204	Came out @ H38, then H37, then H40, then H35, then H16, then H41, then H42
18	1+17	4:00	Refusal @ Surface / Concrete or Grout	N	0	
19	1+23	4:00	Potential Void / Will Grout	Y	0	Built Pressure to 4 psi
20	1+29.5	5:00	Refusal @ Surface / Concrete or Grout	N	0	
21	1+35	4:00	Probe @ 2" / Dense Till	N	0	
22	1+43.5	4:00	Probe @ 2" / Dense Clay	N	0	

23	0+24	8:00	Refusal @ Surface / Dense Till	N	0	
24	0+29	8:00	Refusal @ Surface / Dense Till	N	0	
25	0+35	7:30	Apparent Void 1" / Will Grout	Y	153	Came out @ H24, then H23, then H28, then H5, then H3
26	0+44	8:30	Refusal @ Surface / Dense Till	N	0	
27	0+48	8:00	Potential Void / Will Grout	Y	153	Came out @ H6, then H7, then H9, then H26, then H30
28	0+53	7:00	Apparent Void 1" / Will Grout	Y	0	
29	0+55	8:00	Apparent Void 1" / Will Grout	Y	230	Came out @ H27, then H31, built 3 psi pressure
30	0+61.5	8:00	Probe @ 1" / Will Grout	Y	0	
31	0+67.5	7:00	Apparent Void 1" / Will Grout	Y	0	
32	0+74	7:30	Apparent Void 1" / Will Grout	Y	179	Came out on H31, then H11, then H10, then H34, then H12, then H33
33	0+80	8:30	Apparent Void 5" / Will Grout	Y	0	
34	0+84	8:30	Refusal @ Surface / Dense Till	N	0	
35	0+91	8:30	Probe @ 1/2" / Dense Till	N	0	
36	0+99	7:30	Probe @ 1/2" / Dense Till	N	0	
37	1+03	8:00	Probe @ 1/2" / Dense Till	N	0	
38	1+09	8:00	Refusal @ Surface / Dense Till	N	0	
39	1+14	7:30	Refusal @ Surface / Soft Clay / Will Grout	Y	0	
40	1+18	7:30	Probe @ 2" / Dense Clay	N	0	
41	1+23	7:00	Probe @ 2" / Dense Clay	N	0	
42	1+30	7:00	Refusal @ Surface / Concrete or Grout	N	0	
43	1+35	8:00	Refusal @ Surface / Dense Till	N	0	
44	1+43.5	8:00	Probe @ 1" / Dense Clay	N	0	
			Total Grout (Gallons):		1786	
			Total Grout (CY):		8.8	

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DWIGHT STATION

PENSTOCK VOID GROUTING PROGRAM UNIT #4

STATIONS 0+00 to 0+90 (PHASE I)

10/21/14
B. Roy
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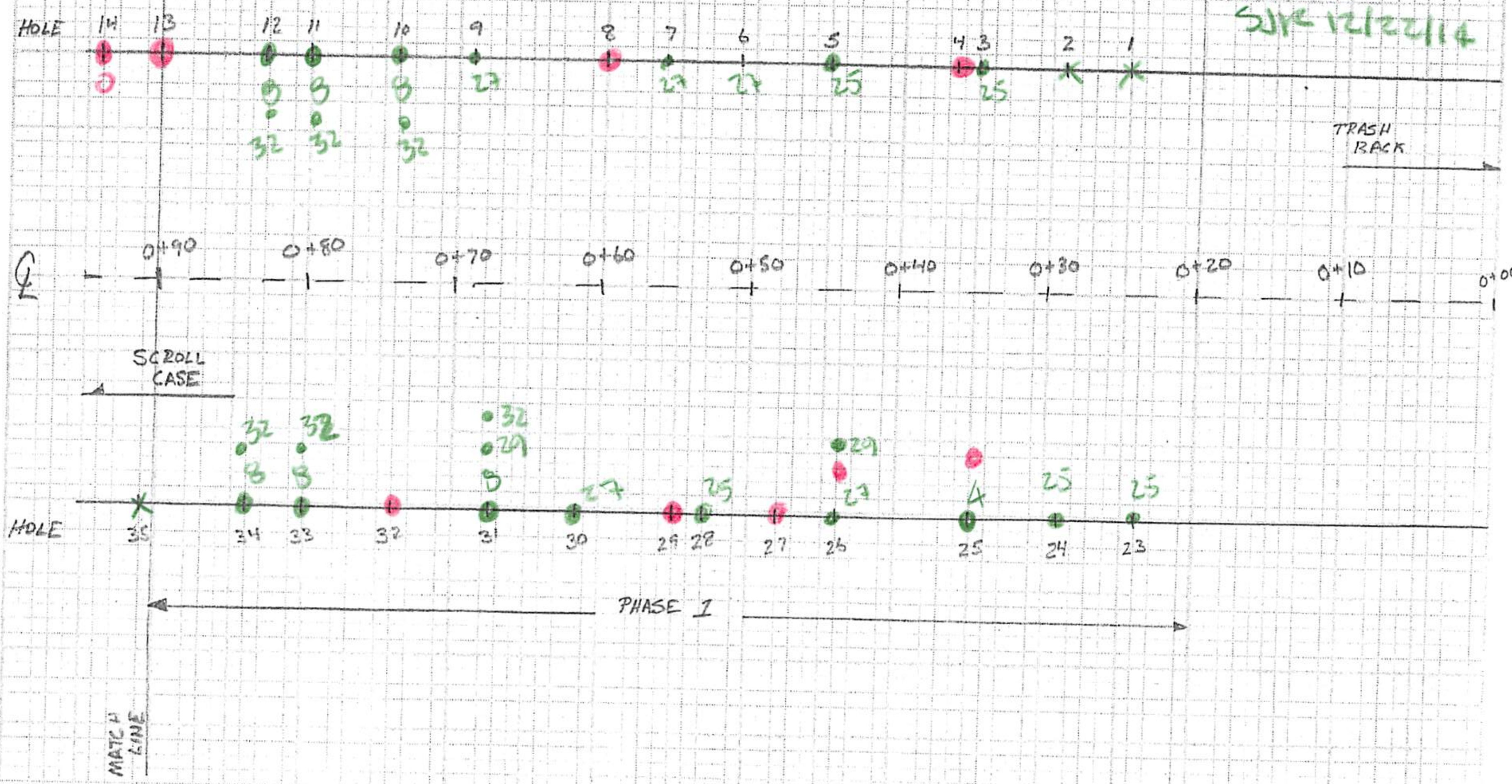
SJK 12/22/14



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PENSTOCK VOID GROUTING PROGRAM UNIT #4

STATIONS 0+90 to 1+50 (PHASE II)

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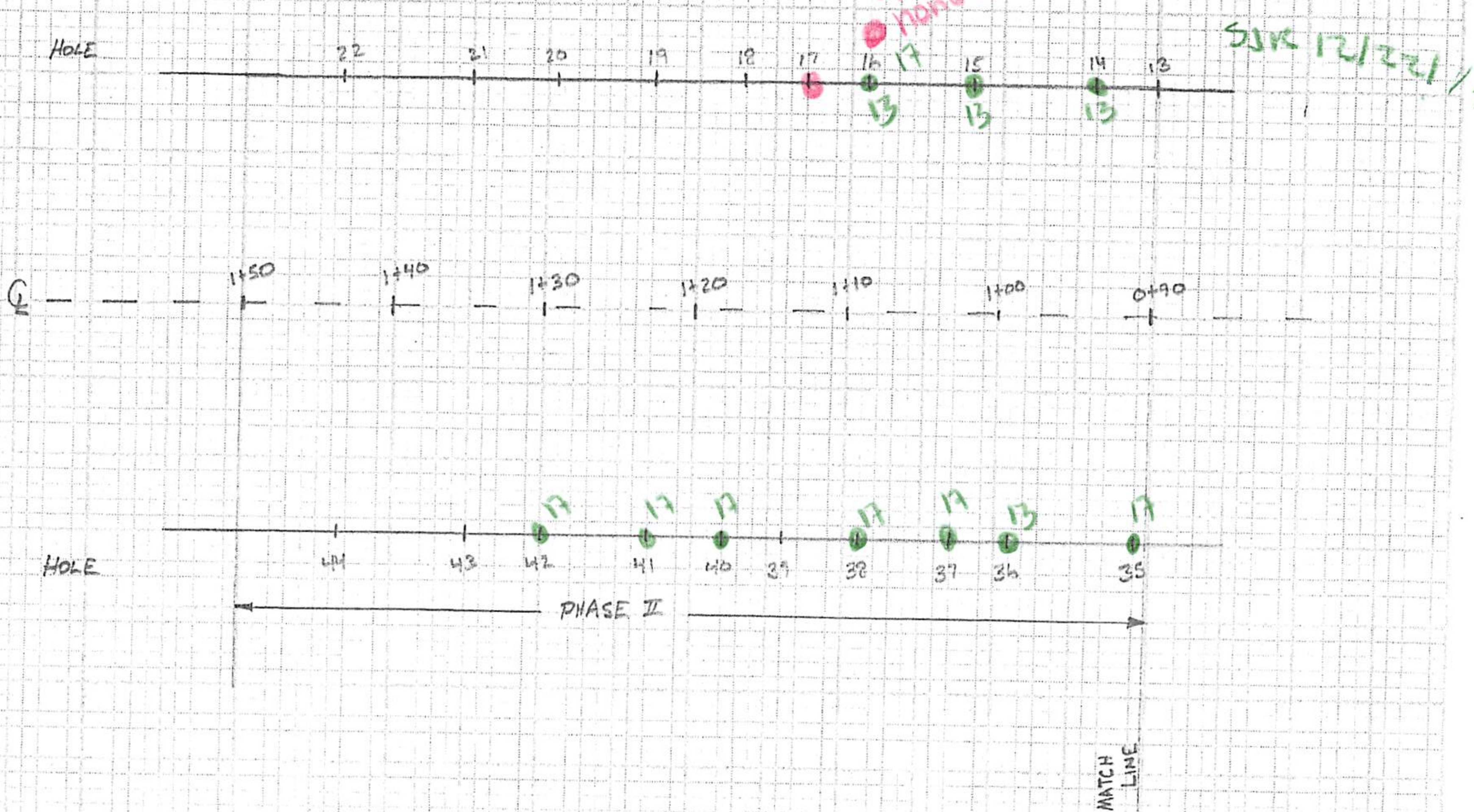

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Kleinschmidt

February 24, 2015

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Dwight Hydroelectric Project – FERC No. 10675-MA
NATDAM ID No. MA00721
Dwight Project –Response to FERC Letter Regarding the Penstock Void Grout Injection Program

Dear Mr. Cross:

Kleinschmidt Associates (Kleinschmidt) submits this letter report in response to your letter to Mr. Kim Marsili of Essential Power Massachusetts, LLC (EP) dated January 30, 2015 (Attachment A) which requested additional clarification of the grout injection program to fill the voids surrounding the penstocks at the Dwight Hydroelectric Project. The requested clarification regarding the grout injection program not contained in Kleinschmidt's December 23, 2014 letter to you is provided below:

- How many adjacent ports were open during grouting?
- How were the adjacent ports treated once grout was observed flowing from the ports?

Every 3/4" diameter port included a ball valve that was left in the open position during the start of grouting. Ports were not closed until grout was observed flowing from the port. Once grout began to flow from the port, the ball valve for that port was closed. All ports adjacent to the injection port were shut if/when grout was observed flowing from the port. If grout did not reach an adjacent open port, then the port was left open to be observed during the next injection, or was used as an injection port. Using this method, every port was observed to either have grout flowing from it or was used as an injection port.

- How was the injection port treated once grouting was deemed sufficient?

Injection ports were pumped with grout until the pressure reached 3-5 psi, or until the steel penstock showed signs of deformation due to the pressure build-up. Once either of those conditions was observed, the injection grouting was stopped and the port was capped.

- If the grout holes were at 8 and 4 o'clock positions, was the grout mobile enough, and contained enough to fill voids above the penstock?

The contractor, Knowles Industrial Services Corporation, reported that the pumped grout had a water cement ratio of 0.70 and a unit weight of about 98 pcf. The contractor also noted that during injection they observed pressures readings that rose and fell during grouting of many ports. Pressure readings would often build to 1 or 2 psi, and then drop dramatically before building up again. The changing pressure readings are attributed to the grout being mobile enough to seep through soil layers and into adjacent void pockets.

At the recorded injection pressures of 3-5 psi, the grout could be pumped between 4.4 and 7.3 feet vertically, which would push the grout to near and potentially above the top of the penstock. The contractor also noted that, in some locations, the grout appeared to be contained and forced into voids above the penstock based on observations of penstock shell movement and grout sweating at the top of the penstock. While it is not possible to confirm that every potential void above the penstock was grouted, it is our opinion that these voids, if present, are not critical to the structural integrity of the building above. Given the location of building columns adjacent to the penstocks, and the penstocks being just a couple feet below the building slab, it is our belief that the columns are supported by footings below the bottom of the penstock. Therefore, filling void space below the penstock is more important than potential void space above the penstock.

Since the penstocks are currently dewatered and will remain so until the penstocks are replaced or rehabilitated, there is little risk or additional material migration and void growth above the penstocks. Any remaining void space above the penstocks can be investigated and filled during penstock replacement, remediation, or abandonment.

- When was the pressure reading recorded?

The pressure at each injection port was read continuously using a fluid pressure gauge. The pressure recorded was the final pressure read at each injection port when injection was stopped and the port capped.

If you have any questions or require additional information regarding this filing, please contact me at 207.487.3328 (email: eric.turgeon@kleinschmidtgroup.com).

Sincerely,

Eric Turgeon
Project Manager

EMT:PHN
Attachments: A - FERC Correspondence (1-30-2015)
cc: John Spain, FERC
Kim Marsili, EP
Nicholas Hollister, EP

ATTACHMENT A

FERC CORRESPONDENCE (1-30-2015)

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections – New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001
Telephone No. (212) 273-5900 **Fax No. (212) 631-8124**

In reply refer to:

P-10675-MA
NATDAM # - ME00721

Dwight Project
Penstock Void Grout Injection Results

January 30, 2015

Mr. Kim Marsili
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

This letter is in response to your consultant's letter dated December 23, 2014 submitting the results of the grouting program at the Dwight facility intended to fill voids suspected to surround the penstocks beneath the Cabotville Mill Building, and through the courtyard between the mill building and the powerhouse. This submittal was provided in response to our November 25, 2014 request for additional information. We understand that close to 22 cubic yards of grout was injected into voids through ports drilled in the penstocks at 6-foot intervals in the 8 and 4 o'clock positions along the pipe.

We are asking for additional clarification on how the grouting was performed. We understand that grout was pumped into a given port starting at the upstream end of each penstock until either the pressure increased or grout was observed flowing out of other open ports. Specifically, we have the following questions:

- How many adjacent ports were open during grouting?
- How was the injection port treated once grouting was deemed sufficient?

- How were the adjacent ports treated once grout was observed flowing from the ports?
- If the grout holes were at 8 and 4 o'clock positions, was the grout mobile enough, and contained enough to fill voids above the penstock?
- When was the pressure reading recorded?

Please respond with the requested clarification within 30 days from the date of this letter. Should you have any questions regarding this matter, please contact Ms. Katherine Adnams of this office at (212) 273-5921 or katherine.adnams@ferc.gov.

Sincerely,

Gerald L. Cross, P.E.
Regional Engineer

Document Content(s)

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections – New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001
Telephone No. (212) 273-5900 **Fax No. (212) 631-8124**

In reply refer to:

P-10675-MA
NATDAM # - ME00721

Dwight Project
Penstock Void Grout Injection Results

March 2, 2015

Mr. Kim Marsili
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

This is in response to your consultant's letter dated December 23, 2014 submitting the results of the grouting program at the Dwight facility and the February 24, 2015 letter providing additional information as asked by our January 30, 2015 letter. Your consultant concluded that, based on the described procedures, the voids have likely been filled to the extent practical with confidence that the voids below and along the sides of the penstocks have been filled, and that voids above the penstock springline have likely been filled based on final pressure of the grout and observations of grout seepage or movement at the crown of the penstocks.

We appreciate your attention to this work, and consider the grouting program to be successfully completed. Should you have any questions regarding this matter, please contact Ms. Katherine Adnams of this office at (212) 273-5921 or katherine.adnams@ferc.gov.

Sincerely,

John Spon For

Gerald L. Cross, P.E.
Regional Engineer

Document Content(s)

Kleinschmidt

July 24, 2015

VIA E-FILING

Mr. Gerald Cross
Regional Engineer
Federal Energy Regulatory Committee
Division of Dam Safety and Inspections
New York Regional Office
19 W 34th St. Ste 400
New York, NY 10001

Complete Pre-Construction Filing – Dwight Penstock Repair Project
Dwight Hydroelectric Project (FERC No. 10675-MA)

Dear Mr. Cross:

On behalf of Essential Power Energy Massachusetts, LLC (EP), Kleinschmidt is submitting the enclosed Pre-Construction documents for the Dwight Penstock Repair Project. These documents include a Quality Control and Inspection Program (QCIP) that contains the project Technical Specifications, Design Drawings and Calculations, and the contractor submitted Soil Erosion and Sedimentation Control Plan. The drawings, specifications and calculations should be treated as **CEII material under 18 CFR § 388.113(c)**.

If you have any questions or require additional information regarding this filing, please contact me at 207.487.3328 or at keenan.goslin@kleinschmidtgroup.com or Nicholas Hollister from EP at 413.730.4721 or at nicholas.hollister@essentialpowerllc.com. Thank you to you and your staff for your assistance on the project.

Sincerely,

KLEINSCHMIDT ASSOCIATES

Keenan Goslin, P.E.
Project Engineer

KG:TMJ
Attachments: Attachment 1. QCIP (CEII Documents: Appendix C–Soil Erosion and Sedimentation Control Plan, Appendix D–Design Drawings, Appendix E–Technical Specifications and Material Safety Data Sheets)
Attachment 2. Penstock Design Calculations – CEII
cc: Chuck Cataldo, John Spain, Katherine E. Adnams P.E. – FERC NYRO
Nicholas Hollister, Kim Marsili, David Schmidt – EP
Chris Tomichek, Jillian Davis – Kleinschmidt

J:\803\031\Docs\Penstock Relining 2015\001 Dwight Penstock Pre-Construction Filing Cover Letter to FERC 7-23-15.docx

QUALITY CONTROL AND INSPECTION PROGRAM

DWIGHT PENSTOCK REPAIR PROJECT

DWIGHT HYDROELECTRIC PROJECT
FERC NO. 10675-MA

Prepared for:

Essential Power Energy Massachusetts, LLC
West Springfield, Massachusetts

Prepared by:

Kleinschmidt

Pittsfield, Maine
www.KleinschmidtGroup.com

July 2015

QUALITY CONTROL AND INSPECTION PROGRAM

DWIGHT PENSTOCK REPAIR PROJECT

DWIGHT HYDROELECTRIC PROJECT
FERC NO. 10675-MA

Prepared for:

Essential Power Energy Massachusetts, LLC
West Springfield, Massachusetts

Prepared by:

Kleinschmidt

Pittsfield, Maine
www.KleinschmidtGroup.com

July 2015

QUALITY CONTROL AND INSPECTION PROGRAM

DWIGHT PENSTOCK REPAIR PROJECT

DWIGHT HYDROELECTRIC PROJECT
FERC NO. 10675-MA

ESSENTIAL POWER ENERGY MASSACHUSETTS, LLC
WEST SPRINGFIELD, MASSACHUSETTS

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J:\803\031\Docs\Penstock Relining 2015\001 QCIP - Dwight Penstock Repair 07_21_2015.docx

QUALITY CONTROL AND INSPECTION PROGRAM

DWIGHT PENSTOCK REPAIR PROJECT

DWIGHT HYDROELECTRIC PROJECT
FERC NO. 10675-MA

ESSENTIAL POWER ENERGY MASSACHUSETTS, LLC
WEST SPRINGFIELD, MASSACHUSETTS

EXECUTIVE SUMMARY

Essential Power Energy Massachusetts, LLC (EP) is planning to repair three 7 foot interior diameter (I.D.) steel penstocks by lining them with a dry-mix shotcrete liner at their the Dwight Hydroelectric Project (FERC No. 10675-MA) in response to a FERC letter in February 2014 requesting their repair or replacement. Dwight is located on the Chicopee River near Chicopee, Massachusetts.

The proposed penstock repairs are a Capital Improvement project at EP's Dwight Station. They plan to reline the deteriorating No. 2, No. 3 and No. 4 steel penstocks with a 4 inch thick steel reinforced dry-mix shotcrete inner pipe. The new shotcrete section is designed to standalone and is not designed to act as a composite section with the existing steel shell though it is occasionally referred to as a liner.

In accordance with Section 12(a)(2) of the FERC's regulations, EP has prepared this Quality Control and Inspection Program (QCIP) for the proposed construction work. Appendix D includes plans and Appendix E contains technical specifications associated with this work. EP prepared this QCIP in accordance with these requirements.

QUALITY CONTROL AND INSPECTION PROGRAM

DWIGHT PENSTOCK REPAIR PROJECT

DWIGHT HYDROELECTRIC PROJECT
FERC NO. 10675-MA

ESSENTIAL POWER ENERGY MASSACHUSETTS, LLC
WEST SPRINGFIELD, MASSACHUSETTS

1.0 PROPOSED CONSTRUCTION ACTIVITIES

Construction for this project consists of relining the existing in-service penstocks, No.2, No. 3 and No. 4, with 4 inches of steel reinforced dry-mix shotcrete to create a standalone structural concrete pipe cast inside the existing steel penstock.

The Dwight Hydroelectric Project consists of an intake structure connected to a power canal, three buried steel penstocks, three active turbine generator units (No. 2, No. 3 and No. 4), and a tailrace structure. Units No. 2, No. 3 and No. 4 each have a hydraulic capacity of 254 cfs at a static head of 18 feet.

The steel penstocks are nominally 7 feet in diameter and approximately 172 feet in length with a centerline drop of 6.16ft along the length of the penstock. Each penstock's longitudinal and circumferential seams are lapped with a single row of rivets. The steel shell exists the intake structure at the power canal and is buried under a minor paved access road then enters the basement of an active mill building where its top surface of the shell is exposed for several feet then is buried under a concrete floor until it exits the building. It is then buried under a courtyard before it enters the basement of the powerstation and is exposed and unsupported for approximately 12 feet and 4 inches.

The power canal will be dewatered for the duration of the project. Headgate leakage into the power canal intake will be pumped to the headpond. The contractor may close the intake gates at each penstock, as needed, for an additional barrier to act as a physical barrier from any of the

canal headgate leakage and against any construction contaminants from entering the canal. The barrier will also contain heat to provide optimal temperatures for curing of the dry-mix shotcrete. Construction efforts will consist of:

- Installing 2 1/8 inch shear studs at 24 inches on center circumferentially and 36 inches on center longitudinally to the interior of the penstock shells. The existing Tnemec interior coating will be removed only in the spots where the studs are located.
- #4 Gr. 60 longitudinal bars spaced at 6-12 inches circumferentially will be tied to the shear studs.
- #6 Gr. 60 reinforcement hoops will be installed at 6 inches longitudinally and connected to the shear studs and longitudinal bars.
- 4 inches of dry-mix shotcrete will be sprayed over the steel reinforcement.
- The cured liner will have a top coat of Tnemec 262, see Appendix E for the Material Safety Data Sheet.
- Steel transitions will be installed at the penstock entrance and transition of the scroll case.

2.0 PROPOSED CONSTRUCTION SEQUENCE, SCHEDULE AND RESPONSIBILITIES

2.1 CONSTRUCTION SEQUENCE

Construction activities for installation of the proposed modifications will take place between August 3, 2015 and November 6, 2015.

2.2 SCHEDULE OF CONSTRUCTION

Construction activities are scheduled to occur from August 2015 to November 2016. Approximate dates for each phase of construction are as follows:

1.	August 3, 2015	Mobilization
2.	Mid August-Mid September	Penstock No. 2 & 3
3.	Mid September-Early October	Penstock No. 2, 3 & 4
4.	Early October – Late October	Penstock No. 3 & 4
4.	November 6, 2015	Demobilization

2.3 ORGANIZATION CHART

Attached as Appendix A is an Organization Chart depicting the construction-related personnel network. Nicholas Hollister at EP will serve as the Owner's Construction Manager for this project. Knowles Industrial (Knowles) is the selected contractor for this project. Billy Roy and Michael Skurski from Knowles will serve as the Contractor's Project Manager and Project Superintendent respectively for this project. Jillian Davis will be Kleinschmidt's Project Manager with Keenan Goslin as the Design Engineer.

Observation of construction activity will be conducted by the Owner's Construction Manager, the Construction Superintendent, and/or the Design Engineer. The Owner's primary contact with the construction work force will be through communications between the EP Construction Manager and the Contractor's Project Superintendent. Other specialized representatives, as discussed in Item 2.4 below, will be present to assist in specialized monitoring tasks.

The Project Quality Control Team will consist of the Construction Manager, the Contractor Project Superintendent and the Design Engineer.

2.4 NUMBER AND SPECIALTIES OF FIELD REPRESENTATIVES

The Construction Project Superintendent and EP personnel will conduct observation and monitoring of key construction activities in the field. He will observe and report on compliance with contract documents. The Design Engineer will perform periodic observations.

2.5 DUTIES AND RESPONSIBILITIES

Attached as Appendix B to this document are résumés of EP's Construction Manager, Knowles Project Manager and Construction Project Superintendent, and Kleinschmidt's Engineers. Any change in personnel, responsibilities, or in the scope of activities will be noted in the monthly report that will be filed with the Regional Director.

Construction monitoring will be performed during times of key construction activities. Progress and potential problems will be reported to EP by the Contractor Project Manager. Observation of construction activities will include, but is not limited to the following items:

(a) Installation of shear studs
(b) Installation of steel reinforcement and steel transitions
(c) Application of dry-mix shotcrete liner
(d) Application of Tnemec Coating
(e) Rewatering of penstocks

The Contractor will be responsible for the safety of all personnel at the construction site. Contract specifications require Contractor adherence to all EP and applicable safety requirements.

2.6 FABRICATION AND FIELD TESTS

Field tests to be performed will consist of:

Concrete Sampling and Testing

Test specimens shall be initially cured onsite, then shall be transported in an approved manner to an approved testing laboratory meeting the requirements of ASTM C1077 within 48 hours of scheduled testing time.

One test panel shall be made for every 50 cubic yards of shotcrete placed but not less than one per each shift during which any shotcrete is placed. Panels shall have minimum dimensions of 18 by 18 by 4 inches and shall be gunned in the same positions as the work represented during the course of the work by the Contractor's regular nozzleman. Panels shall be field cured in the same manner as in the job. Two 4 by 4 by 14 inch beams shall be saw cut from the test panels when fiber-reinforced shotcrete is used. The fiber-reinforced shotcrete beams shall be tested in accordance with ASTM C1140/C1140M.

2.7 FIELD LABORATORY FACILITIES

No field laboratory facilities are planned.

2.8 USE OF CONSULTANTS

The Owner does not anticipate using any additional consultants other than those described above. For the material field testing, an independent qualified testing consultant will be retained for this project.

2.9 EROSION CONTROL AND OTHER ENVIRONMENTAL MEASURES

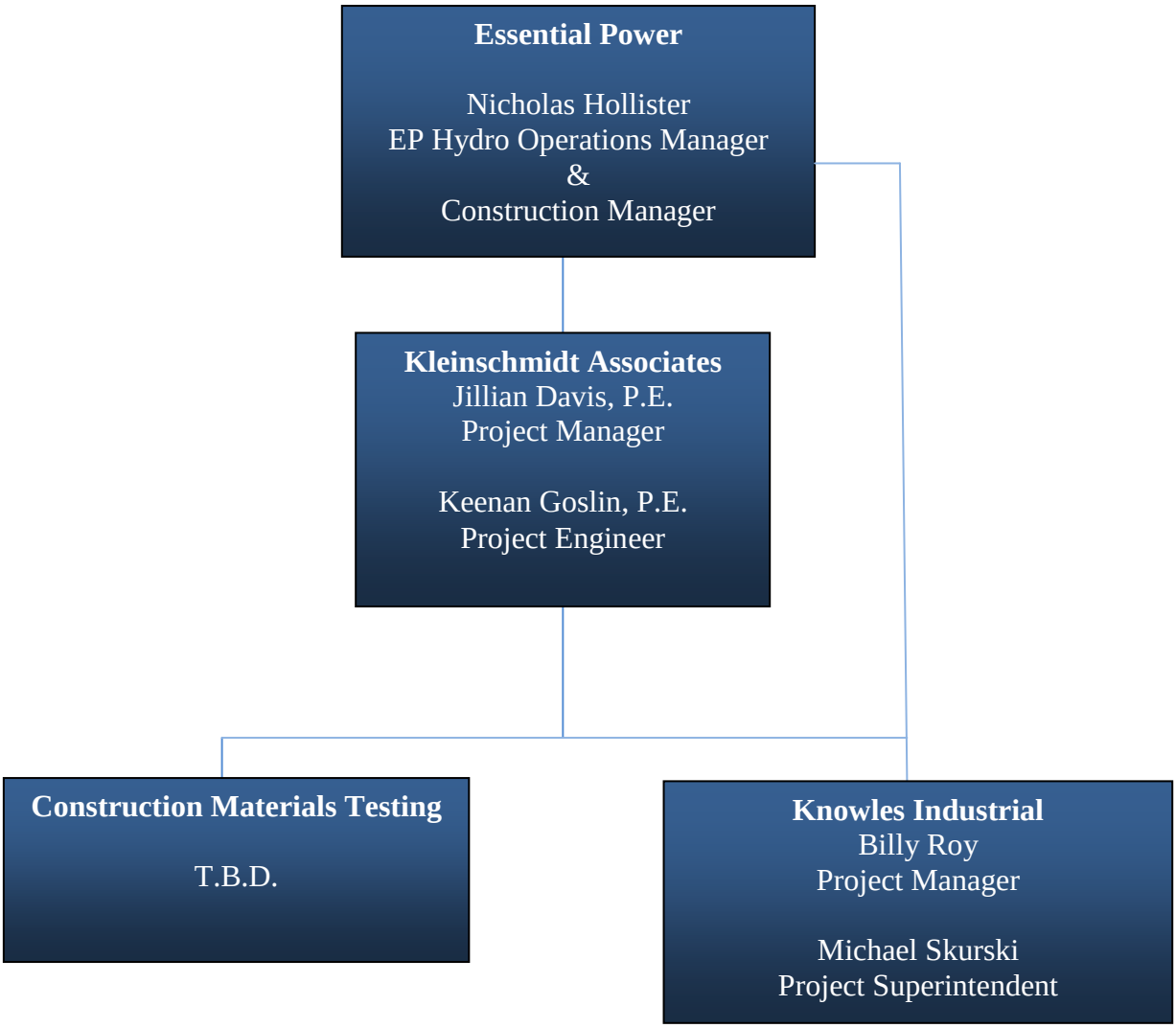
Appendix C includes the Soil Erosion and Sediment Control Plan with details on erosion control measures. The Contractor, Knowles Industrial, will implement other environmental measures in accordance with best construction management practices.

APPENDIX A

GENERAL ORGANIZATION CHART

ESSENTIAL POWER ENERGY MASSACHUSETTS, LLC
DWIGHT HYDROELECTRIC PROJECT
DWIGHT PENSTOCK REPAIR PROJECT
FERC NO. 10675-MA

ORGANIZATIONAL CHART



APPENDIX B

RÉSUMÉS

Essential Power (EP) Project Representative Personnel

Nicholas Hollister

Manager, Hydro Operations with 6.5 years Hydro Power Experience.
He has the authority to stop work due to adverse quality conditions.

Knowles Industrial (Knowles) Representative Personnel

Billy Roy – Project Manager

Company:

Knowles Industrial Services Corporation (Spring 2013 – Present)

Major Projects:

Weldon Dam Roll Gate De-Lead & Paint, Brookfield Power
Mill Hydro Penstock Grouting, Brookfield Power
Rip Dam Concrete/Shotcrete Repairs, Brookfield Power
Parking Garage Sealant Replacement and Concrete Repairs, National Life
Penacook WWTF Concrete Repairs & Coatings, City of Concord
PCC and Clay Tanks Concrete Repairs & Coatings, Twin Rivers Paper
Starvation Brook Culvert Shotcrete Liner Installation, Maine DOT
Snow Pond Dam Rock Anchor Installation, Essex Hydro LLC
Shawsheen Garage Masonry Restoration, Bill Deluca's Cadillac
Rutland Terra Cotta Façade Restoration, Rutland Post Office
Montague Dam Spillway Shotcrete Resurfacing, First Light Power
Verso #5 Paper Machine Press Prep & Paint, Verso Paper
Ceilcote Chemical Resistant Steel Tank Lining, Twin Rivers Technologies
Bull's Bridge Canal Seepage Mitigation, First Light Power

Company:

Sargent Corporation (Summer 2012)

Projects:

University of Maine, Paul Mitchell Batting Pavillion Project
Old Town, ME YMCA Storm Drain Upgrade
Bangor, ME Bangor International Airport General Aviation Apron Project

Company:

Ed Pelletier & Sons (Summers 2006 – 2011)

Projects:

Frenchville, ME Regional Airport Obstruction Removal & Electrical Upgrades
Frenchville, ME Church Road Culvert Replacement
Madawaska, ME Water Main Installation
Cross Lake, ME Heavy Highway Reconstruction
Fort Kent, ME Highway Re-Surfacing and Storm-Drain Installation
Wallagrass, ME Heavy Highway Reconstruction
Madawaska, ME Sewer System Improvement Project

Michael Skurski – Project Foreman

Training/Certification:

ACI 506 Shotcrete Nozzleman Certification Expires 4/17/2019
Construction Supervisor Training Program, AGC of America
OSHA 30-Hour Construction Certification
First Aid/CPR Certified, American Red Cross
Scaffolding & Fall Protection, Safety Works
AGC of America 40 Hour Construction Supervisor Training Program

Work Experience:

Over 20 Years Experience as a Shotcrete Nozzleman

Knowles Industrial Services Corporation	July 91 to Present
United Gunite, Irvington, NJ	Oct 87 to June 91
Pressure Concrete, Florence, AL	Apr 78 to May 84

Related Shotcrete Projects with Knowles:

City of Concord NH N State Street Culvert Rehab
US Army Corp of Engineers Franklin Dam
Public Services of New Hampshire Eastman Falls Dam
Lockhart Power – Pacolet Penstock Rupture Repair
Northeast Utilities – Cabot Station Penstock Shotcrete Lining
Algonquin Powers Systems – Milton Station Penstock Lining
City of Lewiston – Penstock Shotcrete Lining
Holyoke, Massachusetts – Storm water overflow lining
Maine Department of Transportation – Numerous culvert projects in Jay, Bucksport, Waterboro, Jonesboro, Bridgton and the Forks
Public Service of New Hampshire – Numerous dam projects
Boston Water and Sewer Commission – Albany Street sewer
70,000 SF structural shotcrete liner to existing brick sewer
US Army Corps of Engineers – Knightville Dam
24,000 SF dry-mix shotcrete placement to existing spillway and retaining wall
Boston Water and Sewer Commission – South Boston Interceptor
41,000 SF structural shotcrete liner to existing brick sewer ranging from 36’ to 72’ diameter
Georgia Pacific – Bleach Plant Restoration 20,000 SF structural shotcrete repairs to concrete beams, columns, and underside of slabs
International Paper – Livermore Hydro Station
Successfully completed installation of protective shotcrete liners in four steel scroll cases

JILLIAN L. DAVIS, P.E.

PROJECT ENGINEER

Jillian Davis specializes in rehabilitation design of hydroelectric sites, marine structure designs, detailed penstock design and dam safety. Her design experience includes new structures made of reinforced concrete, prestressed concrete, steel, and wood, as well as renovations and repairs to existing structures. Jillian's design of hydropower structures includes powerhouses, intake structures, bulkhead dams, trash racks and rakes, gates, penstocks, retaining walls, overhead crane supports, flashboards including inflatable rubber dams, and fish lifts. She performs dam safety and dam stability analysis and developed Kleinschmidt's in-house dam stability analysis software.

Key Expertise

- Penstock Investigation & Design
- Dam Safety & Structural Assessment
- Dam and Spillway Engineering
- Gates & Water Control Design
- Powerhouse Design
- Dam Rehabilitation Design

Professional Registration

Professional Engineer, ME and NE

Education

B.S. Civil Engineering, University of Maine, 2008

Years of Experience

With Kleinschmidt: 6
Total: 6

Engineering Coordinator, Miscellaneous Projects
New York Power Authority, Statewide NY
Engineering Coordinator for Kleinschmidt's Engineering Services as provided to New York Power Authority.

Penstock Inspection, Loup River Hydroelectric Project
Loup Power District, Columbus, NE
Project Engineer for 20 foot I.D. riveted steel penstock that had buckled without an expansion joint due to large temperature cycles. Inspected and evaluated penstock at buckle failure for penstock compression stability. Coordinated with vendors to provide client with short term and long term (i.e. install expansion joint) options.

Penstock Repair, Red Bridge Hydroelectric Station
Essential Power, Springfield, MA
Project Manager for penstock repair project. Evaluated multiple options of lining and replacing two 13 foot I.D. buried steel penstocks. Coordinated FERC submittals. Penstock repaired with a dry-mix shotcrete liner with steel reinforcement.

Penstock Inspection, Red Bridge Hydroelectric Station
Essential Power, Springfield, MA
Project Manager for inspection and evaluation of two buried riveted steel penstocks.

Structural Engineering, Bryson Trashrake Structure
North Fork Electric, Crumpler, NC
Structural engineering and modeling of steel platform, dragrake structure, and trashrack bars and supports.

Structural Engineering, Marshall Trashrake Platform
North Fork Electric, Crumpler, NC
Structural engineering and modeling of steel platform supporting trashrake water trough.

Penstock Load Rating, Indian Orchard Hydroelectric Station
Essential Power, Springfield, MA
Project Manager for watered and dewatered load rating evaluation of two buried steel penstocks.

Part 12 Dam Inspections, Claytor, Buck and Byllesby Hydroelectric Projects
Appalachian Power Company, Pulaski County and Carroll County, VA
Part 12 Dam Inspections of three Appalachian Power Company sites.

Penstock Replacement, Dwight Hydroelectric Station
Essential Power, Chicopee, MA
Project Manager for penstock replacement project. Evaluated multiple options of lining and replacing three buried steel penstocks. Coordinated FERC submittals, void investigation beneath an old mill building.

Penstock Inspection, Dwight Hydroelectric Project
Essential Power, Chicopee, MA
Project Manager for inspection, evaluation, and report on the three riveted steel penstocks, one of which had a recent failure.

Effluent Pipe Inspection, Twin Rivers Paper Mill
Twin Rivers, Edmundston, NB, Canada
Project Manager for inspection and evaluation of word stave effluent pipe.

KEENAN M. GOSLIN, P.E.

PROJECT ENGINEER

Keenan Goslin specializes in structural engineering, project management, research & development, and product development. He has 7 years of experience at the University of Maine Advanced Structures and Composites Center. His projects at the Center ranged from project engineer for load testing and rating of 17 Maine bridges to project manager for a $1.4M composite bridge research program. Keenan is proficient in Microsoft Project, RISA-3D, MathCad, AutoCad, Matlab, ANSYS, and Risk Management.

Key Expertise

- Powerhouse Design
- Penstock Investigation & Design
- Gates & Water Control Design
- Composite Bridge Research
- Composite Pile Research
- Materials Testing
- Live Load Testing & Load Rating of Bridges & Other Large Structures

Professional Registration

Professional Engineer, ME & RI

Education

Graduate Studies in Bridge Engineering, Experimental Mechanics, & Business Administration, University of Maine

M.S. Civil Engineering with structural focus, University of Maine, 2007

B.S. Civil Engineering with structural focus, University of Maine, 2005

Years of Experience

With Kleinschmidt: 1
Total: 8

Hydro Structural Design, Holtwood Hydroelectric Expansion Project
PPL Holtwood, LLC, Holtwood, PA
Staff Engineer for structural design of concrete and steel members for a $440M, 130 MW hydroelectric project expansion.

Structural Analysis, Massena Recreation Facilities
New York Power Authority, Massena, NY
Staff Engineer for analysis of existing wood structures.

Structural Steel Calculations, Window Walls
Duratherm Windows, Nationwide
Staff Engineer for analysis and design of lateral reinforcement of window walls.

Structural Steel Calculations, Steel Stairs and Connections
American Steel Fabricators, Greenfield, NH
Staff Engineer for analysis of steel stair design and connections.

Design and Specifications, Brunner Island Power Station
PPL Generation LLC, York County, PA
Staff Engineer for design and specifications of new gate and vault for control of discharge from polishing pond. Reviewed shop drawings. Point of contact with general contractor and project engineer.

Structural Design and Analysis, School Street Station
Brookfield, Cohoes, NY
Staff Engineer for analysis of cellular coffer dam for use as temporary wet well for city water. Completed design and analysis of monorail for gatehouse.

Structural Analysis and Design, New Balance Factory Building
New Balance, Skowhegan, ME
Staff Engineer for failure analysis and design of repairs for existing industrial wood and masonry structure.

Previous Experience

Structural Engineering, Composite Bridge Research
Maine Department of Transportation, Orono, ME
Project manager for $1.4M composite bridge research program. Responsible for proposal development, scheduling and budgets, progress and final reports, and engineering support. Technical lead and supervisor for undergraduate and graduate research assistants and risk assessments for test programs, including scheduling and budgets.

Structural Engineering, Composite Pile Development
Maine Department of Transportation, Orono, ME
Project manager for a $600K composite pile development project. Focused on project management and graduate student engineering support while responsible for budgets, schedules, technical support, and coordination between University of Maine staff and students and stakeholders, including state agencies, composite manufacturers, consultants, and construction crews.

Structural Engineering, Testing and Consulting Services
Various Public and Private Clients, Orono, ME
Principal investigator for over 20 projects that included materials testing for quality assurance, structural testing, bridge field testing, structural engineering consulting, and product development.

BRUCE CURTIS
201 SOUTH MAIN STREET
SOLON, ME 04979
CELL# (207) 415-8656

TITLE: Project Foreman

DOB: December 10, 1969

TRAINING/CERTIFICATION:

First Aid/CPR Certification, American Red Cross
Construction Supervisor Training Program, AGC of America
OSHA 10-Hour Construction Certification
Certified Scaffolding Competent Person, Safety Works
ACI 506 Shotcrete Nozzleman Certification Expires 4/17/2019
Over 5 Years Shotcrete Experience

RELEVANT WORK EXPERIENCE:

Knowles Industrial Services Corporation	
Foreman	2007 to Present
Shotcrete Nozzleman	2003 to Present
Leadman (Foreman Assistant)	2005 to 2007
Journeyman	1999 to 2005
Seacoast Scaffolding	
Journeyman	1998 to 1999
Cianbro	
Laborer	1996 to 1997

WORK REFERENCES:

Brookfield Power Johnson Spillway	
Maine Bureau of General Services	Mr. Peter Glasow
MDOT Culvert Rehab Falmouth Maine	
Brookfield Power – Dolby Dam Repair	Mr. Max Upton
Fore Street Garage – Deck Repairs	Mr. Todd Neal
Maine Medical Center Garage Restoration	Mr. Roger Boyington
City of Lewiston – Tailrace Shotcrete Repairs 2006	Mr. Mike Paradis
Northeast Utilities - Numerous Concrete Repair Projects	Mr. Gary Smolen
MDOT – Newcastle Pier Rehabilitation	Mr. Warren Knowles
MDOT – Westbrook Culvert Rehabilitation	Mr. Bernie McCarthy
MDOT – Gilead	Mr. Bob Levesque
511 Congress Street	Mr. Paul Ureneck
MMC – McGeachey Hall	Mr. Roger Boyington
Becker Structural – Casco Bay	Mr. Todd Neal

DARREN GRAF
94 TROPICAL FISH ROAD
CANAAN, ME 04924
CELL# (207) 615-1710

KNOWLES INDUSTRIAL SERVICES

Supervised crews with up to eight men. Specializes in shotcrete, masonry restoration and concrete repair projects.

FOREMAN: April 2012 - Present
JOURNEYMAN: March 2004 – April 2012
LABORER: May 2001 – March 2004

TRAINING/CERTIFICATION:

ACI certified shotcrete nozzleman since 2004
National Safety Council, First Aid/CPR
OSHA 10 hour construction certificate, MEMIC
Cathedral Stone Products, Authorized JAHN Installer

RELEVANT PROJECT EXPERIENCE:

Bar Harbor Municipal Building Restoration	Stan Harmon
Rutland Post Office Terra Cotta Repairs	Nate Roberts
MDOT Culvert Rehabilitation	Brian Luce
PSNH Ayer Island Shotcrete	Newell Porter
Philips Exeter Academy Masonry Restoration	Dan Spinney
WBRC Terra Cotta Façade Restoration	Paul Brody
Brookfield Power Shelburne Falls Masonry Restoration	Peter Brockett
Giqnoux Courthouse Restoration	Alan Brickett
NH DOT Franconia Culvert Rehabilitation	
MDOT Culverts in Jackman & Skowhegan	Dave Doucette
Lockhart Power Pacolet Penstock Repair	
City of Lewiston Penstock Lining	

Todd Labonville
P.O. Box 42
Norridgewock, ME 04957
CELL# (207) 615-8245

KNOWLES INDUSTRIAL SERVICES

Supervised crews with up to eight men. Specializes in concrete repair, shotcrete and industrial coatings projects.

FOREMAN: March 2014 - Present
JOURNEYMAN: May 2005 – February 2014
LABORER: July 2000 – April 2005

TRAINING/CERTIFICATION:

National Safety Council, First Aid/CPR
OSHA 10 hour construction certificate
ACI certified shotcrete nozzleman since April 2014

RELEVANT PROJECT EXPERIENCE:

Essential Power Red Bridge Penstock Repair	Nick Hollister
Pfizer/Terratherm Gunite Stabilization	Bill Condon
Ocean State Power High Yard Painting Project	Brett Davis
SAPPI Clearwell Repair	Steve Pinkham
Nestle Filler Lines Flooring	Jay Fredrick
Dartmouth Garage Water Proofing	Paul Gaundry
Verso Paper #5pm Press Painting	
Cozy Harbor Seafood Urethane Mortar Flooring	Roland Jacques
Jackson Lab Annex 12 Colond Quartz Epoxy	E.L Shea
Bristol Myers MMA Flake	Pat Peltier
Firstlight Power Montague Dam	Joe Lucas
Maine Medical Center Garage Repair	Brandon Romano

APPENDIX C

SOIL EROSION AND SEDIMENTATION CONTROL PLAN – PLEASE SEE APPENDIX E FOR ALL DRAWINGS

Not Included in Public Version
(This Material is Critical Energy Infrastructure Information (CEII). Members of the Public May Obtain Nonpublic or Privileged Information by Submitting a Freedom of Information Act (FOIA) Request. See www.ferc.gov/legal/ceii-foia.asp for More Information.)

APPENDIX D

DESIGN DRAWINGS

Not Included in Public Version
(This Material is Critical Energy Infrastructure Information (CEII). Members of the Public May Obtain Nonpublic or Privileged Information by Submitting a Freedom of Information Act (FOIA) Request. See www.ferc.gov/legal/ceii-foia.asp for More Information.)

APPENDIX E

TECHNICAL SPECIFICATIONS AND MATERIAL SAFETY DATA SHEETS

Not Included in Public Version
(This Material is Critical Energy Infrastructure Information (CEII). Members of the Public May Obtain Nonpublic or Privileged Information by Submitting a Freedom of Information Act (FOIA) Request. See www.ferc.gov/legal/ceii-foia.asp for More Information.)

Document Content(s)

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
Division of Dam Safety and Inspections – New York Regional Office
19 West 34th Street – Suite 400
New York, New York 10001

Office No. (212) 273-5900 **FAX No. (212) 631-8124**

In reply refer to:
P-10675-MA
NATDAM# MA00721

Dwight Penstock
Rewatering Plan
Response

October 21, 2015

Mr. Kim Marsili
Manager – Hydro Operations
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

We have reviewed the Penstock Rewatering Plan for the Dwight Penstock Repair Project submitted by Kleinschmidt on August 20, 2015. In general, we find that the plan for initial observation and monitoring during watering up the penstocks acceptable. However, because the penstock extends below an occupied building, we will require the first internal inspection be performed after 10 days of initiating unit operations, and again within 6 to 8 months as proposed in the Rewatering Plan.

The findings of each inspection should be submitted to us within 30 days of the date of inspection. Should you have any questions, please contact Ms. Katy Adnams at (212) 273-5921 or by email at Katherine.adnams@ferc.gov.

Sincerely,

Gerald L. Cross, P.E.
Regional Engineer

Document Content(s)

Kleinschmidt

January 21, 2016

VIA E-FILING

Mr. Gerald Cross
Regional Engineer
Federal Energy Regulatory Commission
Division of Dam Safety and Inspections
New York Regional Office
19 W 34th St. Ste 400
New York, NY 10001

Final Construction Report
Dwight Hydroelectric Project (FERC No. 10675-MA)

Dear Mr. Cross:

On behalf of Essential Power Energy Massachusetts, LLC (EP), Kleinschmidt is submitting the final construction report for the Dwight Penstock Repair Project.

If you have any questions or require additional information regarding this filing, please contact me at 207.487.3328 or at keenan.goslin@kleinschmidtgroup.com.

Sincerely,

KLEINSCHMIDT ASSOCIATES

Keenan Goslin, P.E.
Project Engineer

KMG:TMJ
Attachments: Dwight Final Construction Report – Filed Separately as CEII Information
cc: Nicholas Hollister – EP
Chris Tomichek, Jillian Davis – Kleinschmidt

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Document Content(s)

P-10675 Dwight Final Construction Report FERC Filing Ltr.PDF.....1-1

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF ENERGY PROJECTS
Division of Dam Safety and Inspections – New York Regional Office
19 West 34th Street – Suite 400
New York, New York 10001

Office No. (212) 273-5900 **FAX No. (212) 631-8124**

In reply refer to:
P-10675-MA
NATDAM# MA00721

Dwight Penstock Repair
Final Construction Report

January 27, 2016

Mr. Kim Marsili
EP Energy Massachusetts, LLC
15 Agawam Avenue
West Springfield, MA 01089

Dear Mr. Marsili:

We have reviewed the Final Construction Report for the Dwight penstock lining project. We understand that the construction was found to be acceptable to your Consultant, Kleinschmidt. One modification was made in the design where a concrete patch was found in the bottom half of a portion of Penstock 2. We also acknowledge that while two concrete tests resulted in break strengths less than specified, the average strengths are higher than specified. We have reviewed these modifications, which were reviewed during construction by your consultant and find that there are no adverse impacts to the design.

We understand that Penstocks 3 and 4 have been re-watered but the units have not been returned to service pending some mechanical work required prior to operation. Penstock 2 has not been rewatered pending repairs to the headgate. Please notify us when these units return to service. We also remind you that per our October 21, 2015 letter, an internal inspection is to be performed after 10 days of initiating unit operations.

Should you have any questions, please contact Ms. Katy Adnams at (212) 273-5921 or by email at Katherine.adnams@ferc.gov.

Sincerely,

John Spain, P.E.
Acting Regional Engineer

Document Content(s)

ESSENTIAL POWER

February 10, 2016

VIA E-FILING

Mr. Gerald L. Cross, P.E.
Regional Engineer
Federal Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

FERC No.'s P-10675-MA,
RE: letters dated October 21, 2015 and January 27, 2016 Dwight Rewatering Plan and Dwight Penstock Repair Final construction Report

Dear Mr. Cross:

This letter is in regards to the letters dated October 21, 2015 and January 27, 2016 that details FERC's request that a penstock inspection occur at Dwight station 10 days after the return to active service of the penstocks.

Generation resumed on 1/26/16 with unit #3. On 2/9/16, after 11.5 days of run time, an ROV was deployed at the unit intakes to perform an internal inspection of the unit #3 and the unit #4 penstock. Note that the unit #2 penstock remains dewatered and isolated via the unit headgate until the headgate operator is in working order. Dave Schmidt (Maintenance Manager) and Nick Hollister (Manager Hydro Operations) performed the inspection and witnessed the video feed from the ROV.

Visibility in the #3 penstock was clear, and is estimated to be about 6'. The Tnemec coating displayed well under the ROV's lights, making it easy to discern leaves and other small debris inside the penstock. The condition of the Tnemec appeared good, and did not show any signs of air bubbles behind the coating or any areas where the liner was peeling away from the shotcrete. The shotcrete itself is not visible anywhere inside the penstock due to the liner, however there were no signs of deformities.

Visibility was slightly worse in #4 due to more silt and small debris, but it was still plenty clear for an easy examination of the surface of the liner. The condition did not appear any different than unit #3, looking to be in good condition. Again, no air bubbles seemed present under the surface, and there were no sections peeling away from the shotcrete. No deformities were seen inside the penstock.

We hope that this inspection satisfies the requirements for the post penstock installation inspection. The penstocks will next be viewed later this year as water flows around for the annual internal inspection in a dewatered state.

If you have any questions regarding these items, please contact me at (413) 730-4721.

Sincerely,

Kim Marsili

cc: Katherine Adnams, FERC
cc: John Bahrs, VP PGS, Essential Power LLC™
cc: Patrick Brown, Director Compliance, Essential Power LLC™
cc: Nick Hollister, Manager, Hydro Operations, Essential Power LLC™

Document Content(s)

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 627 Main Street, Worcester MA 01608 • 508-792-7650

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

William P. Short III
On behalf of Central Rivers Power MA, LLC
P.O. Box 237173
New York, New York 10023-7173

November 22, 2019

Re: Request for Water Quality Status
Dwight Project, FERC #10675

Dear Mr. Short,

In order to receive certification from the Low Impact Hydropower Institute, Central Rivers Power MA, LLC seeks a letter from the Massachusetts Department of Environmental Protection (Department) that discusses the water quality and the minimum flows at the Dwight Project impoundment, bypassed reach and tailrace.

Water Quality of Dwight Project Impoundment
The Department does not possess water quality data collected at the Project site; however, the Department does have data collected in the Project vicinity and believes the presence of wet weather combined sewer overflows upstream of the Project is likely the cause for this segment of the Chicopee River (MA36-25) to require a TMDL for Escherichia coli. The Department believes the Project does not cause nor contribute to the presence of Escherichia coli in the Project area.

The Department does not expect the project to cause or contribute to violations of state Water Quality Standards due to water chemistry.

Water Quality of Dwight Project Bypassed Reach to the Confluence with the Tailrace and the Chicopee River
The Department does not possess water quality data collected at the Project site; however, the Department does have data collected in the Project vicinity and believes the Project does not cause nor contribute to the presence of Escherichia coli in the Project area.

Water Quality of Dwight Project Tailrace to the Confluence with the Bypassed Reach and the Chicopee River

The Department does not possess water quality data collected at the Project site; however, the Department does have data collected in the Project vicinity and believes the Project does not cause nor contribute to the presence of Escherichia coli in the Project area.

Minimum Flows of Dwight Project Bypassed Reach to the Confluence with the Tailrace and the Chicopee River

The Department understands the minimum flow in the bypassed reach is 258 cfs or inflow, if less, and that the impoundment be maintained at least five inches above dam crest when boards are out. The Department has no record of flow violations.

Minimum Flows of Dwight Project Impoundment and/or Tailrace to the Confluence with the Bypassed Reach and the Chicopee River

The Department is unaware of any minimum flow requirement for the Dwight Project impoundment or the tailrace to the confluence with the bypassed reach and the Chicopee River.

If you have any questions, please contact me at 508-767-2854.

Sincerely,

Robert Kubit, P.E.
MA Department of Environmental Protection
8 New Bond Street
Worcester MA 01606
Robert.kubit@state.ma.us

Cc: Caleb Slater/MADFW
Melissa Grader/USFWS

CENTRAL RIVERS POWER MA, LLC
c/o William P. Short III
44 West 62nd Street, P.O. Box 237173
New York, New York 10023-7173
(917) 206-0001; (201) 970-3707
w.shortiii@verizon.net

March 6, 2020

(Via US Mail and E-Mail)

Ms. Melissa Grader
Fish and Wildlife Biologist
United States Fish and Wildlife Service
US FWS/New England Field Office
c/o CT River Coordinator's Office
103 East Plumtree Road
Sunderland, MA 1375

Re: Application of Dwight Project for Certification by the Low Impact Hydropower Institute ("LIHI")

Dear Ms. Grader:

Central Rivers Power MA, LLC (the "Applicant") is working an application for certification by LIHI for Dwight Project (FERC Project P-10675). To summarize, we have been asked by LIHI for certain additional information on the Project's Water Quality, Fish Passage, and Riverine Fish.

We know from MDEP records that the Project's water quality in the vicinity of the Project is substandard. The MDEP has informed us that *e. coli* is present in the vicinity of the Project but that the Project does not cause or contribute to violations of the state Water Quality Standards due to water chemistry. A copy of that letter is attached. We seek a letter from USFWS whether or not the Project's water quality is substandard or not and, if yes, does the Project cause or contribute to violations of federal or state water quality standards.

Currently, there is no upstream passage at the Project. We are seeking a USFWS recommendation addressing upstream passage needs for diadromous species at the Project. We have received an unofficial, but not a formal, MDFW recommendation on the matter. That recommendation is attached. We are looking for a letter from USFWS addressing the upstream passage needs, if any, for diadromous species at the Project.

We seek a list of the riverine species found in the Project's impoundment and whether the riverine species found typically move between riverine environments, i.e., Dwight impoundment to the Chicopee Falls impoundment and vice-a-versa. If riverine species do move between these two impoundments, does the Project contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles?

Please review each of these requests. If you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely yours,

/S/.

attachments

cc: Patricia McIlvaine (e-mail only)
Maryalice Fischer (e-mail only)
Michael Mann (e-mail only)
Kevin Telford (e-mail only)
Ryan McQueeney (e-mail only)
Randall Osteen (e-mail only)

TABLE OF ATTACHMENTS

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

August 21, 2019

Michael Mann, Associate
Hull Street Energy
4920 Elm Street, Suite 205
Bethesda, MD 20814
mmann@hullstreetenergy.com

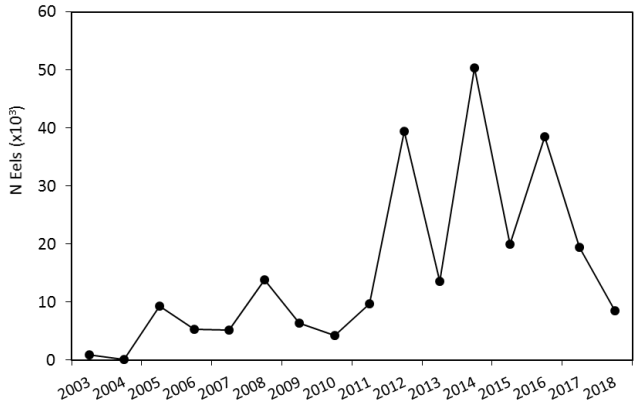
RE: CEC grant application

Michael,

I understand that you are applying for a grant from the Massachusetts Clean Energy Center (CEC) for upgrades to your Dwight hydroelectric project on the Chicopee River in Chicopee, MA. As part of the application process the CEC requires that the project be certified by the Low Impact Hydropower Institute (LIHI), or a letter from the Division of Fisheries and Wildlife that identifies any concerns that may affect LIHI certification and potential solutions to those concerns.

The Dwight Dam is the first barrier on the Chicopee River, and as the Chicopee River enters the Connecticut River downstream of the Holyoke Dam, the first barrier from the ocean for diadromous fish. Each spring thousands of American Shad and River Herring attempt to ascend the Chicopee River and are stopped by the Dwight project. I would love to see a modern fish passage facility at this project, however the cost of such a facility would be prohibitive while the ecological benefit small, given that the next barrier on the Chicopee River is just 1.5 miles upstream.

If asked by LIHI to certify the Dwight Project I would ask for upstream passage for juvenile American Eel. Upstream eel passage is relatively inexpensive and has proven to be very effective at many hydro projects in MA. In fact the Holyoke Project has passed hundreds of thousands of juvenile eels since passage was installed in 2003 (see figure below).



In addition, ¾ inch clear space trash racks for the full depth of the turbine intakes will be necessary to prevent entrainment of downstream migrant adult eels. However, due to the fact that eels spend a prolonged period in river before downstream migration, a delay of 5 to 10 years between the start of upstream eel passage and the installation of the ¾ inch racks for downstream passage is would be acceptable. If ¾ inch racks are not feasible, night-time turbine shutdowns in the fall have been shown to reduce entrainment.

Thank you for this opportunity to comment and please contact me if you have any questions.

Sincerely,

Anadromous Fish Project Leader

CENTRAL RIVERS POWER MA, LLC
c/o William P. Short III
44 West 62nd Street, P.O. Box 237173
New York, New York 10023-7173
(917) 206-0001; (201) 970-3707
w.shortiii@verizon.net

March 6, 2020

(Via US Mail and E-Mail)

Caleb Slater, PhD
Anadromous Fish Project Leader
Massachusetts Division of Fisheries and Wildlife
100 Hartwell Street, Suite 230
West Boylston, Massachusetts 01583

Re: Application of Dwight Project for Certification by the Low Impact Hydropower Institute ("LIHI")

Dear Doctor Slater:

Central Rivers Power MA, LLC (the "Applicant") is working an application for certification by LIHI for Dwight Project (FERC Project P-10675). To summarize, we have been asked by LIHI for certain additional information on the Project's Riverine Fish.

We seek a list of the riverine species found in the Project's impoundment and whether the riverine species found typically move between riverine environments, i.e., Dwight impoundment to the Chicopee Falls impoundment and vice-a-versa. If riverine species do move between these two impoundments, does the Project contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles?

Please review this request. If you have any questions or concerns, please do not hesitate to contact the undersigned.

Sincerely yours,

/S/.

cc: Patricia McIlvaine (e-mail only)
Maryalice Fischer (e-mail only)

Michael Mann (e-mail only)
Kevin Telford (e-mail only)
Ryan McQueeney (e-mail only)
Randall Osteen (e-mail only)

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Hampden County, Massachusetts

Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE"

INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Cerulean Warbler Dendroica cerulea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20
Evening Grosbeak Coccothraustes vespertinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in

knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	CHI.E
Historic Name:	Dwight Manufacturing Company
Common Name:	
Address:	
City/Town:	Chicopee
Village/Neighborhood:	Chicopee Center
Local No:	
Year Constructed:	
Architect(s):	
Architectural Style(s):	
Use(s):	Industrial Complex or District; Textile Mill; Utilities Other; Abandoned or Vacant; Textile Mill Cotton
Significance:	Architecture; Community Planning; Engineering; Industry
Area(s):	
Designation(s):	
Building Materials(s):	

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

FORM A - AREA

Assessor's Sheets	USGS Quad	Area Letter	Form Numbers in Area
0095/ 40010	Springfield North	CHI.E	See Data Sheet

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Town/City: Chicopee

Place *(neighborhood or village)*: Chicopee Center

Name of Area: Dwight Manufacturing Company

Present Use: Industrial / Vacant

Construction Dates or Period: 1832-1950

Overall Condition: Good

Major Intrusions and Alterations:
Removal of mill buildings 1950, 2014

Acreage: Approximately 18 acres

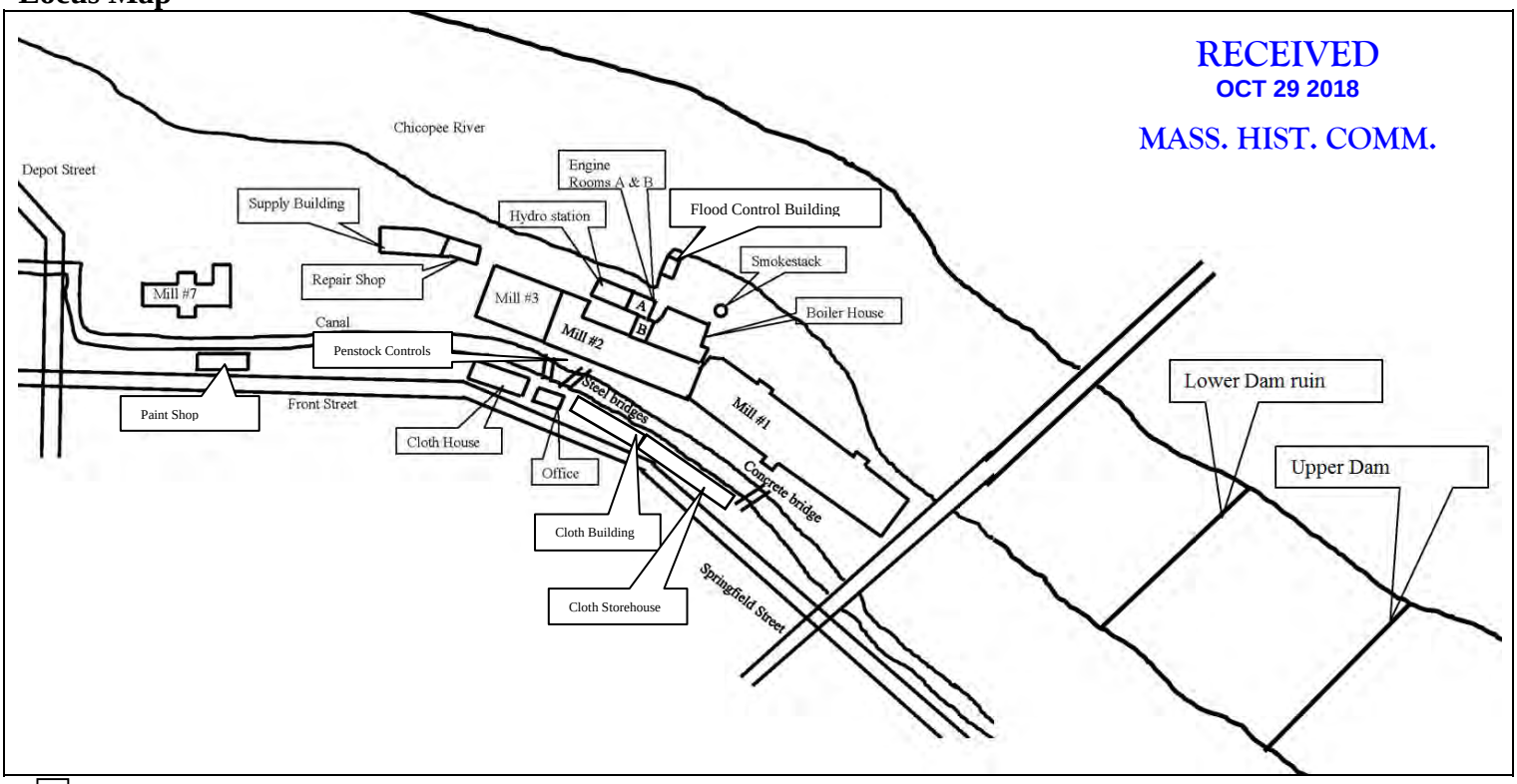
Recorded by: Brian Lever

Organization: Epsilon Associates

Date *(month/year):* October / 2018

Photograph

Locus Map



☐ *see continuation sheet*

☒ Recommended for listing in the National Register of Historic Places.

Use as much space as necessary to complete the following entries, allowing text to flow onto additional continuation sheets.

ARCHITECTURAL DESCRIPTION

Describe architectural, structural and landscape features and evaluate in terms of other areas within the community.

Initially constructed in 1832, the Dwight Manufacturing Company complex contains multi-story red brick industrial buildings, a canal with penstock gates and bridges as well as one functioning dam and another ruin of a dam and a smokestack. The complex is situated on the south side of the Chicopee River bordered by Front, Depot and Springfield Streets, with the dams located upriver separated from the main complex. The complex includes examples of Greek Revival, Italianate and Classical Revival styles.

Buildings:

Office / Counting House
Built circa 1840 for the Perkins Mills, the Office is a two and a half story, five by two bay Greek Revival style building. The building has a red brick exterior with brownstone lintels and sills and replacement 1/1 double hung windows as well as wood 6/6 windows. The building has its main entrance on the façade (south elevation) featuring a modern entry with sidelights and transom below a brownstone lintel. The rear elevation has two bay window projections with wood paneling as well as an enclosed porch and fully exposed basement level entrances due to sloping topography. Brick corbeling and dentils wrap around the building at the roofline. The side gable roof is covered in asphalt shingles and at the gable ends are brick pediments.

Mill #7 / Lyman Building
Built circa 1845 by the Springfield Canal Company (John Chase agent) for the Dwight Mills. This Italianate style industrial red brick building has a main block that is four stories in height with two five story stairtowers and a four story addition at the rear. Due to sloping topography, the rear (north) elevation is six stories in height. The main block is five by 23 bays and the addition is five by three bays. A modern late 20th century metal clad addition is also located on the rear of the building consisting of two stories, three by seven bays. The building has a low-pitched gable roof at the main block and rear brick addition with hip roofs on the stairtowers consisting of membrane and rolled asphalt roofing. The metal clad rear addition has a fat roof covered in membrane roofing. Surviving wood windows on the building are double hung and a mixture of 2/2 and 6/6 muntin patterns with brownstone lintels and sills. The building has brick corbelling at the roofline that wraps around the main block below brickwork emulating brackets and a wide overhanging cornice.

Cloth Storehouse
Built circa 1850 for the Perkins Mills, the Cloth Storehouse is two stories 5 by 29 bays. The building has a rectangular footprint and a four bay wide bump out projection on the façade (south elevation). The building is clad in red brick with every bay separated by a projecting brick pier. Window openings are segmental arched with brick lintels and brownstone sills. Windows are a mixture of historic 2/2 and 12/12 with modern replacements. Below the roofline is brick corbelling that wraps around the building. The roof is a low-pitched gable roof with exposed rafter ends and covered in asphalt roofing.

Cloth Building
Built circa 1850 for the Perkins Mills, the Cloth Building is one and a half stories 4 by 20 bays. The building has a rectangular footprint with a front gable roofed portion and a two-story flat roofed rear circa 1911 addition that is 4 by 20 bays. The sloping topography at the rear of the building next to the canal gives the addition two full stories. Both sections of the building are clad in red brick, but the brick and mortar are different for the rear addition. The original portion of the building has rectangular window openings with brownstone lintels and sills with replacement 1/1 windows. The original

portion of the building retains some wood panel doors and has corbelling wrapping around the building at the roofline and within the gable ends. The roof of the original portion of the building is asphalt shingles.

The circa 1911 addition sits on the edge of the canal and has a combination of rectangular and segmental arched window openings. Rectangular window openings have brownstone lintels and sills while the arched openings have brick lintels and brownstone sills. Most windows are replacement 1/1 double hung windows with a few multi-light windows installed in a concrete clad section.

Cloth House

The Cloth House was built circa 1880 for the Dwight Manufacturing Company. The Greek Revival style building is attached to the Office at its western end. The building is one story at the façade (south elevation) and two stories at the rear and 14 by four bays. The building is clad in red brick and has segmental arched window openings with brick lintels and brownstone sills. Most windows are replaced, but historic 12/12 double hung windows remain on the rear as well as one surviving wood door, the remainder have been replaced. Below the roofline is a band of raised brickwork resembling a Greek key wrapping around the building. The building has a low-pitched gable roof covered in asphalt roofing.

Supply Building / Repair Shop

The Supply Building / Repair Shop was initially constructed in 1886 by the Dwight Manufacturing Company. The Classical Revival style building consists of the Repair Shop at the eastern end and the Supply Building consisting of the western ¾ of the building constructed circa 1910. Both buildings are two stories in height and consist of red brick with low pitched gable roofs covered in rolled asphalt. A brick firewall separates the two buildings. The Repair Shop is seven by three bays with a rectangular footprint, as well as segmental arched window openings and door openings separated by brick piers. Window openings are segmental arched and have brick lintels and granite sills and 15/15 double hung windows. Surviving historic doors consist of solid wood panel doors with transoms in arched brick openings. Elsewhere modern steel doors are in place in existing openings.

The Supply Building is 17 by five bays with an irregular footprint. The building at its eastern end is the same width as the Repair Shop then elongates and turns southward on its north elevation following the riverfront. The building has the same design features as the Repair Shop including materials and windows. Entrances on the building are modern steel doors including a large overhead door on the western end of the building, used as a loading dock and sheltered by metal roofed canopy.

Boiler House / Engine Rooms A and B

Boiler House / Engine Rooms A and B were initially built circa 1910 by the Dwight Manufacturing Company. This grouping of interconnected buildings are all red brick two-story buildings with modern replacement and multi-light steel windows. The Boiler House is eight by eight bays with a chamfered northwest corner and a low-pitched gable roof with a monitor and membrane roofing. The Boiler House connects to the Smokestack at its northeast corner. Brick piers separate window openings. Between the Boiler House and Mill #1 is a one-story wing, which housed the compressor. A one-story brick and concrete block addition circa 1960 infills between the Boiler House and Engine Rooms A & B. Engine Room A is five by five bays with only one exposed elevation with segmental arched window openings and multi-light windows. Engine Room A has a flat roof with a skylight and is covered in membrane roofing. Engine Room, B is three by five bays and has a flat roof with asphalt roofing. Engine Room B has segmental arched window openings with brick lintels and granite sills with multi-light windows.

Mill #1

Mill #1 was built 1912 by the Dwight Manufacturing Company. The building is five stories on the façade and six stories at the rear and 49 by 10 bays. The red brick Classical Revival style building has a rectangular footprint with a chamfered northwest corner as well as projecting stairtower on the façade, two projecting stairtowers on the rear and an additional stairtower at the southwest corner of the building, all projecting one additional story in height to provide roof access. Each bay is separated by a brick pier. Window openings are segmental arched with brick lintels and granite sills. Windows are a mixture of surviving historic windows and modern replacements. Historic windows are: paired multi-light 18-lite windows with a center mullion and a pair of six lite pivot windows; paired nine lite windows with three lite transoms; 10/10 double

hung windows with or without 10 lite transoms; as well as 8/8 and 6/6 double hung windows and an oculus. The eastern end of the building and stairtower on the façade contain recessed brick bays lacking windows. The façade's stairtower has a large brick arch at its base containing an entrance and the building's designation "No 1" in granite with the 1912 datestone in granite above and is trimmed with granite blocks. The building has a low-pitched gable roof with exposed rafter ends and is covered with asphalt roofing. The façade's stairtower has a hip roof with asphalt shingles. A loading bay is on the rear of the building at the first story, sheltered by a metal roofed canopy.

Paint Shop
The Paint Shop was built circa 1912 by the Dwight Manufacturing Company. The Print Shop consists of two sections the, eastern end is lumber storage and the western end is the Paint Shop. The building is one story at the façade (south elevation) and two stories at the rear and has a rectangular footprint measuring ten by two bays. The red brick building has been painted. The eastern end of the façade contains rectangular window openings with cast stone lintels and sills and 12/12 double-hung windows. The western end of the façade contains segmental arched double door openings with paired steel doors. The rear of the building has segmental arched window openings, most of which have been boarded over. The building has a flat roof with a parapet wall separating the two sections and is covered in asphalt and membrane roofing.

Mill #2
Mill #2 was built 1913 by the Dwight Manufacturing Company. The red brick building is five stories on the façade (south elevation) and six stories at the rear and measures 32 by six bays, with a three by four bay projection at its northwest corner creating the building's L-shaped footprint. A stairtower is on at the east end of the building and a projecting tower is on the rear elevation. The building has matching details to Mill #1 including segmental arched window openings with brick lintels and granite sills as well as matching muntin patterns. Mill #2 has its own granite datestone eastern stairtower adjacent Mill #1 on the façade. The façade's stairtower is the most ornate portion of the building. A center brick arch contains a recessed entry with an arched transom and is flanked by granite block with a granite keystone. Above the arch is a double-hung 10/10 window and brick corbelling with granite blocks projecting outward as well as additional window openings, which are recessed and the datestone. The sixth story of the stairtower has arched 4/4 windows with granite sills and brick lintels. Additional granite block trim is present and brick corbeling. The roof of the building is a low pitch gable roof with exposed rafter ends and covered in asphalt roofing.

Mill #3
Mill #3 was built in 1920 by the Dwight Manufacturing Company. The red brick building is five stories on the façade (south elevation) and six stories at the rear and measures 15 by eight bays. The building has a rectangular footprint. The building has matching details to Mill #1 and Mill #2 including segmental arched window openings with brick lintels and granite sills as well as matching muntin patterns. However, on the west end of Mill #3 are large multi-light industrial sash windows not seen on the other buildings as well as an exterior fire escape and one steel door per floor. Mill #3 has its own granite datestone on its stairtower adjacent Mill #2 on the façade. The stairtower is the most ornate portion of the building. A center brick arch contains a recessed entry with an arched transom and is flanked by granite block with a granite keystone. Above the arch is a double-hung 10/10 window and brick corbelling with granite blocks projecting outward as well as additional window openings, which are recessed and the datestone. The sixth story of the stairtower has arched 4/4 windows with granite sills and brick lintels. Additional granite block trim is present and brick corbeling. The roof of the building is a low pitch gable roof with exposed rafter ends and covered in asphalt roofing. A loading bay is on the rear of the building at the first story, sheltered by a metal roofed canopy.

Hydrostation
The Hydrostation was built circa 1920 by the Dwight Manufacturing Company. The red brick building is three stories and seven by four bays. On the north and south elevations window openings are separated by brick piers. The east elevation is obscured by Engine Room A. On the west elevation the building's window openings are paired and set within recessed brickwork flanked by corbelling. Window openings are segmental arched at the third story and rectangular elsewhere and have brick lintels and granite sills. Windows are multi-light industrial sash with pivot panels at the top or above the midline. Doors have been replaced and are modern steel doors. The roof has a projecting cornice and is flat covered in asphalt roofing.

Flood Control Building
The Flood Control Building was built in 1941 for the Industrial Buildings Corporation. The building is two stories consisting of red brick and measures one by four bays with a rectangular footprint. The building has a concrete foundation and watertable with brick above and brick quoining at its corners. The building has glass block windows and a set of double steel doors. The building has a flat roof covered with asphalt roofing.

Structures:

Canal
Constructed in 1832 by the Springfield Canal Company (John Chase agent), the Canal is open channel and runs through the complex supported by a combination of stone block and concrete block sidewalls. The Canal originates upstream at the Chicopee River at the Upper Dam flowing downstream through the Ames Manufacturing Company (CHI.A / NR 1983) into the Dwight Manufacturing Company complex and emptying out into the Springfield River. The eastern portion of the Canal is concrete lined while the western section has exposed stone blocks.

Smokestack
Constructed in 1910 by the Dwight Manufacturing Company of red brick, the round smokestack is 145-feet high.

Upper Dam
1832 built by Charles W. McClellan (subcontractor to Springfield Canal Company). The masonry dam is approximately 300-feet in length spanning the Chicopee River and providing water to the Canal. At the east end of the dam is a circa 1950 gate control structure.

Lower Dam Ruin
1834 built by Charles W. McClellan (subcontractor to Springfield Canal Company). The dam was an overflow dam to the Upper Dam. Like the Upper Dam the Lower Dam is a masonry dam spanning the Chicopee River and provided water to the Canal. The damn was approximately 200-feet in length when constructed, in 1888 an ice damn carried away the superstructure of the dam leaving underwater portions still in the river creating a small rapid.

Bridges #1 & #2
Built circa 1870 by the Dwight Manufacturing Company, Bridges 1 & 2 are steel Warren (with verticals) pony truss bridges. They are oriented diagonal to each other forming a triangle with the Penstock Controls between them at their northern end. The bridges have steel deck plates. They are each approximately 10-feet wide and 50-feet in length spanning the Canal and located south of Mill #2.

Penstock Controls
The Penstock Controls were constructed circa 1910 by the Dwight Manufacturing Company. The controls consist of a movable lift gate which operates like a tram moving between the two gates in front of Mill #2.

Entry Gate
The Entry Gate was constructed in 1894 connecting the Office and Cloth Building by the Dwight Manufacturing Company. The gate consisting of three entrances, two pedestrian entrances flanking a center vehicle entrance. The eastern pedestrian entrance no longer has its decorative iron gates, while the others remain. Two granite posts flank the vehicle entrance with dates “1841 and “1894” commemorating the establishment of the Dwight Mills and expansion of the Dwight Manufacturing Company. Elliptical arches are above each entrance with decorative brickwork and two oculi are above the pedestrian entrances. A granite nameplate, brick corbelling and a cast stone cornice with dentil detail and additional ironwork top the gate.

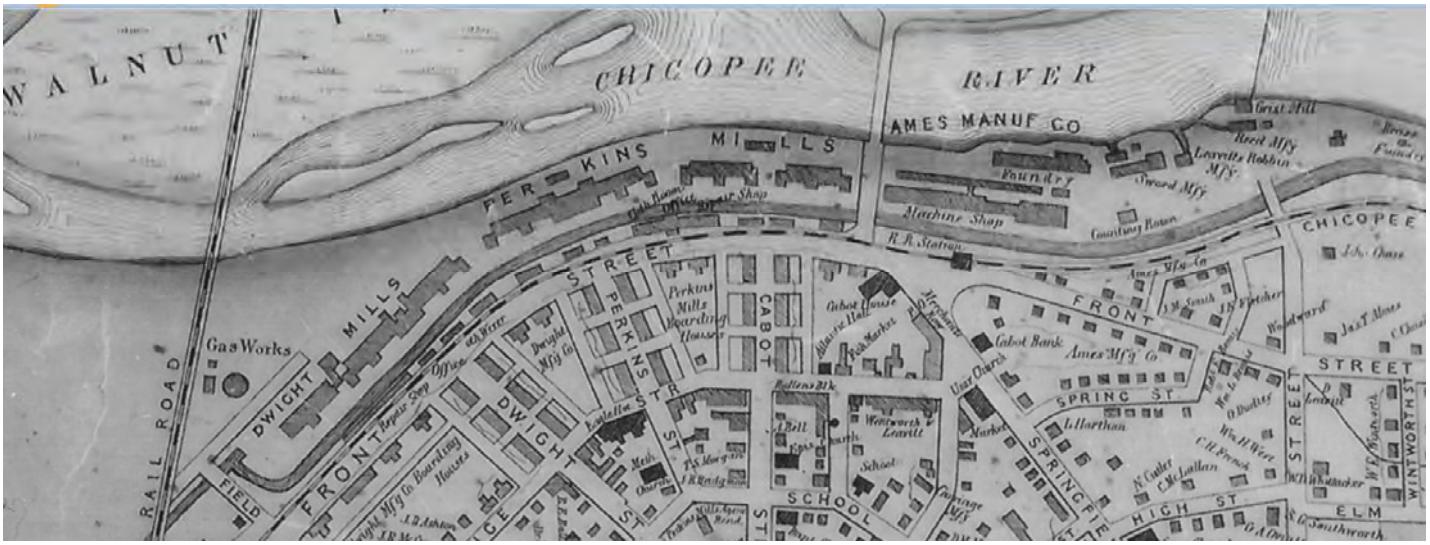
Bridge #3
Bridge #3 was built approximately 1960 by the Industrial Building's Corporation. It is a concrete slab bridge with concrete sidewalls topped with metal pipe rails. It is approximately 10-feet wide and 50-feet in length spanning the Canal and located south of Mill #1

HISTORICAL NARRATIVE

Explain historical development of the area. Discuss how this relates to the historical development of the community.

The Dwight Manufacturing Company is named for Edmund Dwight (1780-1849) of Boston an industrialist who envisioned an industrial town on the Chicopee River. Dwight having a country home in Chicopee had begun a previous venture with his brother Johnathan at Chicopee Falls creating the Chicopee Manufacturing Company (incorporated in 1823) to produce cotton cloth. With the success of the Chicopee Manufacturing Company, the Dwights along with other investors including Harrison Gray Otis formed the Springfield Canal Company in 1831. The goal was to create the "new Lowell" an industrial community in what is now Chicopee Center. The Company secured property and water rights along the Chicopee River. The area that is now Chicopee Center was sparsely developed at the time and the Company began construction of the Canal and Upper Dam in 1832 with Irish labor. John Chase served as agent for the Company and Charles W McClellan built the dams with the Lower Dam completed in 1834. With the Canal and dams in place and the property available for development the Company began to attract and then dispose of property to industrial developers, such as the Ames Manufacturing Company (CHI.A, NR 1983) in 1834 located east of the Dwight Manufacturing Company across Springfield Street.

Although the Dwight Manufacturing Company eventually takes control of the property west of Springfield Street along the Chicopee River, that was not the initial purpose. The goal was to create an industrial city and to encourage different mill owners and developers to start operations here. The first mill to be constructed was the Cabot Mill (not extant) in 1834 with R.E Bemis as its agent. The second company was the Perkins Mills which established its first mill here in 1836 and is responsible for the Office, Cloth Storehouse and Cloth Building. Mr. Whittier served as agent for the Perkins Mills. The Dwight Mills, established by Edmund Dwight completed its first mill in 1841. The mills benefited from the creation of the Chicopee Falls branch railroad line, in 1839 which ran adjacent to the property and replaced shipping product by boat via the Connecticut River. Whale oil was first used to light the mills until gas was installed in 1850. Equipment operators worked 14-hour days. Most employees were New England born from nearby communities, except for some specialized staff that came from Lowell. In 1855 the combined production of all three mills was 14,000,000 yards a year.



Circa 1850 Map of Dwight Cabot and Perkins Mills

In 1856 the Dwight Mills purchased the Perkins and Cabot Mills creating the Dwight Manufacturing Company and consolidating all their cotton cloth manufacturing into one organization. In addition to the Mills, the Company previously established employee housing (CHI.Z, NR 1977) along Depot and Dwight Streets. The creation of employee housing allowed the Company to attract new employees in particular women who could be housed together. In 1866 of the 1,475 hands, 1,030 were women. Throughout the Company's history were boom and bust cycles were the mills would be forced to shut down temporarily or run on shorter schedules. Additionally, the work was at times hazardous to employees with heavy and fast-moving equipment. During the Civil War, the Company benefited through Army contracts providing cloth for uniforms. By 1873 the Company was averaging 18 Million yards of cotton cloth per year however the panics of the 1870's created times of great difficulty and shut downs. During the 1890s, the Company was plagued with a series of fires resulting in the loss of hundreds of thousands of dollars. Ultimately an employee confessed to arson. In addition to the fires, the Company also had labor disputes with employees resulting in lockouts or strikes as well as competition from Southern mills. In order to complete, the Company in 1894 established a mill in Alabama City Alabama to take advantage of lower labor costs. For a time the move proved successful and the Company began a rebuilding phase in the 1910s creating the present Mills #1, #2, and #3 (which replaced previous mill buildings #1, #2 and #3) as well as converting from steam power to electricity with its own Hydroplant in 1920. Overtime as production methods changed and technology evolved, all the original mills except for Mill #7 / Lyman Building would be replaced and numerous other support buildings would be erected, modified and/or replaced. Despite the changes the Company could not remain profitable and shut down production in 1927 and ultimately sold the land and equipment in 1930.

After the closure of the Dwight Manufacturing Company the Company transferred operations to a plant in Somersworth NH leaving 1,500 employees at the Chicopee site out of work. The Company moved its equipment out of the buildings but retained ownership of the property keeping a small workforce of roughly 180 on site to help transfer equipment and maintain the buildings. In 1930 the buildings and property were sold to Raphael Sagalyn of Springfield who formed the Industrial Buildings Corporation as the ownership entity. Sagalyn believed an industrial use was still possible for the site by occupying it with multiple tenants. In 1931 Sagalyn got his first tenant the Berkshire Upholstered Furniture Company. In 1932 the Quinnehtuk Company purchased the water rights and usage of the Upper Dam, Canal and Hydroplant to produce electricity. In 1941 the Flood Control Building was constructed along with a new retaining wall along the Chicopee River serving as an outlet for water passing through the Hydroplant.

The Industrial Buildings Corporation largely retained the existing buildings but select demolition did occur. With so many buildings and only partial occupancy there was far more space than could be utilized. By 1950 Mills #5 and #6 as well as the Slasher Building, which were situated east of Mill #7 / Lyman Building were removed. The removal of these buildings allowed for additional parking for other tenants such as the John R. Lyman Company, which occupied Mill #7 / Lyman Building from 1950-2012 before moving to 225 Westover Road. The Lyman Company produces clean wipes for electronics and medical equipment. The Industrial Buildings Corporation retained control of the property into the 1980s. As a result of the construction of I391 in 1982 the Weave Building at the rear of the site along the Chicopee River was demolished. More recently in 2014 the Cloth Storehouse formerly situated on Front Street west of the Cloth House was demolished. Despite the demolition that has occurred the majority of the former Dwight Manufacturing Company site remains intact.

<u>Charles T Main</u>
Charles T Main is credited with designing several buildings in the complex including Mills #1, #2, and #3 as well as the Slasher Building (not extant). Charles T. Main (1856-1943) was born in Marblehead, MA and was educated at the Massachusetts Institute of Technology, where he later served as an assistant in the department of mechanical engineering. He became a draftsman at the Manchester Mills in Manchester, NH after which he worked for the Lower Pacific Mills in Lawrence, MA where for eleven years he was engineer and superintendent. Main was a prolific designer of mills and hydroelectric facilities in the US and Canada. Main designed and supervised the construction of numerous industrial steam power and water power plants. Among his largest undertakings were the Wood Worsted and Ayer Mills in Lawrence, MA and four hydroelectric developments for the Montana Power Company. Among Main's many commissions are the Smith & Dove Flax Mill (1894) in Andover, MA (MHC# ANV.458), the Stevens Linen Carding &

Hackling Mill (1913) in Dudley, MA (NR/ MHC# DUD.229, DUD.H), and the Wood Worsted Mill complex (1906) in Lawrence, MA (NR / MHC# LAW.Q).

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Dwight Manufacturing Company, Friday 5/16/1873, page 4
Dwight Mills, Wednesday 6/4/1873, page 6
Chicopee Dwight Mills, Saturday 1/6/1877, page 2
Dwight Manufacturing Company, Monday 8/1/1881, page 1
A Terrible Accident, Tuesday 8/15/1882, page 1
Mill Troubles, Tuesday 2/3/1890, page 1
Chicopee Carries Away a Dam, Tuesday 2/21/1888, page 2
$30,000 Fire at Chicopee, Sunday 2/23/1890, page 1
Chicopee Warehouse Gone, Saturday 4/19/1890, page 10
The Fire in the Dwight Mills, Tuesday 12/29/1891, page 3
Hadden's Lawless Mania, Monday 1/18/1892, page 5
Mills Can't Stand It, Tuesday 3/14/1893, page 4
Throws Many Out of Work, Tuesday 9/5/1893, page 3
Weavers Go Out, Wednesday 9/6/1983, page 5
Will Return at the Reduced Wages, Monday 9/18/1893, page 5
Business Good at Chicopee, Thursday 9/1/1894, Page 2
Analysis of the Dwight Manufacturing Company, Thursday 4/29/1915, page13
Mill Shutdown at Chicopee, 2,000 Idle, Monday 5/15/1922, page 6
Cut Valuation of Chicopee Mills, Monday 3/21/1917, page 17
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Dwight Manufacturing Company Area Data Sheet

Photo#	MHC#	Assessor's Parcel	Address	Historic Name	Construction Date	Resource Type	Contrib. / Non-contrib.
2, 5-6	CHI.529	0096-00035	165 Front St	Office/ Counting House	Circa 1840	B	C
3-4	CHI.149	0095-00003	165 Front St	Mill #7	Circa 1845	B	C
7-8	CHI.532	0096-00035	165 Front St	Cloth Storehouse	Circa 1850	B	C
9-10	CHI.531	0096-00035	165 Front St	Cloth Building	Circa 1850	B	C
2, 11-12	CHI.530	0096-00031	165 Front St	Cloth House	Circa 1880	B	C
13-14	CHI.540	0095-40005	165 Front St	Supply Building / Repair Shop	1886	B	C
15-16	CHI.542	0095-40005	165 Front St	Boiler House /	Circa 1910	B	C
16-17, 21	CHI.537	0095-40005	165 Front St	Engine Rooms A & B	Circa 1910	B	C
18-20	CHI.539	0095-40005	165 Front St	Mill #1	1912	B	C
1, 21	CHI.541	0095-0004A	165 Front St	Paint Shop	Circa 1912	B	C
22-23	CHI.538	0095-40005	165 Front St	Mill #2	1913	B	C
1-2, 24-25	CHI.533	0095-40005	165 Front St	Mill #3	1920	B	C
25-26	CHI.528	0098-00052	165 Front St	Hydrostation	1920	B	C
22	CHI.1011	0098-00052	165 Front St	Flood Control Building	1941	B	NC
6, 7, 12, 23, 28	CHI.901	0098-00052	Front St	Canal	1832	S	C
NA	CHI.940	0098-00052	Chicopee River	Upper Dam	1832	S	C
29	CHI.941	0098-00050	Chicopee River	Lower Dam Ruin	1834	S	NC
10, 23, 28	CHI.942 CHI.943	0098-00052	165 Front St	Bridges #1 & #2	Circa 1870	S	C
5, 9, 28	CHI.944	0098-00052	165 Front St	Entry Gate	1894	S	C
25	CHI.945	0098-00052	165 Front St	Smokestack	1910	S	C
8, 23, 28	CHI.946	0098-00052	165 Front St	Penstock Controls	Circa 1910	S	C
8, 30	CHI.947	0098-00052	165 Front St	Bridge #3	Circa 1960	S	NC

National Register of Historic Places Criteria Statement Form

Check all that apply:

☐ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☒ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

Statement of Significance by Brian Lever
The criteria that are checked in the above sections must be justified here.

The Dwight Manufacturing Company is intrinsically intertwined with the development of Chicopee Center. At its peak the Company employed 2,500 people as one of the largest employers in the City. The Company and its growth and expansion turned Chicopee Center from an area of sparsely populated farms to a thriving community. Housing both Company owned and privately developed bore their creation to the Company. From 1841 until its permanent closure in 1930 the fortunes of many Chicopee residents were tied to the Company's success or failure. The Company meets Criterion A as part of the development and growth of industry in Chicopee from the mid-19th century through the early 20th century. The Company contains a variety of types of historic buildings and structures and architectural styles including Greek Revival, Italianate and Classical Revival. Despite some replacement windows and doors as well as changes overtime, the Company meets Criterion C as an intact industrial complex exhibiting well preserved examples of 19th and 20th century architecture.

ADDITIONAL PHOTOGRAPHS:

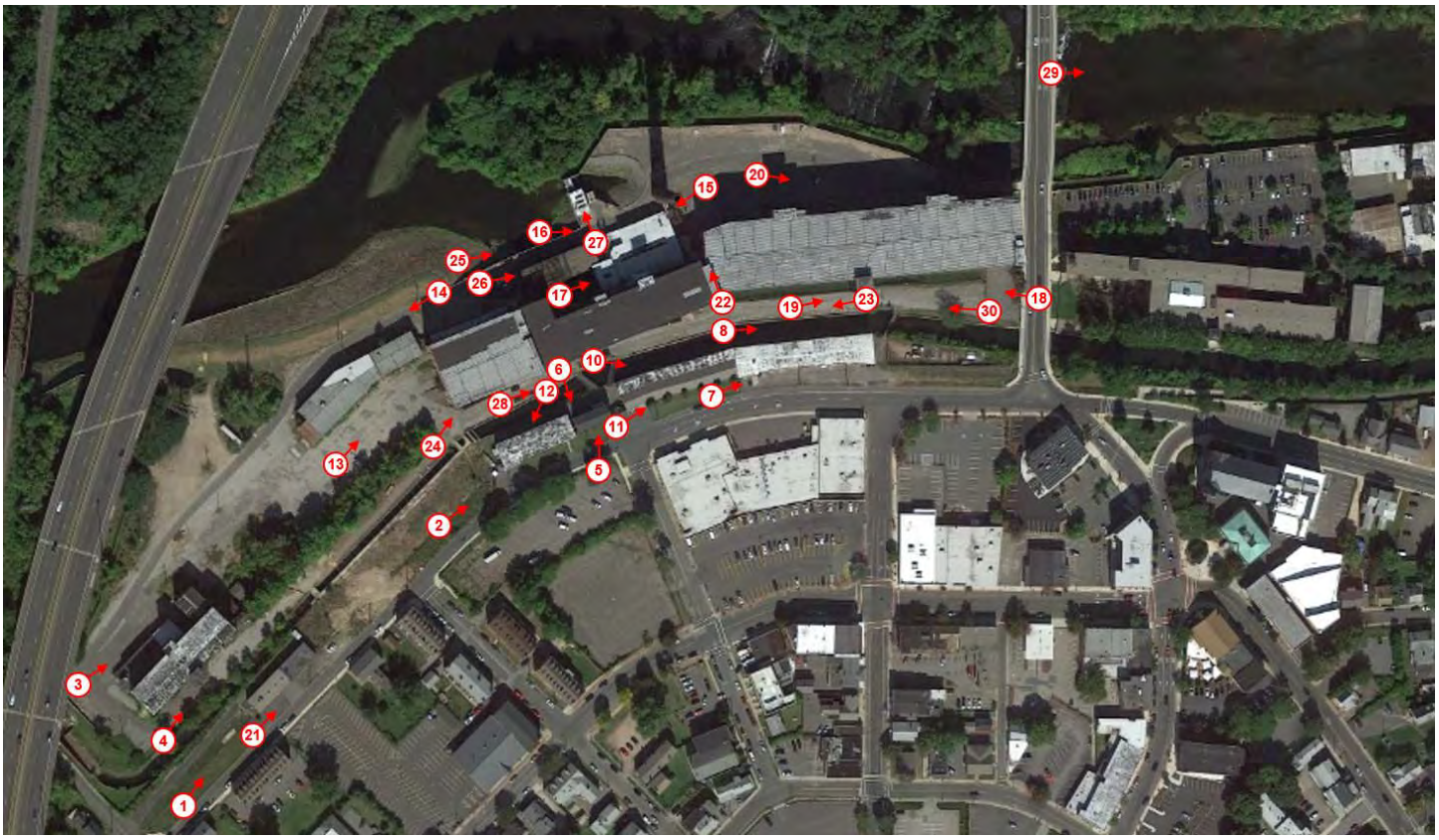


Photo Location Key


Photo 1: View northwest of complex along Front Street, Mill #7 at left


Photo 2: View northeast of complex along Front Street, Mill #3 at left


Photo 3: View east of complex, Mill #7 / Lyman Building, at right


Photo 4: View northeast of Mill ##7 / Lyman Building

Photo 5: View northeast of Office/Counting House (left), Entry Gate and Cloth Building (right).

Photo 6: View southeast of Canal (foreground) Cloth Building (left), Office/Counting House (center) and Cloth House (right)


Photo 7: View northeast of Cloth Storehouse


Photo 8: View southeast of Cloth Storehouse, Canal, and Bridge #3 at background left

Photo 9: View southeast of Cloth Building, Entry Gate at left

Photo 10: View southeast of Cloth Building and Bridges 1 & 2


Photo 11: View northeast of Cloth House


Photo 12: View southwest of Cloth House and Canal


Photo 13: View northeast of Supply Building / Repair Shop


Photo 14: View southwest of Supply Building / Repair Shop


Photo 15: View southwest of Boiler House


Photo 16: View east of Boiler House (background, left) and Engine Room A (foreground, right)


Photo 17: View east of Engine Room B (center).


Photo 18: View northwest of Mill #1


Photo 19: View northeast of Mill #1


Photo 20: View east of Mill #1


Photo 21: View northeast of Paint Shop


Photo 22: View north of Mill #2 stairtower entrance on façade


Photo 23: View northeast of Mill #2, Canal, Bridges 1 & 2 and Penstock Controls


Photo 24: View northeast of Mill #2

Photo 25: View east of smokestack (left), Hydrostation (center) and Mill # 3 (right)


Photo 26: View east of Boiler House (background, far left), Engine Room A (background, left), Hydrostation (center) and Mill # 3 (right)

Photo 27: View north of Flood Control Building


Photo 28: View of complex interior to the east including Cloth Building, Entry Gate, Canal, Penstock Controls and Bridges 1 and 2


Photo 29: View east of Lower Dam ruin


Photo 30: View west of complex including Bridge #3 (left) and Mill #1 (foreground, right) and Mill #2 (background, right)

CH1.E

FORM A - AREA

Area Letter	Form numbers in this area
DGS E	227P + 901 ~~1,2~~

MASSACHUSETTS HISTORICAL COMMISSION
80 BOYLSTON STREET, BOSTON, MA 02116

Town Chicopee

Name of Area (if any)

Dwight Generating Station

Present Use hydroelectric station

General Date or Period 1856-1920

General Condition good

Acreage approx. 9

Recorded by Matthew Roth

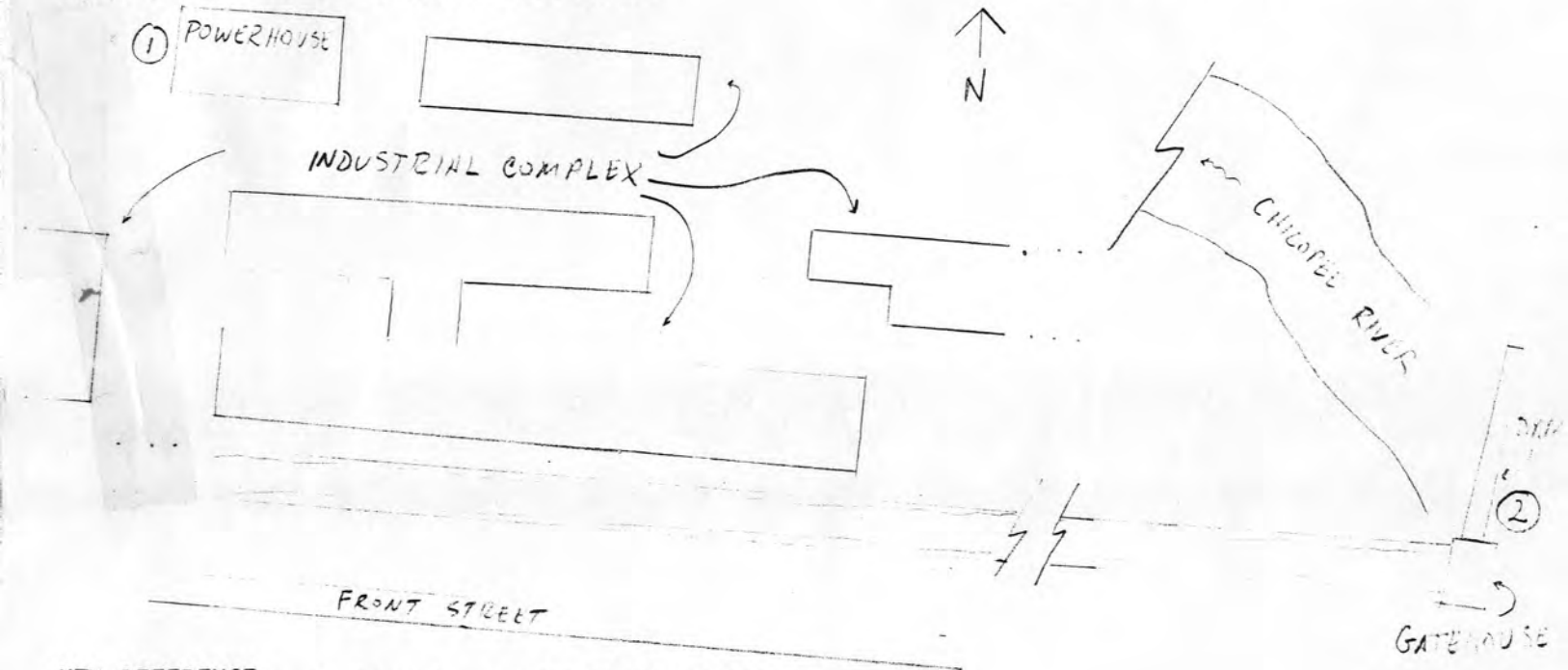
Organization Historic Resource Cons.

Date July 21, 1989

Photos (3"x3" or 3"x5" black & white). Indicate on back of each photo street addresses for buildings shown. Staple to left side of form.

SEE ATTACHED PHOTOS

Sketch Map. Draw a general map of the area indicating properties within it. Number each property for which individual inventory forms have been completed. Label streets including route numbers, if any. Indicate north. (Attach a separate sheet if space here is not sufficient).



UTM REFERENCE
1. Powerhouse: 18.697650.4668980
2. Dam: 18.698250.4668960

USGS QUADRANGLE Springfield North
SCALE 1:25000

CH1.E

NATIONAL REGISTER CRITERIA STATEMENT (if applicable)

Dwight Generating Station includes an 1856 dam, gatehouse and canal, and a 1920 powerhouse that represent the typical hydropower technology of the mid- and late 19th century, respectively (Criterion C). The system is also related to several locally significant manufacturing firms that operated at or near this location (Criterion A).

ARCHITECTURAL SIGNIFICANCE Describe important architectural features and evaluate in terms of other areas within the community.

Dam: gravity structure built of stone masonry, 1856
Gatehouse: brick, gable roof, c.1856
Canal: open channel with walls reinforced by masonry, c.1856
Powerhouse: brick-pier construction, gable roof, 1920.

The dam and canal used construction techniques that were typical of hydropower developments in New England during the mid-19th century. The 1920 powerhouse employed the brick mill construction that is ubiquitous in the industrial complexes built in central Massachusetts during the early 20th century.

HISTORICAL SIGNIFICANCE Explain historical importance of area and how the area relates to the development of other areas of the community.

The Dwight Generating Station is a small but interesting chapter in the industrial development of Chicopee, which began in earnest in the 1820s, when a waterpower company first sought to capitalize on the power of the Chicopee River at this water privilege. The key investors were the Dwight family, which over the next three decades consolidated all the water rights under the firm that was eventually incorporated, in 1856, as the Dwight Manufacturing Co. A prominent early (and continuous) tenant was Ames Manufacturing Co., which in the 1830s bought land and began leasing power from the Dwights. In 1856 the Dwights, whose main business was cotton manufacturing, built the present dam and canal. By 1900, some ten turbines were powered by the system; there were at least three powerhouses. In 1920, Dwight Manufacturing built a new powerhouse to upgrade the power facilities for its own factories. With the demise of Dwight Manufacturing Co. in the Great Depression, the hydroelectric component of the complex was sold to a local electric utility that, through a series of acquisitions, became a part of the Northeast Utilities system.

BIBLIOGRAPHY and/or REFERENCES

Copeland, Alfred M., ed. A History of Hampden County, Massachusetts, 3 vols. [Springfield?]: Century Memorial Publishing Co., 1902; vol. 2, 263.

Johnson, Clifton, Hampden County, 1636-1936, 2 vols. New York: American Historical Society, Inc., 1936; vol. 2, 633-634.

CH1.E

DWIGHT PROJECT - BYPASS

CHI.E

DWIGHT PROJECT - TAILRACE, LOWER BYPASS REACH,
& BACKWATERING FROM CONNECTICUT RIVER.

CH1.E

PUBLIC ARCHAEOLOGY SURVEY TEAM, INC.

c/o Department of Anthropology • U-176 • University of Connecticut
Storrs, CT 06268 • Phone (203) 486-4264

August 30, 1989

Mr. Andrew Sims
Kleinschmidt Associates
75 Main Street
P.O. Box 576
Pittsfield, ME 04967-0076

Re: Dwight Project UL 88-29-00

Dear Mr. Sims:

The Public Archaeology Survey Team, Inc. has examined the above referenced project with respect to its prehistoric archaeological site potential and potential impacts upon archaeological resources by the planned construction activities. Historic Resource Consultants previously examined the project area with respect to any historic period resources that may be affected by the proposed minimum-flow installations and have identified the potential impacts of the installation options upon historically significant resources.

Our survey of the site area consisted of a brief background survey to determine if any previously reported prehistoric sites are known in the area and a walkover survey and visual examination of the impact area. While no prehistoric sites are reported within or immediately adjacent to the project area, several have been recorded along the Chicopee River, including the Bircham Bend Site near Interhcange 6 of I-90 and the Indian Crossing Site at the confluence of the Chicopee and Connecticut Rivers.

A visual examination of the project area indicated that the project area had been extensively disturbed by construction activities associated with the construction of and the operation of the Dwight facility. Although the impact area has no potential for yielding intact prehistoric sites, the surrounding area is considered to have a high potential for yielding intact prehistoric archaeological sites, based on the topography of the area and its proximity to the Chicopee River.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Kevin A. McBride
Director

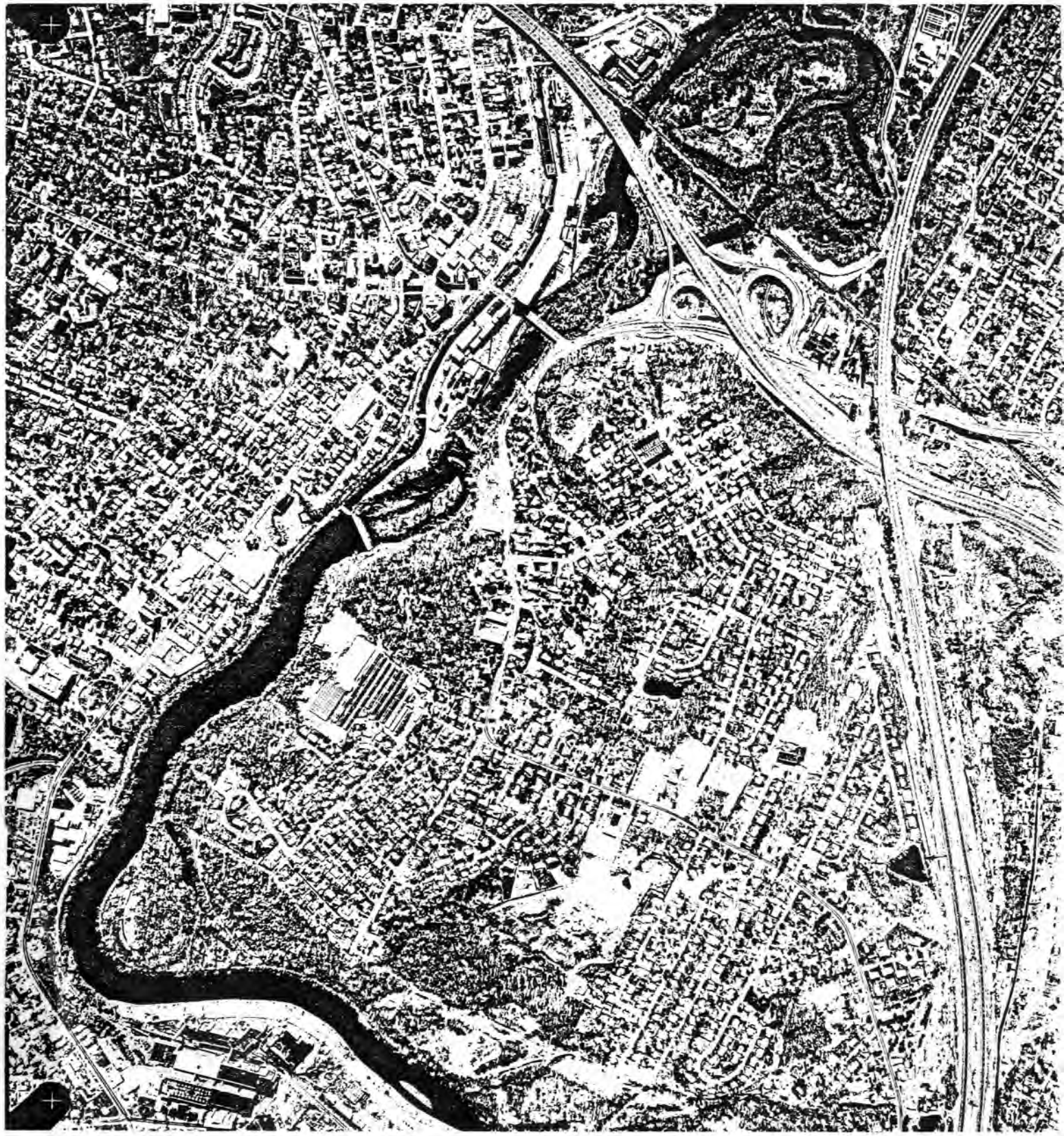
KAM/rlb

CHIE

APPENDIX G

PROJECT PHOTOGRAPHS

CH1.E



DWIGHT PROJECT - AERIAL VIEW

CHI.E

Community: Chicopee

MHC OPINION: ELIGIBILITY FOR NATIONAL REGISTER

Date Received: Date Due: Date Reviewed: January, 1990

Type: Individual District (Attach map indicating boundaries)

Name: Dwight Generating Station
Powerhouse, Dam & Canal
(AKA Ames Manufacturing Co.)

Address:

Requested by: Northeast Utilities

Inventory Form: 120, 217-218, 224-229 Area A and attached #227P + 901

Action: Honor ITC Grant (R & C) Other:

Agency: FERC

Staff in charge of Review: M. Cavanaugh

INDIVIDUAL PROPERTIES Consensus DOE

__ Eligible
__ Eligible, also in district
__ Eligible only in district
__ Ineligible
__ More information needed

DISTRICTS

__ Eligible
__ Ineligible
__ More information needed

CRITERIA: A B C D

LEVEL: Local State National

STATEMENT OF SIGNIFICANCE by _____

See R&C file (Chicopee) for additional information

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	CHI.A
Historic Name:	Ames Manufacturing Company
Common Name:	Ames Mills - Spalding, A. G. and Brothers
Address:	
City/Town:	Chicopee
Village/Neighborhood:	Chicopee Center
Local No:	
Year Constructed:	
Architect(s):	
Architectural Style(s):	
Use(s):	Industrial Complex or District; Military Other; Textile Mill
Significance:	Architecture; Commerce; Industry; Transportation
Area(s):	
Designation(s):	Nat'l Register DOE (12/21/1981); Nat'l Register Individual Property (06/23/1983)
Building Materials(s):	

The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (http://mhc-macris.net/macrisdisclaimer.htm)

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

CHI. A

FORM A - AREA SURVEY

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, State House, Boston

Form numbers in this area	Area no.
120, 217-18 224-229	A

Town Chicopee

Name of area (if any) Ames Manufacturing Company #218

General date or period 1850-1900

Is area uniform (explain):

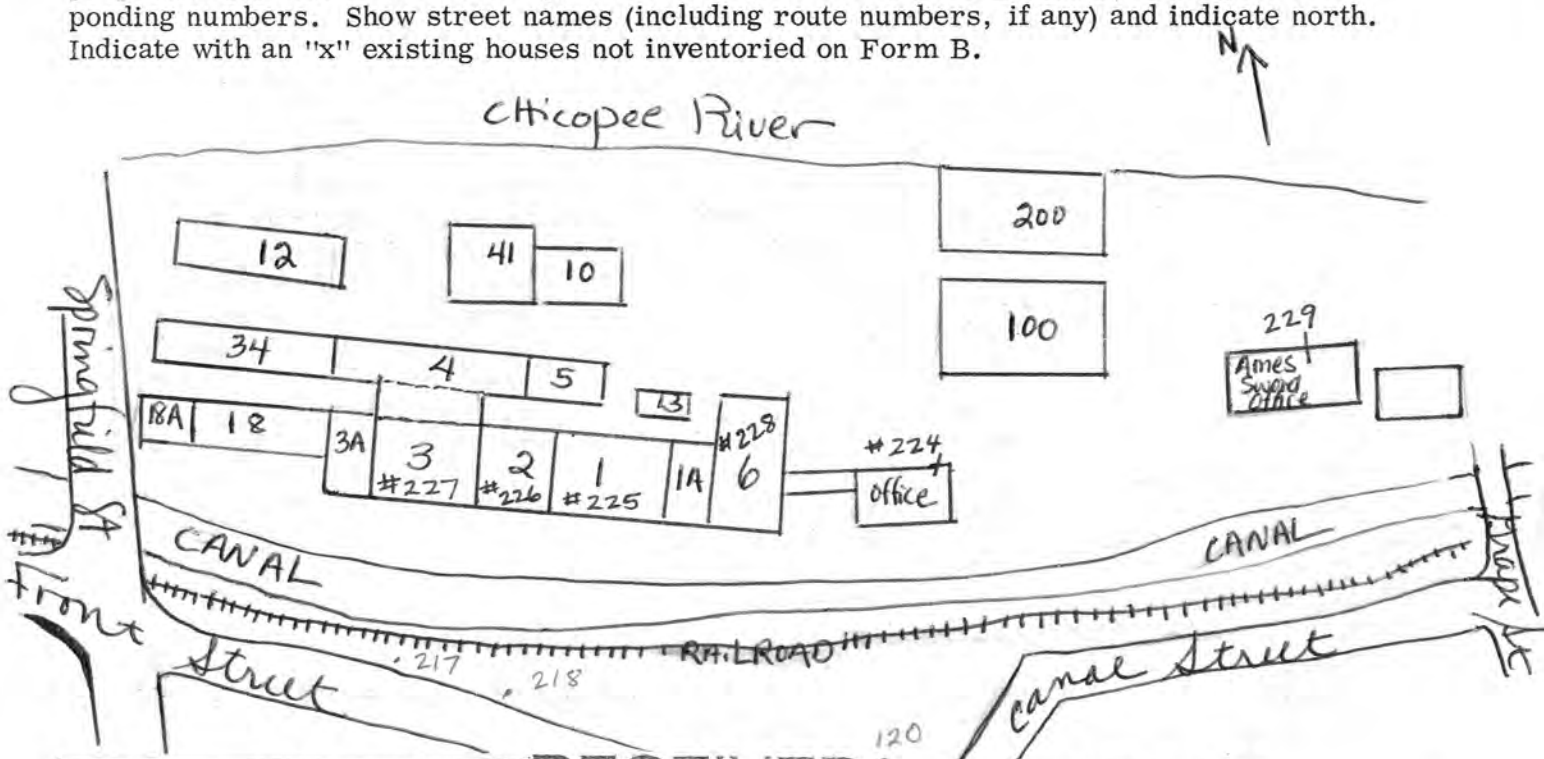
in style? yes brick construction

in condition? yes good, much alteration

in type of ownership? yes industrial

in use? yes industrial

5. Map. Use space below to draw a general map of the area involved. Indicate any historic properties for which individual reports are completed on Forms B thru F, using corresponding numbers. Show street names (including route numbers, if any) and indicate north. Indicate with an "x" existing houses not inventoried on Form B.



DO NOT WRITE IN THIS SPACE
USGS Quadrant

MHC Photo no.

RECEIVED
DEC 12 1978
MASS. HIST. COMM.

6. Recorded by Deborah Shea

Organization Planning and Development

Date November 30, 1978

(over)

5M-2-75-R061465

CH1.A

7. Historical data. Explain the historical/architectural importance of this area.

The Ames Brothers, Nathan and James, established a tool and cutlery business in Chicopee Falls in 1829. A shop complete with machinery and water power was furnished for them by Edmund Dwight, later to found the Dwight Manufacturing Co. When Chicopee Center was improved with dams and canals, the firm relocated. The Ames Manufacturing Co. was incorporated that year, 1834 with a capital of $30,000.00 drawn from outside sources. James and N.P. Ames, Edmund Dwight (the company's first president). J.K. Mills and Ignatius Sargent of Boston were the principal stockholders. The company products included small swords, daggers, bayonets, small tools and machinery.

In 1836 the company began to manufacture cannons and cannon balls for which it received many orders from this government as well as foreign governments. The railroad was built to Chicopee in 1845, thus resolving transportation problems. The company's capital reached $250,000.00 in 1849 signifying an early, steady growth. In 1853 the company began casting statuary and other bronze art works for which it received a world wide reputation. Statuary cast by the company may be seen in parks throughout the states. Among prominent company works are the equestrian statue of Washington in Union Square, NY and Boston, the Franklin Statue also in Boston and the Bronze doors of the Capital in Washington.

The civil war years were profitable for the company. 1500-1600 people were employed and buildings were enlarged to complete increasing government arms orders. In 1867 Emerson Gaylord, T.W. Carter, E.O. Carter and James Ames secured a majority of the companies stock thus transferring company headquarters to Chicopee. In addition to machinery, skates and mailboxes were added to company projuctions as well as ceremonial swords and military regalia. In 1881 the company expanded the sword dept. into a separate entity. The adjacent Gaylord Manufacturing Co. (also Manufactures of swords) was purchased and incorporated with Ames as the Ames Sword Co. The Ames Co. manufactured sewing machine parts and bicycles in its later years until its decline. Among credits to the company is also the introduction of the electroplating process to this country. The company was put up for sale in 1898.

8. Bibliography and/or references such as local histories, deeds, assessor's records, early maps, etc.

1847, 1853 City Directories
1855 Map
Lousi H. Everts, History of the Connecticut Valley in Mass,. Phila. 1879
1937 Map A.G. Spauldings & Bros. Map
Vera Shlakman, Economic History of a Factory Town, Norhtampton 1915
Ames file at Chicopee Library

The site has undergone much change with expansion and demolition. Charles McClallan was the mason of the earlier 19th centruy constructions. While the older buildings are brick, newer construction has been aluminum buildings. The cobblestone streets have been tarred. The earliest buildings - the machince shop consisting of Building #1 (1847-1850), Building 2 (after 1859), Building #3 (1859-1865), Building 6 (1860), and the Ames Office (1847-1850) line the canal. Building 18 (1850 - 2 storys, trabeated lintels and sills, gable roof raised 1865-1870) is attached to Building #3 by Building 3A (1860's upper stories 1908). Building 18A was constructed 1865-1870. Entrances have been altered to accomodate new use and windows have been bricked as is common to industrial sites.

Building 4 (built 1865, 4th story 1913, 5th story 1929) and Building 5 (1865-1870) are attached by an elevated walk to the rear of Building #3. Building #34 attached to the west of Building #4 was constructed in 1915 (5th story 1929) when Spauldings owned the company. Building #13 was constructed 1855-1859. Building 10, a portion of the Ames founday was erected 1855-1860. It contained the brass casting and pickle rooms. The Boiler House was attached to the west in 1922 (Bldg 41). Building 12 (1878) was the forge shop and curing room. Charles Basin, owner of these buildings, leases the buildings as an industrial park.

Building 100 (1908), Building 200 (1911), the Ames Sword Co. office (1863-1870) and metal buildings are owned by Eastern Etching, manufactures of name plates. These buildings are separated fomr Mr. Basin's by a wire fence. The original Ames Sword buildings were razed in 1935.

CHI. A

NRIND - 2/23/83
NPSDOE - 12/21/82

	~~545~~	A

(Attach photo here)

FORM B - BUILDING SURVEY

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, State House, Boston

1. Is this building historically significant to:
Town + Commonwealth + Nation

Building has historical connection with the following themes: (see also reverse side)

Scholar	Commerce/industry
Agriculture	Science/invention
Art/Sculpture	Travel/communication
Education	Military Affairs
Government	Religion/philosophy
Literature	Indians
Music	Other Technology

Development of town/city

Architectural reason for inventorying: Style interest relative to function

2. Town Chicopee (Hampden County)
(Cabotville; Chicopee Center)
Street address Chicopee Street at Chicopee River

Name Ames Manufacturing Company.
(Ames Sword Company)

Use: original & present Firearms; machinery; statuary; tools; bronze castings.

Present owner [illegible] CITIZENS - SPRINGFIELD

Open to public No.

Ref. * 45

Date 18~~88~~ Style Industrial (Italianate Tower)

Source of date Observation SEE B

Architect Unknown.

OR part of Area # —

3. CONDITION Excellent Good Fair Deteriorated Moved Altered Added
(Roof - c. 1880)

4. DESCRIPTION

FOUNDATION/BASEMENT: High Regular Low Material (Blockstone cut and coursed)

WALL COVER: Wood Brick Stone Other

ROOF: Ridge (Flat) Gambrel Flat Hip Mansard (Former pitched roof replaced) (Tar and crushed stone covering)
Tower Cupola Dormer windows Balustrade Grillwork
(Front central stair tower - open arches - corbel tables)

CHIMNEYS: 1 2 3 4 Center End Interior Irregular Cluster Elaborate

STORIES: 1 2 3 4 ATTACHMENTS: Wings Ell Shed

PORCHES: 1 2 3 4 None PORTICO None Balcony

FACADE: Gable end: Front/side Ornament (Dentil molding under eaves)

Entrance: Side Front: Center/Side Details: None.

Windows: Spacing: Regular/Irregular Identical/Varied (Double sash)

Corners: Plain Pilasters Quoins Cornerboards

5. Indicate location of building in relation to nearest cross streets and other buildings ←N

6. Footage of structure from street 25±
Property has 100± feet frontage on street (Chicopee Street)

Recorder Bryant F. Tolles, Jr. - Special Consultant

For M.H.C.

Photo # 70-2916 Date 8/16/70

SEE REVERSE SIDE

CH1. A

RELATION OF SURROUNDING STRUCTURE

1. Outbuildings Associated Industrial structures.

2. Landscape Features: Agriculture Open Wooded Garden: Formal/Informal
Predominant features Trees Along canal and river course.
Landscape architect ———

3. Neighboring Structures
Style: Colonial Federal Greek Revival Gothic Revival Italian Villa Lombard Rom.
Venetian Gothic Mansard Richardsonian Modern

Use: Residential Commercial Religious Industrial Conditions: Excellent Good Fair Deteriorated

---

GIVE A BRIEF DESCRIPTION OF HISTORIC IMPORTANCE OF SITE (Refer and elaborate on theme circled on front of form)

Historic Significance:

1. In 1828, Nathan P. Ames moved business from Chelmsford to Chicopee and commenced production of swords for U.S. Govt. - present location occupied in 1834 - brass foundry (1836) andiron foundry added (1845) - history of company another illustration of regional ingenuity (has adjusted products to market demands) - company has always specialized in domestic and military bayonets, sabres, swords and also: cutlery; fine edge tools; cotton machinery bronze doors and statuary, guns and cannon, projectiles, plated ware, water turbine wheels - has held government contracts for arms - made famed Boyden turbine - has produced large statues - in 1929, employed 150 operatives to make society and military goods (one

Architectural Importance: of oldest and most highly regarded companies in its field)

1. Though it performed a greatly different function, the structure takes on an appearance similar to that of Connecticut River textile factories of the same time. (rectangular floorplans; front central stair tower, etc.)

2. Most striking feature is front central stair tower with its fine open arches, dentil molding, and corbel tables — of Italianate inspiration

3. Site between the Chicopee River and power canal of interest for scenic and engineering reasons.

BIBLIOGRAPHY AND/OR REFERENCE

1. History of the Connecticut Valley in Massachusetts, 2 vols. Philadelphia: Louis H. Everts, 1879. (II, p. 974)

*2. Szetela, Thaddeus M. History of Chicopee. Chicopee, Massachusetts: Szetela and Rice Publishing Company, 1948. (pp. 72-80; 86; 88-92)

3. Holland, Josiah G. History of Western Massachusetts. 2 vols. Springfield, Massachusetts: Samuel Bowles and Company, 1855. (II, pp. 48-49)

4. Stowe, Orrin L. History of Massachusetts Industries. 4 vols. Boston and Chicago: The S.J. Clarke Publishing Company, 1930. (I, pp. 631-32)

5. Spence, V. "Industrial History of Chicopee." M.A. Thesis, Clark University, Worcester, Massachusetts, 1930.

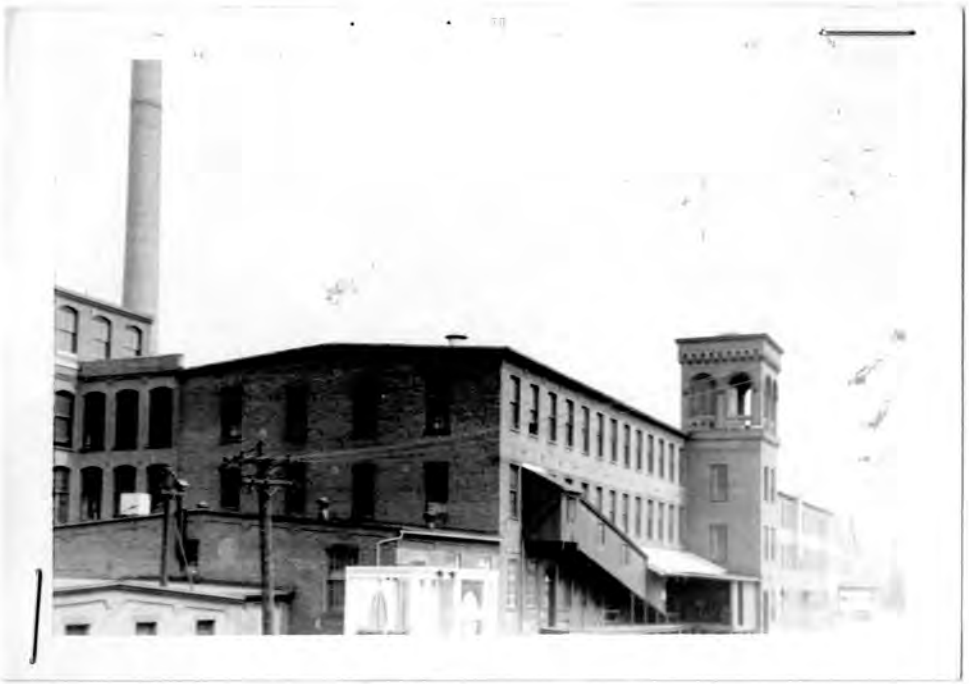
6. Shlakman, Vera. Economic History of a Factory Town: A Study of Chicopee, Massachusetts. Smith College Studies in History #20 Northampton, Massachusetts: Smith College, 1936.

7. History of the Connecticut Valley in Massachusetts, 2 vols. Philadelphia: Louis H. Everts, 1879. (II, p. 974)

RESTRICTIONS ———

Original Owner: ———

Deed Information: Book Number ——— Page ———, ——— Registry of Deeds



The Ames Manufacturing Company - Chicopee (Cabotville)

① History of the Connecticut Valley in Massachusetts. 2 vols. Philadelphia: Louis H. Evarts, 1874 (II, P. 9-7)
- origin dates to 1879 (Chelmsford, Mass.) - works moved to Chicopee in 1829 by N.P. Ames, Jr. and James T. Ames - (awards manufactured) - in 1834 works built at Cabotville and Ames incorporated with James T. Mitchell Edmund Dwight as the "Ames Manufacturing Company" (capital of $70,000)

"Ames Manufacturing Company" - Springfield
charter - 1834, Ch. 31 (Revised by Chap. 290, Acts 1907)
1887, Ch. 100
Massachusetts Special Laws 7 (1830-37) - 1834 (Chap. 31)

Chap. 31.

AN ACT to incorporate the Ames Manufacturing Company.

Persons incorporated.

SECT. 1. *BE it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same*, That Nathan P. Ames, James T. Ames, Edmund Dwight and James K. Mills, their associates, successors and assigns, are hereby made a corporation, by the name of the Ames Manufacturing Company, for the purpose of manufacturing hardware, cutlery, and other articles in that line, in the town of Springfield, in the county of Hampden, and for those purposes shall have all the powers and privileges, and be subject to all the duties and requirements, contained in an act entitled "an act defining the general powers and duties of manufacturing corporations," passed the twenty-third day of February, in the year of our Lord one thousand eight hundred and thirty.

Powers and duties.

1829 ch. 53.

Real and personal estate.

SECT. 2. *Be it further enacted*, That said corporation may be seized and possessed of such real estate, not exceeding the value of forty thousand dollars, and such personal estate, not exceeding the value of sixty thousand dollars, as may be necessary and convenient for the purposes aforesaid. [*Feb.* 24, 1834.]

CH1.A

Community: Chicopee

MHC OPINION: ELIGIBILITY FOR NATIONAL REGISTER

Date Received: Date Due: Date Reviewed: January, 1990

Type: Individual District (Attach map indicating boundaries)

Name: Dwight Generating Station
Powerhouse, Dam & Canal
(AKA Ames Manufacturing Co.)

Address:

Inventory Form: 120, 217-218, 224-229 Area A and attached

A

Requested by: Northeast Utilities

Action: Honor ITC Grant (R & C) Other:

Agency: FERC

Staff in charge of Review: M. Cavanaugh

INDIVIDUAL PROPERTIES Consensus DOE

__ Eligible
__ Eligible, also in district
__ Eligible only in district
__ Ineligible
__ More information needed

DISTRICTS

__ Eligible
__ Ineligible
__ More information needed

CRITERIA: A B C D

LEVEL: Local State National

STATEMENT OF SIGNIFICANCE by_____

See R&C file (Chicopee) for additional information

NPS Form 10-900
(8-81)

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only

received

date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic Ames Manufacturing Company

and/or common Ames Mills

2. Location

street & number 5-7 Springfield Street ~~N/A~~ not for publication

city, town Chicopee ~~N/A~~ vicinity of ~~congressional district~~

state Massachusetts **code** 025 **county** Hampden **code** 013

3. Classification

Category	Ownership	Status	Present Use	
___ district	___ public	___ occupied	___ agriculture	___ museum
X building(s)	X private	___ unoccupied	___ commercial	___ park
___ structure	___ both	___ work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
___ object	N/A in process	___ yes: restricted	___ government	___ scientific
	___ being considered	X yes: unrestricted	X industrial	___ transportation
		___ no	___ military	___ other:

4. Owner of Property

name Edward J. Wickles; Thomas J. Wickles; Joseph Partyka, Jr.; Joan Partyka

street & number c/o 142 Casino Avenue

city, town Chicopee N/A vicinity of **state** Massachusetts

5. Location of Legal Description

courthouse, registry of deeds, etc. Hampden County Registry of Deeds

street & number 50 State Street

city, town Springfield **state** MA

6. Representation in Existing Surveys

title Inventory of the Historic Assets of the Commonwealth #224-228

has this property been determined eligible? ___ yes X no 12/21/81

date 1979 ___ federal X state ___ county ___ local

depository for survey records Massachusetts Historical Commission

city, town Boston **state** MA

7. Description Ames Manufacturing Company

Condition		Check one	Check one	
___ excellent	___ deteriorated	___ unaltered	_X_ original site	
___ good	___ ruins	_X_ altered	___ moved	date N/A
_X_ fair	___ unexposed			

Describe the present and original (if known) physical appearance

The Ames Manufacturing Company, occupies 19 interconnected buildings (19,000 square feet of floor area in all) on approximately five acres of land between the Chicopee River and the Chicopee Power Canal. This H-shaped complex of industrial buildings was constructed in several stages between 1847 and 1915, all utilizing load bearing, brick exterior walls and heavy timber columns and beams. A range ofstyles and degrees of ornamentation is exhibited yet the whole is remarkably consistent in form. This cohesion derives from the common building material, proportions, and multipaned fenestration. Many of the buildings, constructed by the same contractor, display common bricklaying techniques--as in the corbelled gable ends of buildings 8 and 14 (Photo 6) -- and in the cornice of double brick dentil courses supported by brackets found in most of the other buildings (Photo 2).

The factory in its present configuration was substantially in place by the end of the Civil War. Since that time, upper floors have been added to several buildings and some demolition has occurred, but these changes have not latered the factory's basic character as strongly established by the mid-19th century.

Generally, the buildings have no pretensions to architectural style, but are typical New England mill construction, with a minimum of decorative trim. Buildings 2 and 8, which have pilasters and pediments of the late Greek Revival style (Photo 5) are exceptions, as is the added top stage of the central tower, using the Romanesque Revival style(Photo 1).

A power canal to the south of the buildings take advantage of a 36-foot drop in the Chicopee River at this point. A notch in the canal's retaining wall just west of the tower between buildings 6 and 7 indicates the former water intake position. A remnant of the penstock remains in the cellar of Building 7. The sluiceway turned northwest at the north wall of Building 7 and ran in a straight line to a point in the river now marked by a notch in the river's retaining wall. Thus, grade level in most of the site is below the level of the canal A roadway runs along the north side of the canal (Photo 2). (To the south of the canal is a railroad track and then the center of the town.) A substantial distance separates the roadway from the south wall of Buildings 1,6, and 7, permitting natural light to reach their ground floors.

The roadway and courts on the site now are covered with macadam, but cobblestones are still exposed to the east of Building 2, suggesting that cobblestones were initially used for the paving surface throughout.

Representative and Key Buildings

Buildings 1 and 7 , the original machine shop (1847-50) with addition (c.1860), just east of the twer, are linked and appear as one building (Photo 1). Together they have 25 bays of 12/12 double hung sash on the

(Continued)

south elevation. Lintels and sills are brownstone. Originally three stories high with a gable roof and dormers(as seen in a Civil War time view), a fourth story was added in the late 1860's; the plane of this fourth story wall projects one wythe. Star anchors, located at each floor between the windows mark the location of interior building tie rods. There are four doors at the second floor, with bridges leading to the canal roadway. The north elevation is similar, but with one additional bay to compensate for the tower. Windows at ground floor are 9/9. Both buildings have cellars.

Building 6, another machine shop (1859-65), also a three story structure with an added fourth story(Photos 1,2,4). It has 13 bays of 12/12 windows (on the first floor they are 16/12), and more of the star anchors. Its cornice line is higher than that of Buildings 1 and 7, but the break provided by the tower detracts attention from the differences. The north elevation of Building 6 has one more bay (14) to compensate for the tower, with 16/16 windows at first floor level. A connector to the north range of buildings, forming the cross bar of the H configuration, joins the second, third and fourth stories of Building 6. The west elevation has two stories above Building 9, with four 12/12 windows at each level. Here the roof appears as a low pitched gable.

The tower that projects between buildings 6and 7 does not show on the 1855 map but does appear ina Civil War period view, and may have been part of the building program precipitated by the War(Photo 1). In the second, third, fourth floors (above the canal roadway level) it has two 12/12 windows in the south face, one such window in the west face, and no fenestration in the east face. The top stage has two round arched openings in each of the four faces. Spanning the base of each of these openings are three small round arched openings. Each large arch has a prominent drip molding, and these are surmounted by an arcaded corbel course. There is a molded cornice under this top or belfry stage which, together with the brighter red shade of bricks and the white tone of the mortar (all other mortar in the factory is red), suggests that the top stage of the tower may have been added, although it shows in the Civil War time view. As there is no further record or confirmation of when it was constructed, the matter remains unresolved.

Building 9,1908, Building 6 with Building 3. Both Building 9 and Building 3 (Photos 2 and 4) are one story high on their south elevations, toward the canal, and two stories high on their north elevation. Their north elevations form a continuous wall with 9/9 windows and doors in the lower level, 15/15 windows above in Building 9, and 6/6 above Building 3. Building 3 has a low gable roof with ridge line running east-west. The south elevation is made irregular by the projection of Building 18. Building 18 has a low gable roof with ridge line running north-south, and has three 15/15 windows facing the canal.

(Continued)

Building 3, 13, and 18 all have the distinctive double dentil course supported by bracket, in brick, at the cornice line. A portion of building 18, however, is a later, perhaps early 20th century addition of wood that is unique in the complex and for which no explanation has been found.

Building 2, the counting room and office (1847-50), is at the (east) end of the range of buildings along the canal(Photos 5, and 8). Like the others it is a pre-Civil War structure, but has some architectural pretensions. It is 2½stories high, with three bays, twin chimneys, and a slate, gable roof. The central door is glazed with side lights and transom under a peaked, wooden hood supported by diagonal braces. The words "Ames Manufacturing Co." appear above the door in raised brownstone lettering. The three front steps are wood, flanked an Ames manufactured cannon ball at each side on the ground. The first floor has double 12/12 windows flanking the entrance. The brownstone lintels of these windows are slightly peaked and supported by small blocks. The second floor initially had three12/12 windows, but the end windows have been shortened; the original sills have been left in place. Four pilasters, projecting one wythe, define the corners of the building and separate the bays.

On the rear (North) elevation, grade is at basement floor level, exposing the brick basement walls. There are four pilasters at first and second story levels, as on the facade. Originally, both first and second stories had four 12/12 windows, but some changes have been made. The basement has three double warehouse doors. On the east elevation the gable end has a brick dentil course for many a pediment and highlightning its ranking cornice. An 8/8 window occupies the gable field while two 12/12 windows appear at second and first story and basement levels. The cornice at the top, the water table at the bottom, and the pilasters at the corners, all project slightly, to frame the four windows. The west elevation is similar but is now obscured by a metal addition. A brownstone water table encircles the building, forming the lintels of the basement windows and there is brownstone facing under the water table on the facade. The projecting slate roof has two molded brick chimneys.

Building 2 is connected by a 20th century shed (Building 19) to Building 8 established by the raised numerals 1860 in two cast-iron lintels in its basement floor(Photos 3,5,6). The facade of Building 8, facing the canal, repeats the pediment and pilasters of the office. Wide friezes run under raking cornices to define the pediment, which is recessed one wythe. Of the original, paired, 9/9 windows, one remains in the pedimented and three at the second floor. The two central pilasters have been replaced with modern 25-pane windows at second-floor, andfour such new windows and a door have been installed at first-floor level. The original windows have brownstone lintels and sills. Segments of the removed pilasters remain in place on the facade. The rear (north) elevation does not repeat the pediment. Instead, the gable end's are accentuated by diagonal lines and corbelled stretchers. There are paired windows in the gable end and 12/12 windows at the basement and first-and second-story levels with doors and

(Continued)

and added windows. The side elevations have an irregular pattern of 12/12 windows and the cast-iron lintels with the 1860 year date. There is a square, brick stair tower on the east elevation, near the front (south). The roof is slate, and has five monitors in its east slope

Building 8 is connected to Building 1 by Building 15, which is a small, 20th century infill structure. It does have the brick dentils at the roof line, and multi-pane windows on the top two floors. On the first two floors the west half of the structure is a void, for reasons unknown.

Turning now to the other side of the H configuration, Building 12 is the easternmost structure in the north range of three buildings toward the river (Photo 3). Built between 1865 and 1870, it has three floors with 11 bays of 12/12 windows on the north and south elevations. The windows have segmental relieving arches of two rows of headers, and brownstone sills. There are star and round cast-iron washers between the windows to anchor tie rods. It has a cornice of brick dentils and brackets. The end (east) elevation has a large, central door at the first floor, double loading doors at the second, both flanked by sindows, and three such windows on the third floor. The low gable end is similar to that of other roofs, and the double dentil course and brackets are continued under the gable end.

Building 10 originally a long three-story structure, received a fourth floor in 1913 and a partial fifth floor in 1929 (Photo 1, 3). It has 25 bays of 15/20 windows with rock-faced brownstone sills and segmental lintels, except in the seven bays of the fifth floor where the windows are 2/2. The north elevation of Building 10, is the largest expanse of uninterrupted wall in the complex. In the basement of the south elevation are two double loading doors with transoms under segmental relieving arches, this time of three rows of headers. Fourteen bays of the south elevation are part of the connector to the south range of buildings, apparently constructed as part of Building #6. The Building #11 is a substantial structure itself with three bays of the segmental-arched, 15/20 windows on its east and west elevations in the upper floors. Building 11 is open at grade forming a tunnel with round-arched openings at the east and west ends. The two ranges of buildings are also connected by enclosed wood and metal walkways east of the connector, at the upper levels.

Building 16, the westernmost structure in the north range, was built as a four-story structure in 1915 with a fifth story added in 1929(Photo 1-4). Its north and south elevations have 13-bays which continued the line of Building #10. In the ground floor are single-sash, 15-pane windows on the south, 18-pane on the north, in the second floor 18/24, in the third and fourth windows of two vertical panes under a divided transom, and in the fifth 2/2 all with segmental lintels. Sills in floors one through four are rock-faced granite, and in the fifth floor are concrete. The typical motif of brick double dentil course and brackets is used at the top of the fourth floor, surmounted by a concrete string course, while only a single dentil course appears at the roof line.

(Continued)

The main entrance, 5 Springfield Street, is located in the west end of Building 16. It has a recessed double door, each leaf with a vertical recesssed panel with bolection moldings over a smaller horizontal panel. There is a molded, metal-clad cornice over the doorway, supported by modest consoles. A wide, oak staircase rises from a foyer, inside the entrance, to the fifth floor. It has dog-leg runs, square newel posts with molded tops, a heavy molded hand rail, and octagonal balusters in a closed string course. The wall side of the stairway is a panelled dado, while the ceilings of the landings and hall are embossed metal. At the top of the stairway is a 1929-era executive's office with panelled walls, exposed beams, and a large, built-in cupboard under round arch with keystone -- all executed in dark colored wood.

Building 14 , a a forge shop and curing room, constructed in 1878, is a free-stanidng structure located between the northern range of the H configuration and the river(Photograph 3,7). One story high, it has a steeply-pitched, slate roof with two-gable-roofed cupolas, and stepped gable ends as found at the north gable of Building 8. The fenestration of Building 13's north elevation is nine 12/12 windows with brownstone sills and lintels and a double, panelled, wood loading door. The south elevation has seven of these windows, a modern door, and an overhead garage door. There is an added shed dormer on this slope of the roof. The west elevation displays stone lintels for two windows that have been bricked up, and a cinder-block-filled section that apparently once was a garage door. The east elevation is a solid wall except for one small, six-pane window, with no indication it ever had more fenestration.

Building 17 is two-story boiler house with a tall round stack at the southwest corner (Photo 3.) The date 1922 appears in the parapet of the west elevation. WHile the brick laying is different from that of the older building, it is still carefully done. For example, on the north and south elevations, piers form recessed areas for the multi-paned windows.

Building 5 abuts Building 17, to its east. Part of the Civil War time construction, Building 5 is a 1½ story, gable-roofed structure. In the east elevation is a large, central, round-arched opening that has been bricked up. There are three 9/9 original windows in the north elevation, and several new andclosed in openings. The south elevation has two wide gauge doors and several smaller openings, one or two of which may be original.

Building 4 is a small, free standing structure located between Building 12 and west of Building 8(Photo 3). Dating from (1855-59), it is one story high with a low gable roof and dentils at the eaves. The north elevation has four 12/12 windows, while the south is a solid wall. The east elevation has a single door, and the west a recessed doorway under a segmental arch.

(Continued)

Interior Construction

The interiors of the Civil War era buildings are typical, heavy, timber mill construction, tied in with the load-bearing, brick exterior walls. The heavy posts, beams, and sub-flooring tended to char rather than burn freely, a scheme encouraged by the insurance companies to curb fire losses. The difference in the number of posts in the various buildings is a dramatic indication of the advance in the technology of industrial construction. At one extreme is the forest of posts found in the first floor of Building 7 (Photograph 8), while at the other extreme the upper floors of Building 16 are free of posts under wide-spanning steel trusses.

The cellars of Buildings 1 and 7 have square brick posts, and the buildings are divided from one another by brick walls. There are several stairways in the complex, at least one of which is narrow and made up mostly of winders. The tower facing the canal was built for an elevator, whose housing is easily visible in the belfry.

8. Significance Ames Manufacturing Company, Chicopee, MA

Period	Areas of Significance—Check and justify below			
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion
___ 1400–1499	___ archeology-historic	___ conservation	___ law	___ science
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture
___ 1600–1699	___ architecture	___ education	X military	___ social/ humanitarian
___ 1700–1799	___ art	___ engineering	___ music	___ theater
X 1800–1899	X commerce	___ exploration/settlement	___ philosophy	___ transportation
___ 1900–	___ communications	X industry	___ politics/government	___ other (specify)
		___ invention		

Specific dates 1847-50, 1859-65 **Builder/Architect** Charles McClallan

Statement of Significance (in one paragraph)

The Ames Manufacturing Company reflects Chicopee's dramatic growth as an industrial center in the 19th century. Through structures dating from the mid 19th to early 20th centuries, the architecture incorporates important changes in technology and economic development. Possessing integrity of design, materials, workmanship, location, and setting, the property meets Criteria A and C of the National Register.

Until the early 19th century, Chicopee was little more than an agricultural district of Springfield (from which it separated in 1848). Several early Federal period mills began to harness the power of a 50-foot drop in the Chicopee River between Chicopee Falls and the Connecticut River. However, it was not until the introduction of outside capital that industrial prosperity was well established.

In 1822, Edmund Dwight of Springfield established in Chiocopee Falls the first company town in western Massachusetts. His Boston and Springfield Manufacturing Company (later called the Chicopee Manufacturing Company), incorporated to build cotton mills as well as to develop the surrounding town, was backed by the same Boston investors who financed the mills at Waltham and Lowell. In Chicopee, these incorporators were resoponsible for building the factories, power canal, streets, schools, and housing.

The textile mills which quickly developed required a wide variety of related manufactures which characterized Chicopee's small industry for the next half century. In 1829 Edmund Dwight induced Nathan Peabody Ames and James Tyler Ames to relocate their edge tool business from Chelmsford to Chicopee. Dwight furnished a shop, machinery, and water power for the manufacture of small steel edge tools such as knives, hatchets, and chisels.

In 1834 the Ames Manufacturing Company was incorporated (with Dwight as its first president) with a capital of $30,000 and buildings were erected in Chicopee Center. During the 1830's the company won wide recognition for its swords, cannon, and cannonballs produced for the U.S. Army, gun machinery made for England and Germany, bells cast for public buildings, and for leather belting, military accoutrements, and military harness. The company introduced electroplating in 1839, and with the acquisition of the Springfield Canal Company machine shop in 1845 became a major manufacturer of textile and other machinery. The resulting prosperity was aided by the arrival of the Chicopee Branch Railroad in 1846 and by the forthcoming government needs of the Mexican War.

(Continued)

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

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received
date entered

By 1848, 300 men were employed in the Ames shops, by then producing the Boyden turbine, lathes, planning machines, and gunstock machinery as well. Ames became one of the first firms in the U.S. to manufacture and market a standard line of machine tools to the general public. Among its customers were pioneers in the American machine tool industry, as well as both national armories. Casting of bronze statues was begun in 1853, making Ames the first American factory to do so.

This antebellum period of growth resulted in the relocation of the company to its present quarters. Charles McClallan (b.1803) was the builder of the mid-19th century structures (Buildings 1,6,7,8), as well as many other period mills and houses in the area. McClallan started as a bricklayer, established himself as a contractor, and carried on an extensive construction business in Massachusetts. The corbelled brick cornices found in the gable ends of several buildings here are characteristics of his masonry work.

Although Chicopee did not attain the same extraordinary growth as Springfield from the Civil War, this was the most active period in the history of the Ames Manufacturing Company. Employment reached 1500 as the company of cannon, cannon shot, and other munitions for the Union Army. During the height of the Civil War, the Ames Company was the nation's largest producer of light artillery and the third largest supplier of heavy ordance. Intensified business called for new building program, and by the end of the war the present H-shape configuration of the complex was substantially in place.

After the war, the company encountered problems finding peacetime business. Bronze and cast iron as industrial materials gave way to steel, but Ames did not progress with the times. Despite large foreign orders, by the late 1870's the number of employees was down to 350.

Even the Spanish-American manufacture of sewing machines, bicycles (the "Victor" wheel), and automobiles (the Stevens-Duryea) proved to be unsuccessful attempts to stay in business. The Ames Sword Company, specializing in society swords and uniforms until 1936 was a pale 20th century survivor of the Ames activities.

In 1908 the property was purchased by A.G. Spalding and Brothers Manufacturing Company, which employed nearly 200 people in the production of sporting equipment. Albert Goodwill Spalding (1850-1915), a baseball player, broke into the major leagues as a pitcher for the Boston Red Sox (then the Bostons) in 1871. He moved to Chicago in the mid-1870's where, in addition to playing baseball, he opened a sporting goods store. After pursuing both careers for some years, when his playing days came to an end, he concentrated on the manufacture and sale of sporting goods. His firm was active in supplying merchandise for the popular production of bicycles for him by the Lamb Knitting Machine Co. there.

(Continued)

A.G. Spalding & Bros. Manufacturing Company bacame an important presence in Chicopee with its purchase of the Ames Manufacturing Co. facotry then largely idle. Spalding used all the existing manufacturing space and added more, including Building 16 and the top floor of other buildings,as noted. He also built a range of structures along the river's edge, now demolished. Various departments of the factory were devoted to gymnasium apparatus, racquet manufacturing, wood work, golf clubs, and so on. Building 8 was entirely devoted to the production of golf balls. At its height, the Spalding empire had 14 factories in various locations and 60 retail stores, manufacturing being concentrated in Chicopee. In 1948, Spalding moved to a new factory several miles away and sold the old buildings, which have been rented to various tenants over the ensuing decades.

The 19th century complex of the Ames Manufacturing Company has remained substantially intact dispite profound economic change. The firm's extensive and diverse activities are represented today by the surviving counting room and offices, machine shops, founding and forge shop, boiler house, etcetera, thus providing a significant example of industrial development in Chicopee.

Section 9 Continued

Associated Factory Mutual, Map of A.G. Spalding & Bros. Manufacturing Co., Boston: 1937.

History of the Connecticut Valley in Massachusetts, Philadelphia: Louis H. Everts, 1879, v.2.

Edward Hitchcock, Map of Hampden County, 1855.

Insurance Maps of Chicopee, New York: Sanborn Map Co., 1915.

Deborah Shea, research notes and inventory forms, Department of Planning and Development, City of Chicopee.

Springfield City Directory and Business Advertiser, 1875-76, Clark W. Bryan & Co., 1875.

Springfield Union, December 15, 1964. December 21, 1949

Thaddeus M. Szetela, History of Chicopee, Chicopee: City of Chicopee, nd (1958?), based on newspaper articles by Bessie Kerr.

Smith, Merritt Roe, Harpers Ferry Armory and the New Technology. The Challenge of Change. Ithaca, NY: 1977

9. Major Bibliographical References

1) Area Survey and Inventory Forms; Massachusetts Historical Commissin, by Deborah Shea, November 30, 1978. 2) 1847, 1853 City Directories. 3) 1937 Map, A.G. Spaldings and Brothers Map. 4) Vera Shlakman, Economic History of a Factory Town, Northampton, 1915. 5) Ames file at Chicopee (Cont.

10. Geographical Data

Acreage of nominated property 4.9 acres

Quadrangle name Springfield North Ma. **Quadrangle scale** 1:25,000

UMT References

	Zone	Easting	Northing
A	18	6 9 7 8 8 0	4 6 6 8 9 2 0
B	18	6 9 7 8 9 0	4 6 6 8 8 9 0
C	18	6 9 7 8 3 0	4 6 6 8 8 7 0
D	18	6 9 7 7 6 2 0	4 6 6 8 8 3 0
E	18	6 9 7 6 4 0	4 6 6 8 9 8 0
F	18	6 9 7 6 9 0	4 6 6 9 9 6 0
G	18	6 9 7 8 1 0	4 6 6 8 9 9 0
H	18	6 9 7 8 2 0	4 6 6 8 9 2 0

Verbal boundary description and justification

see attached deed description and sketch map

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
N/A			
state	code	county	code

11. Form Prepared By

name/title Wendy Frontiero, Preservation Planner, with Peter Stott, MHC, David Ransom, consultant, and Charles Schmitt, consultant

organization Massachusetts Historical Commission **date** January 18, 1983

street & number 294 Washington Street **telephone** (617) 727-8470

city or town Boston **state** Massachusetts

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

___ national ___ state X local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature Patricia Weslowski

title State Historic Preservation Officer **date** 4/28/83

For NPS use only

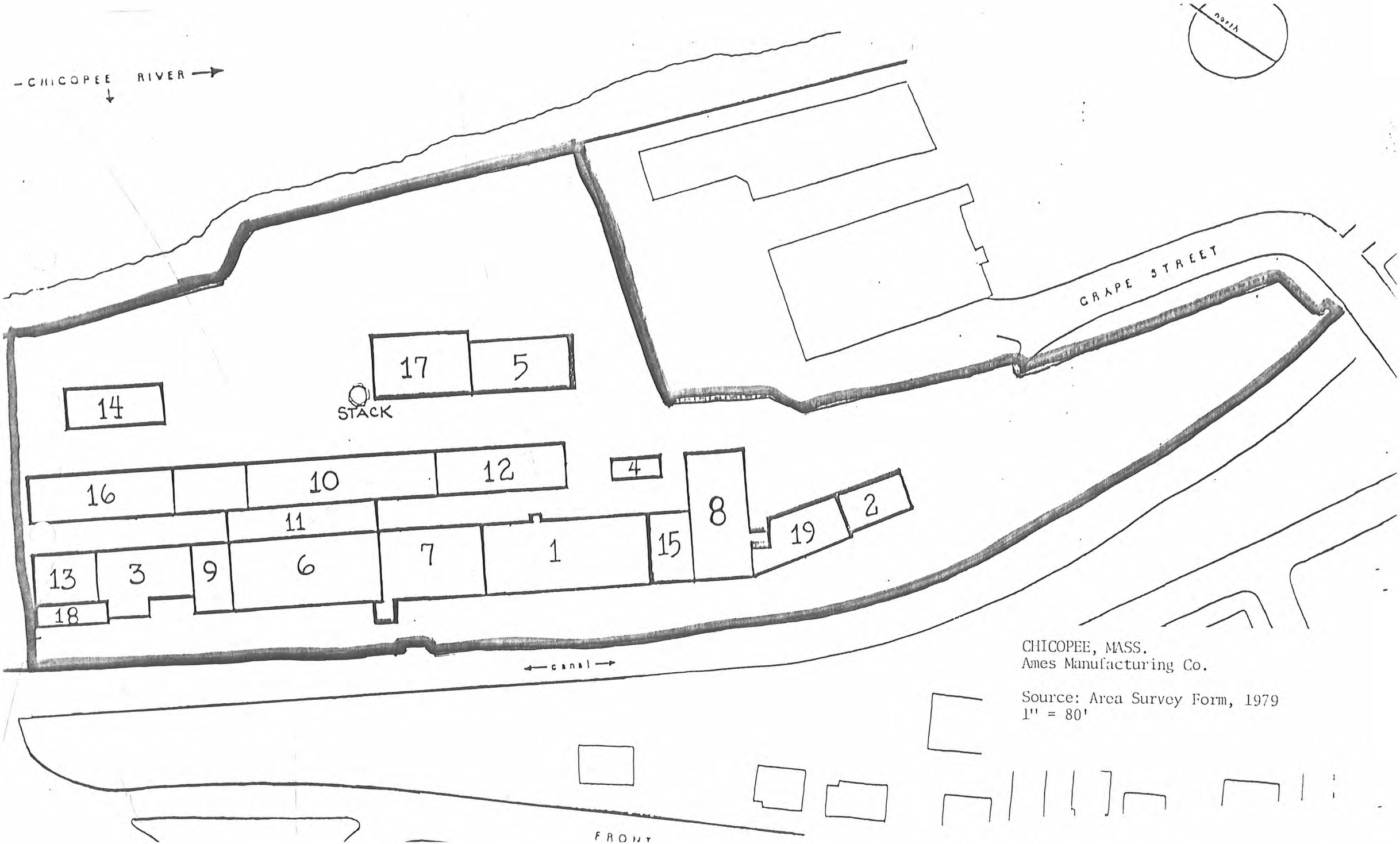
I hereby certify that this property is included in the National Register

date

Keeper of the National Register

Attest: **date**

Chief of Registration



CHICOPEE, MASS.
Ames Manufacturing Co.

Source: Area Survey Form, 1979
1" = 80'

22637

KNOW ALL MEN BY THESE PRESENTS, that, THE OLD SPALDING CORPORATION, a Massachusetts corporation located at 5-7 Springfield Street,

~~X~~ Chicopee, Hampden County, Massachusetts

~~xxxxxxxxxx~~, for consideration paid, and in full consideration of TWO HUNDRED TEN THOUSAND DOLLARS ($210,000.00)

grants to THOMAS J. WICKLES of 10 Pleasant View Drive, and EDWARD J. WICKLES of 32 Pleasant View Drive, both in Hatfield, Hampshire County, Massachusetts, and JOSEPH F. PARTYKA and JOAN PARTYKA, both of P. O. Box 248, Chicopee, Hampden County, Massachusetts

~~XX~~ with ~~warranty~~ covenants

~~xxxxxxxx~~ Certain real estate situated on the easterly side of Springfield Street, Chicopee, Hampden County, Massachusetts, being more particularly bounded and described as follows: [Description and encumbrances, if any]

PARCEL ONE: Beginning at a point on the Easterly side of Springfield Street, said point being the intersection of the Southerly face of the North wall of the canal and the Easterly line of Springfield Street; thence running N. 13° 34' 45" E. twenty-seven (27) feet along the Easterly side of said Springfield Street to a drill hole at an angle in said street line, said drill hole being sixty-six and 77/100 (66.77) feet Northerly from the North face of the South wall of said canal, measured along said Easterly line of said Springfield Street; thence running N. 17° 28' 40" E. along said Easterly line of said Springfield Street two hundred seventeen and 35/100 (217.35) feet to the Northerly face of a concrete wall; thence S. 84° 52' 20" E., one hundred sixty-three and 5/100 (163.05) feet along the Northerly face of said concrete wall; thence running N. 49° 55' 40" E., fifty and 11/100 (50.11) feet along the Northwesterly face of said concrete wall; thence running S. 84° 59' 40" E. Two hundred fifty-six and 14/100 (256.14) feet along said Northerly face of said concrete wall to land of the J. A. Realty Company of Springfield, Inc.; thence running S. 0° 25' 20" W. along said land of the J. A. Realty Company of Springfield, Inc., two hundred eleven and 59/100 (211.59) feet to a drill hole; thence continuing S. 74° 02' 30" E. along land of the J. A. Realty Company of Springfield, Inc., two hundred seventy-two and 9/100 (272.09) feet to an iron pin in the Southerly line of Grape Street; thence continuing S. 89° 48' 40" E. along said Southerly line of Grape Street, two hundred twenty-one and 18/100 (221.18) feet to an iron pin; thence running S. 29° 28' 40" E. along the Westerly line of Grape Street, about forty-four and 46/100 (44.46) feet to the Southerly face of the Northerly wall of said canal; thence running Westerly along said Southerly face of said Northerly wall of said canal about one thousand sixty (1,060) feet to the place of beginning.

Also including all other land owned of record by the grantor herein lying between the concrete wall as mentioned in the third, fourth, and fifth courses of the above description and the Chicopee River. Said land is subject to an easement given to the City of Chicopee along the said Chicopee River under instrument recorded in the Hampden County Registry of Deeds, Book 1709, Page 562.

Being the same premises as shown on Plan of Cobb, Beesley & Miles, Engineers, dated August, 1948, entitled "Plan of Property in Chicopee, Mass. owned by A. G. Spalding & Bros., Inc.", recorded in the Hampden County Registry of Deeds.

Also including any waterpower rights owned of record by the grantor which pertain to the above described property and subject to water rights as set forth in instruments recorded in said Registry, Book 196, Page 223, and Book 1551, Page 234, if applicable.

Subject to the rights to the canal wall as given to the Quinnehtuk Company under instrument recorded in the Hampden County Registry of Deeds, Book 1498, Page 311, if applicable.

Also subject to any restrictions or so-called conditions of record so far as the same may now be in force.

Together with the benefits and subject to the burdens of any and all easements, rights of way and water rights of record, so far as the same affect the above described premises and may be now in force.

Subject to possible rights of way referred to under instrument recorded in said Registry, Book 669, Page 17, so far as the same may now exist.

Being the same premises conveyed to The Old Spalding Corporation by deed of Bernard M. Crosby and James R. Crowe dated October 16, 1967 and recorded in Hampden County Registry of Deeds, Book 3298, Page 251.

PARCEL TWO: Beginning at a point situated in the southerly line of lower Grape Street, Chicopee, Massachusetts, said point being the southeasterly corner of the parcel herein described and being the intersection of two courses designated as S 74° 02' 30" E., 272.09 feet and S 89° 48' 40" E, 221.18 feet, as shown on a plan recorded in Hampden County Registry of Deeds, Book of Plans 27, Page 122, entitled plan of property in Chicopee, Massachusetts, owned by A. G. Spalding & Brothers, Inc. dated August 1948; thence running,

N 43° 12' 55" W	Along land of said The Old Spalding Corporation a distance of 88.84 feet to a point; thence running,
S 51° 01' 26" E	Along other land of J. A. Realty Company of Springfield, Inc., a distance of 69.75 feet to a point; thence running,
S 57° 17' 53" E	Along other land of J. A. Realty Company of Springfield, Inc., a distance of 16.50 feet to a point situated in the Westerly line of lower Grape Street; thence running
S 31° 17' 20" W	Along the Westerly line of said lower Grape Street, a distance of 14.00 feet to a point, the place of beginning.

The above described parcel of land contains 536 square feet, and all as shown on a plan made by Durkee, White, Towne & Chapdelaine, Civil Engineers, Drawing 93-5382 A, recorded in the Hampden County Registry of Deeds, Book of Plans 117, Page 76 and 77.

Excepting the premises conveyed to J. A. Realty Company of Springfield, MA, by deed of The Old Spalding Corporation dated June 30, 1969 and recorded in Book 3457, Page 25 of the Hampden County Registry of Deeds as shown on Plan recorded in Book of Plans 117, Page 76.

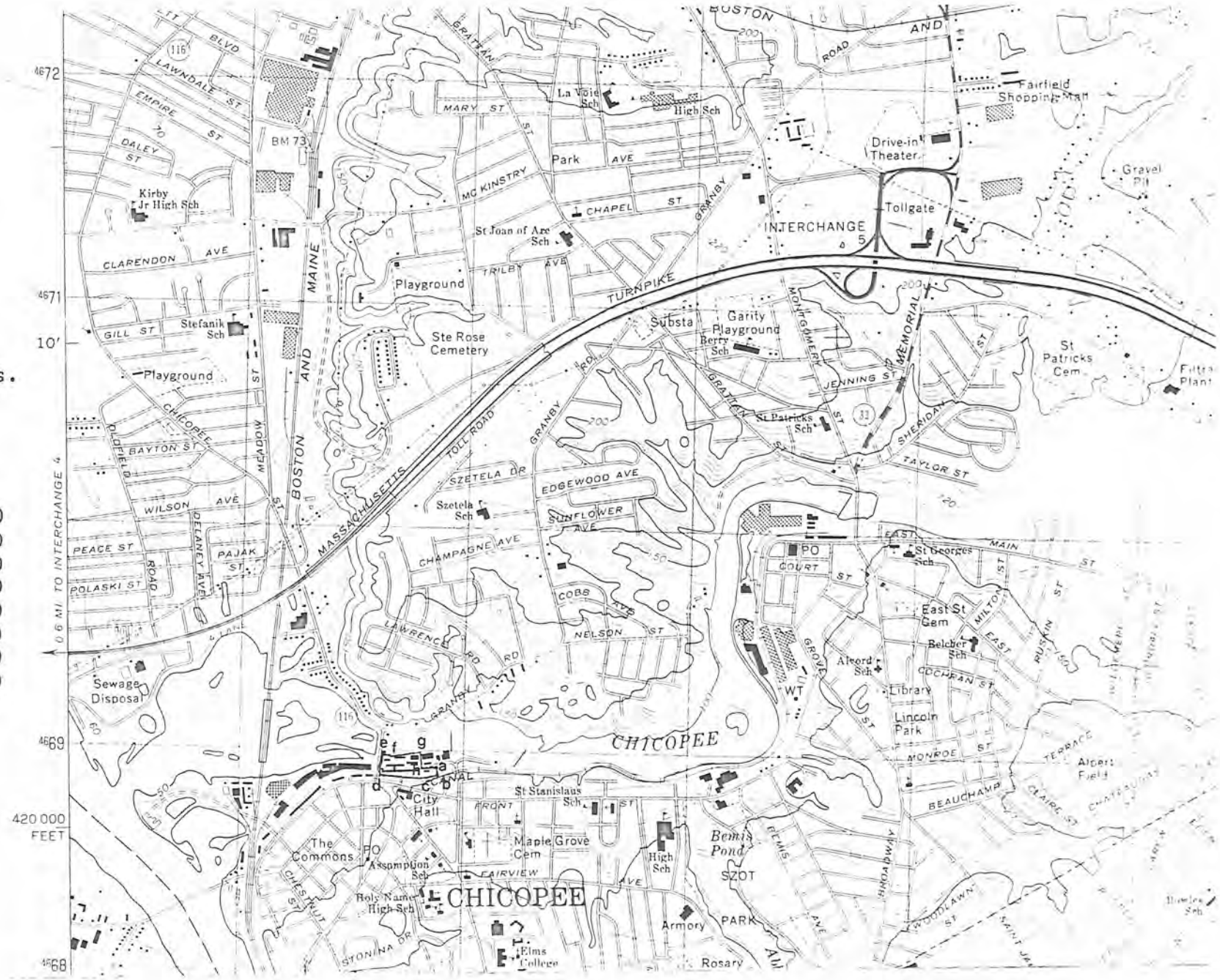
Subject to a right to maintain pump house as it now exists over and as shown on said Plan Book 27, Page 122.

Subject to restrictions of record.

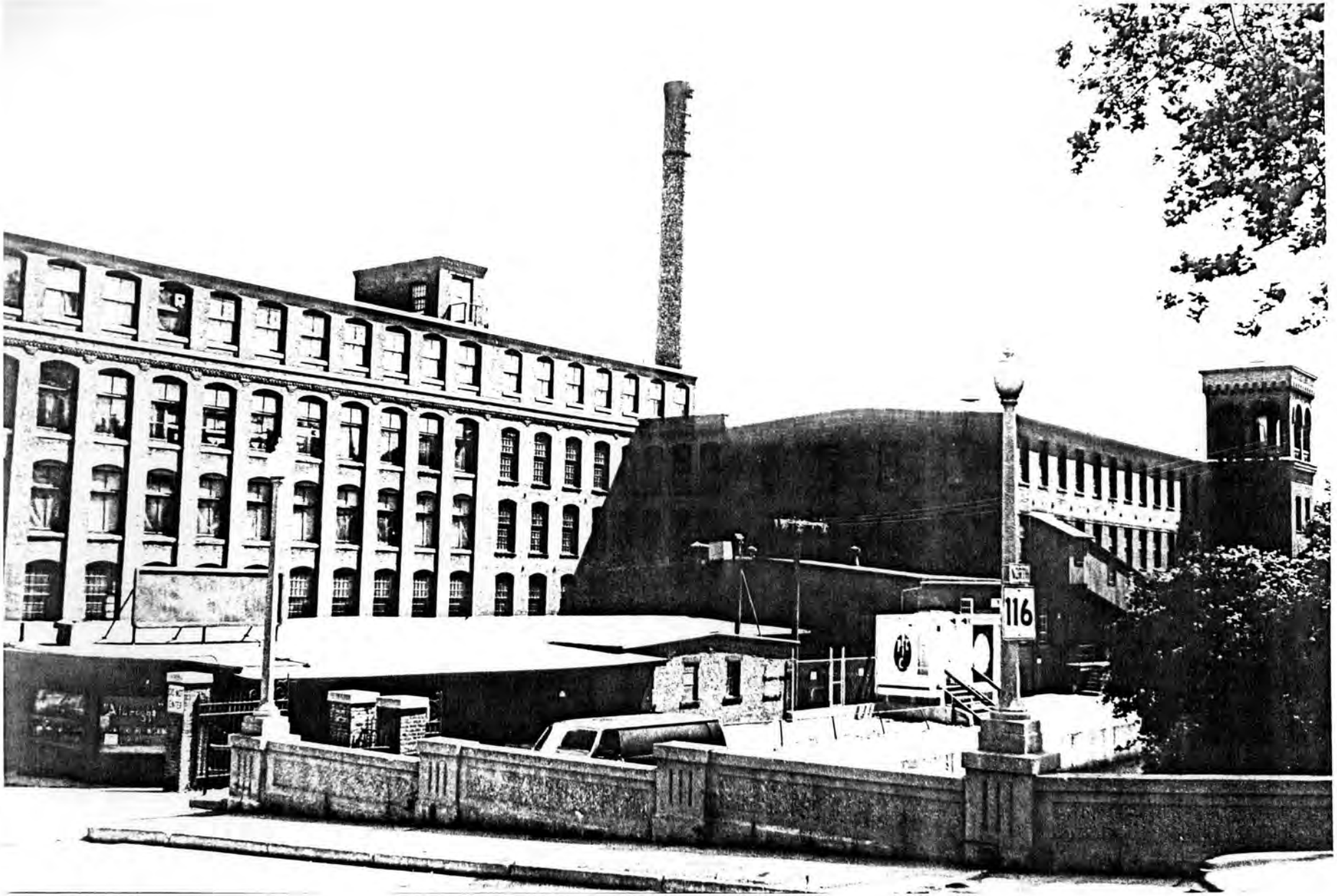
Being a portion of the same premises conveyed to to The Old Spalding Corporation by deed of J. A. Realty Company of Springfield, Inc. dated June 30, 1969 and recorded in the Hampden County Pegistry of Deeds, Book 3443, Page 300.

A.G. Spalding & Bros.
Mfg. Co.
Chicopee
Hampden Cy., MA

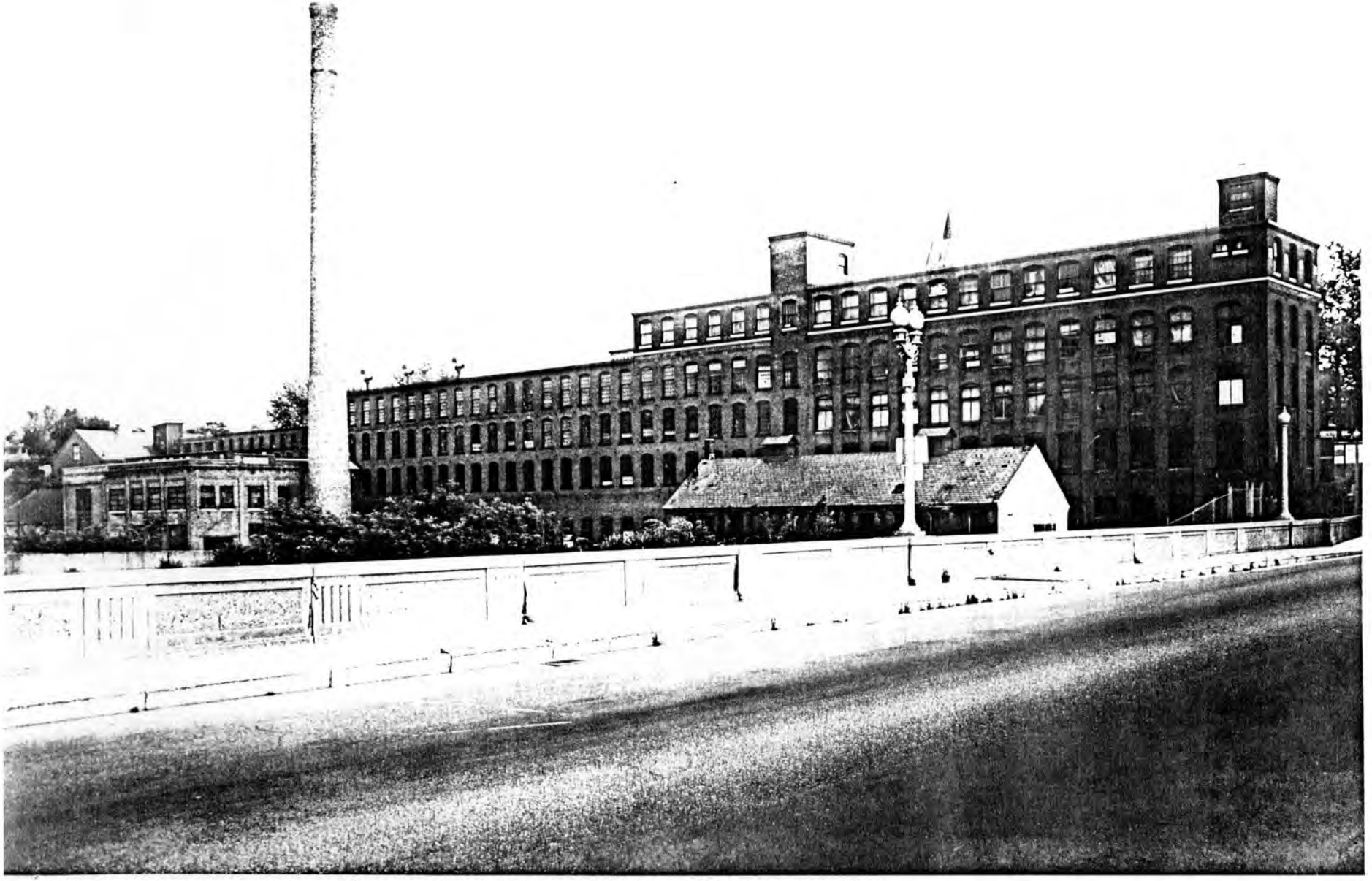
UTM References:
A 18/697880/4668920
B 18/697890/4668890
C 18/697830/4668870
D 18/697620/4668880
E 18/697640/4668980
F 18/697690/4668960
G 18/697810/4668990
H 18/697820/4668920



1. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)

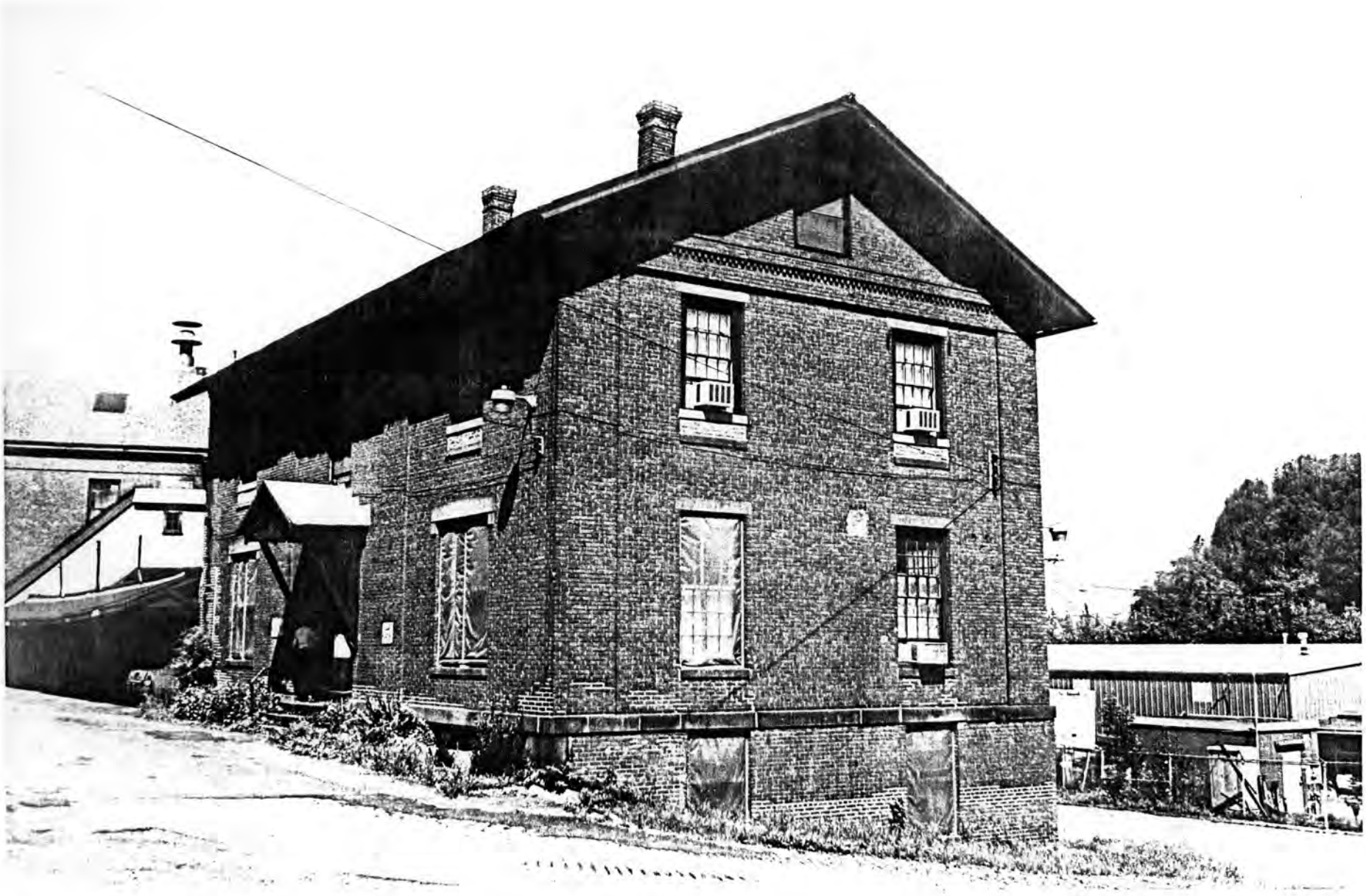


2. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)



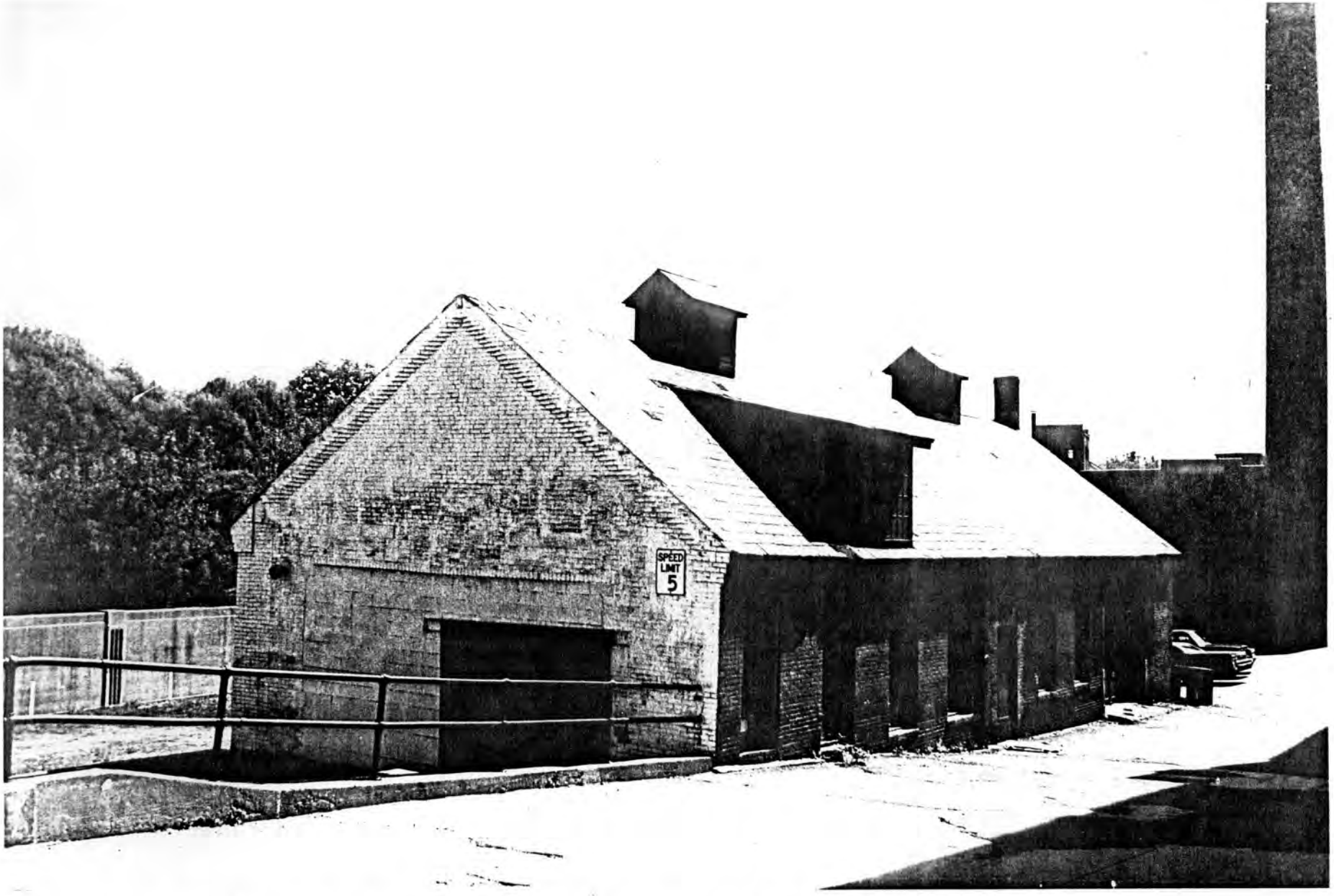
3. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)

4. Northwest elevation. (Photograph: Michael Janeczck, June 1982)

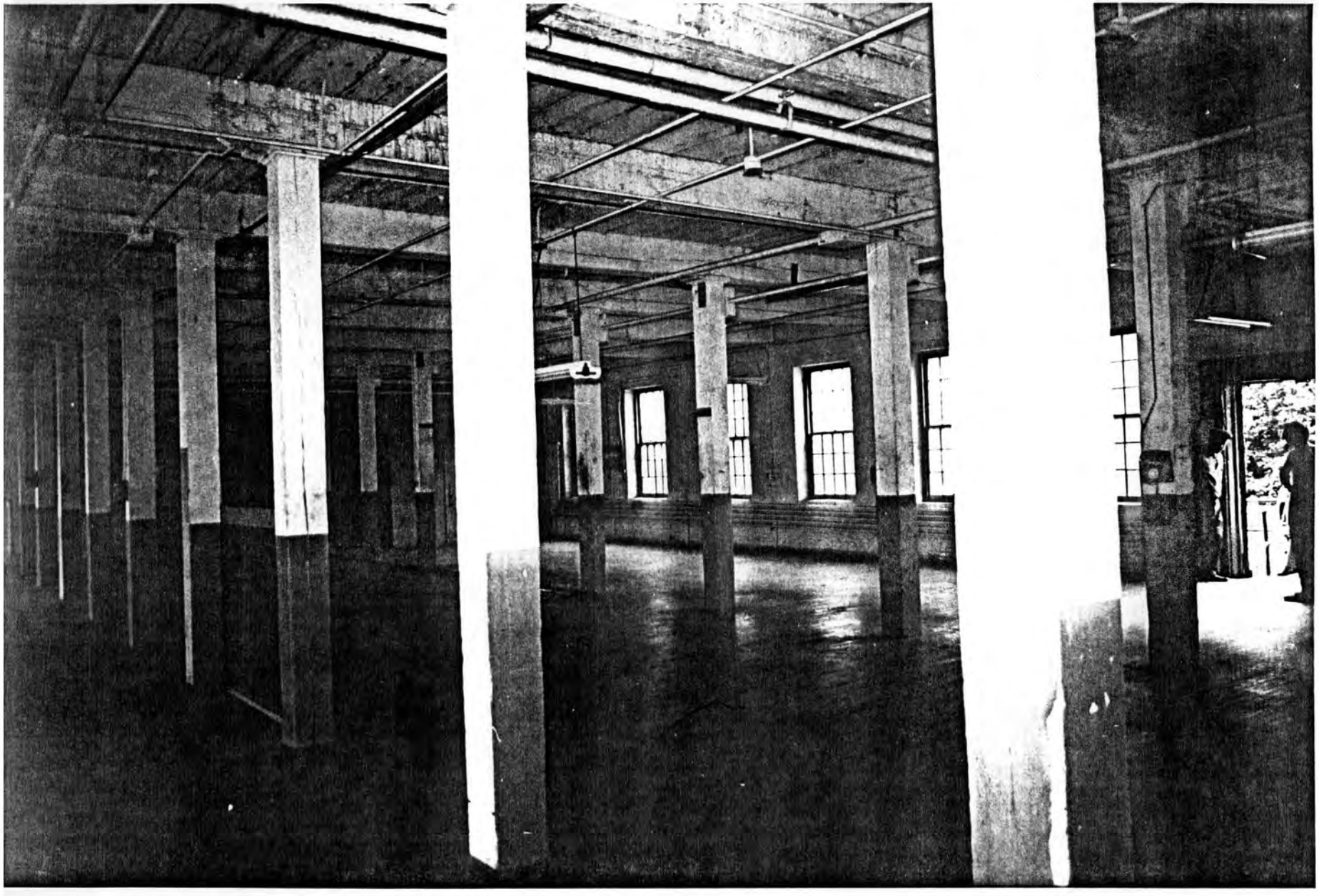


5. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)

6. Southeast elevation. (Photograph: Michael Janeczck, June 1982)



7. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)



8. *[No caption retained]* (Photocopy from an original photograph by Michael Janeczck, June 1982)