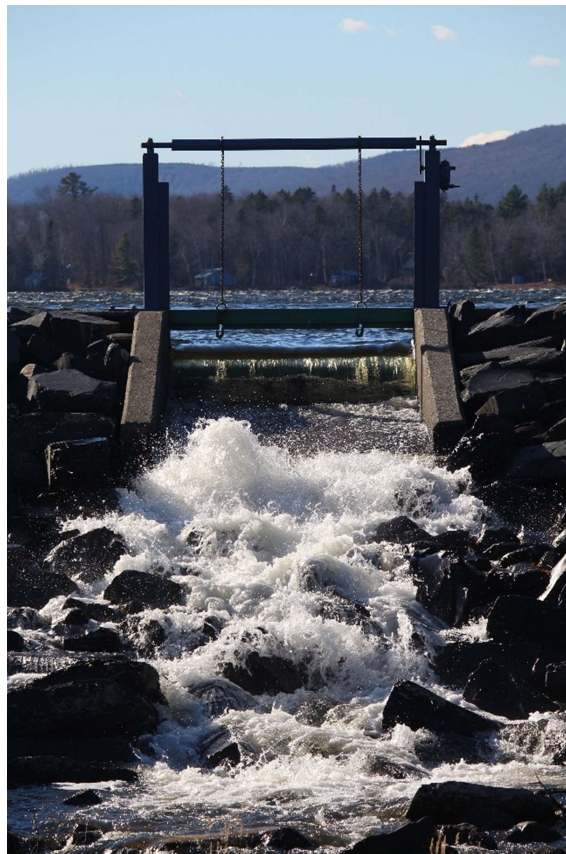


KINGSBURY PLANTATION
ROBERT C. FURBER DAM
OPERATION AND MAINTENANCE
MANUAL



FIRST DRAFT CREATED

2017

UPDATED APRIL 2019

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INTRODUCTION

The Kingsbury Plantation Operation and Maintenance Manual for the Robert C. Furber Dam provides historical, written, and graphical information of the procedures, maintenance and inspections needed to operate and maintain the dam. The Assessors and Dam Operators created and update the manual to ensure the dam functions safely and is maintained for current and future use by the community.

The Manual contains the following sections:

SECTION I: GENERAL INFORMATION provides historical and general information about the dam as well as an overview of the manual.

SECTION II: DATA SHEET is a concise list of important dam information, including state ID numbers, contact information, storage information and details regarding the gate and spillways.

SECTION III: DAM OPERATION details how the dam, equipment, and related tools are operated, with details for the different season and emergency needs.

SECTION IV: MAINTENANCE includes detailed information and instructions for performing seasonal, on-going, and emergency maintenance and upkeep at the dam.

SECTION V: INSPECTION provides information on performing regular inspections of a dam.

SECTION VI: MONITORING provides instructions and reports for monitoring and recording of data.

SECTION VII: UPDATING provides procedures for the periodic updating of the manual.

APPENDICES: RELEVANT forms to monitor and archive routine, annual, and periodic inspections and maintenance, in addition to plans, references, and photographs.

ROBERT C. FURBER DAM KINGSBURY PLANTATION

SECTION I - GENERAL INFORMATION

PURPOSE

This Operation and Maintenance Manual (O & M Manual) provides the information, forms, and plans to ensure Kingsbury Plantation safely operates, inspects, and maintains the Robert C. Furber Dam. The Manual is designed to provide information and forms to ensure proper operation of the dam by regular and emergency operators.

GENERAL DESCRIPTION OF THE ROBERT C. FURBER DAM

The Robert C. Furber Dam, also known as Kingsbury Dam, is on Kingsbury Stream in Kingsbury Plantation, off Route 16 in Piscataquis County, Maine. The dam was privately owned and operated until it was deeded to the plantation in 1961 by Robert Furber. It has been owned and operated by Kingsbury Plantation since 1961. The dam creates and maintains the water level for Kingsbury and Mayfield Ponds, and is also used for flood control and recreation.

Construction History:

1858

- The dam was originally constructed in 1858 (USACE NID Report) as earthen fill with granite and wooden spillways.

1969/1974

- The dam went out in Spring 1969.
- In rebuilding the dam in 1969 and in 1974, concrete wingwalls and spillways were constructed on approximately two thirds of the dam.
- In 1974, the plantation received a federal grant to add the slate riprap.

2000

- In 2000, a new 82-foot long reinforced concrete wing wall was constructed on the left side of the dam, and eroded areas were filled and graded.
- Over the first gate/spillway, a 14 foot by 14-foot concrete deck consisting of pre-formed slabs replaced the wooden deck, and the plantation added safety railings and posts to prohibit vehicles from driving on the deck.
- The fish screen at Spillway 1 was replaced.
- Hand-laid granite riprap donated by Conan Furber replaced deteriorated riprap at side and the bottom of Spillway 1.
- A dry hydrant was installed.

2018

- In 2018, the Assessors addressed several key issues with Kingsbury Dam expressed by residents and landowners and prioritized in the engineering reports. The Assessors and Dam Operators worked with H.E. Callahan on the priority repairs to the dam:

- Replacing the main gate with a new gate and hoist system to control leaks and ensure we can safely raise and lower the gate. Engineering drawings are included in the Appendix.
- Finding and repairing a leak on the side of the gate—photos of the work are included in the Appendix. The leak followed a decayed part of the wooden crib.
- Repairing erosion damage: Riprap plans and before/after photos are in the Appendix.

2019

- January 2019, H.E. Callahan added a hoist cover to protect the new equipment and a metal cover between the deck and new gate for safety.
- The Assessors plan to repair the gate wall to stabilize the granite wall damaged by the leak, remove trees and roots from the spillway, and repair the cement in the spillways. Drawings for the gate wall are in the Appendix.
- The Assessors will continue to host public meetings to discuss timelines, costs, and review plans to minimize impact on the community while ensuring the safety and maintenance of the dam.

The dam is 13 feet high and 210 feet long and is classified as a low hazard potential dam. The dam impounds the 390-acre Kingsbury Pond and stores 3,584-acre feet at Normal Pool.

The dam consists of three (3) water control sections:

- **Gate 1/Spillway 1:**
 - The gate section #1 is located on the left side of the dam and the gate opening is approximately 5'-4 ½" wide by 9'-2" high. The spillway opening is constructed of concrete with downstream laid-up granite abutments.
 - The opening maintains normal pool elevation of 8'-1"
 - There is an upstream fish screen located on the upstream face of the gate section #1 intake.
 - Before the gate was replaced in 2018, it included two (2) – 1-inch thick steel panels stacked onto each other in a 1 ½ inch wide x 4-inch deep guide slot and required large equipment to be brought to the location to raise and lower the panels.
 - The gate was replaced in 2018. Detailed engineering drawings are in the Appendix.
 - In January 2019, a steel plate was installed over the gap between the concrete deck and gate for safety. Holes were drilled and a bolt was added to allow the gate hoist mechanism to raise the gate for maintenance, safety, any dam work needed and emergencies.
- **Spillway 2:**
 - Spillway 2 is located approximately 44 feet to the right of the gate section 1 and is constructed of a concrete floor and concrete sidewalls in the shape of a U.
 - Spillway 2 is 8 feet wide with 3-foot high sidewalls. The base slab and walls are 12-inch thick reinforced concrete.
 - There is a mechanized gate secured by a lock.
- **Spillway 3:**
 - Spillway 3 located approximately 49'-6" feet to the right of Spillway 2 and is constructed with a concrete base and concrete sidewalls in the shape of a U.
 - Spillway 3 is 8 feet wide with 2-foot sidewalls. The base slab and walls are 12-inch thick reinforced concrete. There are 2-inch wide x 4-inch deep slots on the sidewalls to accommodate stoplogs.

Additional information is provided in the Data Sheet in the following section. A plan view of the dam compiled from the original 1974 drawing, new 2000 concrete left wall information and 2017 field dimensions are included in the Appendix. The original plan for the 2000 update is also included in the Appendix. The engineering plans, drawings, and photographs for 2018 and 2019 work are in the Appendix.

OPERATING PERSONNEL RESPONSIBILITIES

Overall Responsibility for Dam	Board of Assessors
Equipment Operation at Dam	Dam Operators: <ul style="list-style-type: none">○ Jeff Bridges○ Errol Nightingale
Performing Monthly Inspections	Board of Assessors and Dam Operators
Performing Annual Inspection	Board of Assessors and Dam Operators
Routine Maintenance Work	Hired by Board of Assessors
Routine Landscaping	Hired by Board of Assessors
Emergency Operations	Dam Operators and Board of Assessors

SECTION II: DATA SHEET

General	The Robert C. Furber Dam is on Kingsbury Stream in Kingsbury Plantation, off Route 16 in Piscataquis County, ME. Latitude: 45.12; Longitude: -69.65
State I.D.	DEP: 00808; ME ID: ME00170
Owner	Kingsbury Plantation
Dam Operators	<ol style="list-style-type: none"> 1. Jeff Bridges 2. Errol Nightingale
Construction Date(s)	<ul style="list-style-type: none"> • Original construction 1858 • Rebuilt 1969-1974 • Updated 2000 • Gate replaced 2018
Purpose	The dam creates and maintains the water level for Kingsbury and Mayfield Ponds, and is also used for flood control, fire prevention, and recreation.
Downstream Hazard Classification	Low
Reservoir Watershed	<p>The dam impounds the 390-acre Kingsbury Pond</p> <ul style="list-style-type: none"> • Upstream Blocked Miles: 11.45 • HUC 12 Sub Basin: Kingsbury Pond • HUC 10 Watershed: Upper Piscataquis River • HUC 8 Sub Basin: Piscataquis River • HUC 6 Basin: Penobscot River
Active Storage	3,584-acre feet at Normal Pool.
Dam Type	Earth fill, log crib, concrete spillways and wall, granite riprap, steel plates
Gate / Spillway 1	<p>Type:</p> <ul style="list-style-type: none"> • Concrete with downstream laid-up granite abutments. • Two (2) – 1-inch thick steel panels stacked onto each other in a 1 ½ inch wide x 4-inch deep guide slot. • Upstream log crib and fish screen on the face of the intake. <p>Elevation:</p> <ul style="list-style-type: none"> • Normal pool elevation 8’-1” <p>Dimensions:</p> <ul style="list-style-type: none"> • 5’-4 ½” wide by 9’-2” high
Spillway 2	<p>Type:</p> <ul style="list-style-type: none"> • Concrete floor and concrete sidewalls in the shape of a U. The base slab and walls are 12-inch thick reinforced concrete. Mechanized gate. <p>Location:</p> <ul style="list-style-type: none"> • Approximately 44 feet to the right of the gate section #1 <p>Dimensions:</p> <ul style="list-style-type: none"> • 8 feet wide with 3-foot high sidewalls.
Spillway 3	<p>Type:</p> <ul style="list-style-type: none"> • Concrete base and concrete sidewalls in the shape of a U. The base slab and walls are 12-inch thick reinforced concrete. There are 2-inch wide x 4-inch deep slots on the sidewalls to accommodate stoplogs. <p>Location:</p> <ul style="list-style-type: none"> • Approximately 49’-6” feet to the right of spillway #2 <p>Dimensions:</p> <ul style="list-style-type: none"> • 8 feet wide with 2-foot sidewalls.

SECTION III: DAM OPERATION .

This section provides detailed operating routine procedures for operating the dam. Emergency operating procedures are included in the Emergency Action Plan.

ROUTINE OPERATION PLAN

The primary purpose of Robert C. Furber Dam is to maintain water levels in Kingsbury and Mayfield Ponds. The ponds receive their water supply by direct flows from Bigelow Brook, Kingsbury Stream, and by several springs, brooks, and creeks.

GATE SCHEDULE

All gates are closed in the Spring after flood season (typically mid-May), and all available water flow is stored up to a normal pool elevation of 8'-1". Seepage through the dam, controlled flow over the spillways, and flows from springs immediately below the dam provide sufficient flow for fish in Kingsbury Stream. The planks in Spillway 2 and/or Gate 1 can be raised to provide additional flow to Kingsbury Stream if needed.

The planks on Spillway 2 are opened in November (date varies by season) to bring the water level down before the pond ices over to alleviate potential spring flooding.

RELEASE SCHEDULE

Except for flood control purposes, releases from the spillways are only made as required for seasonal changes, maintenance, and emergency flood management.

OPERATING INSTRUCTIONS FOR DAM

To adjust water levels:

1. **Spillway 3:**
 - Check Spillway 3 to ensure there is no impediment to water.
2. **Spillway 2:**
 - Unlock gate of Spillway 2 and use hand crank to completely open the gate (lift all sections). Water should be allowed to flow freely through the Spillway.
3. **Gate 1:**
 - Unlock chain and carefully open gate. Fasten and lock chain after use. Adjust gate as needed to manage and maintain water level.

OPERATING INSTRUCTIONS FOR CONTROL MECHANISMS

The manual will provide complete, clear, step-by-step instructions for operating all mechanisms associated with a dam. Proper sequences along with photographs will be included, along with the correct method of opening and closing gates during low and high flows.

FLOOD CONTROL OPERATION

Kingsbury Pond will be regulated for optimum flood reductions. During flood control regulation, the spillway gates are to be operated in a uniform manner, detailed below:

1. **Spillway 3:**
 - Check Spillway 3 to ensure there is no impediment to water.
2. **Spillway 2:**
 - Unlock gate of Spillway 2 and use hand crank to open the gates needed to optimum level to avoid or manage flood waters.
 - Adjust gate as needed to maintain water level until flood is managed, and close gate to return water level to appropriate standard.
3. **Gate 1:**
 - Gate 1 is needed to manage water level each Spring to manage water levels in the pond and stream, and as needed to avoid floods throughout the year. Adjust gate as needed to maintain water level, and close gate to return water level to appropriate standard. To open or close gate, unlock chain and use chain/hoist to adjust gate. Fasten and lock chain after use.

SECTION IV: MAINTENANCE

This section of the O & M Manual provides detailed information and instructions on performing periodic maintenance at a dam. Maintenance is a task which should never be neglected. A good maintenance program will prevent deterioration of the dam, prolong its life and maintain a safe structure. A maintenance program should consist of the following three elements:

- Regularly Scheduled Maintenance
- Monitored Maintenance
- Unscheduled Maintenance

REGULARLY SCHEDULED MAINTENANCE

Scheduled maintenance involves servicing equipment, replacing parts, or performing routine tasks according to an established schedule. Scheduled maintenance may be anything from painting metal to scheduled replacement of component parts on a gate.

MONITORED MAINTENANCE

Monitored maintenance involves periodic surveillance and testing of equipment and making repairs or modifications as needed. A surveillance schedule is established based on predictions of the wear rates of certain types of materials. For example, monitored maintenance would include: inspecting gates weekly and clearing debris as needed, and checking gate leakage monthly.

MAINTENANCE PLAN

Instructions for performing periodic maintenance should be given in detail, so that new personnel can understand the tasks, and experienced personnel can verify that they have performed the work properly. All regularly scheduled and monitored maintenance should be identified and listed in a maintenance plan section of the O & M Manual. An overview of the maintenance plan appears below, and the forms are in the Appendix.

SCHEDULED MAINTENANCE

Despite having a proper maintenance program, unexpected deficiencies can occur at any time, prompting the need for repairs or replacement. Unscheduled maintenance is maintenance that is performed on an as-needed basis. The need for unscheduled maintenance may be identified during the performance of preventative maintenance, dam safety or O & M inspections, or after an unusual event such as a flood. Examples of unscheduled maintenance would include:

- Repairing and reseeding eroded areas and gullies on embankment dams.
- Repairing defective gates and other equipment discovered during inspections.
- Repairing damage to spillways following a flood.

Although unscheduled maintenance cannot be planned for in a maintenance plan, Kingsbury Plantation maintains a Dam Account in anticipation of the need for repair or rehabilitation of unexpected deficiencies. Major repairs or improvements require review and approval by the Board of Assessors.

SECTION V: INSPECTION

An effective inspection program is essential for identifying problems and providing safe performance of a dam. The inspection program includes the three types of inspections:

- Routine, informal inspections
- Annual safety inspections
- 10-year formal inspection

ROUTINE INSPECTIONS

Routine inspections are typically performed on a regular basis. The frequency of routine inspections is tied to the need for operation and monitoring based on the season. Important monitoring data recorded during a routine inspection includes: visual inspection, reservoir level, flow, and other dam-specific information. The visual inspection is critical to observe, record, and repair any obvious changes which may threaten dam safety.

ROUTINE INSPECTION PLAN

- I. Check Reservoir Level
 - a. Check and Record Outlet Flow
 - b. Make Required Changes in Gates
- II. Visually Examine Condition:
 - a. Check Spillway Channels for Debris
 - b. Check Foundation Seepage Area
 - c. Check Condition of Gate and Spillway 1
 - d. Check Condition of Spillway 2
 - e. Check Condition of Spillway 3
 - f. Check Riprap for Vegetation, Human, and Animal Damage and Debris
 - g. Check Embankments for Vegetation, Human, and Animal Damage and Debris
- III. Check Operating Condition of Gates:
 - a. Operate Gate
 - b. Operate Spillway 2

***Seasonal Routine Inspection Plan**

- Between April 1 and September 15, inspect dam once/week.
- Between September 15 and November 1, inspect dam once every two weeks.
- Between November 1 and April 1 (depending on spring thaw), inspect dam once/month.

ANNUAL INSPECTION

An annual inspection is a more detailed inspection to review, inspect, evaluate, and document all critical features and equipment of the dam. The inspection will be performed by the Board of Assessors (or agents) and Dam Operators. The Annual Inspection Form ensures all critical features are examined and that information is archived. Typical inspection items would include: the condition of the dam crest, upstream, and downstream slopes, condition of the spillway and outlet, observation and measurement of all seepage, and any other critical dam features. During the annual inspection, all operable mechanisms should be test-operated to ensure they are in proper working order. Monitoring information over the past year should be reviewed for development of any adverse conditions. All information from the annual inspection should be recorded in the Annual Inspection Form in the Appendix.

1. Perform Detailed Annual Inspection of the Gate and All Spillways
 - a. Gates
 - b. Concrete
 - c. Embankments
 - d. Upstream Slopes
 - e. Downstream Slopes
2. Survey Settlement Monuments
3. Check Corrosion Protection on all Exposed Metalwork
4. Review and Update Emergency Action Plan

10-YEAR PERIODIC INSPECTION

Kingsbury Plantation will be performing 10-year periodic inspections on the following schedule:

- 2017
- 2027
- 2037
- 2047
- 2057

These inspections should be performed by professional engineering specialists, registered in Maine, and familiar with the design and construction of dams and should include a thorough assessment of structure safety. This type of inspection includes:

- A visual inspection of all dam elements,
- An analysis of the dam elements under extreme flood and emergency situations,
- A review of dam operation and maintenance procedures,
- A comprehensive report of findings.

SECTION VI: MONITORING AND INSTRUMENTATION

Monitoring and instrumentation at Robert C. Furber Dam consists of the following:

- Marks for recording reservoir levels will be added during 2019 dam repairs
- Settlement Monuments along the dam crest will be added during 2019 dam repairs

MONITORING INSTRUCTIONS

Seepage Measurements

- Measurement Point No. 1 will be added during 2019 dam repairs
- Measurement Point No. 2 will be added during 2019 dam repairs

Bridge Monitoring

- To avoid damage to the bridge on Hotel Road, the downstream water level needs to be below the red zone marked on the concrete wall.
- Dam releases need to be carefully managed, especially during spring runoff, to avoid damaging the bridge.

OPERATING INSTRUCTIONS

- For the Reservoir Level, read the value on the marker and record the information on the reporting form.
- For the Seepage Measurement, catch water in a container of known capacity, and record the time it takes to fill. Enter Data on the Seepage Monitoring Form, along with the reservoir level at the time. Also note whether the seepage is clear, cloudy, or muddy.

NOTE: The presence of cloudy or muddy seepage, or an unusual increase in seepage over time, are indicators of a potential problem developing. Immediately inform the Board of Assessors if any such adverse change in seepage is noted.

INTERVAL

- Reservoir Level:
 - Weekly – April to November
- Seepage Measurement:
 - Monthly - April to November

SECTION VII: UPDATNG

Updating information in the Operation and Maintenance Manual should be done annually or when major changes have occurred. Things to consider when updating include:

- Increase or decrease the frequency of an examination or the maintenance routine based on the performance at the time of the observation
- Add or subtract operation and maintenance information as changes are made
- Change the operation and/or maintenance procedure(s) based on performance at the time of the observation
- Change in Dam Operator contact information
- Alterations to the data due to changes at the dam.

All copies of the Operation and Maintenance Manual need to be updated. Here are the locations of the O & M Manual:

- Kingsbury Plantation Records Office
- Kingsbury Dam Operators
- Kingsbury Board of Assessors

APPENDIX A: MAINTENANCE PLAN

DAM EMBANKMENT	FREQUENCY	DESCRIPTION
Vegetation Control	Weekly May-October Monthly October-April	Cut grass at least weekly May-October to allow for visual surveillance of the embankment surfaces. Maximum grass height should not exceed eight inches. Remove small trees and brush weekly May-October, and check vegetation Monthly October-April. DO NOT REMOVE TREES LARGER THAN SIX INCHES IN DIAMETER WITHOUT ADVICE FROM A PROFESSIONAL ENGINEER!
Control of Burrowing Animals	Annual	Repair animal burrows by compacting fill into the excavated areas. If the burrowing is extensive, seek the advice of a qualified engineer. Eliminate the burrowing animals to alleviate the problem for the long term.
Maintain Surrounding Area	Biannual	Gravel Walkways: Add gravel and/or chips and grade eroded areas as needed.
Maintain Crest Design Elevation	Biannual	Maintain the design elevation of unimproved crest surfaces by leveling and grading the crest to design specifications. Fill any ruts or minor depressions.
Maintain Upstream Slope Protection	Annually & After Floods	Repair damage or potential damage to riprap by replacing or repairing the bedding material and riprap as needed. Repair substantial voids in the riprap by adding or moving riprap as needed.
Erosion Control on Downstream Face	Annually & After Floods	Repair erosion gullies by removing loose materials and replacing them with compacted fill. Gravel and cobbles or planted grass should be added as appropriate.
SPILLWAY CHANNELS	FREQUENCY	DESCRIPTION
Erosion Control	Annually & After Floods	Repair erosion gullies by removing loose materials and replacing them with compacted fill. Gravel and cobbles or chips and planted grass should be added as appropriate to the damaged area to prevent future erosion.
Maintain Spillway Channels	Weekly May-October Monthly October-April	Remove any obstructions or debris from the spillway channel. Cut grass. Remove small trees and bushes that would affect flows now or in the future if let to grow.
Inspect and Repair Concrete	Annual	Examine and make repairs to concrete surfaces and joints.
Maintain Metal Features	Biannual	Remove mineral deposits and paint metal features, as needed, check to see that the cathodic protection is performing adequately, and restore corroded metal to acceptable condition.

GATES	FREQUENCY	DESCRIPTION
Gates	Weekly May- October Monthly October-April	Visual inspection of gates defects and leakage.
Gate Controls	Biannual	Operate gates, note and repair any defects.

APPENDIX B: ANNUAL INSPECTION FORM

Dam Name:	Robert C. Furber Dam, also known as Kingsbury Dam
Date of Inspection:	
Inspected by:	
Weather:	
Reservoir	
Reservoir Level at Time of Inspection: (feet below dam crest)	
Reservoir Inflow at Time of Inspection:	
Reservoir Outflow at Time of Inspection:	
Condition of Dam	
Crest: Check for: surface cracking, animal burrows, low areas, horizontal alignment, ruts, trees, brush.	
Upstream Face: Check for: slumps, slides, scarps, sinkholes, animal burrows, slope protection, wave erosion, trees, brush.	
Downstream Face: Check for: wet areas [no flow], seepage [note location], slides, slumps, scarps, change in slope, animal burrows, erosion, unusual movement, trees, brush, water loving vegetation.	
Gate: Examine: gates, fishscreen, handrails, sidewalls, channel floor, approach area, discharge area. Check for: rust, alignment, movement, cracking, spalling, undermining, erosion protection, vegetation, debris.	
Spillway 1: Examine: gates, sidewalls, channel floor, approach area, discharge area.	

<p>Check for: rust, alignment, movement, cracking, spalling, undermining, erosion protection, vegetation, debris.</p>	
<p>Spillway 2: Examine: sidewalls, channel floor, approach area, discharge area. Check for: alignment, movement, cracking, spalling, undermining, erosion protection, vegetation, debris.</p>	
<p>Maintenance Deficiencies: Check for seepage, undermining, erosion, corrosion.</p>	
<p>Additional Comments:</p>	
<p>NOTE: Attach Photographs of Dam and Reservoir Site</p>	

APPENDIX C: MONITORING RECORDING FORMS

DATA FORM FOR SEEPAGE

DATE	LOCATION	CLARITY (Clear, Cloudy, or Muddy)	RESERVOIR ELEVATION (ft.)	OBSERVER

SETTLEMENT/MOVEMENT MONITORING DATA

NAME:

MONUMENT NUMBER	DATE	ELEVATION	TOTAL SETTLEMENT	LATERAL DISPLACEMENT AND DIRECTION

GATE REPORTING

NAME:

GATE / SPILLWAY	DATE	CHANGE TO GATE / PLANKS	REASON	IMPACT ON WATER LEVEL

APPENDIX D: DATES AND DATA

ICE OUT DATES

- 2010:
- 2011:
- 2012:
- 2013:
- 2014:
- 2015:
- 2016:
- 2017:
- 2018:
- 2019:

SPRING 2019 FLOOD MANAGEMENT GATE ADJUSTMENTS

- Details to be added from Dam Operator reports

APPENDIX E: REFERENCES AND CREDITS

Credits:

The first draft of the *Robert C. Furber Operations and Maintenance Manual* was created by Tamara Wederbrand.

The first edition of the *Robert C. Furber Operations and Maintenance Manual* was created and edited by Tamara Wederbrand, Chris Russell, and Tammy Bridges.

The updated edition of the *Robert C. Furber Operations and Maintenance Manual* was created and edited by Tamara Wederbrand, Jeff Bridges, and Errol Nightingale.

All photographs are courtesy of Tamara Wederbrand.

References:

Association of State Dam Safety Officials (2014, May 13). *Developing Operations and Maintenance Manuals for Dams*. Retrieved from

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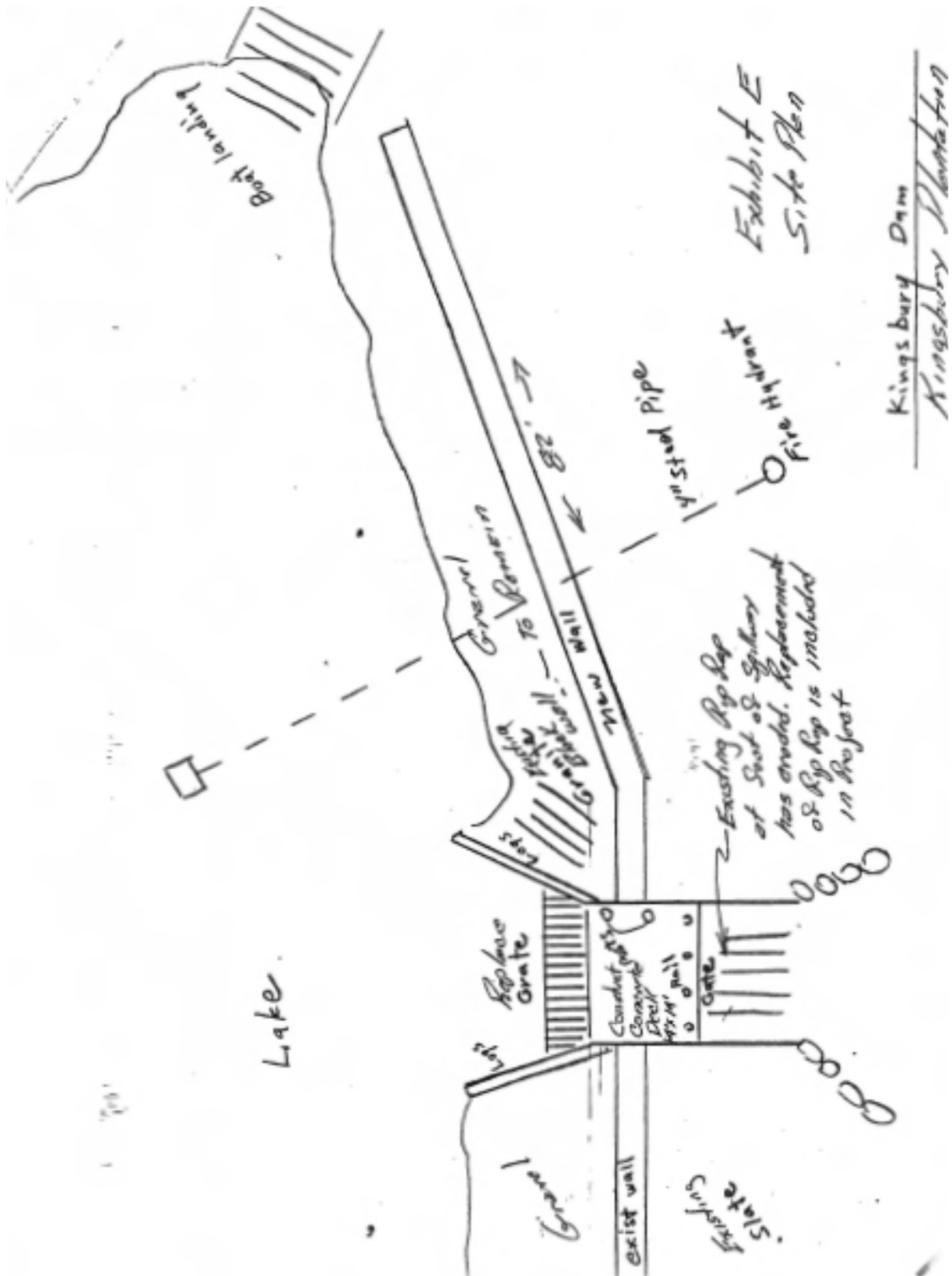
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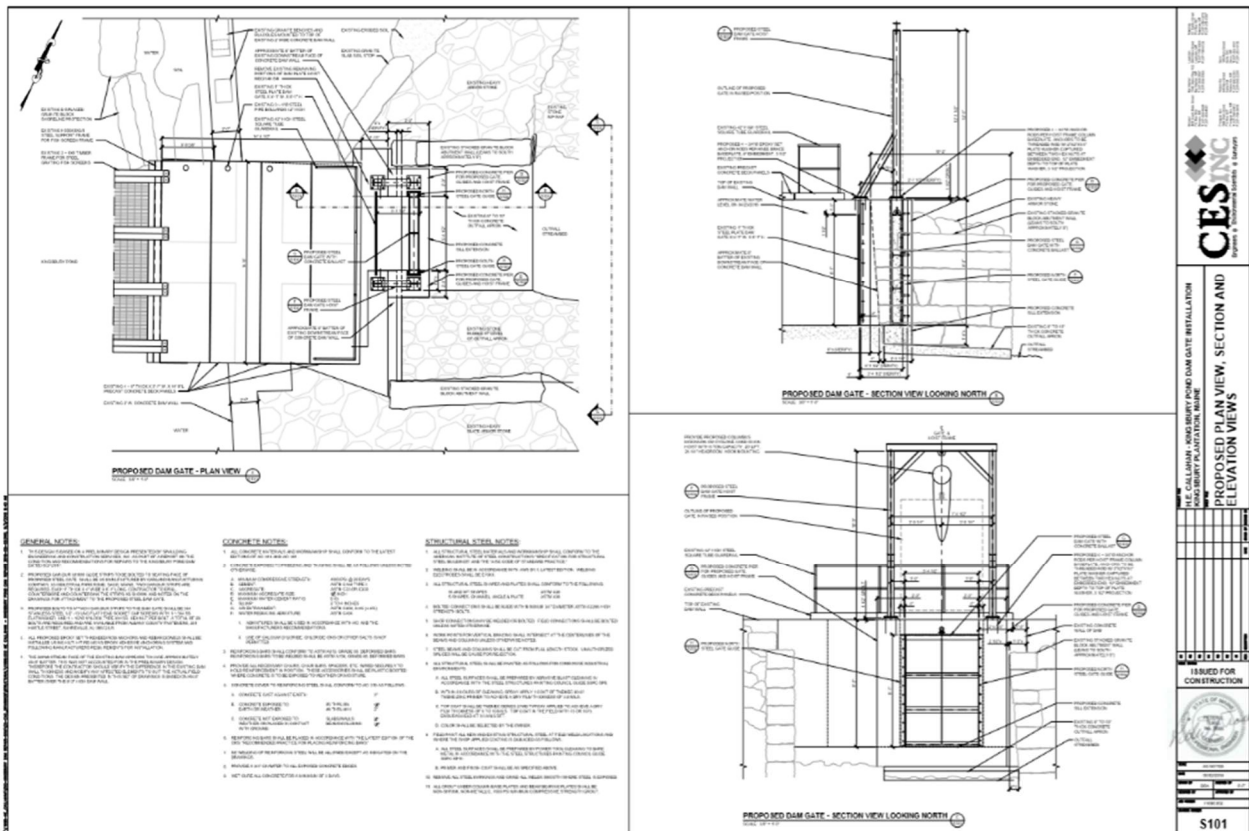
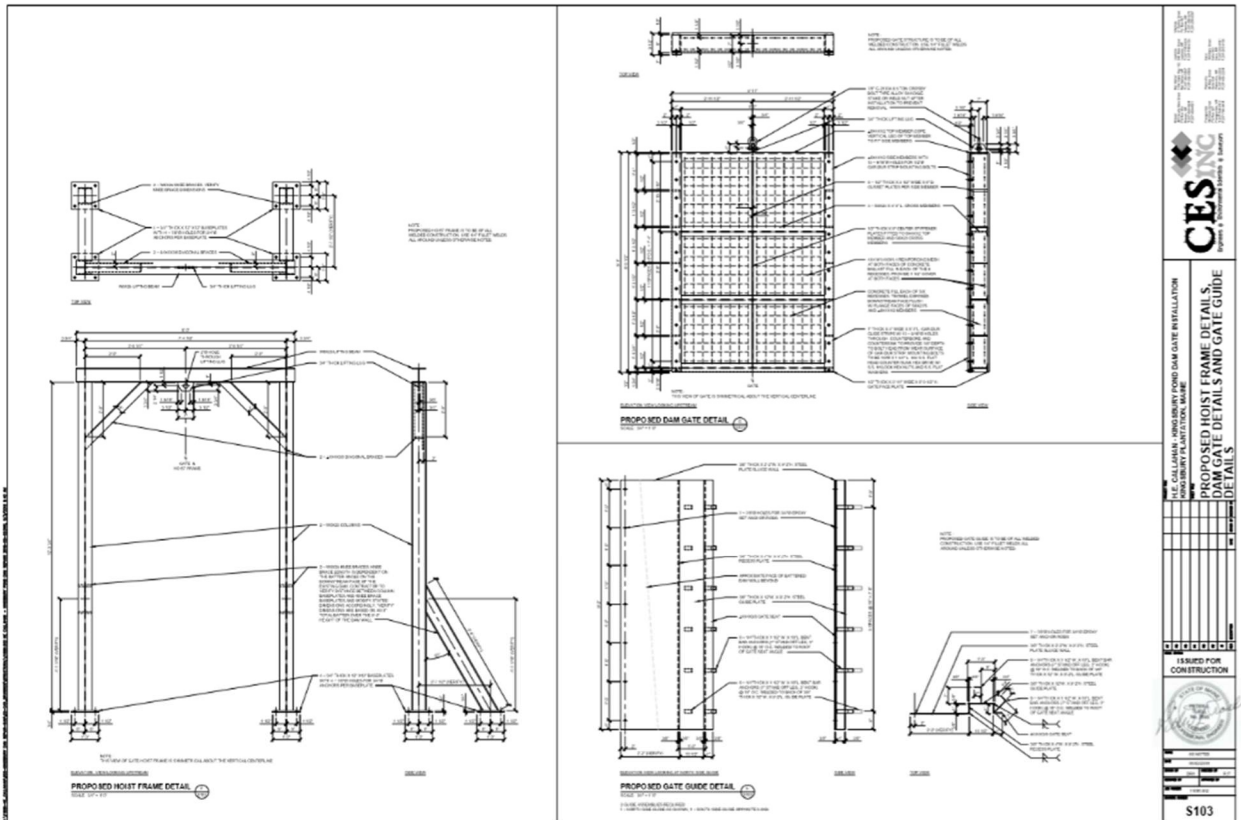
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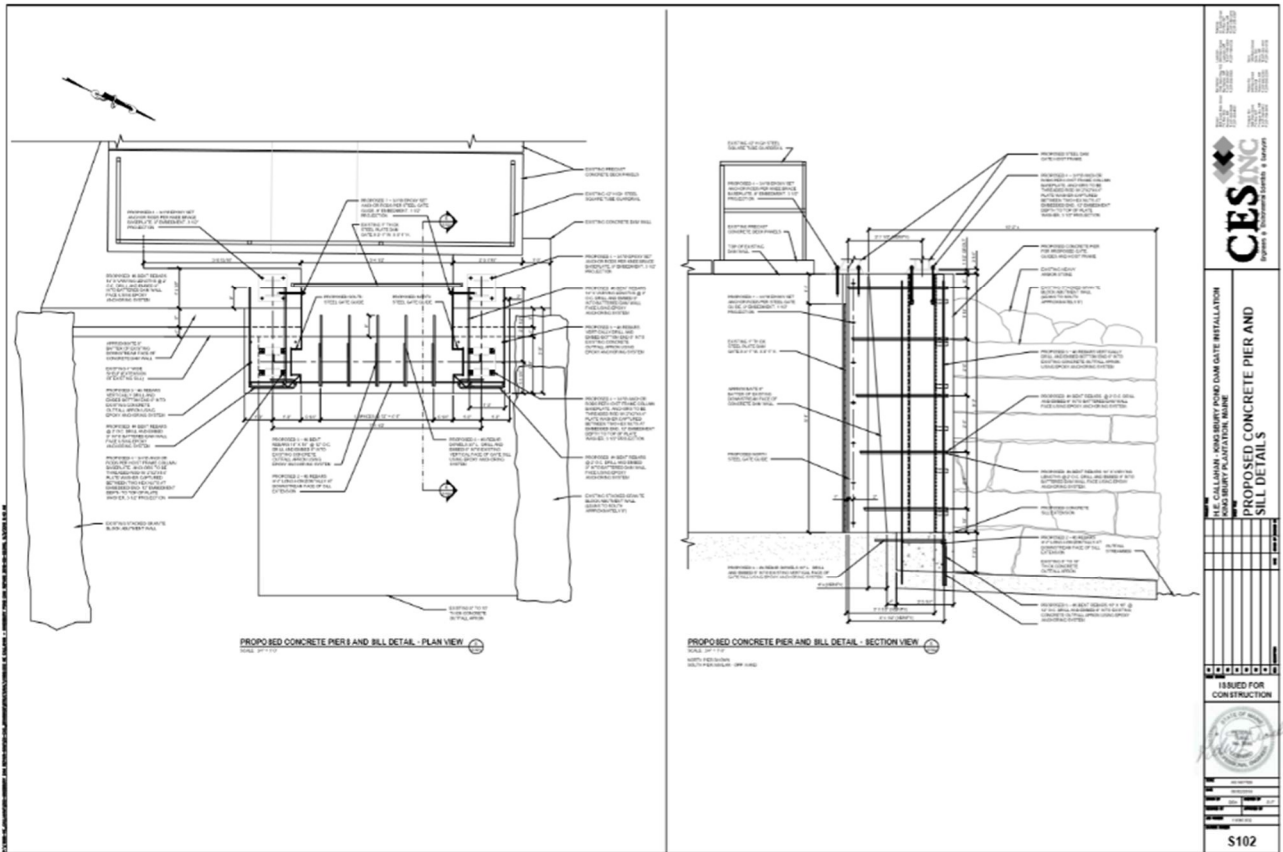
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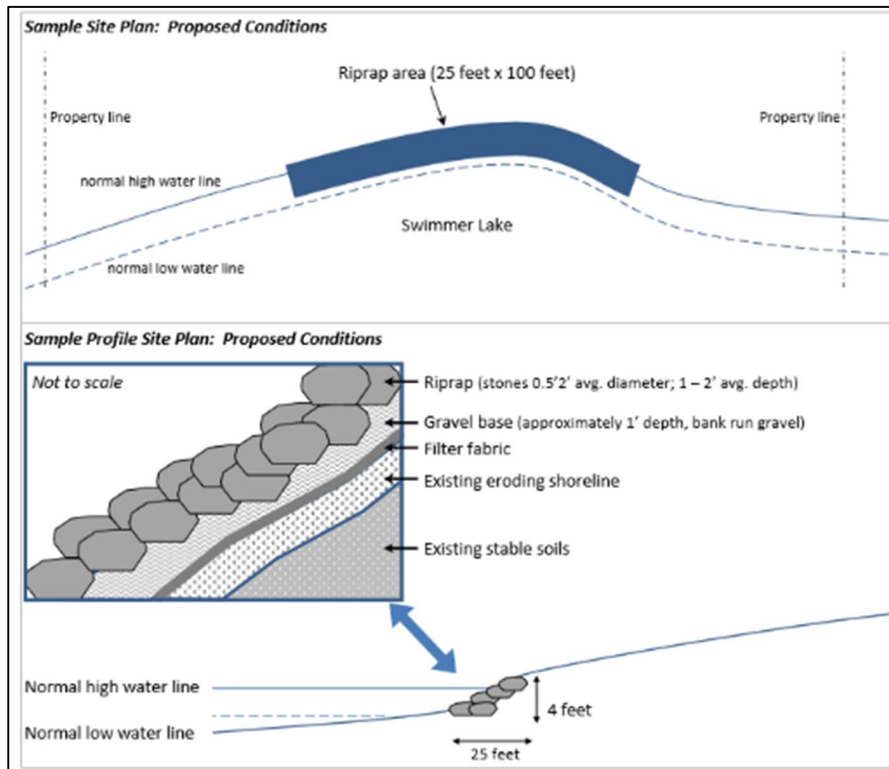


2018 Gate Engineering Plans and Drawings

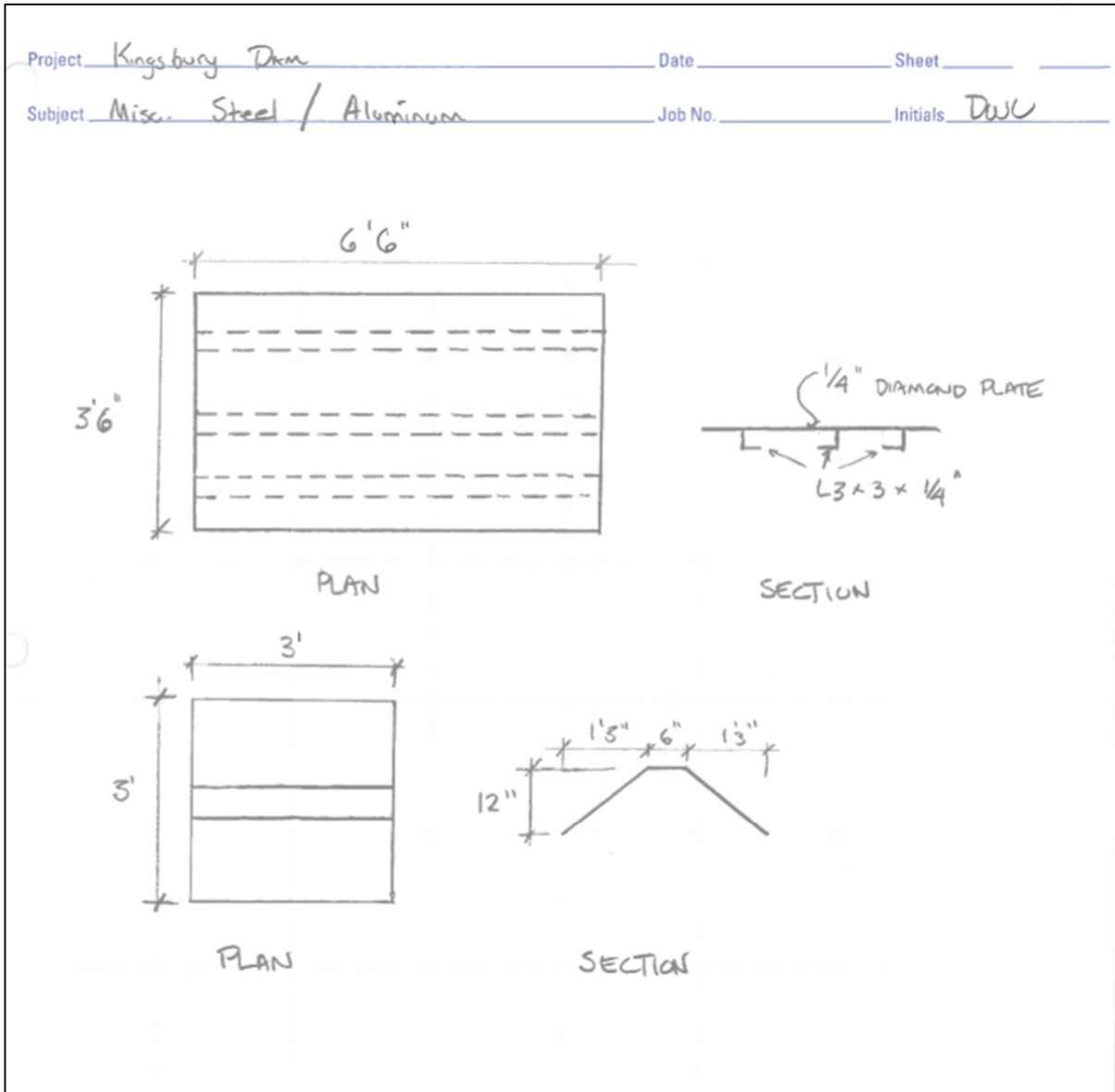




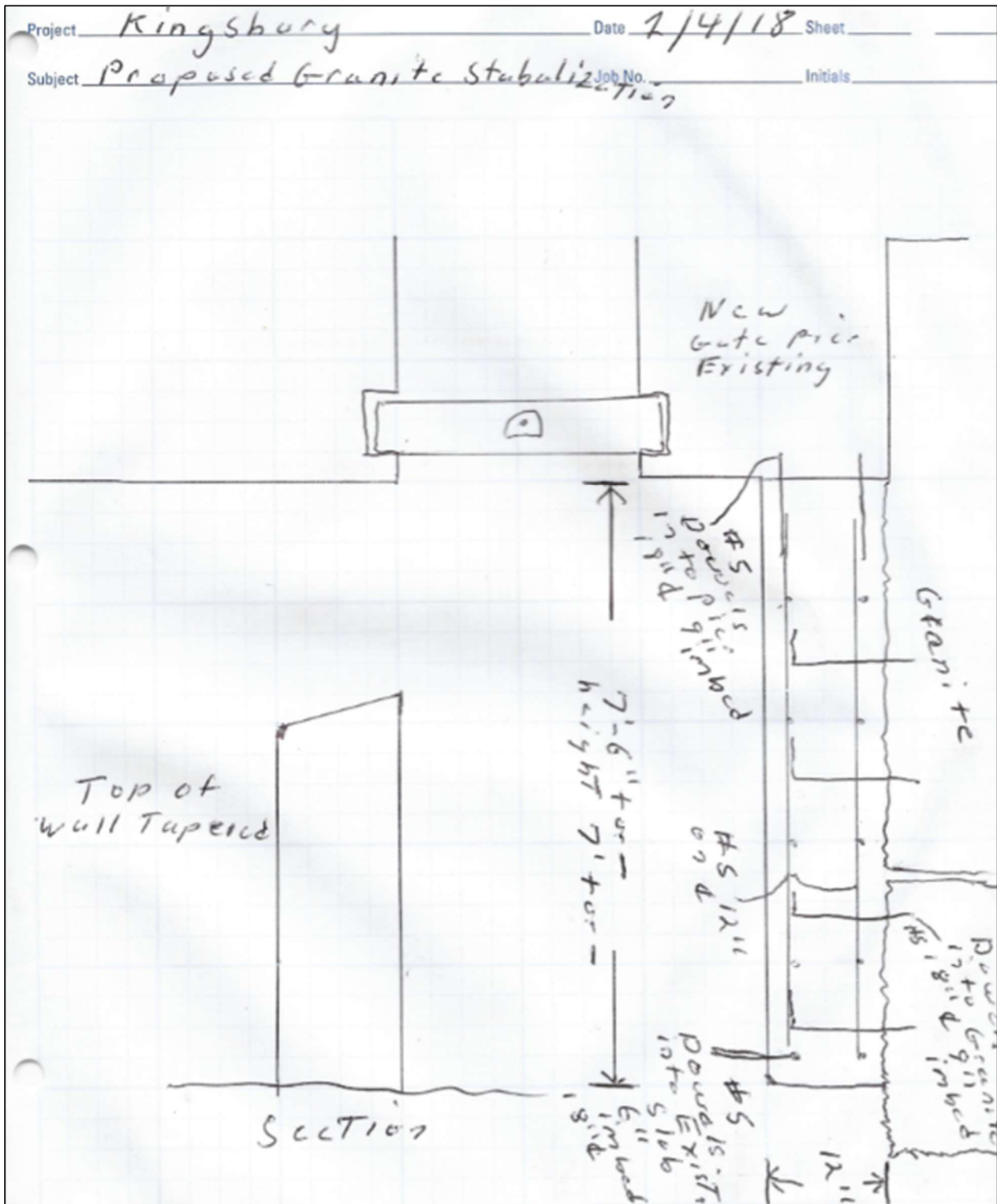
2018 Riprap Improvement



2019 Plate Covering Opening
Between Concrete and Gate



2019 Gate 1 Wall Original Drawing



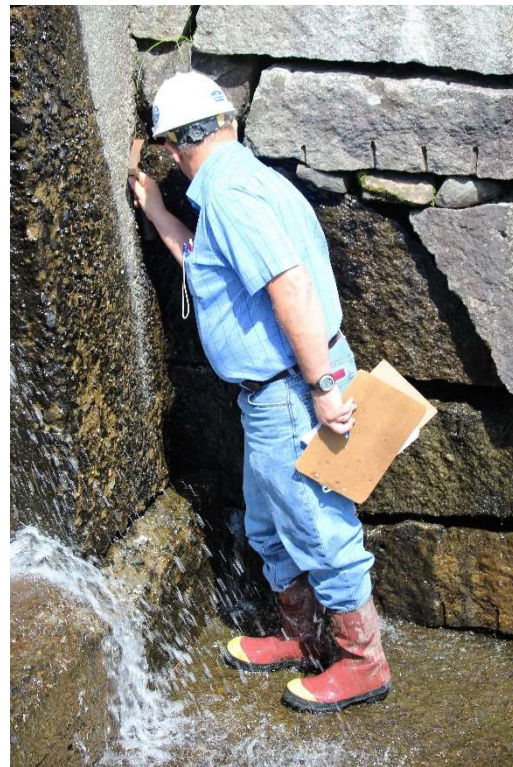
APPENDIX G: PHOTOGRAPHS

Photographs from 2000 Construction:

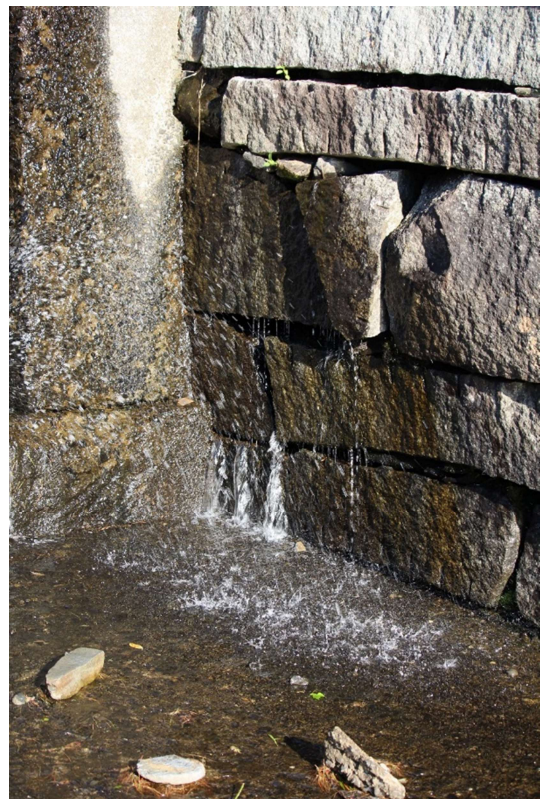




Photographs from 2017 Dam Inspection:

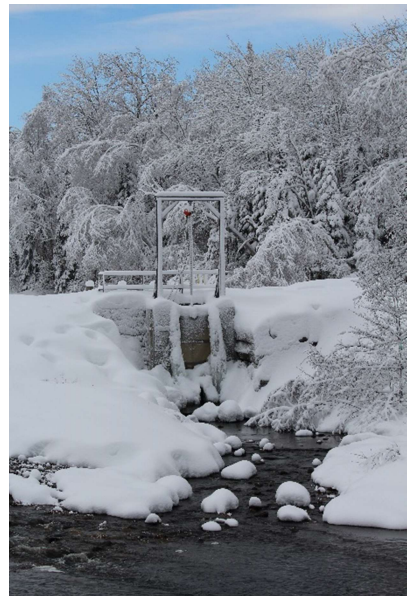


July 2018 Before Dam Work:



2018 During Dam Work:





www.kingsburyplantation.com