PROJECT MANAGER ANNUAL REPORT

MEMPHREMAGOG WATERSHED ASSOCIATION

Patrick Hurley – MWA Project Manager | phurley@mwavt.org | 781.389.4494
Gabryel Gianoni – MWA Project Coordinator | ggianoni@mwavt.org | 814.823.1198

August 10, 2023

Welcome to Our New Project Coordinator!

Gabryel Gianoni

- **Leading Riparian Streambank Assessments** on the Clyde River
- **Coordinating subcontractors and implementation** crews on River Restoration and Stormwater Improvement projects
- **Performing outreach & project development** with private landowners throughout the basin

ROOM 214 WORKS COMMONS | MONTGOMERY WARD BUILDING

194 MAIN ST | NEWPORT, VT 05855

ACTIVE GRANTS & PROJECTS	AMOUNT	CLOSE DATE
Great Lakes Fisheries Commission Riparian Lands (VT FWD)	$295,000	3/31/2025
Valley Brook Restoration Project Phase 1 (CWSP)	$142,581	10/31/2024
FY2023 Tactical Basin Planning Support (WUV)	$13,900	7/15/2023
FY2024 Tactical Basin Planning Support (WUV)	$12,700	7/15/2024
Echo-Seymour Lakes Watershed Action Plan (OCNRCD/DEC)	$31,810	12/31/2024
Willoughby Lake Watershed Action Plan (OCRNCD/DEC)	$19,550	4/1/2024
Shadow Lake Shoreland Restoration Designs (OCNRCD)	$5,885	6/30/2023
Newport Marina Stormwater Improvements Project (WUV)	$444,047	10/1/2024
Glover Town Office/Community School Stormwater Design (WUV)	$10,579	10/31/2024
Barton Village Stormwater Design Project (WUV)	$39,877	10/1/2024
Forested Headwaters Project Development (WUV)	$7,940	6/30/2024

Farrant St Stormwater Improvement Project

Construction In Progress!

Removing pollutants from:

- **125-acre drainage**
- **25 acres of impervious surfaces**
- **19.8 lbs of phosphorus**
- **>1 ton of sediment**

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River Restoration

200-year flood event!

- Culvert upgrades & removal
- Floodplain restoration
- Riparian buffer plantings
- Beaver dam analogues
- Wetland restoration
- Strategic wood additions
- Habitat restoration
- Road BMPs & upgrades
- Ditch plugging

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Lake Watershed Action Plans

MWA work with Orleans County Conservation District to:

- Perform background research and geospatial review
- Conduct stream, roadway, and lakeshore assessments
- Identify and prioritize potential water quality projects
- Develop 30% conceptual restoration designs
- Draft Final Report with recommendations and priorities

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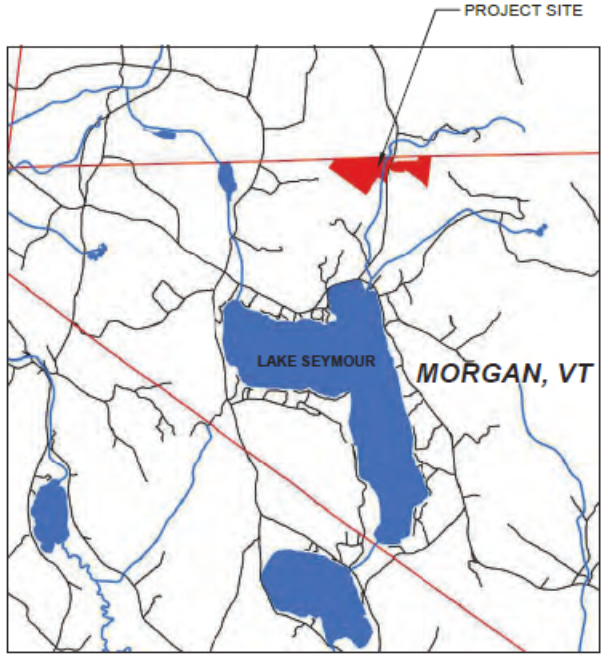
Orleans County Conservation District

FARROW FARM STREAMBANK MANAGEMENT AREA

VERMONT FISH & WILDLIFE DEPARTMENT
RIPARIAN LANDS TEAM

LOCATION MAP



VICINITY MAP

SHEET SET

1. COVER SHEET
2. QUANTITIES & GENERAL NOTES
3. PROJECT OVERVIEW
4. GRADING OVERVIEW
5. BARNYARD FLOOD BENCH GRADING
6. LOWER FLOOD BENCHES GRADING
7. TRIBUTARY FAN RESTORATION
8. TRIBUTARY RESTORATION PROFILES & SECTIONS
9. FARM ROAD DECOMMISSION & REVEGETATION
10. RESTORATION TREATMENTS DETAILS & NOTES
11. WOODY STRUCTURES DETAILS & NOTES
12. 4' CULVERT REMOVAL & CROSSING RESTORATION
13. CONSTRUCTED RIFFLE & LOG WEIR PROFILE

VALLEY BROOK RESTORATION PROJECT PHASE 1 - 100% DESIGN PLANS

PREPARED FOR:

VERMONT FISH & WILDLIFE DEPARTMENT
374 EMERSON FALLS RD SUITE 4
ST JOHNSBURY, VT 05819
PETER EMERSON
PETER.EMERSON@VERMONT.GOV
802-751-0485

PREPARED BY:

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PO BOX 513 | 194 MAIN ST
NEWPORT, VT 05855
PATRICK HURLEY
PHURLEY@MWAVT.ORG
www.memphremagogwatershedassociation.com

PETER EMERSON — DATE 7/7/2023

PATRICK HURLEY — DATE 7/7/2023

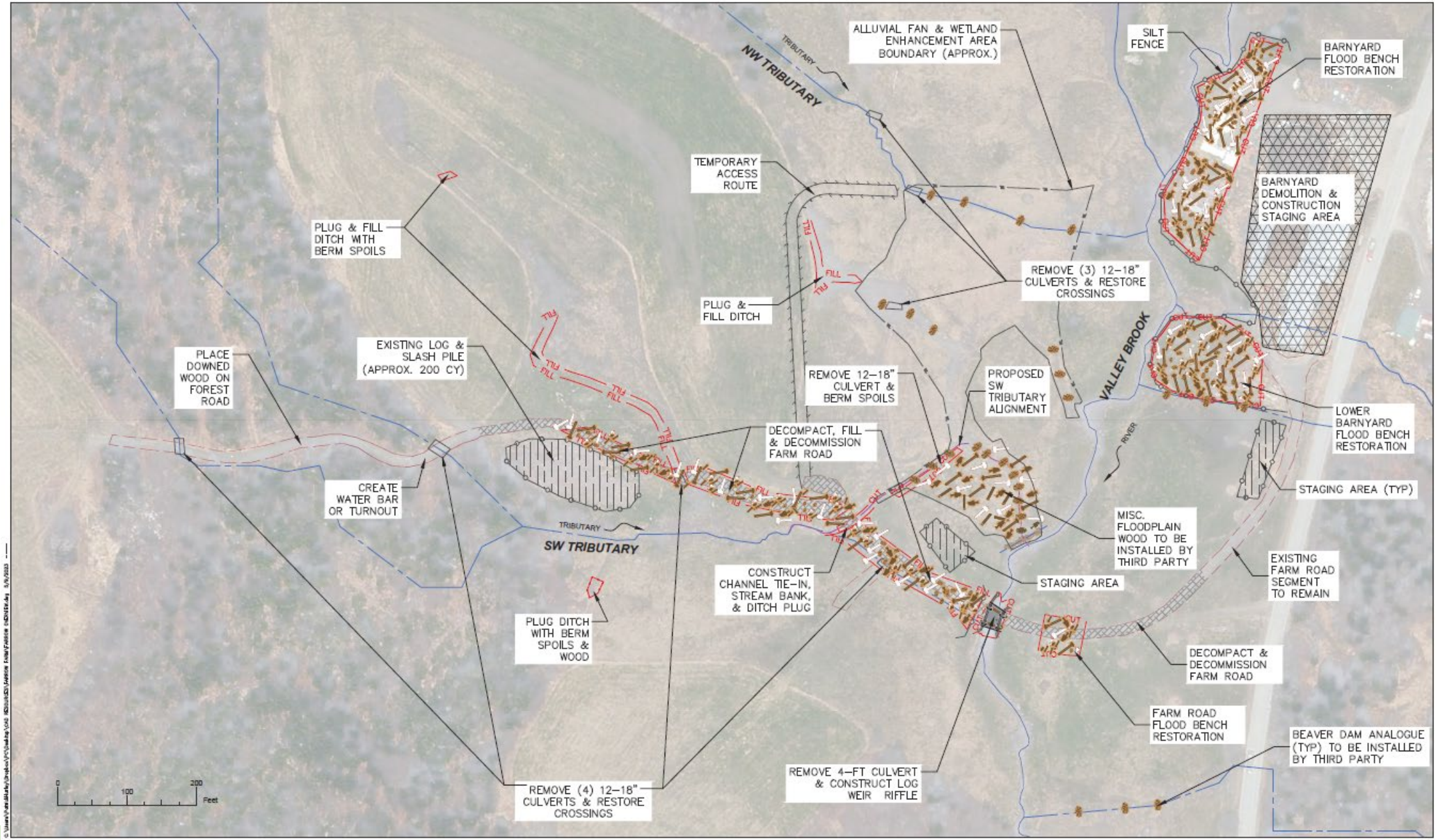
REVISIONS — DESCRIPTION — DATE — MADE BY

DRAWN BY: P. HURLEY
CHECKED BY: P. EMERSON
FILENAME: CO VERSHEET.DWG
PLOTTED BY: PATRICK HURLEY
PLOT DATE: 3/30/023
PLOT TIME: 8:35 AM

SHEET 1 OF 13

VALLEY BROOK RESTORATION PROJECT
100% DESIGNS

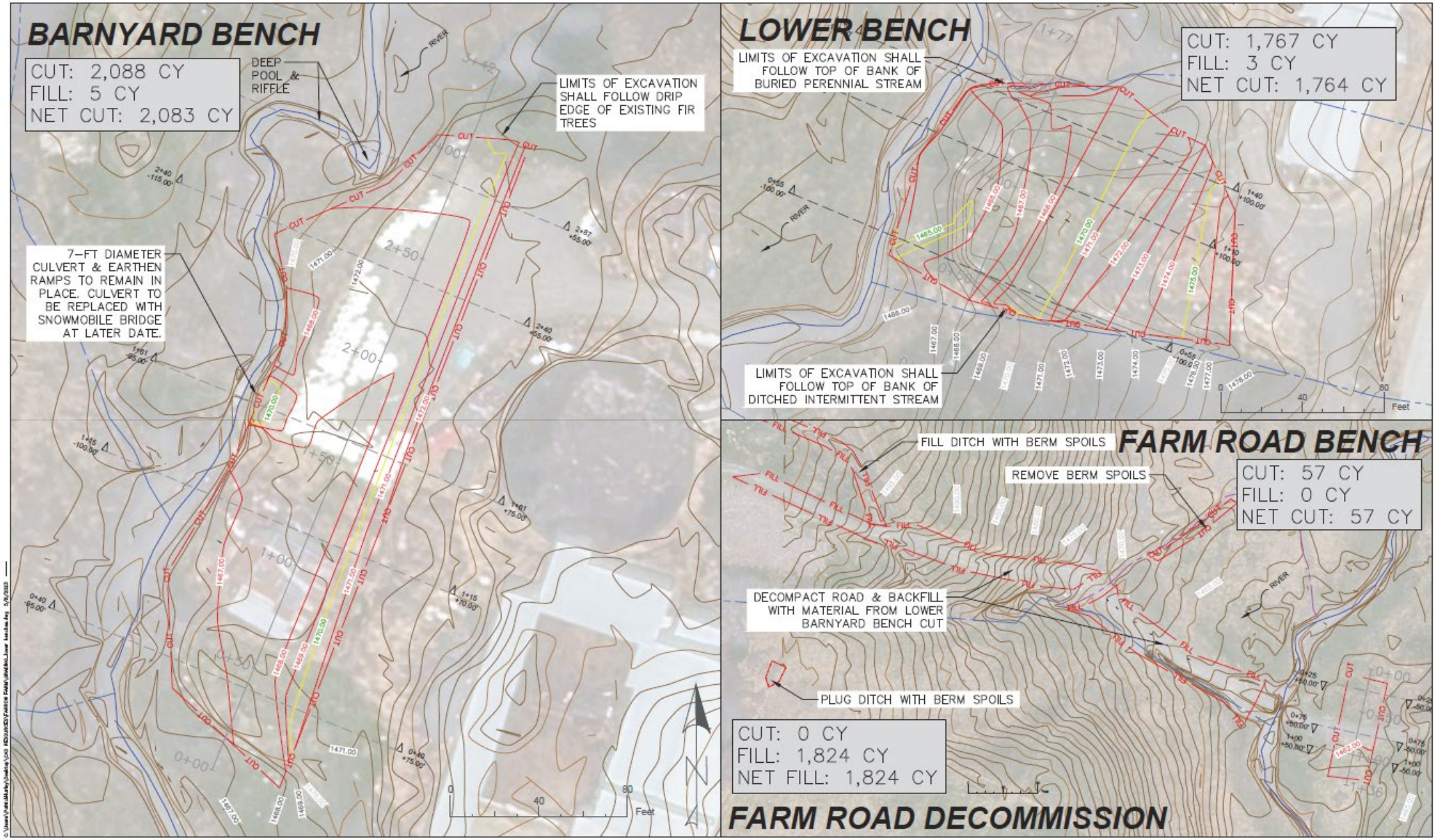
VERMONT FISH & WILDLIFE DEPARTMENT
DISTRICT 5



PHASE 1 RESTORATION ACTIONS - OVERVIEW MAP

VALLEY BROOK RESTORATION PROJECT
July 7, 2023

MEMPHREMAGOG WATERSHED ASSOCIATION

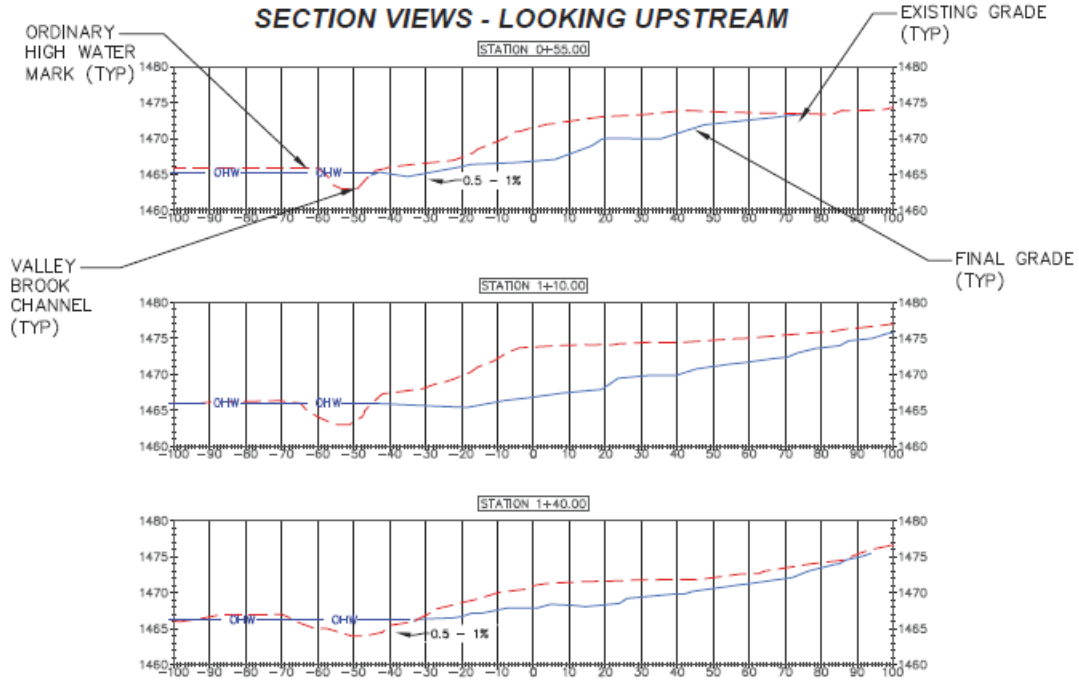


GRADING OVERVIEW - FLOOD BENCHES & FARM ROAD DECOMMISSION

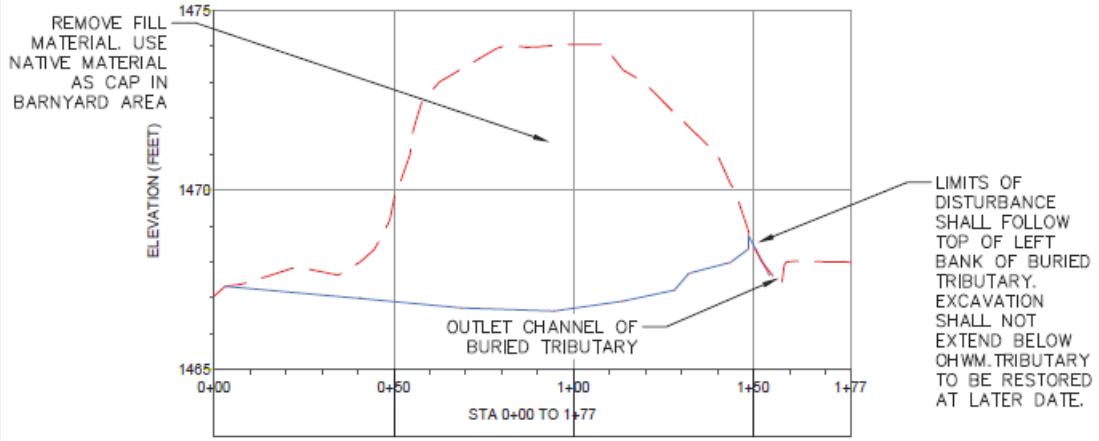
VALLEY BROOK RESTORATION PROJECT
July 7, 2023

LOWER FLOOD BENCH

SECTION VIEWS - LOOKING UPSTREAM

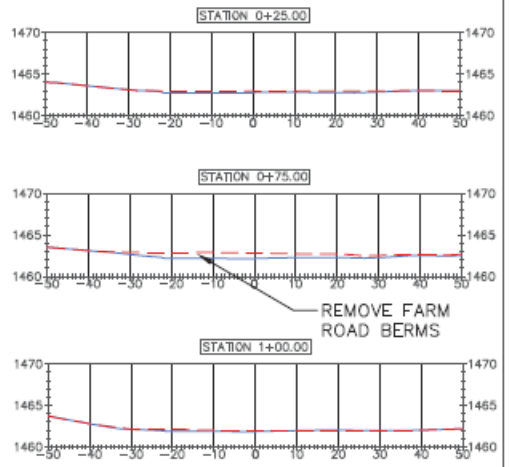


PROFILE VIEW

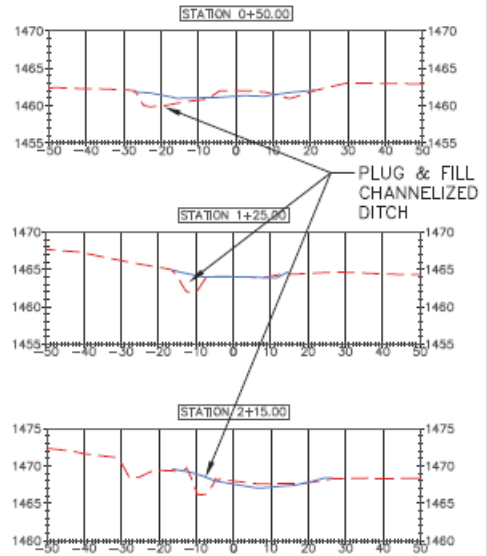


FARM ROAD SECTION VIEWS

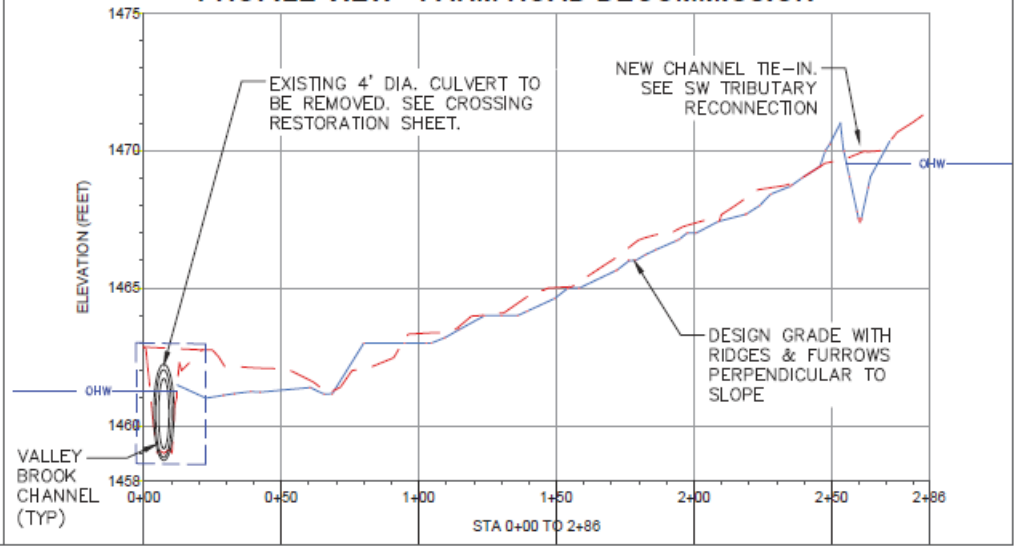
FLOODPLAIN CUT



FARM ROAD DECOMMISSION

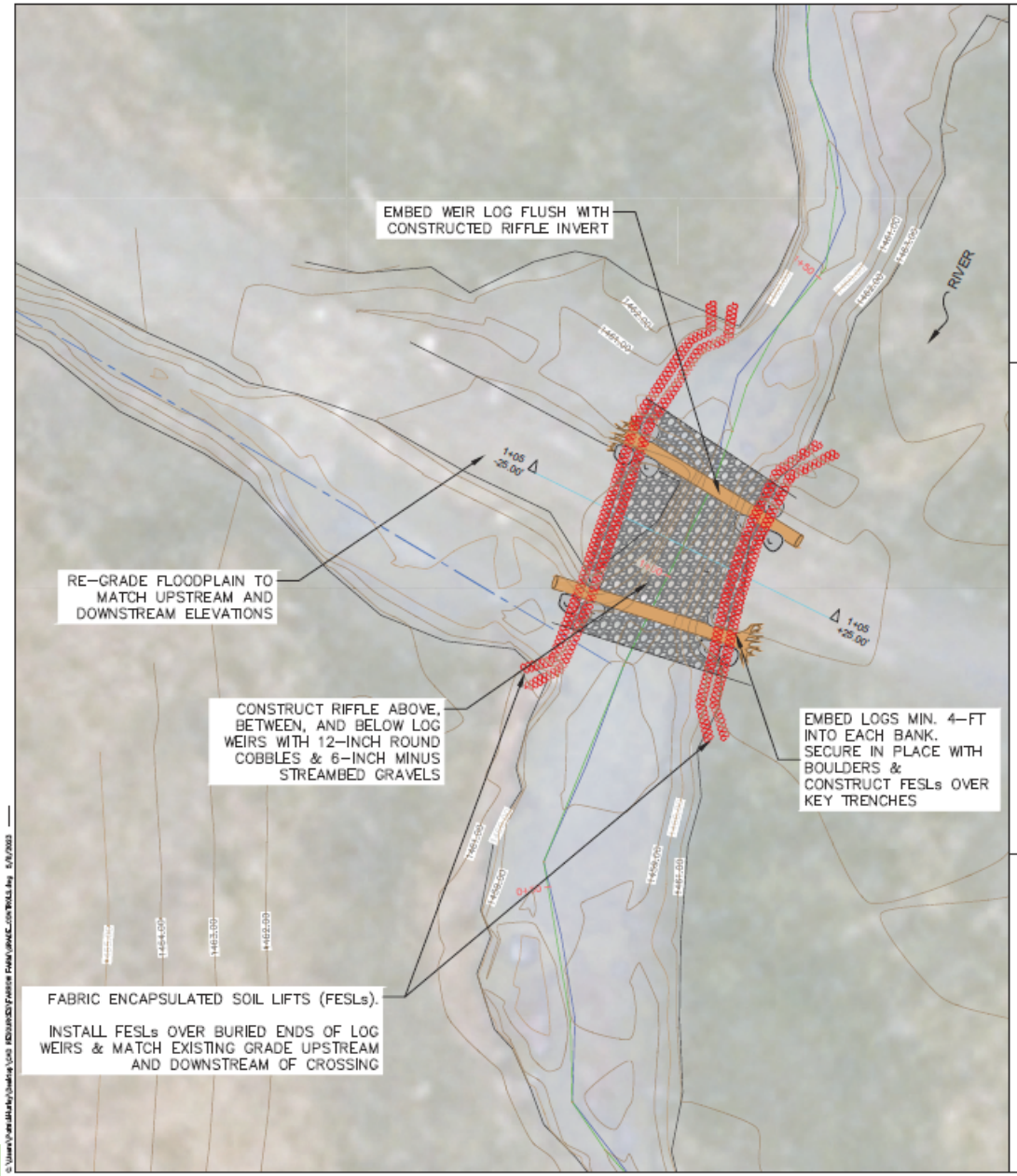


PROFILE VIEW - FARM ROAD DECOMMISSION

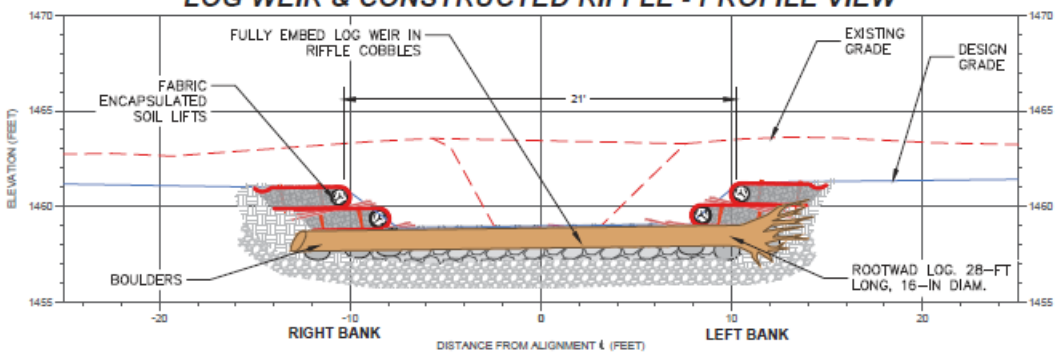


GRADING - LOWER FLOOD BENCH & FARM ROAD

VALLEY BROOK RESTORATION PROJECT
July 7, 2023

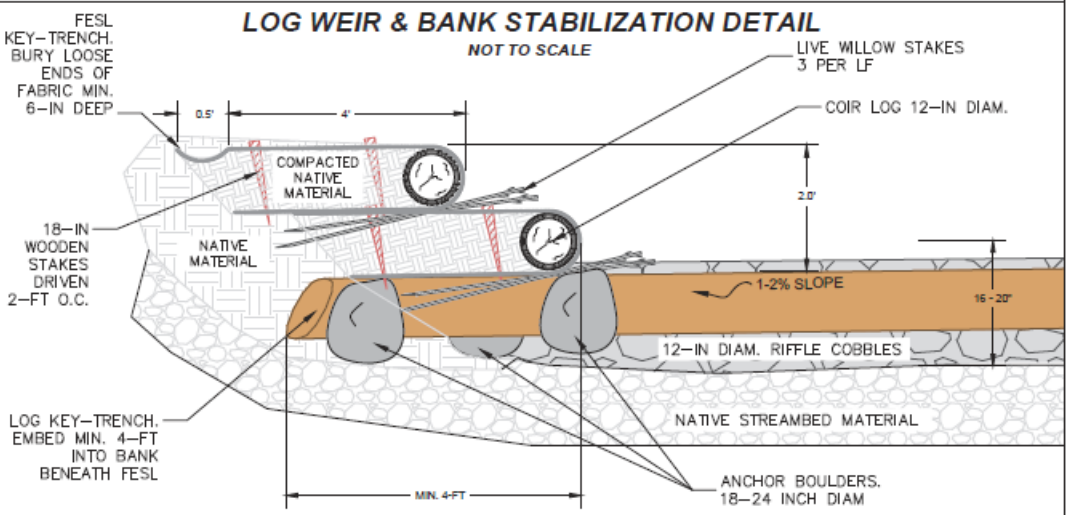


LOG WEIR & CONSTRUCTED RIFFLE - PROFILE VIEW



LOG WEIR & BANK STABILIZATION DETAIL

NOT TO SCALE



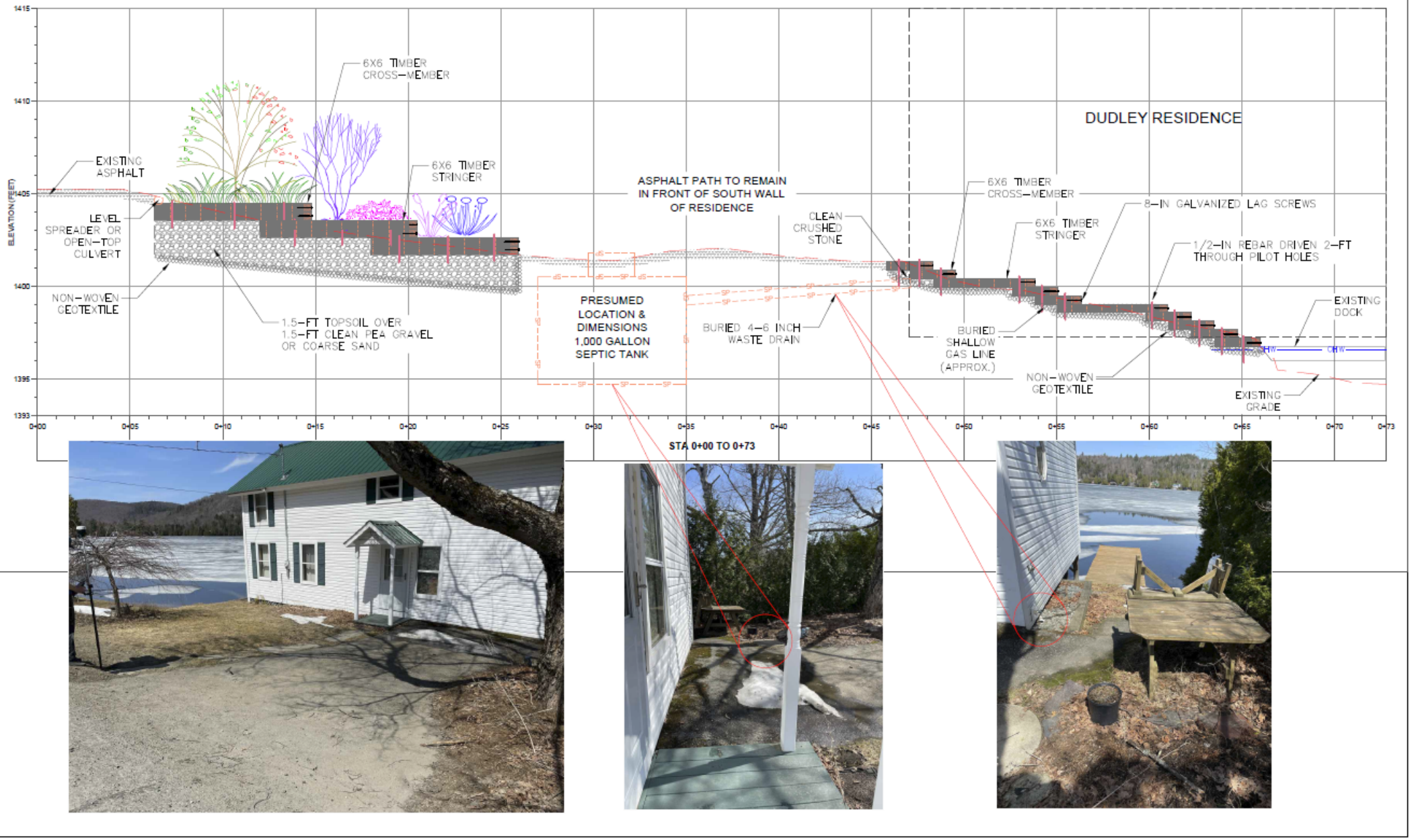
CULVERT REMOVAL & CROSSING RESTORATION NOTES

1. ALL WORK SHALL BE PERFORMED DURING LOW FLOW CONDITIONS. EFFORTS SHALL BE MADE TO REDUCE SEDIMENT LOADING TO VALLEY BROOK DURING CULVERT REMOVAL AND BANK STABILIZATION WORK ACTIVITIES.
2. CONTRACTOR SHALL PROPOSE STREAM DIVERSION METHODS TO DIVERT FLOW AROUND CROSSING RESTORATION AREA. DIVERSION METHODS SHALL BE APPROVED BY PROJECT OWNER AND COMPLY WITH PERMIT REQUIREMENTS.
3. REMOVE RIPRAP, STEEL PIPE, AND EXCAVATE FILL MATERIAL FROM EARTHEN RAMPS AND STREAM CHANNEL WITHIN WORK AREA.
4. EXCAVATE CHANNEL BED AND KEY TRENCHES. PLACE LOG WEIRS ACROSS CHANNEL, ORIENTING APPROXIMATELY 10–15° OFF PERPENDICULAR TO FLOW. SECURE LOGS IN PLACE WITH AT LEAST THREE BOULDERS WITH MINIMUM DIAMETER OF 18 INCHES. BACKFILL WITH COMPACTED NATIVE MATERIAL.
5. PLACE CLEAN, LARGE RIFFLE COBBLES UPSTREAM, BETWEEN, AND DOWNSTREAM OF LOG WEIRS. MINIMUM DEPTH OF RIFFLE BACKFILL SHALL BE 16 INCHES. RIFFLE COBBLES SHALL AVERAGE 12–IN DIAMETER ON THE B–AXIS. FILL VOIDS BETWEEN COBBLES WITH 6–INCH MINUS STREAMBED GRAVELS.
6. PREPARE SILL FOR FABRIC ENCAPSULATED SOIL LIFTS (FESLs) BY EXCAVATING A LEVEL BENCH ALONG THE ENTIRE LENGTH OF EACH STREAMBANK. SILL SHALL BE AT GRADE WITH EXPOSED TOP OF BURIED LOGS AND RIFFLE MATERIAL. EXCAVATE KEY–TRENCH AT UPSTREAM AND DOWNSTREAM ENDS OF FESLs TO TIE INTO EXISTING STREAMBANKS.
7. PLACE 5–FT WILLOW WHIPS ALONG LENGTH OF FESL SILL/BENCH AT A RATE OF 2–3 PER LINEAR FEET. UNROLL COIR EROSION FABRIC AND LINE INSIDE FACE WITH STRAW FILTER FABRIC. PLACE 12–INCH DIAMETER COIR LOG ALONG LENGTH OF STREAMBANK AT WATERWARD EDGE OF SILL.
8. BACKFILL LIFT NATIVE MATERIAL AND TAMP. FOLD OVER REMAINING COIR AND STRAW FABRIC, AND BURY LOOSE END INTO EXCAVATED TRENCH.
9. CONSTRUCT SECOND TIER OF FESLs FOLLOWING THE SAME APPROACH AND MATCH EXISTING GRADE FROM UPSTREAM TO DOWNSTREAM LIMITS OF CROSSING. STAGGER SUCCESSIVE TIERS OF FESLs AWAY FROM THALWEG AT 2H:1V..
10. DRIVE 18" WOODEN STAKES 2–FT O.C. THROUGH EACH FESL TIER.
11. SECURE LOOSE ENDS OF FABRIC IN 0.5–FT DEEP KEY TRENCH ALONG ENTIRE LENGTH OF CROSSING. SECURE BURIED FABRIC IN TRENCH WITH WOODEN STAKES AND BACKFILL & COMPACT TRENCH. TOPDRESS UPPERMOST TIER OF FESL WITH CLEAN TOPSOIL AND RE–GRADE FLOODPLAIN AREA TO FINAL GRADES.

MEMPHREMAGOG WATERSHED ASSOCIATION

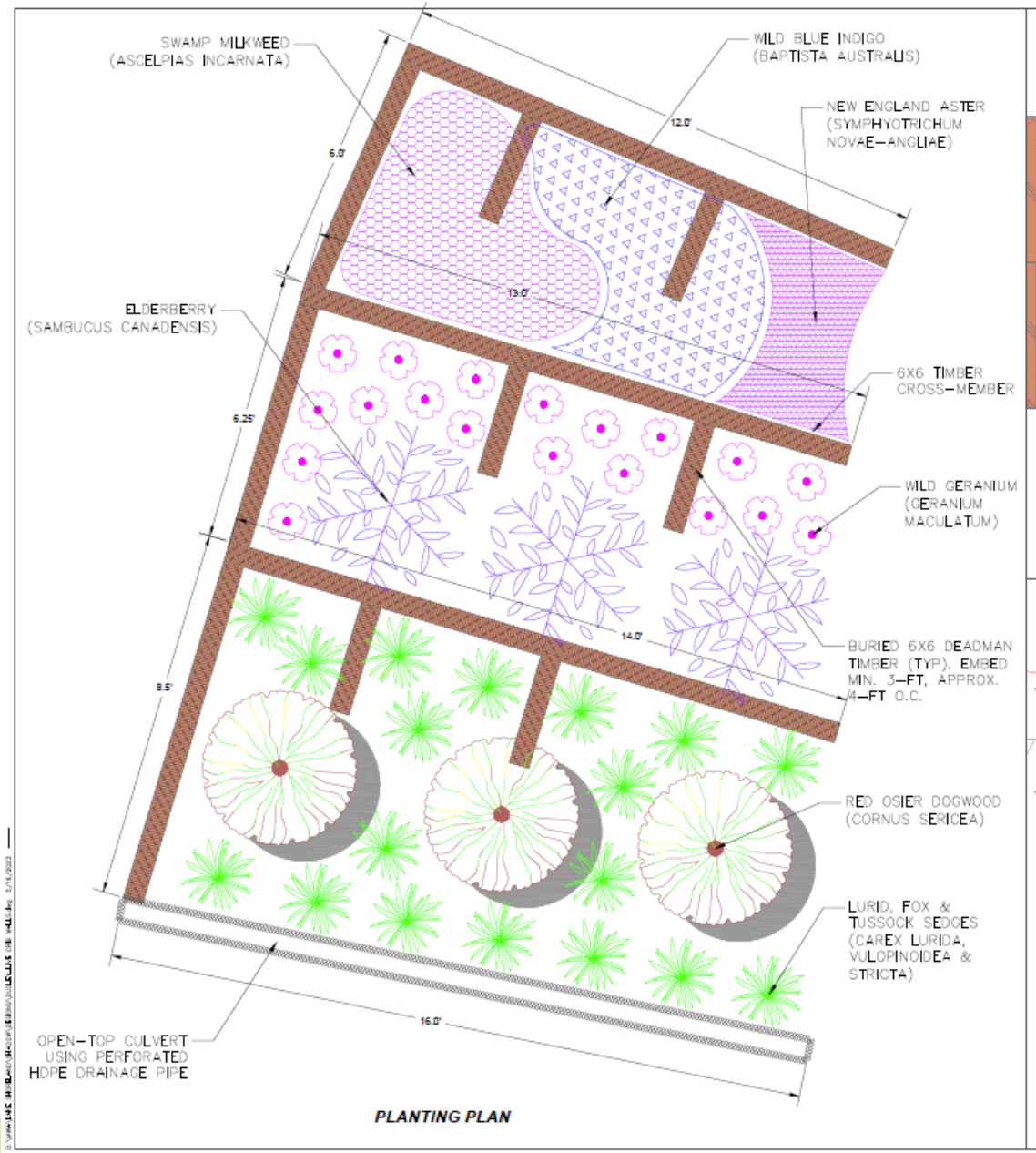
4-FT CULVERT REMOVAL & CROSSING RESTORATION

VALLEY BROOK RESTORATION PROJECT
July 7, 2023

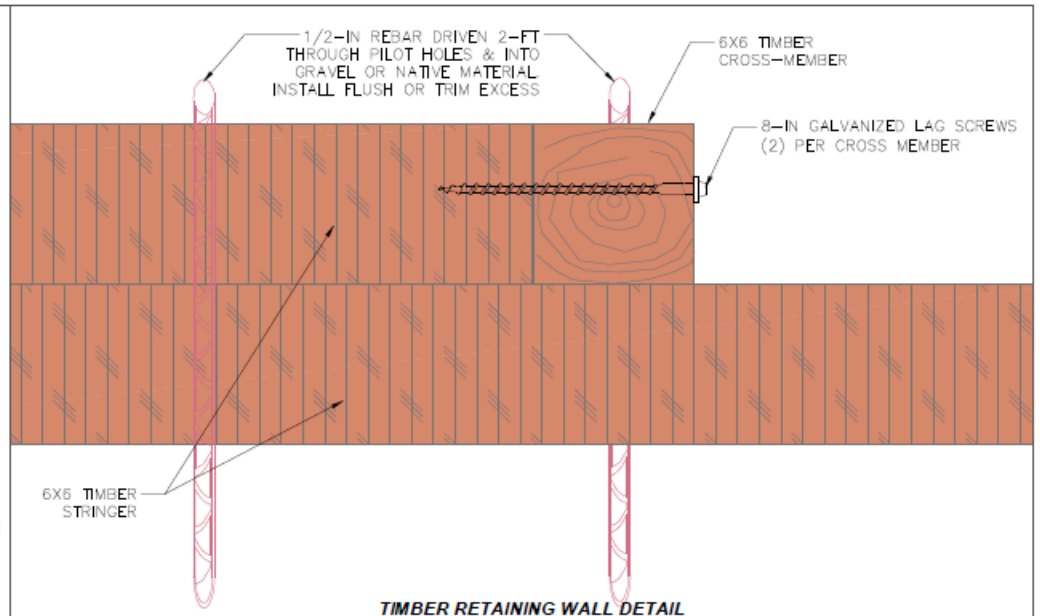


DUDLEY PROPERTY - SHADOW LAKE SHORELAND RESTORATION PROJECT
May 16, 2023

TIMBER RETAINING WALL & INFILTRATION STEPS

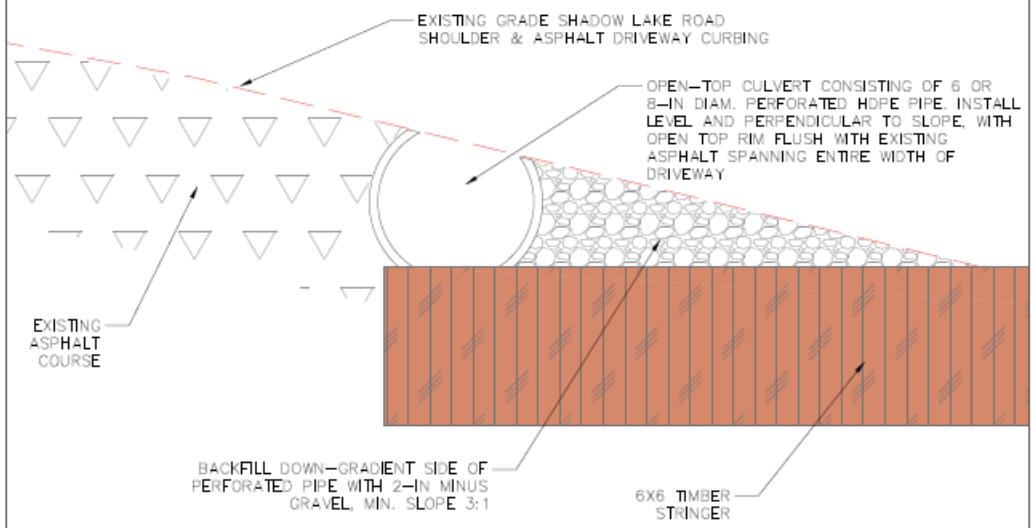


PLANTING PLAN



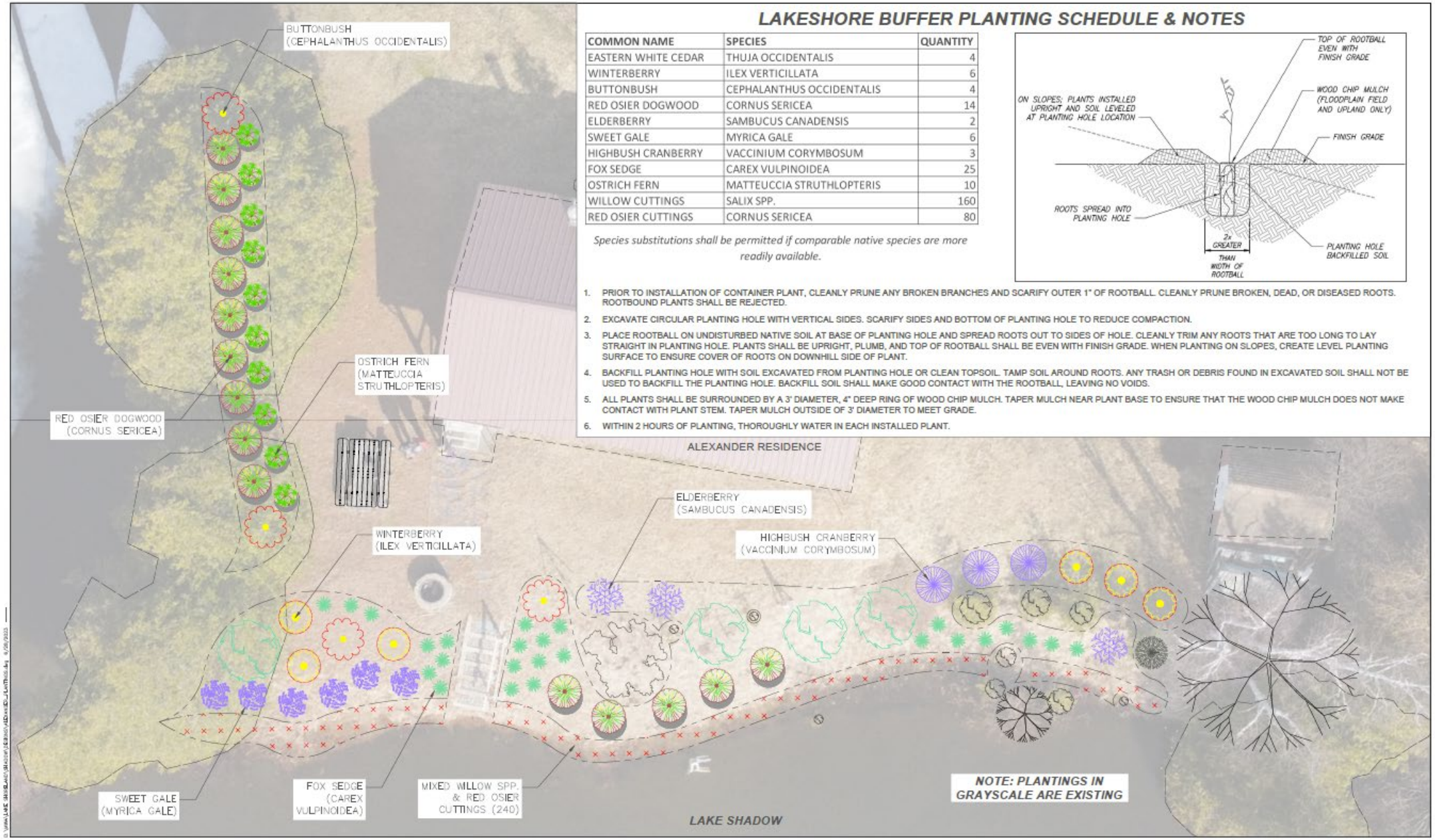
TIMBER RETAINING WALL DETAIL

OPEN-TOP CULVERT DETAIL



DUDLEY PROPERTY - SHADOW LAKE SHORELAND RESTORATION PROJECT
May 16, 2023

TIMBER RETAINING WALL & BIO-INFILTRATION BED DETAILS



LAKESHORE BUFFER PLANTING SCHEDULE & NOTES

COMMON NAME	SPECIES	QUANTITY
EASTERN WHITE CEDAR	THUJA OCCIDENTALIS	4
WINTERBERRY	ILEX VERTICILLATA	6
BUTTONBUSH	CEPHALANTHUS OCCIDENTALIS	4
RED OSIER DOGWOOD	CORNUS SERICEA	14
ELDERBERRY	SAMBUCUS CANADENSIS	2
SWEET GALE	MYRICA GALE	6
HIGHBUSH CRANBERRY	VACCINIUM CORYMBOSUM	3
FOX SEDGE	CAREX VULPINOIDEA	25
OSTRICH FERN	MATTEUCCIA STRUTHLOPTERIS	10
WILLOW CUTTINGS	SALIX SPP.	160
RED OSIER CUTTINGS	CORNUS SERICEA	80

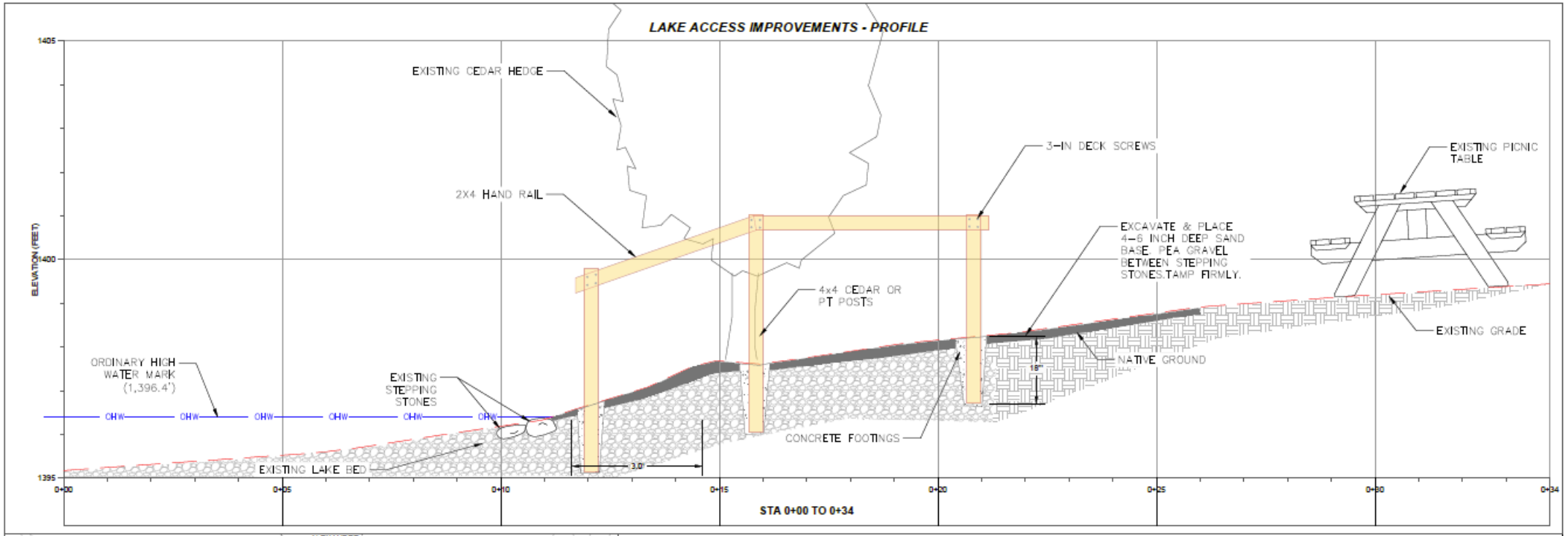
Species substitutions shall be permitted if comparable native species are more readily available.

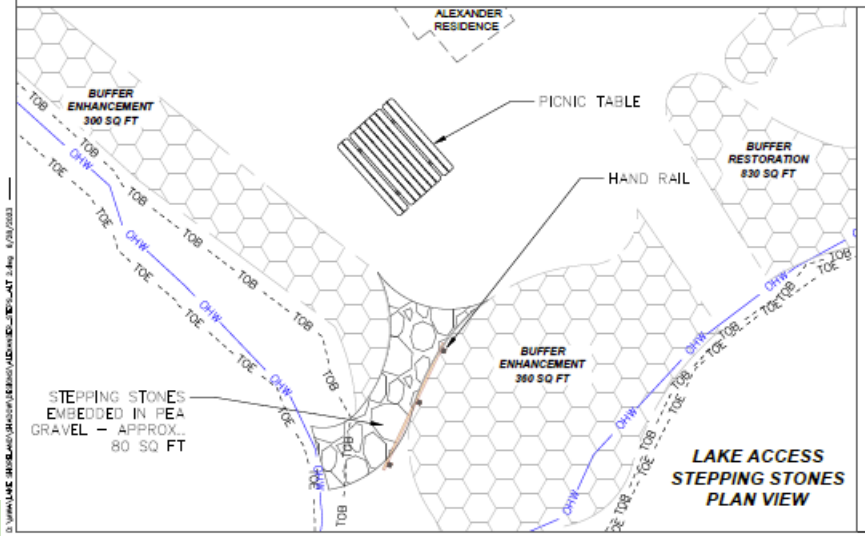
1. PRIOR TO INSTALLATION OF CONTAINER PLANT, CLEANLY PRUNE ANY BROKEN BRANCHES AND SCARIFY OUTER 1" OF ROOTBALL. CLEANLY PRUNE BROKEN, DEAD, OR DISEASED ROOTS. ROOTBOUND PLANTS SHALL BE REJECTED.
2. EXCAVATE CIRCULAR PLANTING HOLE WITH VERTICAL SIDES. SCARIFY SIDES AND BOTTOM OF PLANTING HOLE TO REDUCE COMPACTION.
3. PLACE ROOTBALL ON UNDISTURBED NATIVE SOIL AT BASE OF PLANTING HOLE AND SPREAD ROOTS OUT TO SIDES OF HOLE. CLEANLY TRIM ANY ROOTS THAT ARE TOO LONG TO LAY STRAIGHT IN PLANTING HOLE. PLANTS SHALL BE UPRIGHT, PLUMB, AND TOP OF ROOTBALL SHALL BE EVEN WITH FINISH GRADE. WHEN PLANTING ON SLOPES, CREATE LEVEL PLANTING SURFACE TO ENSURE COVER OF ROOTS ON DOWNHILL SIDE OF PLANT.
4. BACKFILL PLANTING HOLE WITH SOIL EXCAVATED FROM PLANTING HOLE OR CLEAN TOPSOIL. TAMP SOIL AROUND ROOTS. ANY TRASH OR DEBRIS FOUND IN EXCAVATED SOIL SHALL NOT BE USED TO BACKFILL THE PLANTING HOLE. BACKFILL SOIL SHALL MAKE GOOD CONTACT WITH THE ROOTBALL, LEAVING NO VOIDS.
5. ALL PLANTS SHALL BE SURROUNDED BY A 3' DIAMETER, 4" DEEP RING OF WOOD CHIP MULCH. TAPER MULCH NEAR PLANT BASE TO ENSURE THAT THE WOOD CHIP MULCH DOES NOT MAKE CONTACT WITH PLANT STEM. TAPER MULCH OUTSIDE OF 3' DIAMETER TO MEET GRADE.
6. WITHIN 2 HOURS OF PLANTING, THOROUGHLY WATER IN EACH INSTALLED PLANT.

MEMPHREMAGOG WATERSHED ASSOCIATION

LAKESHORE BUFFER RESTORATION

ALEXANDER PROPERTY - SHADOW LAKE SHORELAND RESTORATION PROJECT
JUNE 29, 2023





LAKESHORE ACCESS STEPPING STONES NOTES & QUANTITIES

1. STEPPING STONES SHALL BE PLACED TO BORDER AND PROTECT BUFFER PLANTING AREAS, FUNNEL FOOT TRAFFIC TO DURABLE SURFACES, AND PREVENT OVERUSE OF SENSITIVE SHORELINE AREAS. ARRANGE STONES TO FUNNEL FOOT TRAFFIC DOWN ACCESS PATH RATHER THAN INTO BUFFER PLANTING AREAS.
2. ALL 4X4 POSTS IN CONTACT WITH SOIL SHALL BE PRESSURE TREATED LUMBER OR CEDAR. IF CEDAR IS SELECTED, CONSIDER TREATING TIMBERS WITH WOOD PRESERVATIVE AS ALLOWED BY VT DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
3. EXCAVATE HOLES FOR HAND RAIL POSTS TO A MINIMUM 18-INCH DEPTH. PLACE 4X4 POSTS INTO HOLES, LEVEL AND PLUMB, AND BACKFILL WITH READY-MIX CONCRETE.
4. SECURE 2X4 HANDRAIL TO VERTICAL 4X4 POSTS USING A MINIMUM OF (4) 3-INCH DECK SCREWS. TAPER CUT THE ENDS OF HANDRAIL.
5. EXCAVATE TOPSOIL FROM STEPPING STONE AREA TO A DEPTH OF 4-6 INCHES. REMOVE LOOSE ROOTS, STONES, AND ORGANIC MATERIAL. DISPOSE OF OFF-SITE.
6. PLACE 3-5 INCHES OF SAND IN EXCAVATED STEPPING STONE AREA TO SERVE AS BASE FOUNDATION. LEVEL AND TAMP SAND.
7. LAY STEPPING STONES THROUGHOUT ACCESS AREA AND ENSURE STONE EDGES ARE FLUSH WITH EACH OTHER AND FULLY SUPPORTED BY BED OF SAND BENEATH STONES. BACKFILL GAPS BETWEEN STONES AND EDGE OF ACCESS AREA WITH WASHED PEA GRAVEL. TAMP INTO PLACE. ENSURE ALL PAVERS ARE FLUSH WITH SURROUNDING GRADE AND STABLE UNDERFOOT.

ITEM	DESCRIPTION	QUANTITY	UNITS
STEPPING STONES OR PAVERS	BLUE STONE, SLATE, OR MANUFACTURED PERVIOUS PAVERS	80	SQUARE FEET
SAND	FREE OF GRAVEL AND DEBRIS	1	CUBIC YARD
PEA GRAVEL	WASHED AND FREE OF DEBRIS	0.5	CUBIC YARD
4"X4"X8'	CEDAR OR PRESSURE TREATED	3	POSTS
2"X4"X8'	CEDAR	2	BOARDS
3" DECK SCREWS	EXTERIOR GRADE	12	SCREWS
QUIKRETE	READY MIX CONCRETE	2	80 LB BAGS

ALEXANDER PROPERTY - SHADOW LAKE SHORELAND RESTORATION PROJECT
JUNE 29, 2023

LAKE ACCESS IMPROVEMENTS

MEMPHREMAGOG WATERSHED ASSOCIATION