



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

October 23, 2024

Regulatory Division
File Number: NAE-2021-02497

William Salomaa
Massachusetts Department of Conservation & Recreation – Office of Dam Safety
10 Park Plaza Suite 6620
Boston, Massachusetts 02116
Sent by email: william.salomaa@mass.gov

Dear Mr. Salomaa:

The U.S. Army Corps of Engineers (USACE) has reviewed your application to permanently impact 1,200 square feet and temporarily impact 12,750 square feet of land under Ordinary High Water (OHW) Mark for the purposes of bringing the dam into compliance with Mass DCR's Office of Dam Safety regulations. Associated work will include the removal of 865 cubic yards of accumulated sediment from within an 8,000 square foot area, temporarily impacting 3,770 square feet for installation of the cofferdam and by-pass flow pump upstream of the spillway, and 980 square feet for dewatering within the spillway structure and cofferdam. The 330 square feet and 24 cubic yards of riprap will be placed for bank stabilization purposes. The area to be excavated will be surrounded by a temporary cofferdam to be installed upstream of the existing spillway, and the area inside the cofferdam will be dewatered with a by-pass flow pumping system. The cofferdam will be located along the limit of work within the reservoir. Additional sandbag cofferdams will be placed downstream. There will also be 1,200 square feet of permanent impacts from the installation of fill for the new stilling basin, retaining wall, and bridge support. The dam rehabilitation is proposed to take place starting in June 2024 and will dewater about 15.6 acres due to the lowering of the water level in Lowe's Pond upstream of the temporary cofferdam. This project is located in Lowe's Pond and Lowe's Brook at 3 Huguenot Road, Oxford, Massachusetts. The work is shown on the enclosed plans titled "Lowes Pond Dam Rehabilitation," on 23 sheets, and dated "September, 2023" with amendments made in "August, 2024."

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 2 and 24 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit>.

Please review the enclosed GPs carefully, in particular the general conditions beginning on page 35, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the

GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special condition:

You must complete and return the enclosed Certificate of Compliance within one month following the completion of the authorized work.

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at <https://regulatory.ops.usace.army.mil/customer-service-survey>.

Please contact Abigail Thrall of my staff at abigail.e.thrall@usace.army.mil or (978) 778-6479 if you have any questions.

Sincerely,

Paul Maniccia

Paul Maniccia
Chief, Massachusetts Section
Regulatory Division

cc:

Jennifer Doyle-Breen, AECOM; jennifer.doyle-bree@aecom.com
Ed Reiner, U.S. EPA, Region 1, Boston, MA, reiner.ed@epa.gov

Rachel Croy, U.S. EPA, Region 1, Boston, MA, croy.rachel@epa.gov
DEP CERO, Wetlands and Waterways, Worcester, MA; zero_noi@mass.gov
David Wong, MassDEP, david.w.wong@mass.gov
David Robinson, MA Board of Underwater Archaeological Resources (BUAR);
david.s.robinson@mass.gov
Oxford Conservation Commission, jlochner@town.oxford.ma.us



**US Army Corps
of Engineers**®
New England District

COMPLIANCE CERTIFICATION FORM

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

Permit Number: _____

Project Manager: _____

Name of Permittee: _____

Permit Issuance Date: _____

Note: Choose one of the following. Choose the 2nd when mitigation required.

Please sign this certification and return it to our office upon completion of the activity.

Please sign this certification and return it to our office upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not after the mitigation monitoring, which requires separate submittals.

* E-MAIL TO: cenae-r-ma@usace.army.mil; or *
* * * * *
* MAIL TO: Massachusetts Section *
* Regulatory Division *
* U.S. Army Corps of Engineers, New England District *
* 696 Virginia Road *
* Concord, MA 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

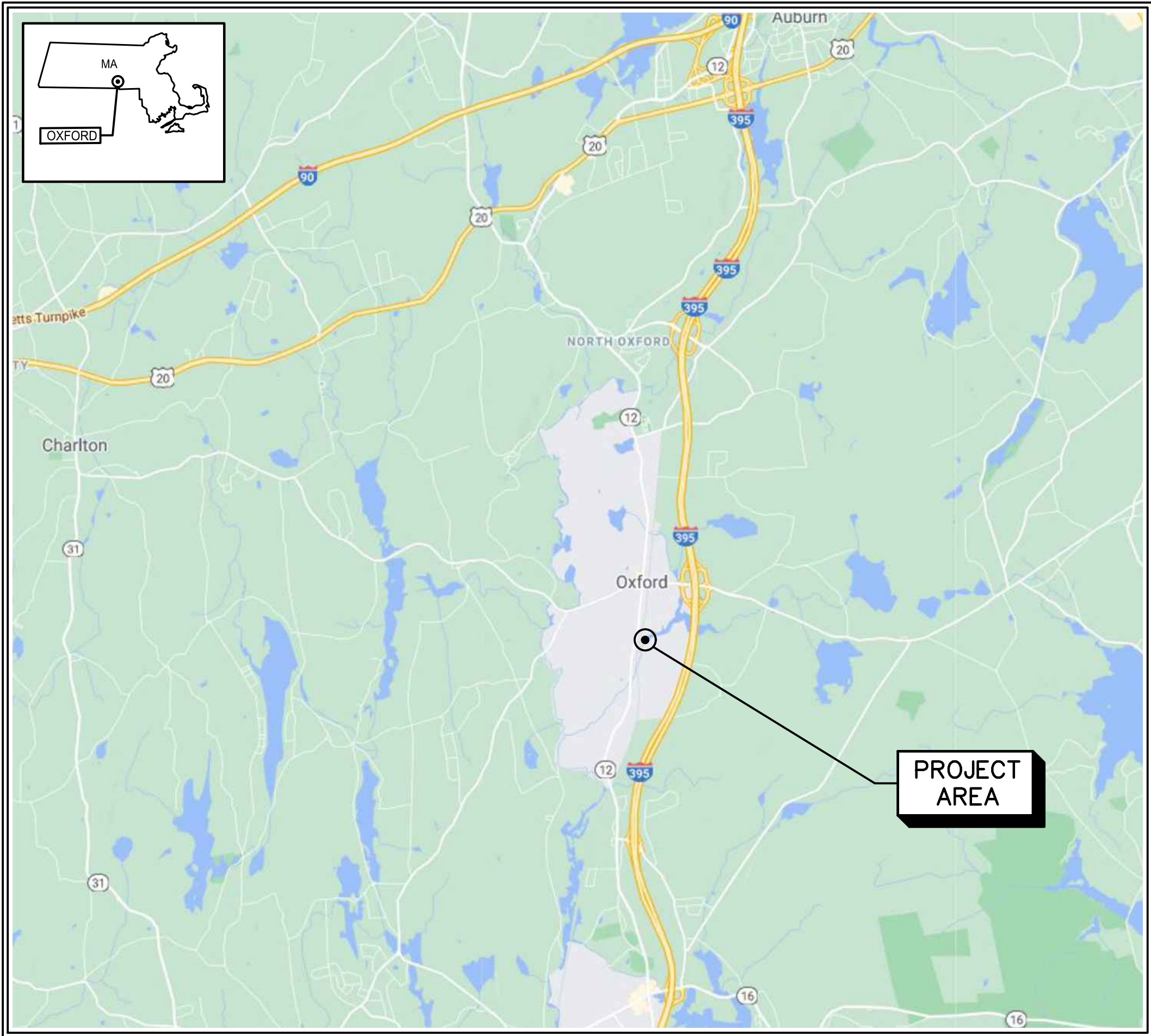
() _____
Telephone Number

() _____
Telephone Number

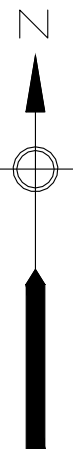
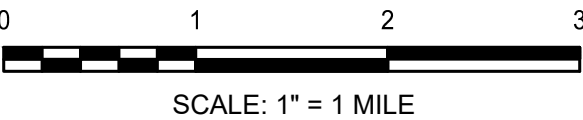
MASSACHUSETTS DEPARTMENT OF
CONSERVATION AND RECREATION

LOWES POND DAM REHABILITATION
OXFORD, MA

SEPTEMBER 2023



LOCATION PLAN
APPROXIMATE SCALE: 1" = 1 Mile



INDEX OF DRAWINGS

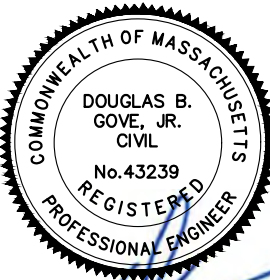
DRAWING NO.	DRAWING TITLE
GENERAL	
00 G-001	COVER SHEET, LOCATION PLAN AND INDEX OF DRAWINGS
CIVIL	
00 C-001	LEGEND, ABBREVIATIONS AND GENERAL NOTES
10 C-101	EXISTING CONDITIONS AND EROSION PROTECTION PLAN
10 C-102	PROJECT HYDROLOGY AND HYDRAULIC DATA
10 C-103	SITE DEMOLITION PLAN I
10 C-104	SITE DEMOLITION PLAN II
10 C-105	SITE LAYOUT PLAN I
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STRUCTURAL	
00 S-001	STRUCTURAL NOTES AND STANDARD DETAILS
10 S-301	SECTIONS I
10 S-302	SECTIONS II
10 S-303	SECTIONS III
10 S-304	SECTIONS IV
99 S-501	STRUCTURAL STANDARD DETAILS I



PROJECT
MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

CLIENT
Massachusetts Department
of Conservation and
Recreation
251 Causeway Street, Suite 600
Boston, MA 02114-2119
617.626.1250 tel 617.626.1351 fax
www.mass.gov/orgs/departement-of-conservation-recreation

CONSULTANT
AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com



REGISTRATION

PRELIMINARY PERMIT
APPLICATION COPY

NOT INTENDED FOR
CONSTRUCTION

ISSUE/REVISION		
I/R	DATE	DESCRIPTION

PROJECT NUMBER	
60604936	
Designed By:	J.P. MINOIS
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE
PERMITTING
SHEET TITLE
LOWES POND
COVER SHEET, LOC. PLAN
AND INDEX OF DRAWINGS
SHEET NUMBER
00 G-001

PATH\\FILENAME: P:\WORKFIELD\DATA_3\PROJECTS\6064936 - MASSDCR SIX ABANDONED DAMS\SHEETS\CLOWES POND\00 C-001.DWG
LAST UPDATE: Wednesday, August 30, 2023 9:43:45 AM
PLOT DATE: Monday, September 18, 2023 12:24:07 PM

GENERAL PLAN NOTES

- TOPOGRAPHIC SURVEY IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED ON JUNE 4TH AND 5TH, 2019, BY ALPHA SURVEY GROUP, LLC.
- THE HORIZONTAL DATUM FOR THIS PROJECT IS THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORS ADJUSTMENT (NA2011/GEOID 12a) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE ON MAY 20TH, 2019 UTILIZING KEYSTONE PRECISION INSTRUMENTS' KEYNET GPS VIRTUAL REFERENCE SYSTEM (VRS) NETWORK.
- THE VERTICAL DATUM FOR THIS PROJECT IS REFERENCED TO THE RECOVERED SITE BENCHMARKS (AS SHOWN ON PLAN ENTITLED "PLAN OF LAND IN, OXFORD, MA, PREPARED FOR, FUSS & O'NEILL" PREPARED BY SHERMAN & FRYDRYCK, INC., DATED 7/22/2014) PROVIDED BY THE CLIENT.
- RESOURCE AREA DELINEATION WAS PERFORMED BY AECOM ON MARCH 18, 2021.
- NO UTILITY INVESTIGATION WAS PERFORMED FOR THIS PROJECT. UTILITY LOCATION SHALL BE PERFORMED IN THE FIELD PRIOR TO THE COMMENCEMENT OF ANY WORK. CALL "DIG SAFE" AT 811.
- THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO APPROXIMATE EXISTING GRADES UPON COMPLETION OF THE CONSTRUCTION, EXCEPT WHERE PERMANENT GRADE CHANGES ARE SPECIFICALLY NOTED OR ORDERED.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF THE EXISTING FEATURES AND STRUCTURES WITHIN AND ADJACENT TO THE WORK. IN THE EVENT OF DAMAGE, THE REPAIRS OR REPLACEMENT SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE AS APPROVED BY THE ENGINEER.
- ALL PIPES OR OTHER UTILITIES DAMAGED DURING THE CONTRACTOR'S OPERATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR OR REPLACE AT NO COST TO THE OWNER.
- EXISTING CONDITIONS ARE SHOWN ON THE PLANS IN A SCREENED (LIGHTER) PENWEIGHT. PROPOSED WORK IS SHOWN IN BOLDER PENWEIGHT.
- THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL WORK AS INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER IN CONFORMANCE WITH ALL APPLICABLE CODES AND IN A PROPER AND WORKMANLIKE MANNER.
- THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL WASTE BUILDING MATERIAL, CONCRETE, MASONRY, TREES, SHRUBS, DEBRIS AND OTHER MATERIALS NECESSARY FOR THE SATISFACTORY COMPLETION OF THE WORK AND AS REQUIRED BY THE OWNER. CONSTRUCTION DEBRIS SHALL BE DISPOSED OF IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL LAWS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LOCAL STREET OPENING OR BUILDING PERMITS AND FOR COORDINATING INSPECTIONS AS REQUIRED. PERMIT FEES SHALL BE PAID DIRECTLY BY THE CONTRACTOR AND SHALL BE INCLUDED IN THE APPROPRIATE ITEM OF THE BID. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH THE PERMITS OBTAINED BY THE OWNER AND REFERENCED IN SPECIFICATION 0110.
- MAINTAIN GRAVEL ROADS AT ALL TIMES DURING CONSTRUCTION. GRAVEL ROADS SHALL BE GRADED AND SHALL BE IN GOOD TRAFFICABLE CONDITIONS WITHOUT RUTS OR WASHOUTS AT THE COMPLETION OF THE PROJECT.
- TREE CLEARING MAY OCCUR UP TO THE LIMIT OF WORK LINE TO FACILITATE EQUIPMENT STAGING AND VEHICULAR MOVEMENT.

DEMOLITION NOTES

- TAKE MEASURES TO PREVENT DAMAGE TO EXISTING STRUCTURES TO REMAIN DURING DEMOLITION. DAMAGE THAT DOES OCCUR SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
- SHORE EXISTING STRUCTURES TO UNLOAD MEMBERS BEFORE REMOVING STRUCTURAL ELEMENTS.
- DAMAGE DUE TO DEMOLITION OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- PATCH AND FINISH EXPOSED SURFACES TO MATCH THE ADJACENT AREA UNLESS OTHERWISE INDICATED OR SPECIFIED.

TRAFFIC MANAGEMENT

- CONTRACTOR SHALL COORDINATE A TRAFFIC MANAGEMENT PLAN WITH LOCAL AUTHORITIES PRIOR TO THE START OF THE PROJECT PER SPECIFICATION 01063.
- CONTRACTOR TO PROVIDE ALL REQUIRED SIGNAGE, FLAGGING, AND TRAFFIC CONTROL DEVICES AS PART OF THE TRAFFIC MANAGEMENT PLAN.
- ACCESS FOR LOCAL RESIDENTS MUST BE MAINTAINED THROUGHOUT THE PROJECT.
- MAINTAIN ONE LANE PASSABLE AT ALL TIMES.

LEGEND

EXISTING

	MINOR CONTOUR
	MAJOR CONTOUR
	EDGE OF PAVEMENT
	EDGE OF GRAVEL
	EDGE OF WATER
	ORDINARY HIGH WATER
	100-FOOT BUFFER ZONE
	200-FOOT RIVERFRONT AREA
	GUARD RAIL
	TREE LINE
	DRAIN
	OVERHEAD WIRE
	100' RESOURCE BUFFER
	WETLAND FLAG - BANK LIMIT
	RIGHT OF WAY
	DIRECTIONAL FLOW ARROW
	BENCHMARK
	SIGN
	SPOT GRADE
	RESOURCE AREA FLAG
	BOULDER
	BORING
	WATER GATE
	FIRE HYDRANT
	UTILITY POLE
	DRAIN MANHOLE
	CATCH BASIN
	TREE (SIZE IN INCHES)
	TRAVERSE (CONTROL) POINT
	CONCRETE
	RIPRAP
	LEDGE

ABBREVIATIONS

BIT.	BITUMINOUS
CONC.	CONCRETE
DH	DRILL HOLE
E.J.	EXPANSION JOINT
HB	HARD BOTTOM
MAG	MAG NAIL
RET.	RETAINING
R.O.W.	RIGHT-OF-WAY
RR	RAILROAD
S&M	STONE AND MORTAR
SPK	SPIKE
VGC	VERTICAL GRANITE CURB
W.S.	WATER STOP

PROPOSED

	LIMIT OF WORK
	TEMPORARY CONSTRUCTION ENTRANCE
	COMPOST SILT SOCK EROSION CONTROL BARRIER
	DEMOLITION
	STRUCTURE
	EXTENT OF STRUCTURAL FOOTING
	STRUCTURAL EXPANSION JOINT
	PLATFORM
	GUARD RAIL
	WOOD GUARD RAIL
	STOP LOG
	24" PIPE AND 24" SLIDE GATE
	SECTION MARK (SEE STRUCTURAL SHEETS FOR SECTIONS)
	MINOR CONTOUR
	MAJOR CONTOUR
	SPOT ELEVATION
	PEDESTRIAN BRIDGE
	NEW TREELINE
	CHAIN LINK FENCE
	SIGN
	PARKING SPACE WITH ACCESSIBLE AISLE
	GRAVEL PATH CENTERLINE
	COORDINATE LOCATION
	EXISTING BOULDER RELOCATION
	SEED MIX
	GRAVEL PATHWAY AND PARKING AREA
	RIPRAP AREA
	HYDRODYNAMIC SEPARATOR, DRAIN PIPE AND RIPRAP AT OUTLET, WITH FLOW DIRECTION
	UNDERDRAIN PIPE WITH CLEANOUT
	SECTION MARK AT BIOINFILTRATION BASINS
	VERTICAL GRANITE CURB
	DRAIN PIPE WITH FLOW DIRECTION
	DRAIN PIPE BEND

AECOM

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

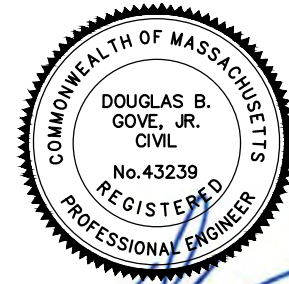
CLIENT

Massachusetts Department
of Conservation and
Recreation

251 Causeway Street, Suite 600
Boston, MA 02114-2119
617.626.1250 tel 617.626.1351 fax
www.mass.gov/orgs/departement-of-conservation-recreation

CONSULTANT

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com



REGISTRATION

PRELIMINARY PERMIT
APPLICATION COPY

NOT INTENDED FOR
CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60604936

Designed By:	J.P. MINOIS
Drawn By:	S. NAPOLITANO
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING

SHEET TITLE

LOWES POND
LEGEND, ABBREVIATIONS
AND GENERAL NOTES
SHEET NUMBER

00 C-001

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

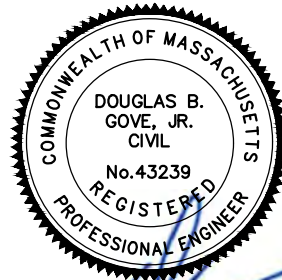
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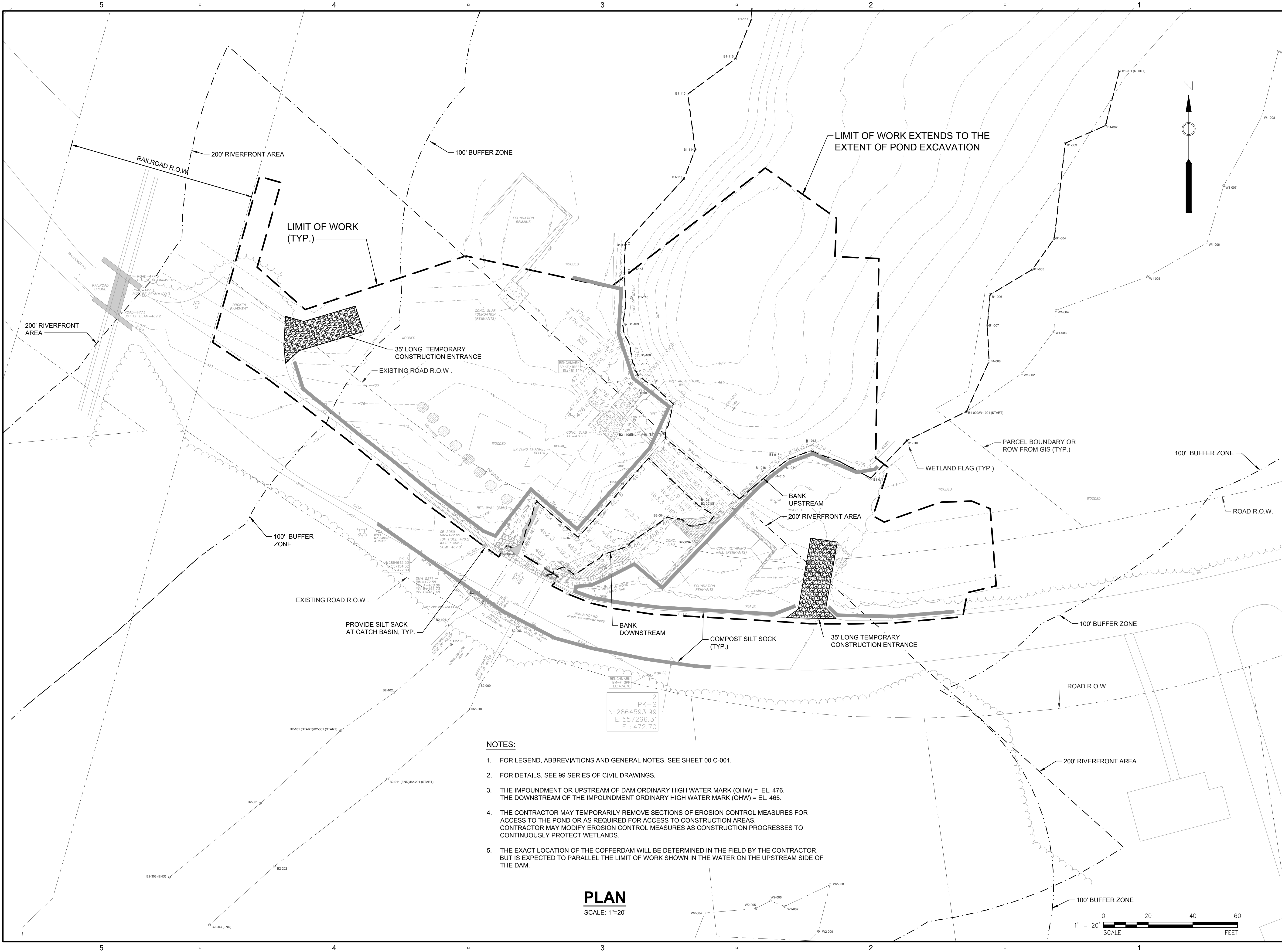
Designed By:	J.P. MINOIS
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
EXISTING CONDITIONS AND
EROSION PROTECTION PLAN
SHEET NUMBER

10 C-101



NOTES:

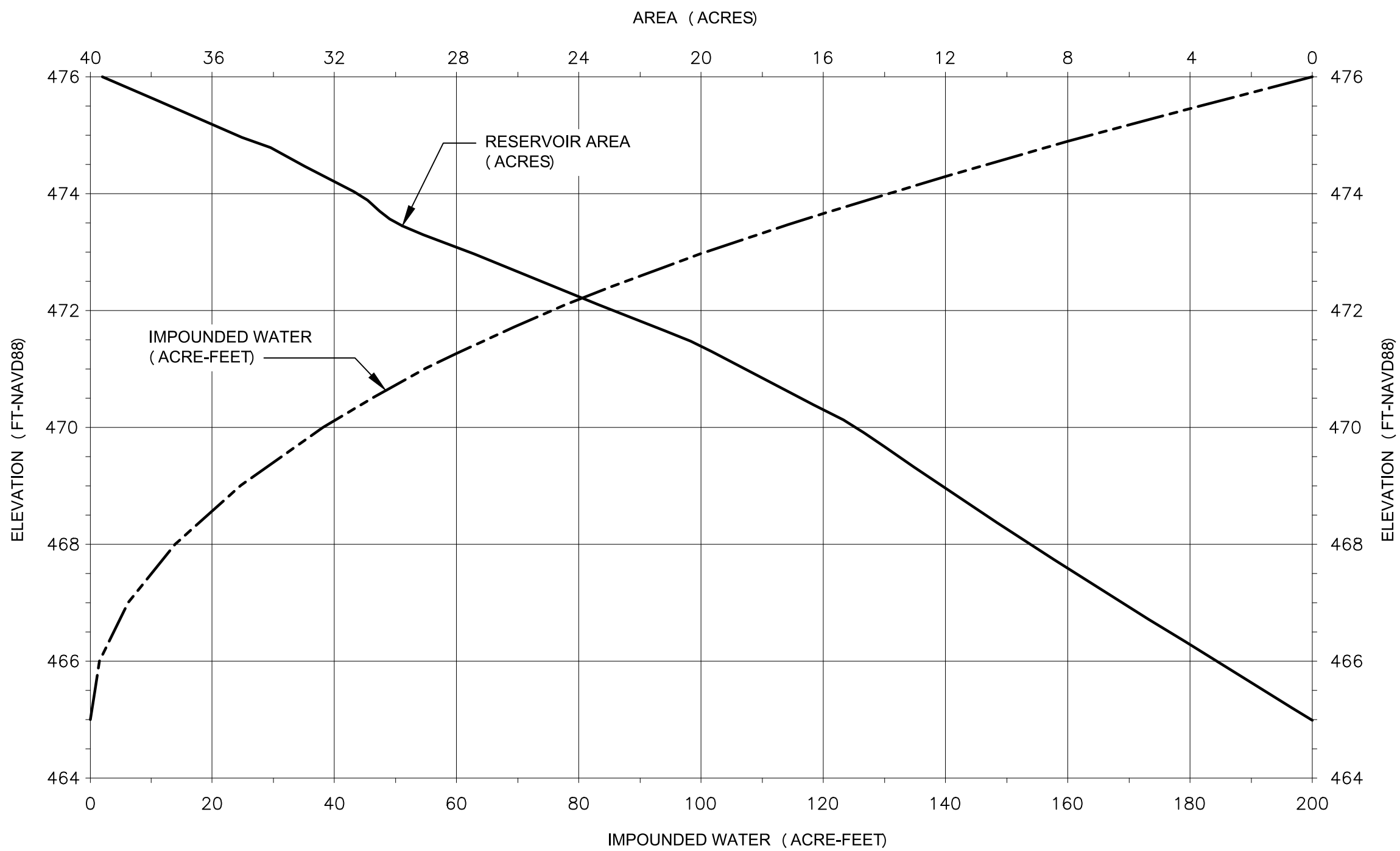
- FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
- FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.
- THE IMPOUNDMENT OR UPSTREAM OF DAM ORDINARY HIGH WATER MARK (OHW) = EL. 476. THE DOWNSTREAM OF THE IMPOUNDMENT ORDINARY HIGH WATER MARK (OHW) = EL. 465.
- THE CONTRACTOR MAY TEMPORARILY REMOVE SECTIONS OF EROSION CONTROL MEASURES FOR ACCESS TO THE POND OR AS REQUIRED FOR ACCESS TO CONSTRUCTION AREAS. CONTRACTOR MAY MODIFY EROSION CONTROL MEASURES AS CONSTRUCTION PROGRESSES TO CONTINUOUSLY PROTECT WETLANDS.
- THE EXACT LOCATION OF THE COFFERDAM WILL BE DETERMINED IN THE FIELD BY THE CONTRACTOR, BUT IS EXPECTED TO PARALLEL THE LIMIT OF WORK SHOWN IN THE WATER ON THE UPSTREAM SIDE OF THE DAM.

PLAN

SCALE: 1"=20'

0 20 40 60
1" = 20' SCALE FEET

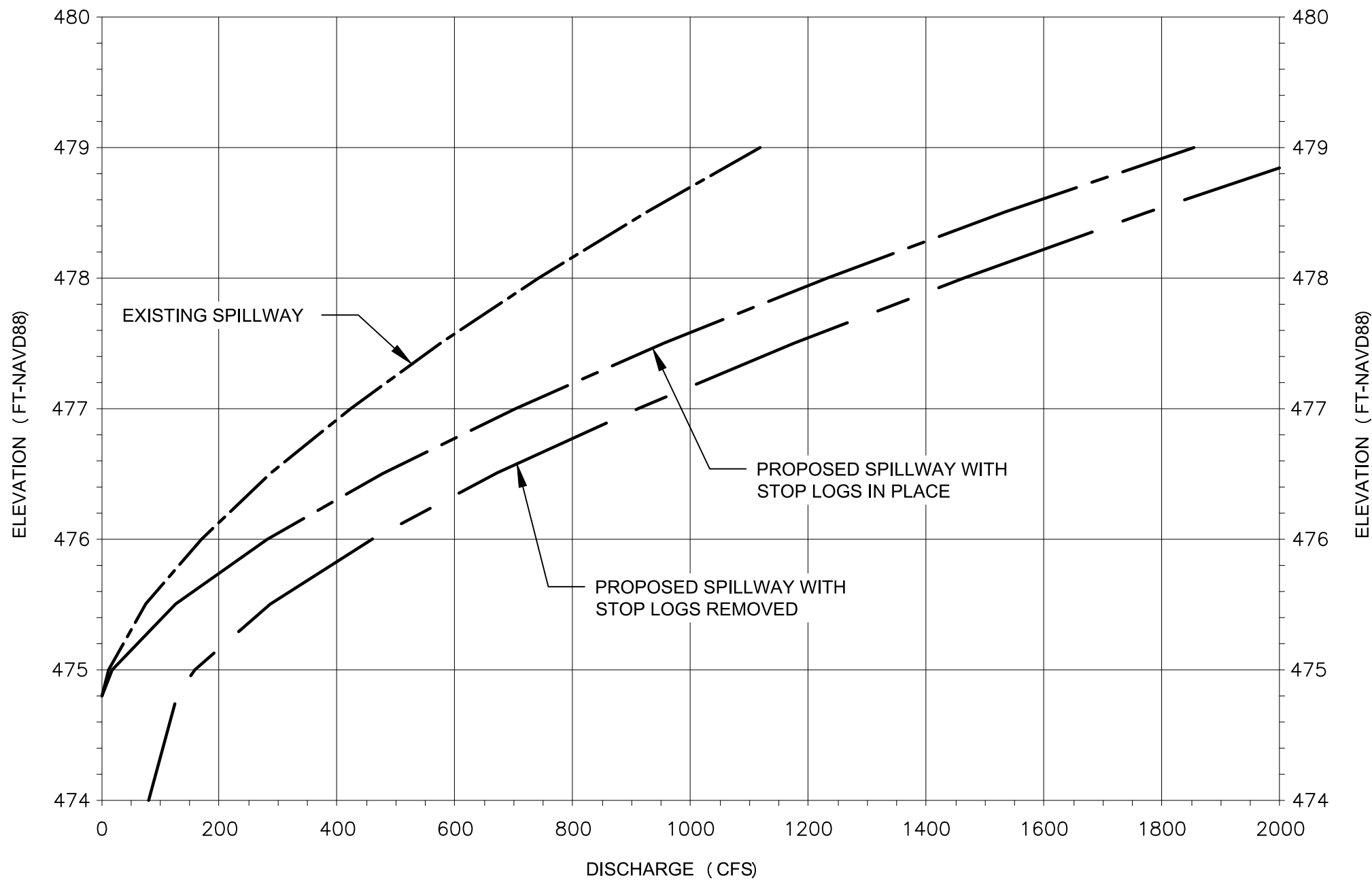
PATH\\FILENAME: P:\\WORK\\FIELD\\DATA_3\\PROJ\\60604936 - MASSDCR SIX ABANDONED DAMS\\SHEETS\\LOWES POND\\10 C-102.DWG
LAST UPDATE: Tuesday, August 29, 2023 3:02:21 PM
PLOT DATE: Monday, September 18, 2023 11:31:12 AM



NOTE:

THE AREA - CAPACITY CURVES ARE BASED ON THE BATHYMETRIC SURVEY OF JULY 2019 PRESENTED IN THE PHASE II REPORT (APRIL 2020).

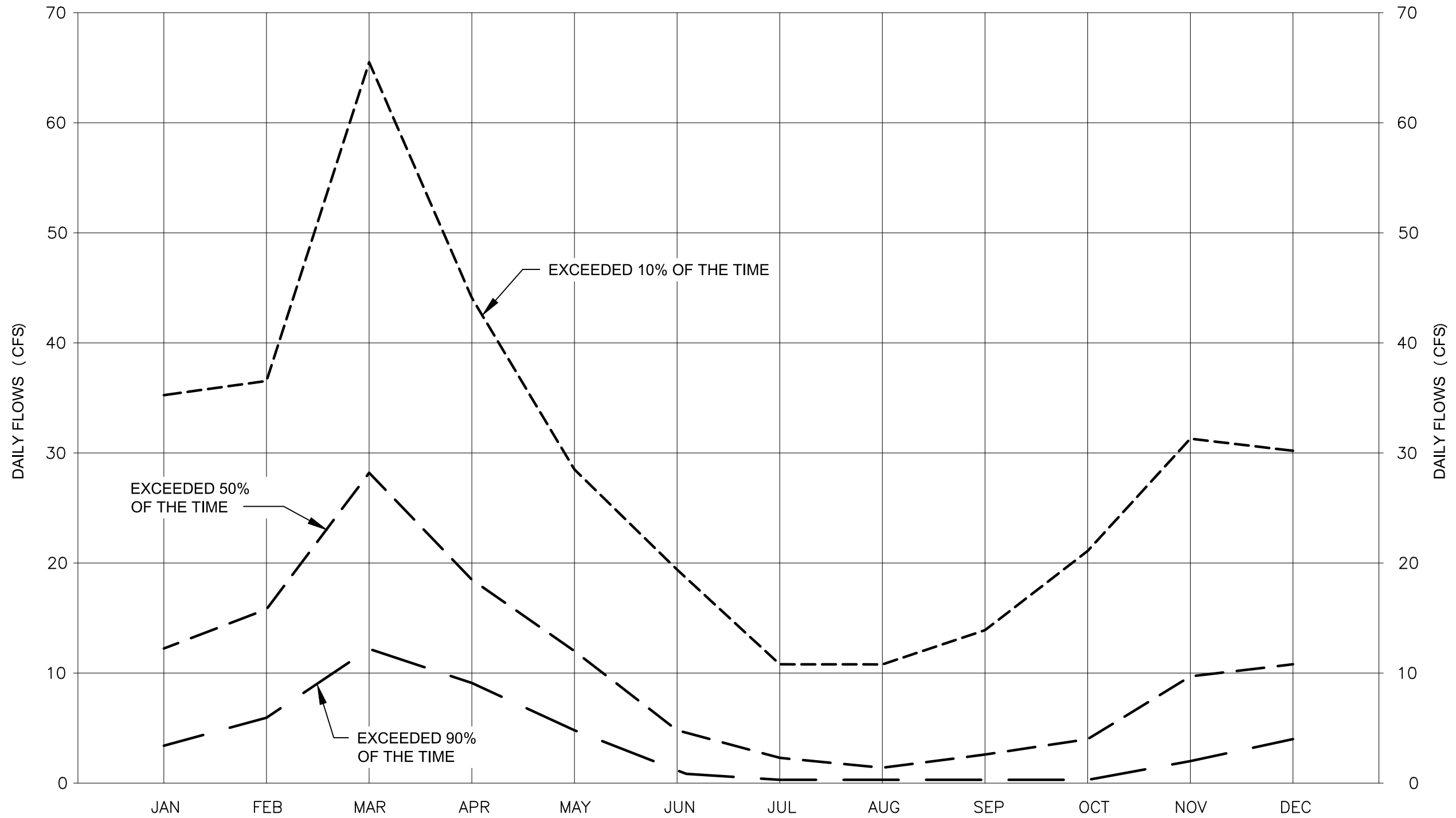
LOWES POND AREA - CAPACITY CURVES



NOTE:

THE SPILLWAY DISCHARGE RATING CURVES WERE DEVELOPED FOR THE PURPOSE OF THE LOWES POND DAM REHABILITATION DESIGN, AND ARE BASED ON A SPILLWAY CREST ELEVATION AT 474.8 FT-NAVD88, AND A STOP LOG INVERT ELEVATION AT 471.8 FT-NAVD88.

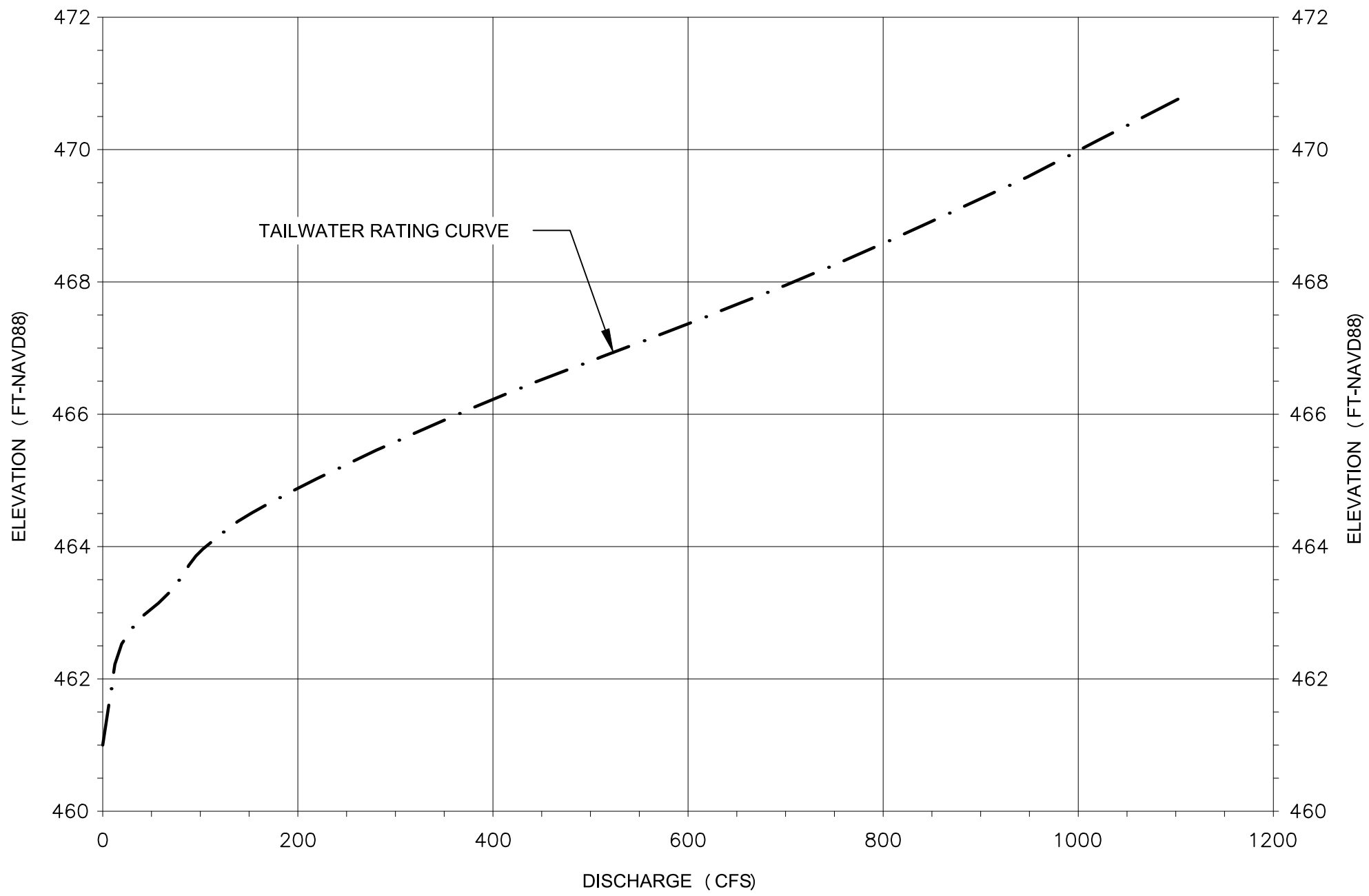
SPILLWAY DISCHARGE RATING CURVES



NOTE:

THE AVERAGE DAILY FLOW STATISTICS WERE ESTIMATED BASED ON THE FLOW RECORDS AT THE USGS GAGING STATION NO. 01124500 ON LITTLE RIVER NEAR OXFORD AND ADJUSTED FOR DRAINAGE AREA.

AVERAGE DAILY FLOWS



NOTE:

THE TAILWATER RATING CURVE WAS DEVELOPED FOR THE PURPOSE OF PHASE 2 REPORT (APRIL 2020) AND IS DERIVED FROM THE FEMA FLOOD PROFILE FOR LOWES BROOK PRESENTED IN FEMA FLOOD INSURANCE STUDY FOR WORCESTER COUNTY, MA DATED JULY 16, 2014.

TAILWATER RATING CURVE UPSTREAM OF HUGUENOT ROAD

FLOOD DISCHARGE PROBABILITIES

	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)
2-YEAR FLOOD	107	128
10-YEAR FLOOD	374	490
50-YEAR FLOOD	753	1030
100-YEAR FLOOD	947	1307

NOTE:

THE FLOOD DISCHARGE PROBABILITIES WERE DEVELOPED DURING THE HYDROLOGY AND HYDRAULICS STUDY COMPLETED FOR THE PHASE II REPORT (APRIL 2020).

AECOM

PROJECT

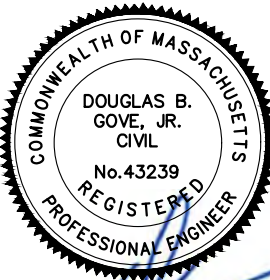
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I/R	DATE	DESCRIPTION
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PROJECT NUMBER

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Designed By:	J.P. MINOIS
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
PROJECT HYDROLOGY AND
HYDRAULIC DATA
SHEET NUMBER

10 C-102



I/R	DATE	DESCRIPTION
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PLAN

SCALE: 1"=10'

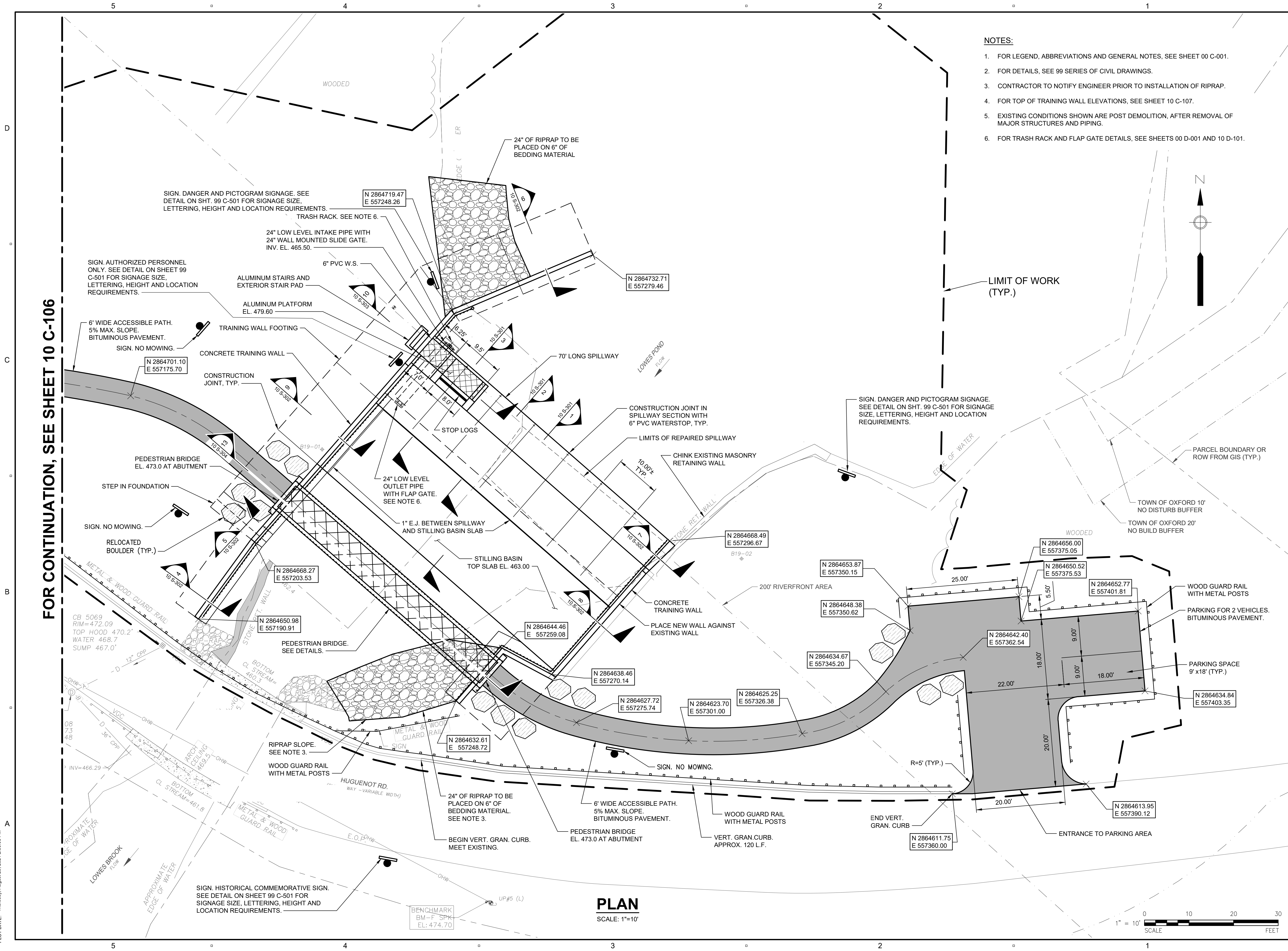
— NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.

0 10 20 30
1" = 10'
SCALE FEET



PATH: \\C:\Users\THIBODEAU\OneDrive\Documents\PROJECTS\MASSDCR\MASSDCR SIX ABANDONED DAMS\PROJECTS\LOWES POND\10 C-105.DWG
LAST UPDATE: Wednesday, August 28, 2024 1:01:55 PM
PLOT DATE: Thursday, August 29, 2024 2:36:08 PM



- NOTES:
- FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
 - FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.
 - CONTRACTOR TO NOTIFY ENGINEER PRIOR TO INSTALLATION OF RIPRAP.
 - FOR TOP OF TRAINING WALL ELEVATIONS, SEE SHEET 10 C-107.
 - EXISTING CONDITIONS SHOWN ARE POST DEMOLITION, AFTER REMOVAL OF MAJOR STRUCTURES AND PIPING.
 - FOR TRASH RACK AND FLAP GATE DETAILS, SEE SHEETS 00 D-001 AND 10 D-101.



PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

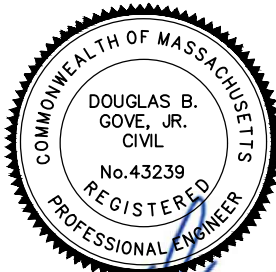
CLIENT

Massachusetts Department
of Conservation and
Recreation

10 Park Plaza, Suite 6620
Boston, MA 02116
617.626.1250 tel 617.626.1351 fax
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CONSULTANT

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250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com



REGISTRATION

ISSUE/REVISION

NO.	DATE	DESCRIPTION

I/R DATE DESCRIPTION

PROJECT NUMBER

60604936

Designed By:	J.P. MINOIS
Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	AUGUST 2024
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

LOWES POND
SITE LAYOUT PLAN I

SHEET NUMBER

10 C-105

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

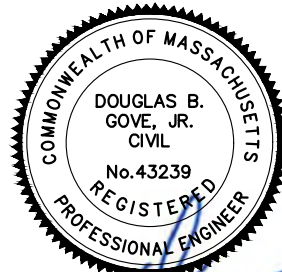
CLIENT

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Recreation

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PROJECT NUMBER

60604936

Designed By: **J.P. MINOIS**

Drawn By: **M. THIBODEAU**

Dept Check: **C. BENZIGER**

Proj Check: **D. GOVE**

Date: **SEPTEMBER 2023**

Scale: **AS NOTED**

DISCIPLINE

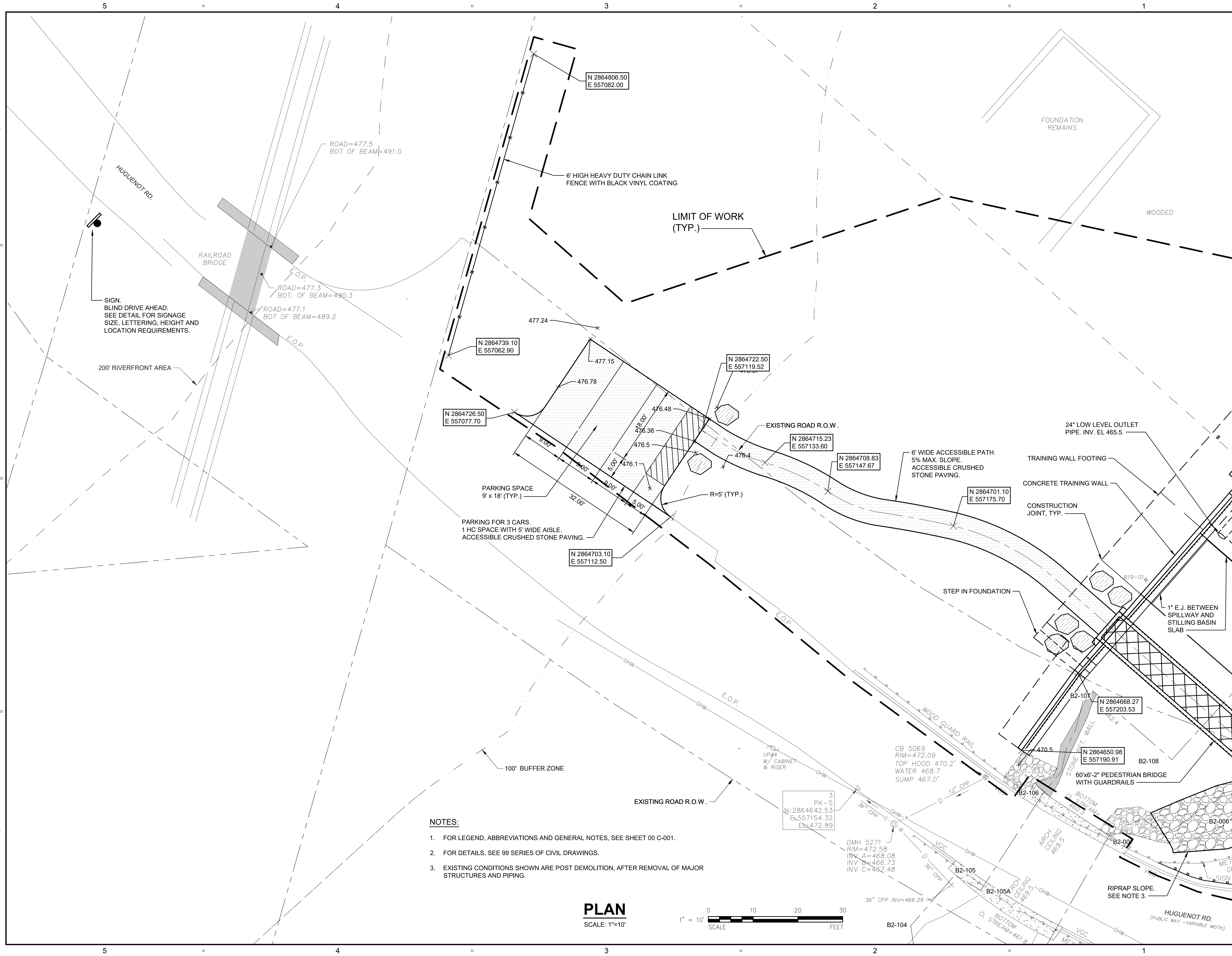
PERMITTING

SHEET TITLE

LOWES POND
SITE LAYOUT PLAN II

SHEET NUMBER

10 C-106

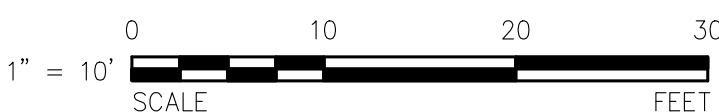


NOTES:

- FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
- FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.
- EXISTING CONDITIONS SHOWN ARE POST DEMOLITION, AFTER REMOVAL OF MAJOR STRUCTURES AND PIPING.

PLAN

SCALE: 1"=10'



FOR CONTINUATION, SEE SHEET 10 C-105





PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

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Date:	SEPTEMBER 2023
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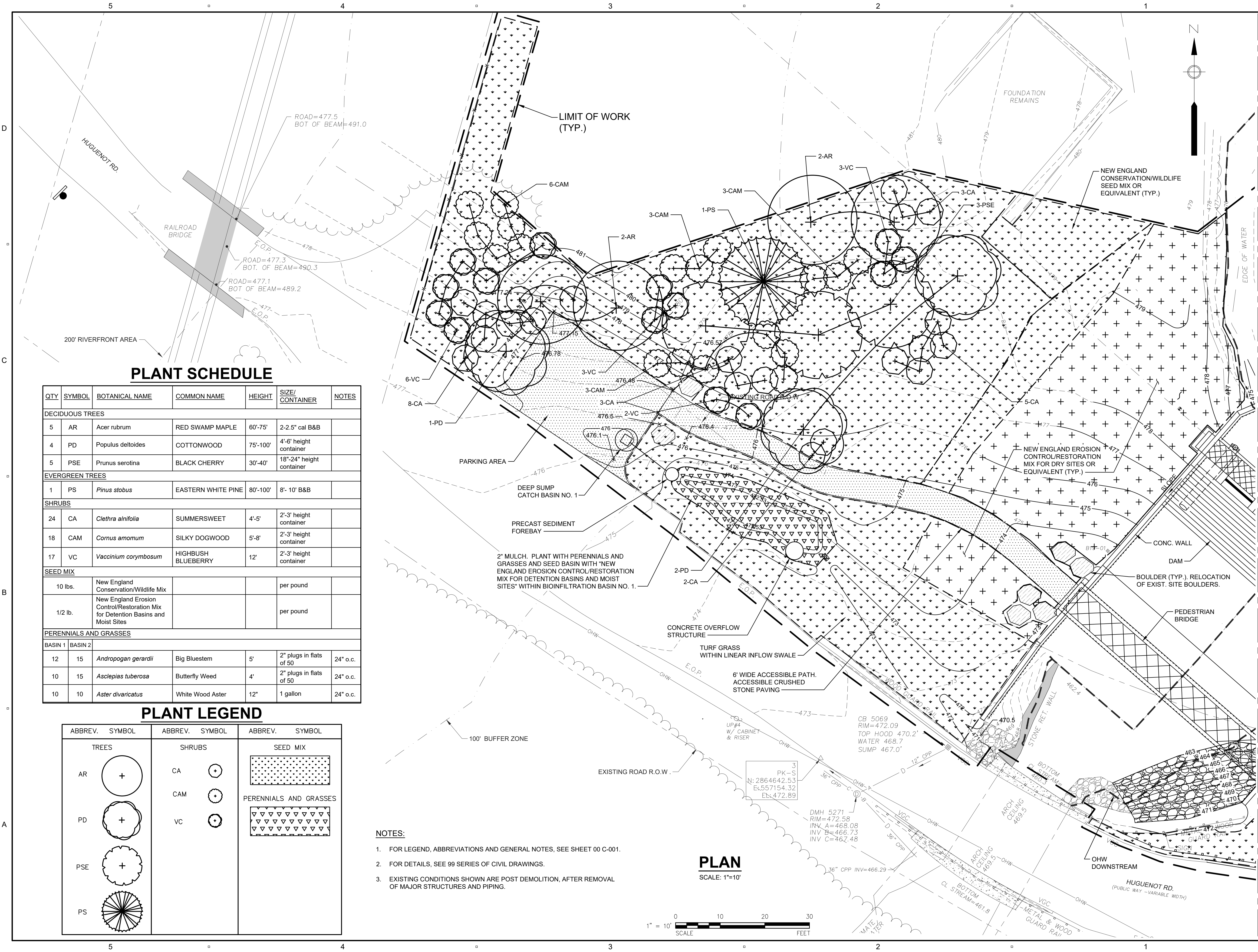
DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
LANDSCAPE PLAN II

SHEET NUMBER

10 C-110



PLANT SCHEDULE

QTY	SYMBOL	BOTANICAL NAME	COMMON NAME	HEIGHT	SIZE/CONTAINER	NOTES
DECIDUOUS TREES						
5	AR	Acer rubrum	RED SWAMP MAPLE	60'-75'	2-2.5" cal B&B	
4	PD	Populus deltoides	COTTONWOOD	75'-100'	4'-6" height container	
5	PSE	Prunus serotina	BLACK CHERRY	30'-40'	18"-24" height container	
EVERGREEN TREES						
1	PS	Pinus strobus	EASTERN WHITE PINE	80'-100'	8'-10' B&B	
SHRUBS						
24	CA	Clethra alnifolia	SUMMERSWEET	4'-5'	2'-3' height container	
18	CAM	Cornus amomum	SILKY DOGWOOD	5'-8'	2'-3' height container	
17	VC	Vaccinium corymbosum	HIGHBUSH BLUEBERRY	12'	2'-3' height container	
SEED MIX						
10 lbs.		New England Conservation/Wildlife Mix			per pound	
1/2 lb.		New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites			per pound	
PERENNIALS AND GRASSES						
BASIN 1	BASIN 2					
12	15	Andropogon gerardii	Big Bluestem	5'	2" plugs in flats of 50	24" o.c.
10	15	Asclepias tuberosa	Butterfly Weed	4'	2" plugs in flats of 50	24" o.c.
10	10	Aster divaricatus	White Wood Aster	12"	1 gallon	24" o.c.

PLANT LEGEND

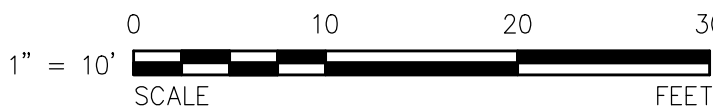
ABBREV.	SYMBOL	ABBREV.	SYMBOL	ABBREV.	SYMBOL
TREES		SHRUBS		SEED MIX	
AR		CA			
PD		CAM			
PSE		VC			
PS					

NOTES:

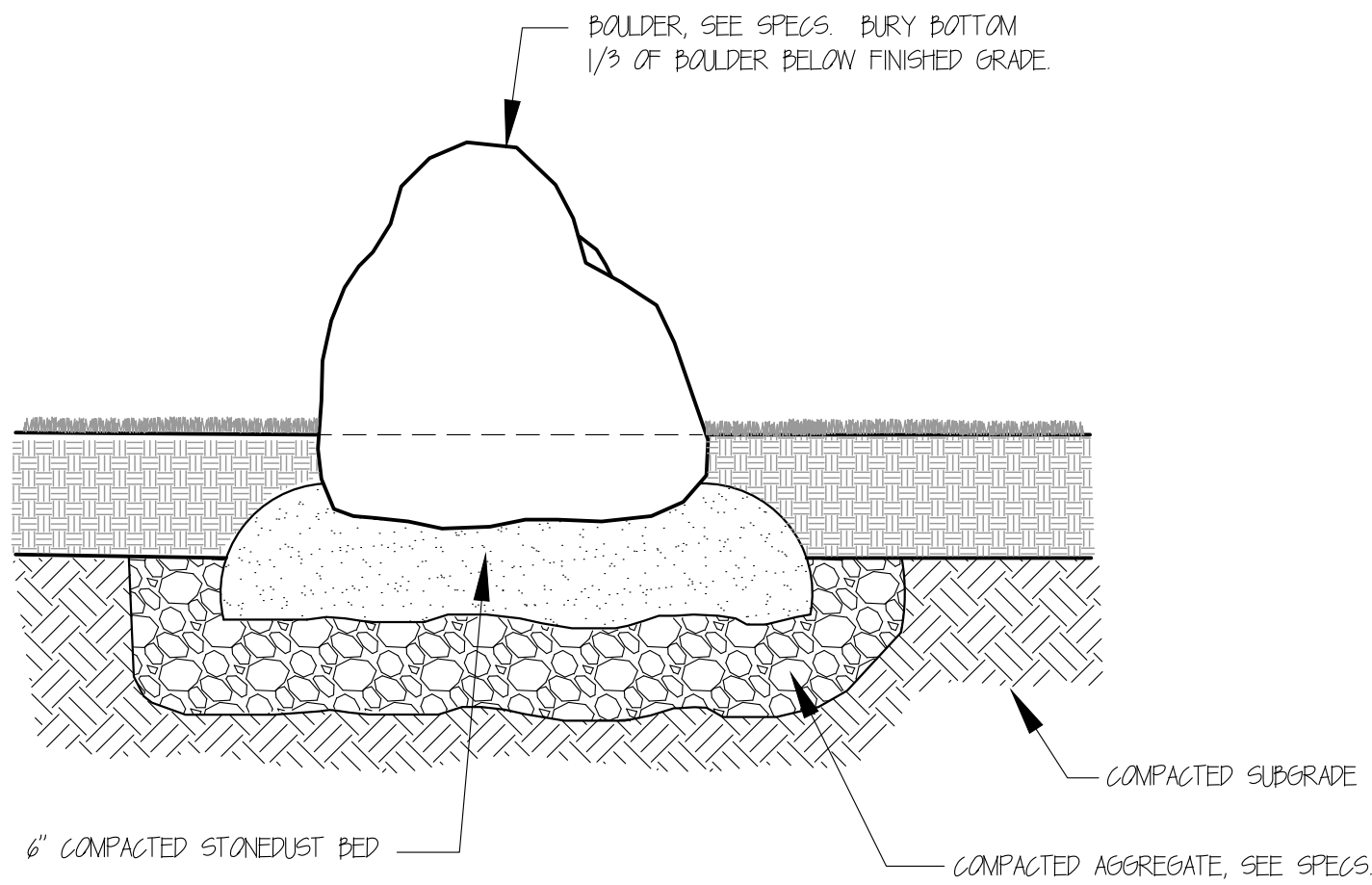
- FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
- FOR DETAILS, SEE 99 SERIES OF CIVIL DRAWINGS.
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PLAN

SCALE: 1"=10'



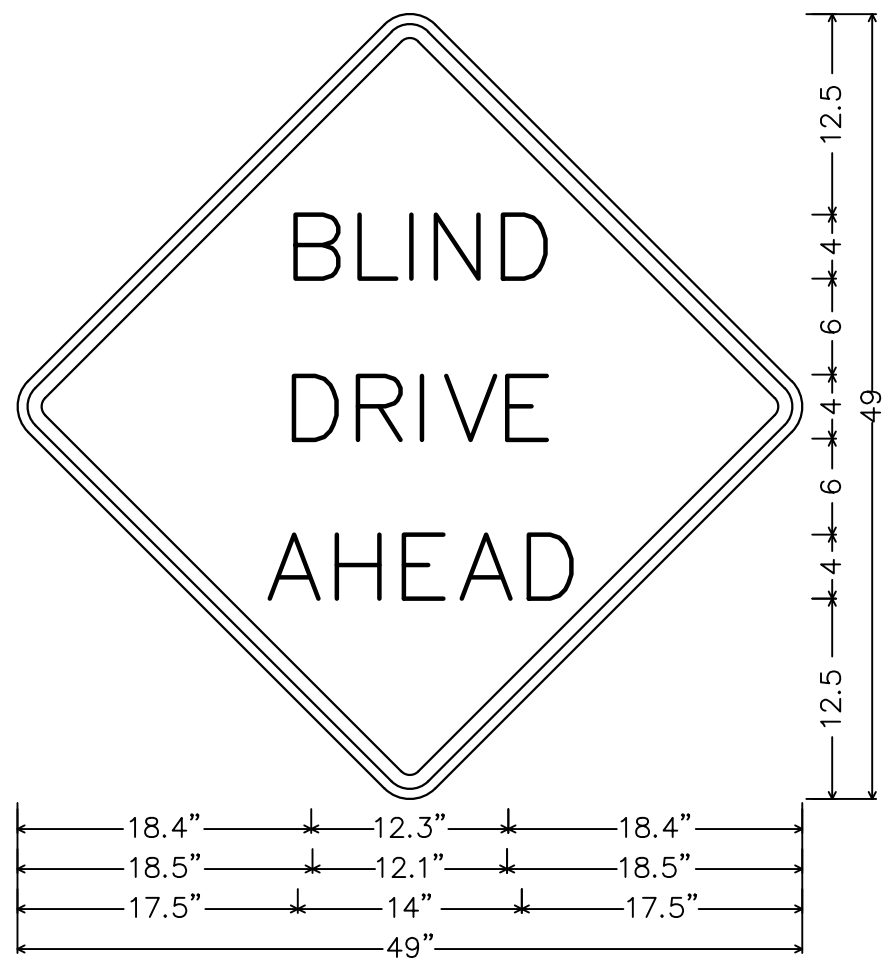
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LAST UPDATE: Monday, September 18, 2023 10:10:05 AM
PLOT DATE: Monday, September 18, 2023 11:55:45 AM



NOTE: DETAIL APPLIES TO THE RELOCATION OF EXISTING SITE BOULDERS.

BOULDER SETTING

NOT TO SCALE

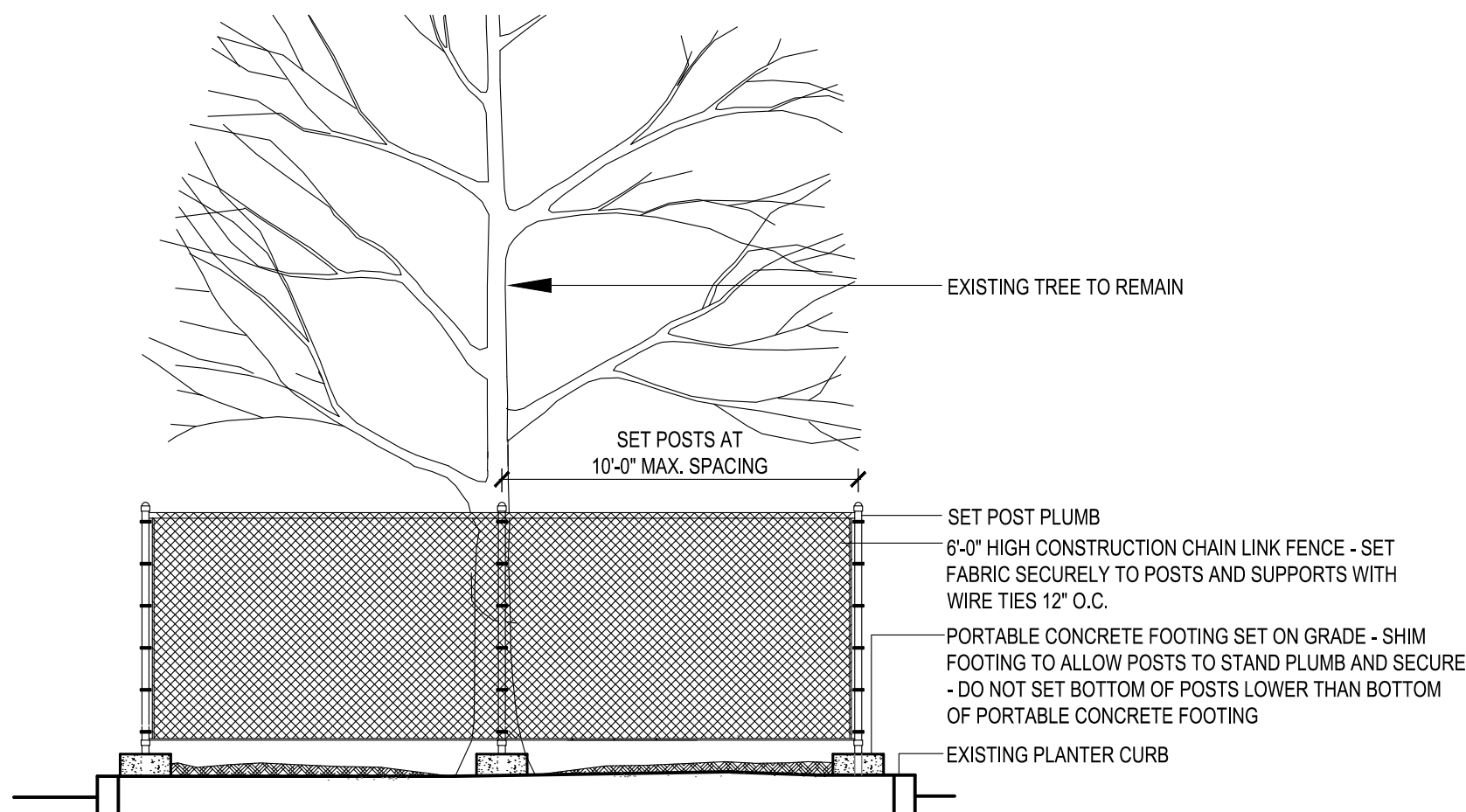


W42-5;
Sign Type : Warning;
36.0" across sides 2.3" Radius, 0.9" Border, 0.6" Indent, Black on, Yellow;
"BLIND", C 2K; "DRIVE", C 2K; "AHEAD", C 2K;

- NOTES:
- SIGN MOUNTING HEIGHT SHALL BE 7'-0" MIN. FROM GRADE TO BOTTOM OF SIGN.
 - SIGN TO BE INSTALLED APPROX. 200' FROM BEGINNING OF WEST SIDE PARKING AREA.

SIGNAGE

NOT TO SCALE



TREE PROTECTION FENCING

NOT TO SCALE

GENERAL NOTES

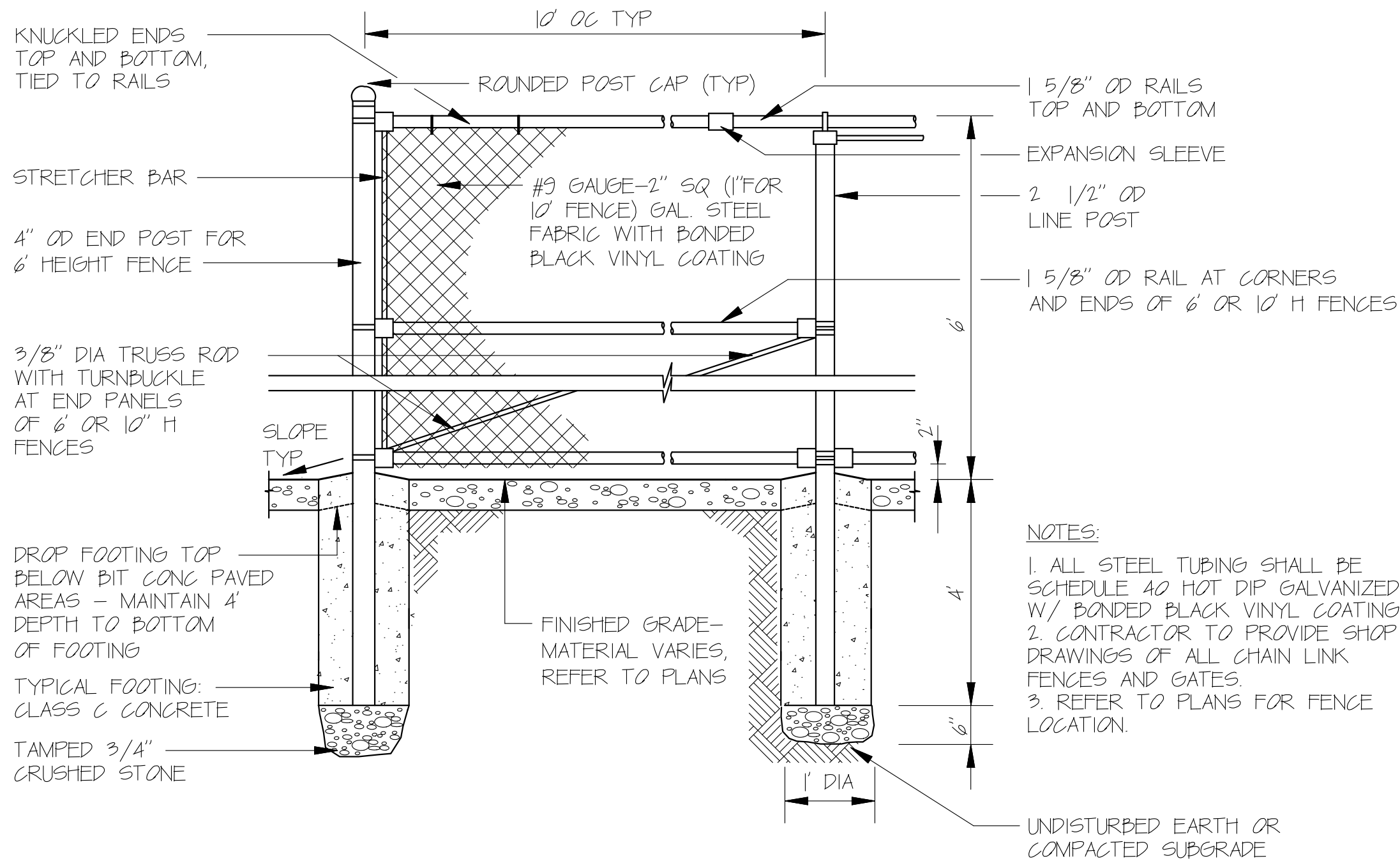
FOR PIPE TRENCHES

- PIPE TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH W_s (SHEETED) OR W_u (UNSHEETED) ABOVE THE TOP OF PIPE ZONE.
- TRENCHES SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH W_u BELOW THE TOP OF PIPE ZONE.
- SHEETING MUST BE USED IF EXCAVATION AND BACKFILL, BELOW NORMAL DEPTH, IS REQUIRED. SHEETING SHALL BE LEFT IN PLACE BELOW A LINE 1'-0" ABOVE THE TOP OF PIPE.
- ALL ROCK WITHIN 3'-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES OR STUBS AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH CONNECTIONS, BRANCHES OR STUBS, SHALL BE EXCAVATED.

TRENCH WIDTH W_s OR W_u		
NOMINAL PIPE DIAMETER D	DEPTH OF PIPE INVERT BELOW GROUND SURFACE	
	0 TO 12'	12' TO 20'
24" AND SMALLER	5'-0"	7'-0"
OVER 24"	D + 3'-0"	D + 5'-0"

GENERAL NOTES FOR PIPE TRENCHES

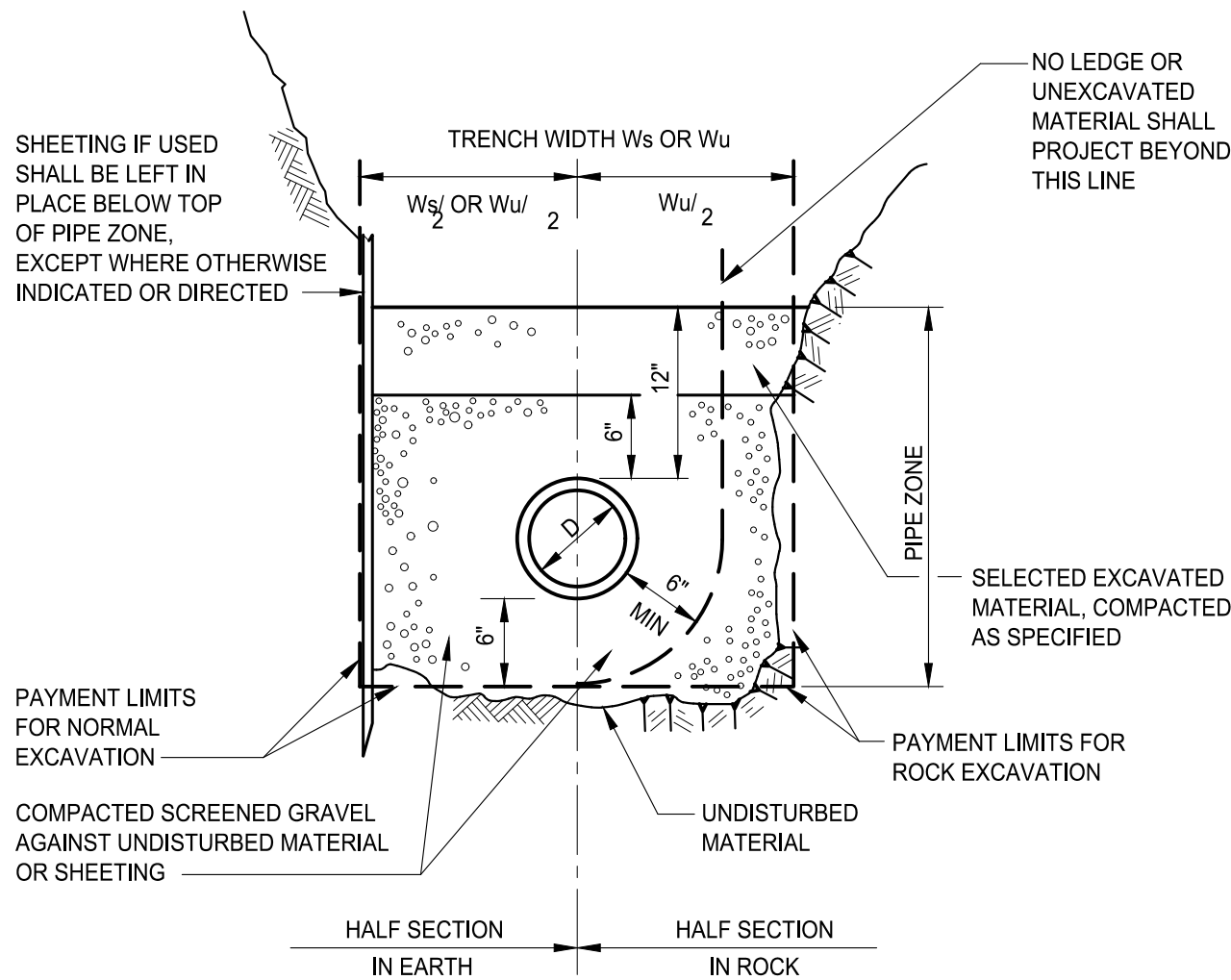
NOT TO SCALE
2-1.1.11 (REV. 10-23-95)



- NOTES:
- ALL STEEL TUBING SHALL BE SCHEDULE 40 HOT DIP GALVANIZED W/ BONDED BLACK VINYL COATING.
 - CONTRACTOR TO PROVIDE SHOP DRAWINGS OF ALL CHAIN LINK FENCES AND GATES.
 - REFER TO PLANS FOR FENCE LOCATION.

CHAIN LINK FENCE 6'

NOT TO SCALE



TRENCH SECTION FOR DI OR PVC PIPE 18 INCH DIAMETER AND SMALLER

NOT TO SCALE
2-1.1.1 (REV. 03-15-95)

AECOM

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

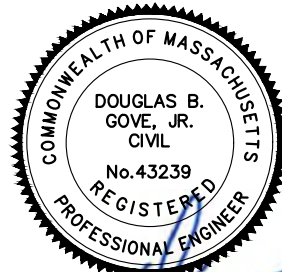
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Drawn By:	M. THIBODEAU
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
DETAILS I

SHEET NUMBER

99 C-501

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

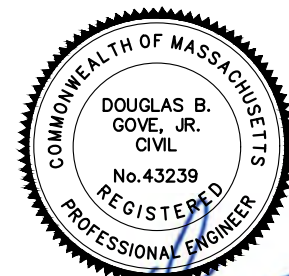
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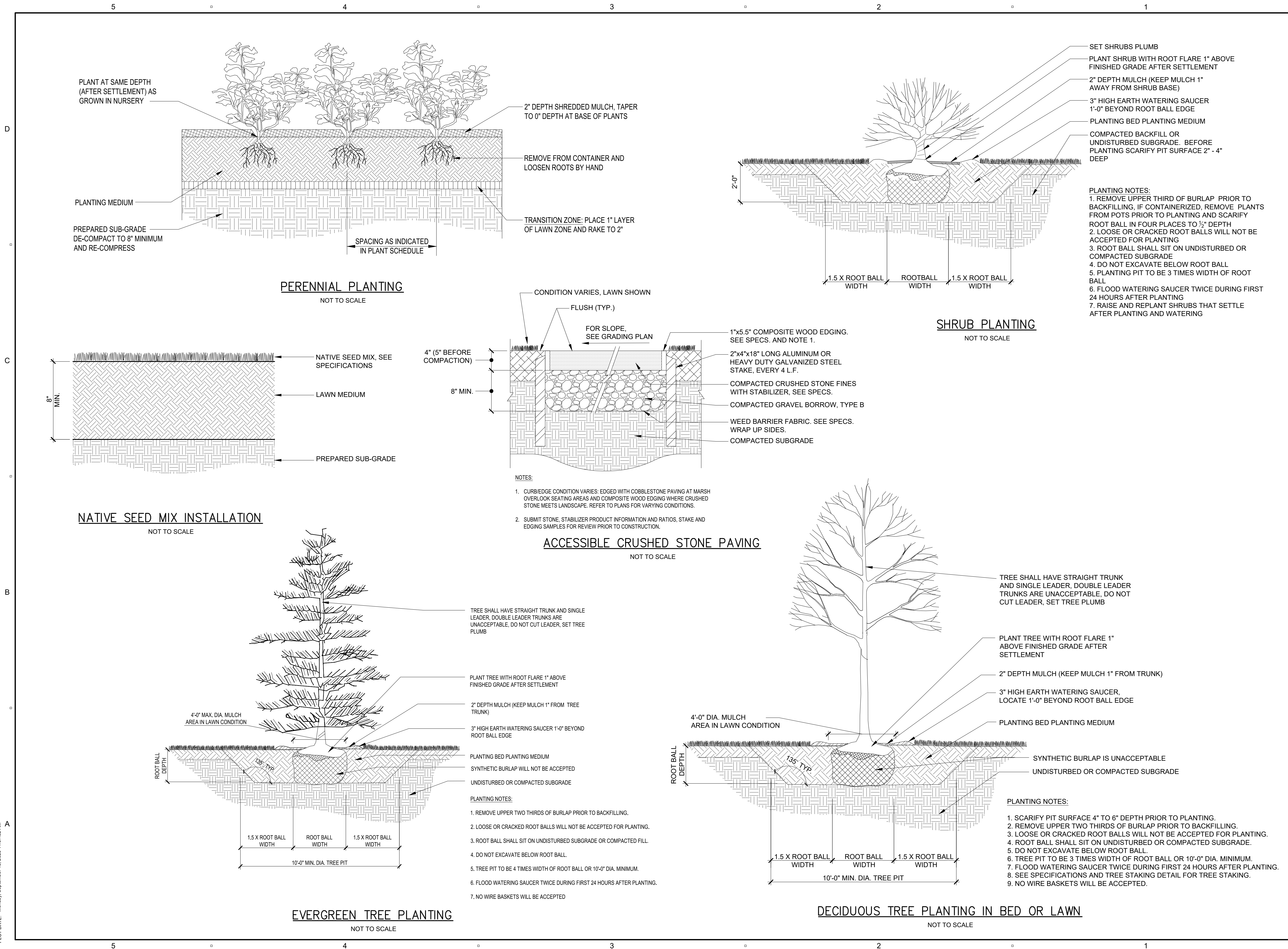
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PERMITTING
SHEET TITLE

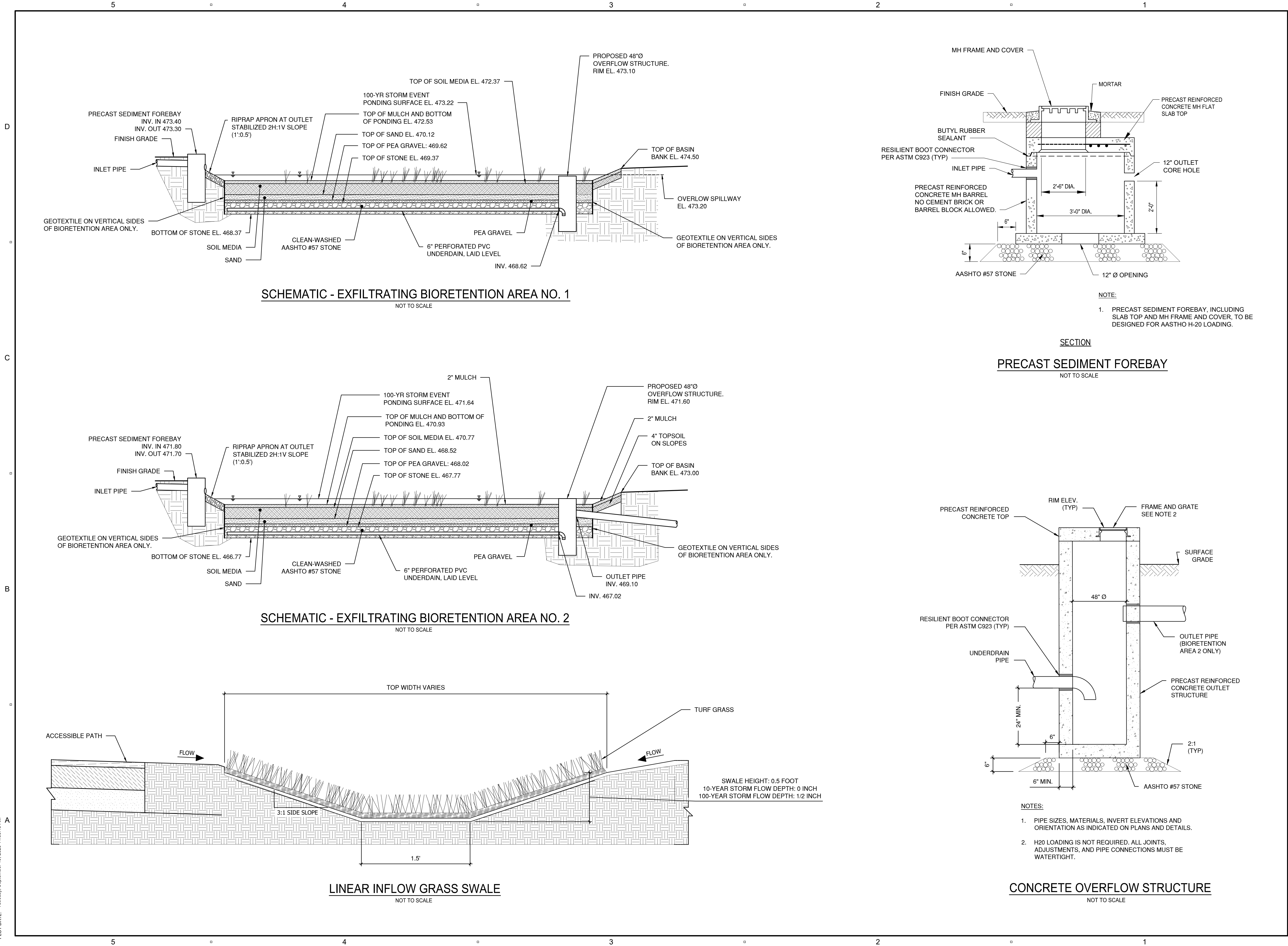
LOWES POND
DETAILS II

SHEET NUMBER

99 C-502



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LAST UPDATE: Friday, September 15, 2023 10:49:00 AM
PLOT DATE: Tuesday, September 19, 2023 11:09:40 AM



AECOM

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

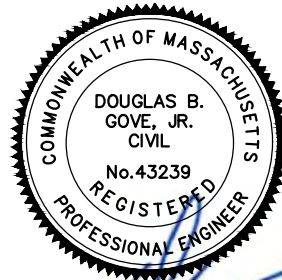
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Drawn By:	S. NAPOLITANO
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
DETAILS III

SHEET NUMBER

99 C-503

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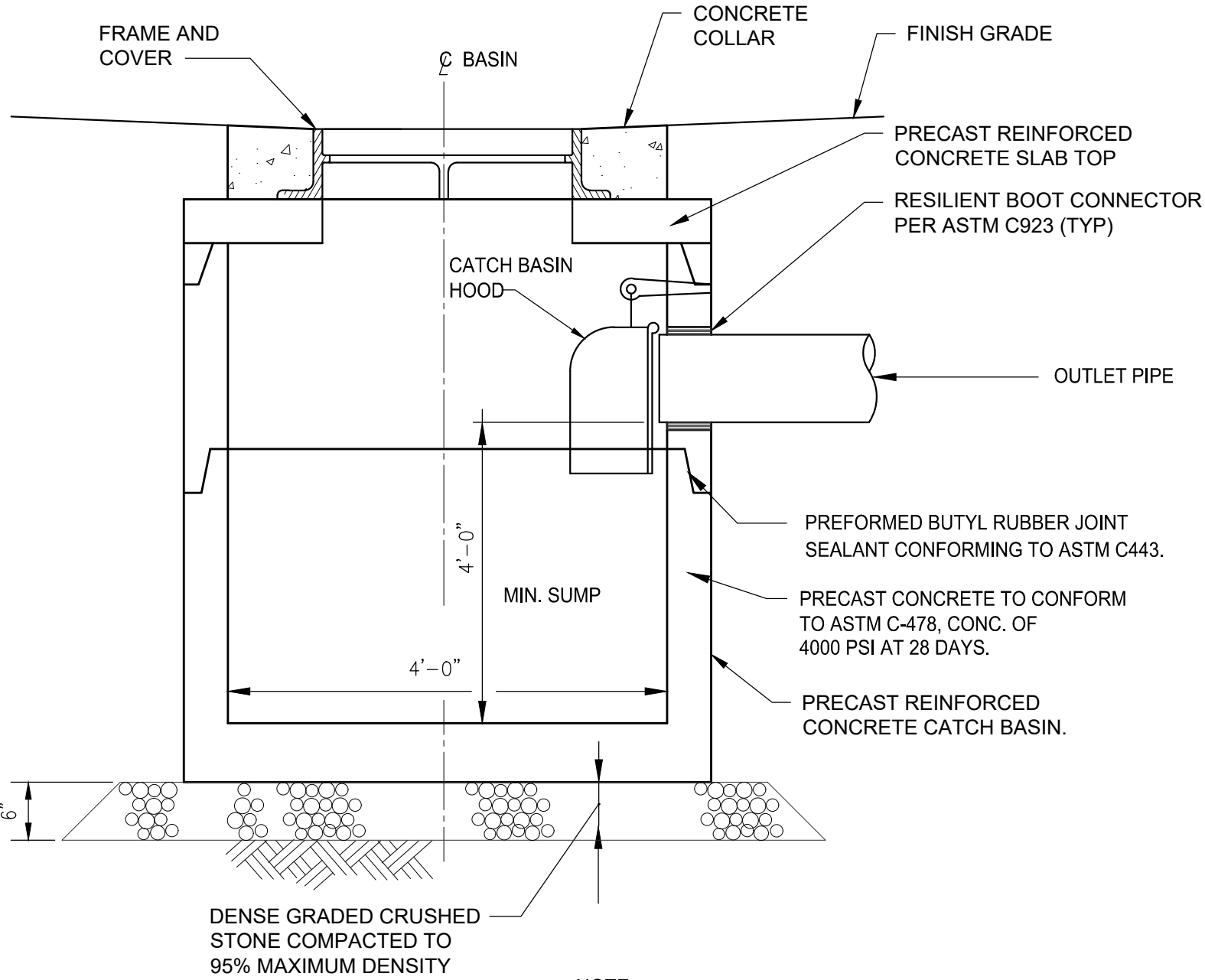
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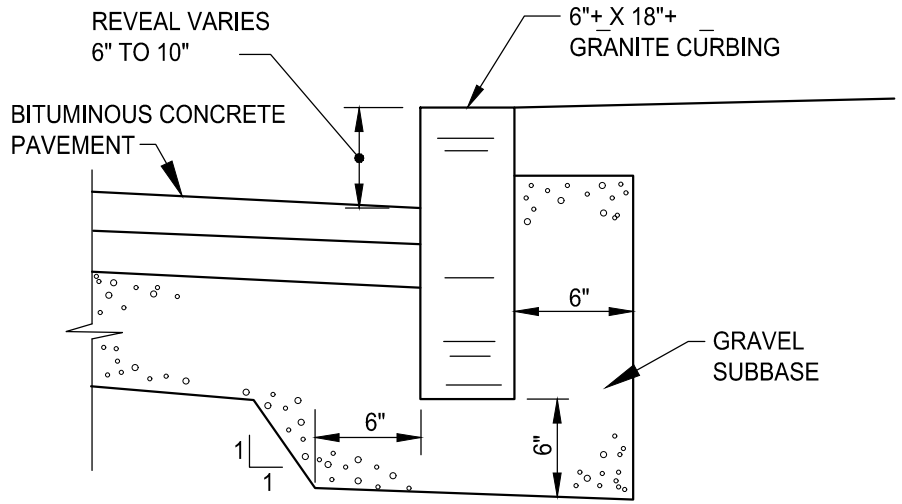


NOTE:

1. PRECAST CONCRETE DEEP SUMP CATCH BASIN, INCLUDING SLAB TOP AND FRAME & GRATE, MUST BE DESIGNED FOR AASHTO H-20 LOADING

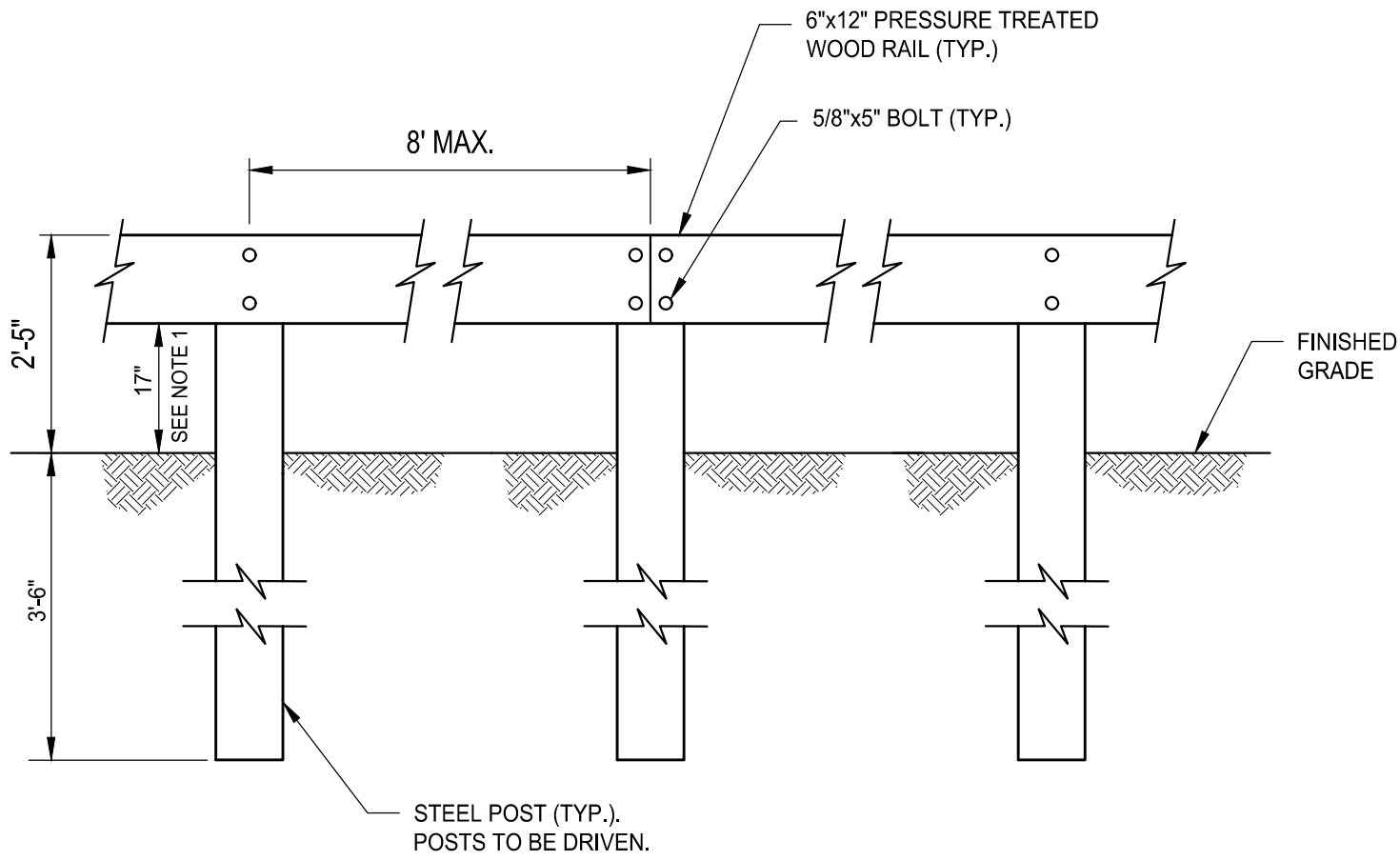
DEEP SUMP CATCH BASIN

NOT TO SCALE



GRANITE CURB

NOT TO SCALE
2-1.42.1 (REV. 12-15-94)



WOOD GUARD RAIL MATERIAL SPECIFICATIONS:

POSTS: 6"x4"x8.5 STEEL "H" POST, GALVANIZED

RAILS: 6"x12" PRESSURE TREATED SOUTHERN YELLOW PINE

BOLTS: 5/8"x5" GALVANIZED CARRIAGE BOLT WITH NUT AND WASHER

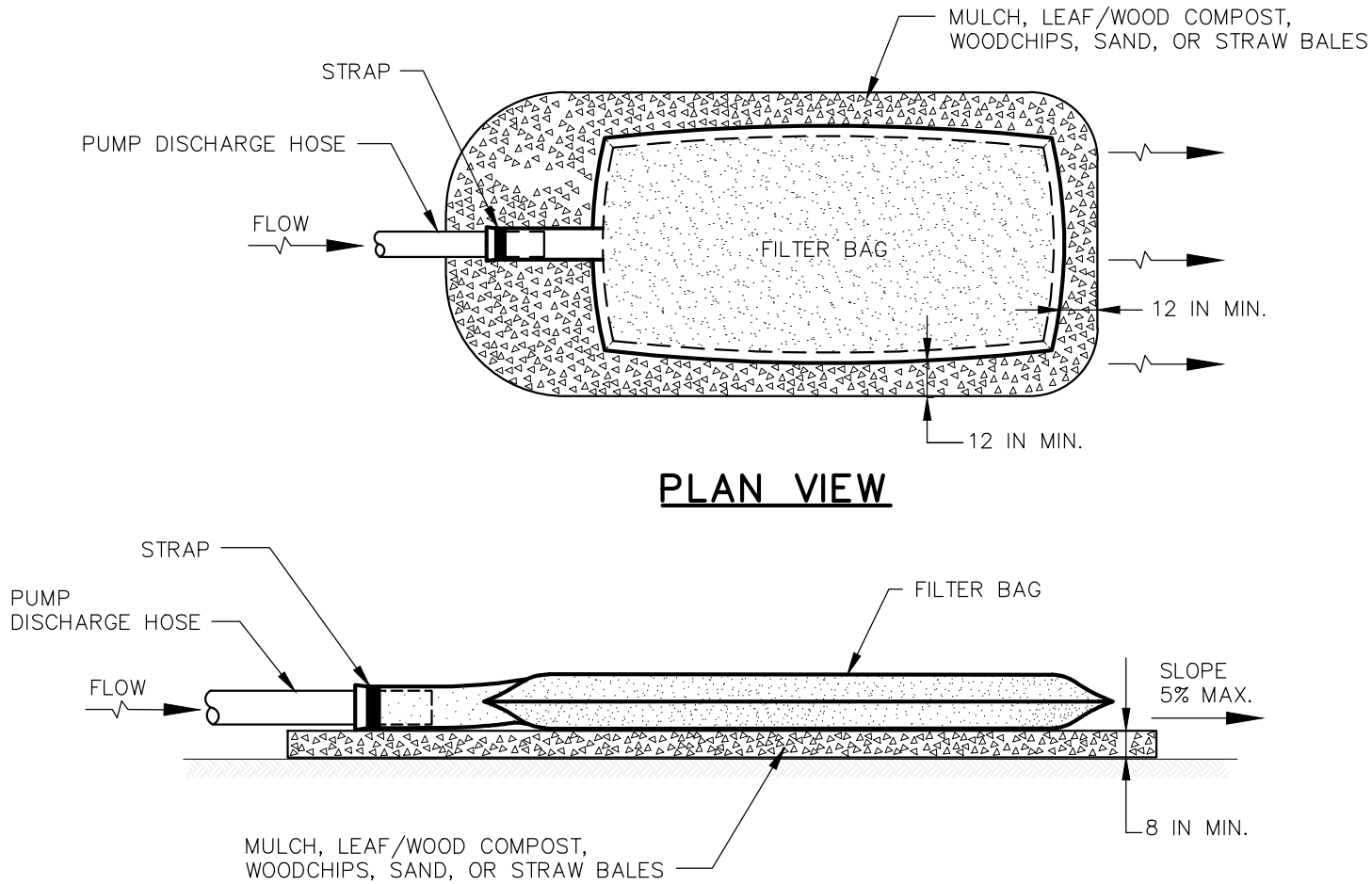
WOOD TREATMENT: .60 ACQ

WOOD GUARD RAIL NOTE:

1. MATCH EXISTING GUARDRAIL HEIGHT.
2. GUARD RAIL TO BE LOCATED AT SAME OFFSET AS EXISTING GUARD RAIL.

WOOD GUARD RAIL WITH STEEL POSTS

NOT TO SCALE



PLAN VIEW

ELEVATION

CONSTRUCTION SPECIFICATIONS

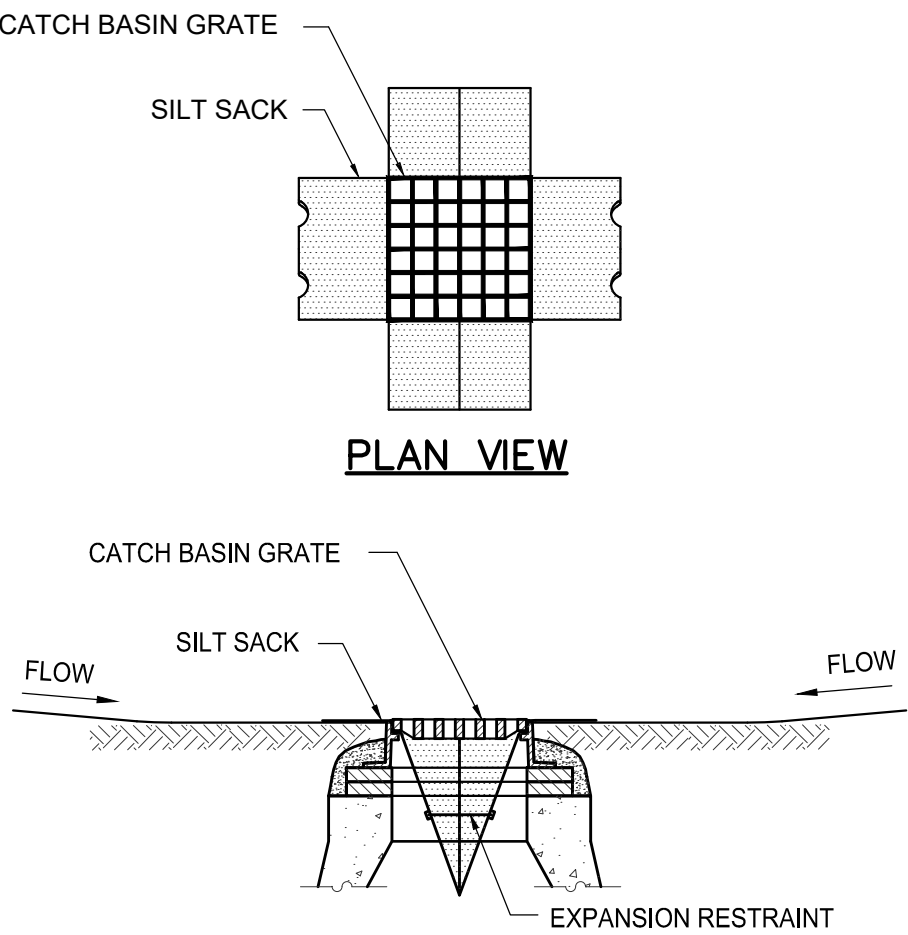
1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT ²	ASTM D-4491
PERMITTIVITY (SEC ⁻¹)	1.2 SEC ⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

SEDIMENTATION FILTER BAG

NOT TO SCALE



PLAN VIEW

SECTION VIEW

NOTES:

1. INSTALL SILT SACK IN ALL CATCH BASINS BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND STRAW BALES HAVE BEEN REMOVED. GRATE TO BE PLACED OVER SILT SACK.
2. SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORMS.
3. EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

SILT SACK SEDIMENT TRAP

NOT TO SCALE

AECOM

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

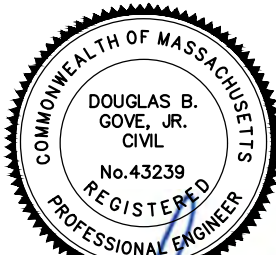
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DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
DETAILS IV

SHEET NUMBER

99 C-504

5

4

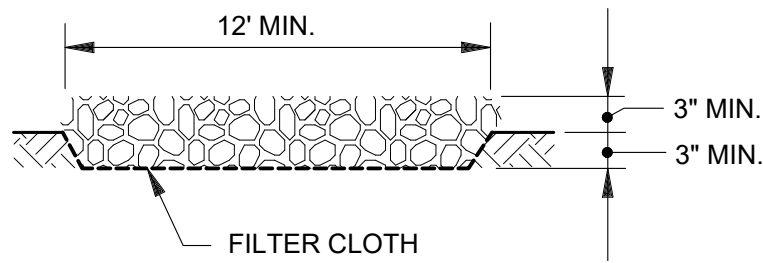
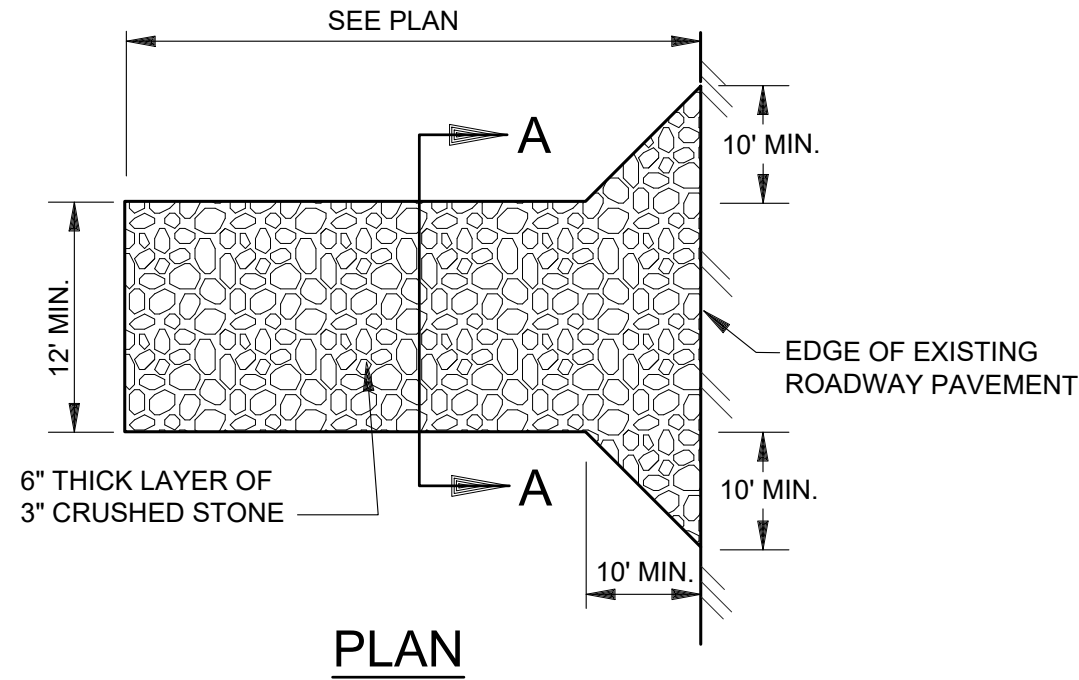
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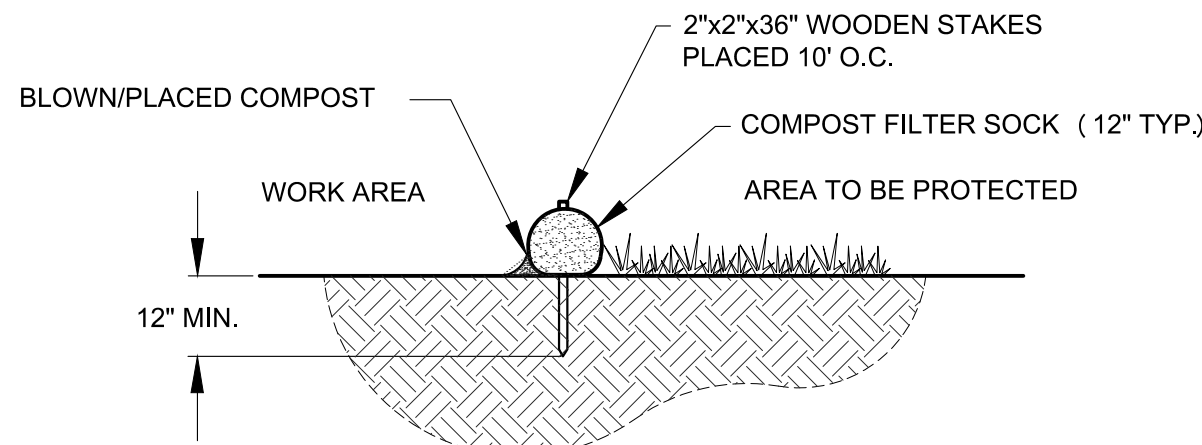
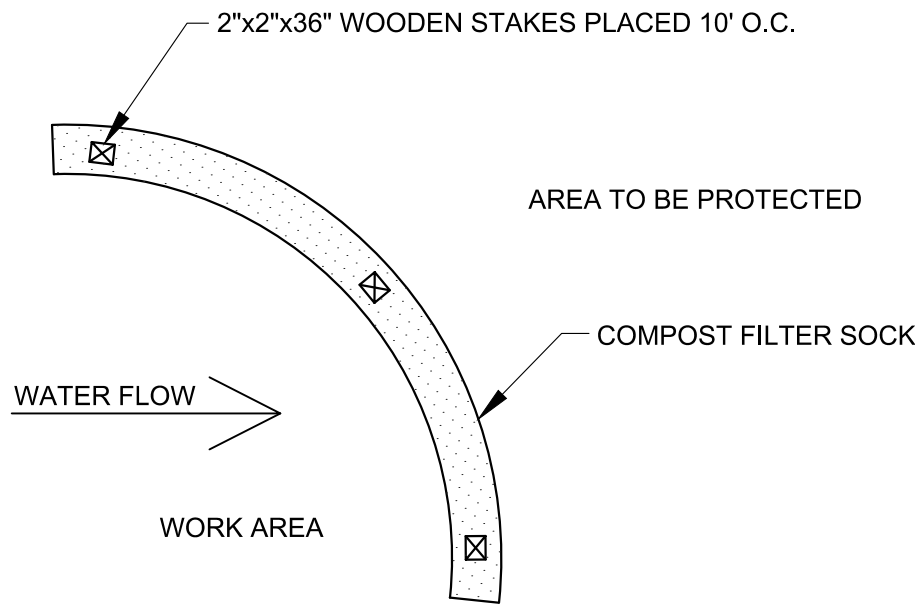
EROSION PROTECTION NOTES

1. SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF AND DURING ALL PHASES OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO AND IMMEDIATELY AFTER ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.
2. WEEKLY INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO ENSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT NO SEDIMENT LEAVES THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH DAY.
3. THE CONTRACTOR SHALL PREVENT MUD/MATERIAL FROM BEING TRACKED ONTO HUGUENOT ROAD OR ONTO ANY AREAS OUTSIDE THE LIMIT OF WORK. IF DETECTED, DEBRIS MUST BE CLEANED UP IMMEDIATELY AND THE CAUSE MUST BE DETERMINED AND RECTIFIED.
4. ALL CONSTRUCTION INGRESS AND EGRESS POINTS SHALL BE PROTECTED WITH A STABILIZED CONSTRUCTION ENTRANCE/EXIT WITH WASH DOWN FACILITIES TO PREVENT TRACKING OF SEDIMENT ONTO THE ROAD.
5. ALL SEDIMENT MUST BE PREVENTED FROM ENTERING ANY STORMWATER COLLECTION SYSTEM, EXCEPT THOSE SYSTEMS SPECIFICALLY DESIGNED AS CONSTRUCTION-PERIOD SEDIMENT REMOVAL DEVICES.
6. CONTRACTOR SHALL PROVIDE COMPOST SILT SOCKS, AS NECESSARY, TO PREVENT SEDIMENT RUNOFF FROM ALL IMPACTED AREAS ASSOCIATED WITH CONSTRUCTION ACTIVITIES. THE SILT FENCE SHALL BE INSPECTED DAILY. THE CONTRACTOR SHALL REMOVE ACCUMULATED SEDIMENT AND REPAIR THE SILT FENCE AS DETERMINED DURING THE INSPECTION TO ORIGINAL CONDITION WITHIN THREE (3) DAYS OF INSPECTION.
7. ONLY DISTURB, CLEAR, OR GRADE AREAS NECESSARY FOR CONSTRUCTION. FLAG OR OTHERWISE DELINEATE AREAS NOT TO BE DISTURBED. EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM AREAS NOT NECESSARY FOR CONSTRUCTION.
8. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL EROSION AND SEDIMENT CONTROLS AT THE COMPLETION OF CONSTRUCTION AND WHEN THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED. REMOVE TEMPORARY EROSION CONTROL MEASURES WITHIN 30 DAYS AFTER THE TRIBUTARY AREA HAS BEEN PERMANENTLY STABILIZED. REMOVE ANY ACCUMULATED SEDIMENTS AND STABILIZE ALL DISTURBED AREAS.
9. CONTRACTOR SHALL PROTECT AND MAINTAIN EXISTING DRAINAGE INLETS, DITCHES, SWALES, CULVERTS, AND DETENTION PONDS WITHIN THE LIMITS OF CONSTRUCTION AS WELL AS ANY OTHER AREAS IMPACTED BY CONSTRUCTION OPERATIONS. IF A DRAINAGE DITCH OR SWALE IS TO BE RELOCATED, THE RELOCATED DITCH SHALL BE IN PLACE PRIOR TO DISTURBANCE OF THE EXISTING DITCH.
10. PROVIDE AND STABILIZE STORMWATER TREATMENT AREAS, DITCHES AND SWALES AS EARLY AS PRACTICAL DURING CONSTRUCTION BUT PRIOR TO DISTURBING THE TRIBUTARY AREA AND PRIOR TO DIRECTING RUNOFF TO THE TREATMENT AREAS, DITCHES AND SWALES.
11. STABILIZE ACCESS DRIVES AND PARKING AREAS WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
12. INSPECT DISTURBED AREAS, STORAGE AREAS, AND EROSION CONTROL MEASURES WEEKLY UNLESS OTHERWISE INDICATED AND AFTER EVERY STORM EVENT OF 1/4 INCH OF RAINFALL OR MORE. ALL INSPECTIONS SHALL BE PERFORMED BY PERSONS FAMILIAR WITH EROSION AND SEDIMENT CONTROL PRACTICES.
13. AFTER ANY SIGNIFICANT RAINFALL (1/4 INCH OR GREATER), SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
14. DOCUMENT EACH INSPECTION IN A REPORT AND LOG, INCLUDING THE FOLLOWING: DATE, NAME (S) AND TITLE OF THE PERSONNEL MAKING THE INSPECTION, WEATHER AND DESCRIPTION OF ANY DISCHARGE OCCURRING AT THE TIME OF INSPECTION, LOCATION OF ANY DISCHARGE OF SEDIMENT OR POLLUTANTS, BEST MANAGEMENT PRACTICES THAT NEED TO BE MAINTAINED, BEST MANAGEMENT PRACTICES THAT FAILED OR OTHERWISE PROVED INADEQUATE, LOCATION WHERE ADDITIONAL BEST MANAGEMENT PRACTICES ARE NEEDED, AND CORRECTIVE ACTION REQUIRED. ALSO NOTE WHAT ACTION WAS TAKEN TO CORRECT DEFICIENCIES OR ENHANCE CONTROLS, INCLUDING THE DATE THE CORRECTIVE ACTION WAS TAKEN. PERFORM CORRECTIVE ACTION OF EROSION CONTROL MEASURES IMMEDIATELY.
15. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEEPED UP AND REMOVED AT THE END OF EACH WORKING DAY AND THE CAUSE OF THE INCIDENT DETERMINED AND CORRECTED.
16. STABILIZED PORTIONS OF A SITE SHALL BE INSPECTED AT LEAST ONCE PER MONTH.
17. MAINTAIN EROSION CONTROL MEASURES FOR THE DURATION OF THE PROJECT AND UNTIL PERMANENT STABILIZATION OF THE ENTIRE SITE IS ESTABLISHED.
18. PROTECT STABILIZED AREAS FROM EROSION AND IMMEDIATELY REPAIR AND RE-VEGETATE ERODED AREAS.



SECTION A-A

TEMPORARY
CONSTRUCTION ENTRANCE
NOT TO SCALE



- NOTES:
1. SEE SPECIFICATION FOR COMPOST FILTER SOCK AND COMPOST FILL MATERIAL REQUIREMENTS.

COMPOST SILT SOCK
NOT TO SCALE



PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

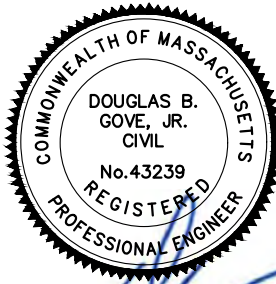
CLIENT

Massachusetts Department
of Conservation and
Recreation

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Boston, MA 02114-2119
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CONSULTANT

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CHELMSFORD, MA 01824
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www.aecom.com



REGISTRATION

PRELIMINARY PERMIT
APPLICATION COPY

NOT INTENDED FOR
CONSTRUCTION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60604936

Designed By:	S. HE
Drawn By:	S. NAPOLITANO
Dept Check:	C. BENZIGER
Proj Check:	D. GOVE
Date:	SEPTEMBER 2023
Scale:	AS NOTED

DISCIPLINE

PERMITTING
SHEET TITLE

LOWES POND
DETAILS V

SHEET NUMBER

99 C-505

	5	4	3	2	1																				
GENERAL 1. ALL WORK SHALL CONFORM TO 780 CMR, NINTH EDITION MASSACHUSETTS AMENDMENTS TO THE 2015 INTERNATIONAL BUILDING CODE AND TO OTHER CODES AND REFERENCES INDICATED OR SPECIFIED. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENT SHALL GOVERN. 2. DESIGN LOADS: A. FLOOR LIVE LOAD: N.A. B. ROOF LIVE LOAD: N.A. C. SNOW LOAD: GROUND SNOW LOAD (PG): 50 PSF FLAT ROOF SNOW LOAD (PF): 35 PSF SNOW EXPOSURE FACTOR (CE): 1.00 SNOW LOAD IMPORTANCE FACTOR (IS): 1.1 SNOW THERMAL FACTOR (CT): 1.10 D. WIND LOAD: ULTIMATE DESIGN WIND SPEED: 136 MPH RISK CATEGORY: IV E. SEISMIC LOAD: SEISMIC IMPORTANCE FACTOR (IE): 1.25 RISK CATEGORY: IV MAPPED SPECTRAL RESPONSE COEFFICIENTS S(S): 0.190 S(1): 0.057 SPECTRAL RESPONSE COEFFICIENTS S(DS): 0.203 S(D1): 0.091 SITE MODIFIED PEAK GROUND ACCELERATION: 0.164 SITE CLASS: CLASS D SEISMIC DESIGN CATEGORY: C 3. PROTECT ALL STRUCTURES AGAINST HYDRAULIC UPLIFT UNTIL STRUCTURES ARE COMPLETED AND BACKFILLED. MAXIMUM FLOOD GROUNDWATER AT THE SITE IS ELEVATION 477.50 FEET 4. FROST DEPTH AT THE SITE IS 4'-0" BELOW FINISHED GRADE. 5. DO NOT SCALE DRAWINGS TO OBTAIN DIMENSIONAL INFORMATION. MISSING OR CONFLICTING DIMENSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. 6. DIMENSIONS AND ELEVATIONS INDICATED ON EXISTING STRUCTURES HAVE BEEN OBTAINED FROM DRAWINGS OR FIELD SURVEYS. VERIFY ALL DIMENSIONS AND ELEVATIONS THAT ARE REQUIRED FOR FABRICATION AND INSTALLATION OF ADDITIONS TO EXISTING STRUCTURES WITH FIELD MEASUREMENTS. 7. REFER TO CIVIL DRAWINGS AND SPECIFICATIONS FOR LOCATIONS AND DIMENSIONS OF CHASES, SLOTS, INSERTS, CURBS, OPENINGS, SLEEVES, ANCHOR BOLTS, FLOOR PITCHES, ANGLE FRAMES, GATE FRAMES, AND OTHER PROJECT REQUIREMENTS NOT INDICATED ON STRUCTURAL DRAWINGS. 8. COORDINATE DIMENSIONS AND VERIFY LOCATION OF STRUCTURAL ELEMENTS WITH PURCHASED EQUIPMENT. ANCHOR BOLTS SHALL BE SIZED AND FURNISHED BY THE EQUIPMENT SUPPLIER UNLESS OTHERWISE INDICATED. 9. PROVIDE OPENINGS REQUIRED FOR PURCHASED EQUIPMENT. PROVIDE ANCHOR BOLTS, NUTS, NON-SHRINK NON-METALLIC GROUT, CONCRETE PADS AND REINFORCING STEEL REQUIRED FOR THE INSTALLATION OF EQUIPMENT. 10. STANDARD DETAILS AS SHOWN ON THE STRUCTURAL STANDARD DETAIL SHEETS ARE APPLICABLE TO ALL STRUCTURAL WORK EXCEPT WHERE A SPECIFIC SECTION OR DETAIL IS SHOWN OTHERWISE ALUMINUM RAILINGS AND GUARDRAILS 1. PROVIDE ALUMINUM RAILING WHERE INDICATED. 2. PROVIDE MOUNTINGS FOR REMOVABLE ALUMINUM RAILING AROUND OPENINGS WHERE INDICATED, COMPLETE WITH CAPS. 3. DESIGN CRITERIA A. RAILINGS AND GUARDRAILS SHALL BE DESIGNED FOR A LINE LOAD OF 100 PLF VERTICAL PLUS 50 PLF HORIZONTAL APPLIED CONCURRENTLY OR A CONCENTRATED LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION AT ANY POINT ALONG THE RAIL, WHICHEVER PRODUCES THE MOST EXTREME CONDITION. B. INTERMEDIATE RAILS, BALUSTERS AND PANELS OR FILLERS SHALL BE DESIGNED FOR A UNIFORM LOAD OF 25 PSF OVER THE GROSS AREA OF THE GUARD OF WHICH THEY ARE A PART. THIS LOADING NEED NOT BE ADDED TO THE LOADING OF THE MAIN MEMBERS PRESCRIBED ABOVE. C. HANDRAILS SHALL BE DESIGNED FOR A LINE LOAD OF 50 PLF APPLIED IN ANY DIRECTION OR A CONCENTRATED LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION AT ANY POINT ALONG THE HANDRAIL, WHICHEVER PRODUCES THE MOST EXTREME CONDITION. 4. ALUMINUM RAILING AND GUARDRAILS SHALL CONFORM TO ALLOY 6061-T6. 5. WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE, AWS D1.2. 6. WELDING SHALL BE BY THE METAL INERT GAS (MIG) OR THE TUNGSTEN INERT GAS (TIG) PROCESS USING 5356 FILLER ALLOY. 7. FIELD WELDING OF ALUMINUM RAILING AND GUARDRAILS IS NOT PERMITTED UNLESS SPECIFICALLY INDICATED. 8. PROVIDE ASTM F 593 TYPE 316 STAINLESS STEEL BOLTS FOR BOLTED CONNECTIONS. PROVIDE DRILLED HOLES 1/16" LARGER THAN THE BOLT DIAMETER UNLESS OTHERWISE INDICATED. PROVIDE ASTM F 594 STAINLESS STEEL NUTS WITH STAINLESS STEEL WASHERS. 9. PAINT ALUMINUM IN CONTACT WITH CONCRETE WITH ASPHALTIC PAINT OR PROVIDE SHEET NEOPRENE BARRIER. 10. PROVIDE DISSIMILAR METAL PROTECTION AT LOCATIONS WHERE DISSIMILAR METALS ARE IN CONTACT. PROTECT WITH A MINIMUM 4-MIL DRY THICKNESS COAT OF ZINC CHROMATE PRIMER ON THE ALUMINUM SURFACES AND A MINIMUM 2-MIL DRY THICKNESS COAT OF ALL-METAL PRIMER FOLLOWED BY ONE COAT OF MINIMUM 3-MIL DRY THICKNESS ALUMINUM PAINT TO THE DISSIMILAR METAL. 11. USE NON-SHRINK, NON-METALLIC GROUT UNDER BASE PLATES.						CONCRETE 1. CONCRETE WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301) AND THE CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES (ACI 350). 2. USE NORMAL WEIGHT CAST-IN-PLACE CONCRETE WITH ASTM C 150, TYPE II CEMENT FOR ALL CONCRETE WORK. 3. CONCRETE SHALL HAVE A. A 28-DAY COMPRESSIVE STRENGTH OF 4,500 PSI; B. A MINIMUM UNIT WEIGHT OF 150 POUNDS PER CUBIC FOOT. C. A MAXIMUM WATER-CEMENT RATIO OF 0.42; D. CONTAIN A SHRINKAGE REDUCING ADMIXTURE OR USE SHRINKAGE COMPENSATING CEMENT; E. A 21-DAY DRYING SHRINKAGE OF 0.028 PERCENT OR LESS AND A 28-DAY DRYING SHRINKAGE OF 0.032 PERCENT OR LESS WHEN TESTED IN ACCORDANCE WITH ASTM C 157 AS MODIFIED BY THE PROJECT SPECIFICATIONS. 4. PROVIDE CONCRETE UNDER FOUNDATIONS HAVING A 28-DAY COMPRESSIVE STRENGTH OF 1,500 PSI WHEN INDICATED OR REQUIRED. 5. AIR-ENTRAIN ALL CONCRETE. 6. REINFORCING BARS SHALL CONFORM TO ASTM A 615, GRADE-60. 7. WELDING REINFORCING BARS IS PROHIBITED EXCEPT WHERE SPECIFICALLY INDICATED ON THE DRAWINGS. REINFORCING BARS INDICATED TO BE WELDED SHALL CONFORM TO ASTM A 706, GRADE-60. 8. PROVIDE REINFORCING BAR SUPPORTS, SPACERS, AND ACCESSORIES AS RECOMMENDED IN ACI 315. PROVIDE PLASTIC BOOTED ACCESSORIES IN CONTACT WITH EXPOSED SURFACES. PROVIDE MINIMUM #5 SUPPORT BARS. 9. WAIT A MINIMUM OF 72 HOURS BEFORE PLACING ADJACENT CONCRETE SECTIONS. 10. SET AND MAINTAIN REINFORCEMENT AT THE CLEAR DISTANCES FROM THE SURFACE OF CONCRETE AS SHOWN IN THE STANDARD DETAIL UNLESS OTHERWISE INDICATED. 11. PROVIDE EMBEDMENT AND SPLICES OF REINFORCEMENT AS SHOWN IN THE STANDARD DETAILS UNLESS OTHERWISE INDICATED. 12. PROVIDE ADDITIONAL REINFORCEMENT ALONG EACH SIDE OF OPENINGS AS INDICATED IN THE STANDARD DETAILS UNLESS OTHERWISE INDICATED. 13. PROVIDE CONSTRUCTION AND EXPANSION JOINTS WHERE INDICATED. DO NOT OMIT OR ADD JOINTS. 14. INTENTIONALLY ROUGHEN SURFACE OF HORIZONTAL CONSTRUCTION JOINTS IN WALLS AND AT BASE OF WALL TO 1/4" AMPLITUDE. 15. PROVIDE 3/4-INCH CHAMFER ON ALL EXPOSED CORNERS OF CONCRETE ELEMENTS. 16. STEEL TROWEL FINISH THE TOP OF ALL WALLS AND SURFACES OF THE SPILLWAY UNLESS OTHERWISE INDICATED OR SPECIFIED. CONCRETE ANCHORS 1. ADHESIVE TYPE ANCHORS SHALL CONFORM TO THE REQUIREMENTS OF ASTM E 488, 'STANDARD TEST METHODS FOR STRENGTH OF ANCHORS IN CONCRETE AND MASONRY ELEMENTS', ASTM 1512, 'STANDARD TEST METHODS FOR TESTING BOND PERFORMANCE OF ADHESIVE-BONDED ANCHORS', ICBO ES AC-308, 'ACCEPTANCE CRITERIA FOR POST-INSTALLED ADHESIVE ANCHORS' AND ACI 355.4 'QUALIFICATION OF POST-INSTALLED ANCHORS IN CONCRETE'. 2. PROVIDE SIZE, TYPE AND EMBEDMENT OF ANCHOR INDICATED INSTALLED TO DEVELOP THE MAXIMUM CAPACITY FOR THE EMBEDMENT, TYPE AND ANCHOR SIZE WITH A MINIMUM SAFETY FACTOR OF FOUR. 3. ANCHORS SHALL HAVE STANDARD UNC THREADS, UNLESS OTHERWISE INDICATED. 4. ANCHOR INSTALLATION SHALL CONFORM TO THE MANUFACTURER'S CURRENT PRINTED INSTRUCTIONS. 5. REMOVE DUST AND DEBRIS FROM DRILLED HOLES USING COMPRESSED AIR OR VACUUM AT BOTTOM OF HOLE. IMMEDIATELY REMOVE STANDING WATER AND THOROUGHLY DRY HOLES TO RECEIVE ADHESIVE ANCHORS. 6. DO NOT HAMMER IN ANCHORS. INSTALL ANCHORS USING A ROTARY HAMMER DRILL AS RECOMMENDED BY ANCHOR MANUFACTURER. THE USE OF HAMMER IN TYPE ADHESIVE CAPSULES IS PROHIBITED. 7. PROVIDE ADHESIVE TYPE ANCHORS CONSISTING INJECTABLE ADHESIVE CARTRIDGES AND THREADED ANCHOR BOLTS SUPPLIED AS A SYSTEM BY ONE MANUFACTURER. PROVIDE EACH ANCHOR WITH NUT AND WASHER. AFTER INSTALLATION, DO NOT DISTURB OR LOAD ANCHORS BEFORE THE SPECIFIED CURING TIME ELAPSES (MAY VARY WITH TEMPERATURE). ADHESIVE ANCHORING SYSTEM SHALL BE: A. HILTI: HIT-HY 200R; B. ITW REDHEAD/RAMSET: EPCON G5; C. POWERS FASTENERS: PE1000+; D. SIMPSON: STRONG-TIE SET-XP; E. OR APPROVED EQUAL.					FOUNDATION 1. FOUNDATION DESIGNS ARE BASED UPON THE ALLOWABLE ROCK BEARING CAPACITIES OF 8,000 PSF. 2. PERCENT COMPACTION IS DEFINED AS THE RATIO OF THE FIELD DRY DENSITY, DETERMINED BY ASTM D-1556, TO THE MAXIMUM DRY DENSITY, DETERMINED BY ASTM-D 1557 (MODIFIED PROCTOR). 3. ALL FOUNDATIONS SHALL BEAR ON COMPETENT BEDROCK. 4. SPILLWAY UNDULATING ROCK SURFACE SHALL BE PREPARED TO A MAXIMUM SLOPE OF 1H:1V WITH NO OVERHANGS. THE OVERALL ROCK SURFACE SHALL BE SLOPED UPWARD FROM HEEL (UPSTREAM) TO TOE (DOWNSTREAM) BETWEEN 1V:20H AND 1V:10H. ALL LOOSE OR UNSOUND ROCK SHALL BE REMOVED AND ALL DIRT AND DUST SHALL BE REMOVED BY AIR OR WATER BLASTING PRIOR TO CONCRETE OR GROUT PLACEMENT. OPEN JOINTS SHALL BE CLEANED OUT AND FILLED WITH GROUT PRIOR TO SPILLWAY CONCRETE PLACEMENT. ROCK SURFACE SHALL BE OBSERVED BY THE ENGINEER PRIOR TO PLACEMENT OF CONCRETE. 5. TRAINING WALL FOUNDATION UNDULATING ROCK SURFACE SHALL BE CLEARED OF ALL LOOSE OR UNSOUND ROCK AND ALL DIRT AND DUST SHALL BE REMOVED BY AIR OR WATER BLASTING PRIOR TO CONCRETE PLACEMENT. 6. SPILLWAY UNDULATING ROCK SURFACE SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER OF RECORD OR A QUALIFIED INDIVIDUAL INSPECTING ON BEHALF OF THE GEOTECHNICAL ENGINEER OF RECORD. 7. PREPARED UNDULATING ROCK SURFACE SHALL BE COATED WITH A CONCRETE BONDING AGENT PRIOR TO CONCRETE PLACEMENT. 8. DO NOT PLACE FOUNDATION CONCRETE IN WATER OR ON FROZEN OR DISTURBED GROUND. 9. A UNIT WEIGHT OF SOIL OF 130 PCF WAS USED IN THE DESIGN. 10. TRAINING WALLS HAVE BEEN DESIGNED FOR ACTIVE SOIL PRESSURES OF AN EQUIVALENT FLUID LATERAL EARTH PRESSURE OF 43 PCF ABOVE THE MAXIMUM GROUNDWATER ELEVATION AND AN EQUIVALENT FLUID LATERAL EARTH PRESSURE OF 85 PCF BELOW THE MAXIMUM GROUNDWATER ELEVATION PLUS A UNIFORM LATERAL PRESSURE OF 100 PSF TO ACCOUNT FOR A 300 PSF SURFACE SURCHARGE ADJACENT TO THE WALLS. 11. DO NOT BACKFILL AGAINST CONCRETE WALLS UNTIL WALLS HAVE REACHED THE SPECIFIED DESIGN STRENGTH. CONCRETE REPAIR 1. TAKE MEASURES TO PREVENT DAMAGE TO STRUCTURES DURING REPAIR OPERATIONS. DAMAGE THAT DOES OCCUR SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER. 2. SHORE STRUCTURES TO UNLOAD MEMBERS BEFORE REPAIRING STRUCTURAL ELEMENTS. 3. DO NOT CUT EXISTING REINFORCING BARS AT INTERFACES BETWEEN REPAIR WORK AND EDGES OF EXISTING SURFACES. 4. DAMAGE DUE TO REPAIR OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. FRACTURED CONCRETE SHALL BE REPAIRED WITH A PRESSURE INJECTED EPOXY SYSTEM APPROVED BY THE ENGINEER. 5. PATCH AND FINISH EXPOSED SURFACES TO MATCH THE ADJACENT AREA TO THE SATISFACTION OF THE ENGINEER. DEMOLITION 1. TAKE MEASURES TO PREVENT DAMAGE TO EXISTING STRUCTURES TO REMAIN DURING DEMOLITION. DAMAGE THAT DOES OCCUR SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER. 2. SHORE EXISTING STRUCTURES TO UNLOAD MEMBERS BEFORE REMOVING STRUCTURAL ELEMENTS. 3. DO NOT OVER CUT CORNERS WHEN USING A ROTARY SAW. CORE HOLES AT CORNERS PRIOR TO SAW CUTTING AND CHIP FLUSH AS INDICATED IN THE STANDARD DETAIL 4. DO NOT CUT EXISTING REINFORCING BARS AT INTERFACES WITH NEW WORK. INCORPORATE EXISTING BARS INTO NEW WORK INSOFAR AS PRACTICABLE. REMOVE THOSE REINFORCING BARS WHICH CANNOT BE BENT INTO AREAS OF NEW CONCRETE WORK. 5. INSURE ADJACENT CONCRETE WILL NOT BE FRACTURED WHEN THE CONCRETE TO BE REMOVED IS BROKEN OUT. REMOVE CONCRETE ANCHORS USED TO SECURE CORING EQUIPMENT, AND FILL HOLES WITH NON-SHRINK, NON-METALLIC GROUT. 6. DAMAGE DUE TO DEMOLITION OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. FRACTURED CONCRETE AND MASONRY SHALL BE REPAIRED WITH A PRESSURE INJECTED EPOXY SYSTEM APPROVED BY THE ENGINEER. 7. PATCH AND FINISH EXPOSED SURFACES TO MATCH THE ADJACENT AREA UNLESS OTHERWISE INDICATED OR SPECIFIED.					WATERSTOPS 1. PROVIDE WATERSTOPS WHERE SHOWN ON CONTRACT DOCUMENTS. 2. WATERSTOPS SHALL FORM A CONTINUOUS WATERTIGHT DIAPHRAGM TO PREVENT LEAKAGE. 3. TERMINATE VERTICAL WATERSTOPS THREE INCHES BELOW TOP OF CONCRETE WALLS. 4. PROVIDE 9" BULBED WATERSTOPS IN CONTRACTION AND EXPANSION JOINTS AND 6" RIBBED WATERSTOPS IN CONSTRUCTION JOINTS. 5. USE FACTORY MADE CROSSES, TEES AND ELLS AT ALL CORNERS AND INTERSECTIONS. 6. INSTALL WATERSTOPS IN CONTINUOUS LENGTHS TO MINIMIZE FIELD SPLICES. 7. PROVIDE 1-INCH MINIMUM CLEARANCE BETWEEN WATERSTOPS AND REINFORCING STEEL OR OTHER EMBEDDED ITEMS. 8. SECURE WATERSTOPS IN POSITION WITH TIE WIRE FROM LOOPS OR GROMMETS TO ADJACENT REINFORCEMENT ON BOTH SIDES AT 12 INCHES MAXIMUM SPACING ALONG EACH EDGE. 9. PROTECT EXPOSED WATERSTOP FROM DAMAGE. 10. PROVIDE HYDROPHILIC WATERSTOPS ONLY WHERE INDICATED ON THE DRAWINGS. 11. PROTECT HYDROPHILIC WATERSTOPS FROM BECOMING WET PRIOR TO CONCRETE PLACEMENT. HYDROPHILIC WATERSTOPS THAT HAVE BECOME WET PRIOR TO CONCRETE PLACEMENT SHALL BE REMOVED AND DISCARDED. ALUMINUM 1. STRUCTURAL ALUMINUM TO CONFORM TO ALLOY 6061-T6. DETAILING, FABRICATION AND ERECTION OF STRUCTURAL ALUMINUM SHALL COMPLY WITH ALL APPLICABLE OSHA REGULATIONS. DETAIL AND FABRICATE IN CONFORMANCE WITH THE LATEST ALUMINUM ASSOCIATION DESIGN MANUAL AND THE SPECIFICATIONS AND GUIDELINES FOR STRUCTURES OF ALUMINUM. 2. WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE, AWS D1.2. 3. WELDING SHALL BE BY THE METAL INERT GAS (MIG) OR THE TUNGSTEN INERT GAS (TIG) PROCESS USING 5356 FILLER ALLOY. 4. FIELD CONNECTIONS SHALL BE BOLTED UNLESS WELDING IS INDICATED. FIELD WELDING OF STRUCTURAL MEMBERS IS NOT PERMITTED UNLESS SPECIFICALLY INDICATED. 5. SHOP CONNECTIONS MAY BE BOLTED OR WELDED UNLESS THE CONNECTION METHOD IS INDICATED. 6. PROVIDE ASTM F 593 TYPE 316 STAINLESS STEEL BOLTS FOR BOLTED CONNECTIONS. PROVIDE DRILLED HOLES 1/16" LARGER THAN THE BOLT DIAMETER UNLESS OTHERWISE INDICATED. PROVIDE ASTM F 594 STAINLESS STEEL NUTS WITH STAINLESS STEEL WASHERS IN BOTH OUTER PLIES. 7. SIMPLY SUPPORTED BEAM-TO-COLUMN AND BEAM-TO-BEAM CONNECTIONS SHALL BE MADE WITH DOUBLE ANGLES IN CONFORMANCE WITH THE ALUMINUM ASSOCIATION DESIGN MANUAL UNLESS OTHERWISE INDICATED. 8. DETAIL BRACING MEMBERS TO AVOID ECCENTRIC CONNECTIONS. 9. PROVIDE TEMPORARY BRACING AND STAYS DURING ERECTION TO RESIST VERTICAL AND LATERAL LOADS UNTIL MEMBERS ARE PERMANENTLY FASTENED. 10. PAINT ALUMINUM IN CONTACT WITH CONCRETE WITH ASPHALTIC PAINT OR PROVIDE SHEET NEOPRENE BARRIER. 11. PROVIDE DISSIMILAR METAL PROTECTION AT LOCATIONS WHERE DISSIMILAR METALS ARE IN CONTACT. PROTECT WITH A MINIMUM 4-MIL DRY THICKNESS COAT OF ZINC CHROMATE PRIMER ON THE ALUMINUM SURFACES AND A MINIMUM 2-MIL DRY THICKNESS COAT OF ALL-METAL PRIMER FOLLOWED BY ONE COAT OF MINIMUM 3-MIL DRY THICKNESS ALUMINUM PAINT TO THE DISSIMILAR METAL. 12. USE NON-SHRINK, NON-METALLIC GROUT UNDER BASE AND BEARING PLATES.					ABBREVIATIONS: AB ANCHOR BOLT ADDL ADDITIONAL ALT ALTERNATE ALUM ALUMINUM ARCH ARCHITECTURAL ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS ASTM ASTM INTERNATIONAL BM BEAM BOT, B BOTTOM CJ CONSTRUCTION JOINT CL, CLR CLEAR CL, C CENTERLINE COL COLUMN CONC CONCRETE CONT CONTINUOUS DEG DEGREE DET DETAIL DIA, Ø DIAMETER DIR DIRECTION DN DOWN DWG DRAWING DWL DOWEL EA EACH EF EACH FACE EJ EXPANSION JOINT EL ELEVATION EW EACH WAY EXIST EXISTING FD FLOOR DRAIN FF FAR FACE FIN FINISH FL FLOOR FTG FOOTING GALV GALVANIZE (HOT-DIP) HORIZ, H HORIZONTAL HP HIGH POINT IF INSIDE FACE LG LONG LLH LONG LEG HORIZONTAL LLV LONG LEG VERTICAL LP LOW POINT MAX MAXIMUM MECH MECHANICAL MFR MANUFACTURER MIN MINIMUM NTS NOT TO SCALE OC ON CENTER OF OUTSIDE FACE OPNG OPENING PC PIECE PCF POUNDS PER CUBIC FOOT PJF PREMOLDED JOINT FILLER PROJ PROJECTION PSF POUNDS PER SQUARE FEET PSI POUNDS PER SQUARE INCH SECT SECTION SPECS SPECIFICATIONS SQ SQUARE SSPC STEEL STRUCTURES PAINTING COUNCIL STD STANDARD STL STEEL STRUCT STRUCTURAL SYM SYMMETRICAL T TOP TOC TOP OF CONCRETE TOS TOP OF STEEL TR TREADS TYP TYPICAL UNO UNLESS NOTED OTHERWISE VERT, V VERTICAL WS WATERSTOP, WATER SURFACE WFW WELDED WIRE FABRIC ↔ DIRECTION IN WHICH BARS EXTEND				

FOUNDATION

1. FOUNDATION DESIGNS ARE BASED UPON THE ALLOWABLE ROCK BEARING CAPACITIES OF 8,000 PSF.

2. PERCENT COMPACTION IS DEFINED AS THE RATIO OF THE FIELD DRY DENSITY, DETERMINED BY ASTM D-1556, TO THE MAXIMUM DRY DENSITY, DETERMINED BY ASTM-D 1557 (MODIFIED PROCTOR).

3. ALL FOUNDATIONS SHALL BEAR ON COMPETENT BEDROCK.

4. SPILLWAY UNDULATING ROCK SURFACE SHALL BE PREPARED TO A MAXIMUM SLOPE OF 1H:1V WITH NO OVERHANGS. THE OVERALL ROCK SURFACE SHALL BE SLOPED UPWARD FROM HEEL (UPSTREAM) TO TOE (DOWNSTREAM) BETWEEN 1V:20H AND 1V:10H. ALL LOOSE OR UNSOUND ROCK SHALL BE REMOVED AND ALL DIRT AND DUST SHALL BE REMOVED BY AIR OR WATER BLASTING PRIOR TO CONCRETE OR GROUT PLACEMENT. OPEN JOINTS SHALL BE CLEANED OUT AND FILLED WITH GROUT PRIOR TO SPILLWAY CONCRETE PLACEMENT. ROCK SURFACE SHALL BE OBSERVED BY THE ENGINEER PRIOR TO PLACEMENT OF CONCRETE.

5. TRAINING WALL FOUNDATION UNDULATING ROCK SURFACE SHALL BE CLEARED OF ALL LOOSE OR UNSOUND ROCK AND ALL DIRT AND DUST SHALL BE REMOVED BY AIR OR WATER BLASTING PRIOR TO CONCRETE PLACEMENT.

6. SPILLWAY UNDULATING ROCK SURFACE SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER OF RECORD OR A QUALIFIED INDIVIDUAL INSPECTING ON BEHALF OF THE GEOTECHNICAL ENGINEER OF RECORD.

7. PREPARED UNDULATING ROCK SURFACE SHALL BE COATED WITH A CONCRETE BONDING AGENT PRIOR TO CONCRETE PLACEMENT.

8. DO NOT PLACE FOUNDATION CONCRETE IN WATER OR ON FROZEN OR DISTURBED GROUND.

9. A UNIT WEIGHT OF SOIL OF 130 PCF WAS USED IN THE DESIGN.

10. TRAINING WALLS HAVE BEEN DESIGNED FOR ACTIVE SOIL PRESSURES OF AN EQUIVALENT FLUID LATERAL EARTH PRESSURE OF 43 PCF ABOVE THE MAXIMUM GROUNDWATER ELEVATION AND AN EQUIVALENT FLUID LATERAL EARTH PRESSURE OF 85 PCF BELOW THE MAXIMUM GROUNDWATER ELEVATION PLUS A UNIFORM LATERAL PRESSURE OF 100 PSF TO ACCOUNT FOR A 300 PSF SURFACE SURCHARGE ADJACENT TO THE WALLS.

11. DO NOT BACKFILL AGAINST CONCRETE WALLS UNTIL WALLS HAVE REACHED THE SPECIFIED DESIGN STRENGTH.

CONCRETE REPAIR

1. TAKE MEASURES TO PREVENT DAMAGE TO STRUCTURES DURING REPAIR OPERATIONS. DAMAGE THAT DOES OCCUR SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

2. SHORE STRUCTURES TO UNLOAD MEMBERS BEFORE REPAIRING STRUCTURAL ELEMENTS.

3. DO NOT CUT EXISTING REINFORCING BARS AT INTERFACES BETWEEN REPAIR WORK AND EDGES OF EXISTING SURFACES.

4. DAMAGE DUE TO REPAIR OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. FRACTURED CONCRETE SHALL BE REPAIRED WITH A PRESSURE INJECTED EPOXY SYSTEM APPROVED BY THE ENGINEER.

5. PATCH AND FINISH EXPOSED SURFACES TO MATCH THE ADJACENT AREA TO THE SATISFACTION OF THE ENGINEER.

DEMOLITION

1. TAKE MEASURES TO PREVENT DAMAGE TO EXISTING STRUCTURES TO REMAIN DURING DEMOLITION. DAMAGE THAT DOES OCCUR SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.

2. SHORE EXISTING STRUCTURES TO UNLOAD MEMBERS BEFORE REMOVING STRUCTURAL ELEMENTS.

3. DO NOT OVER CUT CORNERS WHEN USING A ROTARY SAW. CORE HOLES AT CORNERS PRIOR TO SAW CUTTING AND CHIP FLUSH AS INDICATED IN THE STANDARD DETAIL

4. DO NOT CUT EXISTING REINFORCING BARS AT INTERFACES WITH NEW WORK. INCORPORATE EXISTING BARS INTO NEW WORK INSOFAR AS PRACTICABLE. REMOVE THOSE REINFORCING BARS WHICH CANNOT BE BENT INTO AREAS OF NEW CONCRETE WORK.

5. INSURE ADJACENT CONCRETE WILL NOT BE FRACTURED WHEN THE CONCRETE TO BE REMOVED IS BROKEN OUT. REMOVE CONCRETE ANCHORS USED TO SECURE CORING EQUIPMENT, AND FILL HOLES WITH NON-SHRINK, NON-METALLIC GROUT.

6. DAMAGE DUE TO DEMOLITION OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE. FRACTURED CONCRETE AND MASONRY SHALL BE REPAIRED WITH A PRESSURE INJECTED EPOXY SYSTEM APPROVED BY THE ENGINEER.

7. PATCH AND FINISH EXPOSED SURFACES TO MATCH THE ADJACENT AREA UNLESS OTHERWISE INDICATED OR SPECIFIED.



PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

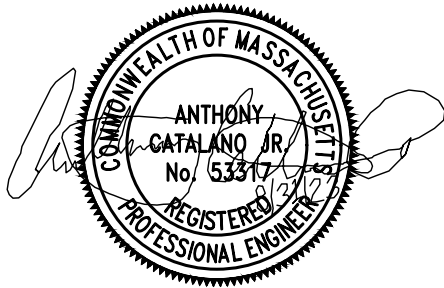
CLIENT

Massachusetts Department
of Conservation and
Recreation

251 Causeway Street, Suite 600
Boston, MA 02114-2119
617.626.1250 tel 617.626.1351 fax
www.mass.gov/orgs/departement-of-conservation-recreation

CONSULTANT

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ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60604936

Designed By:	J. PRIVITERA
Drawn By:	A. CATALANO
Dept Check:	M. MALENFANT
Proj Check:	D. GOVE
Date:	JUNE 2022
Scale:	AS NOTED

DISCIPLINE

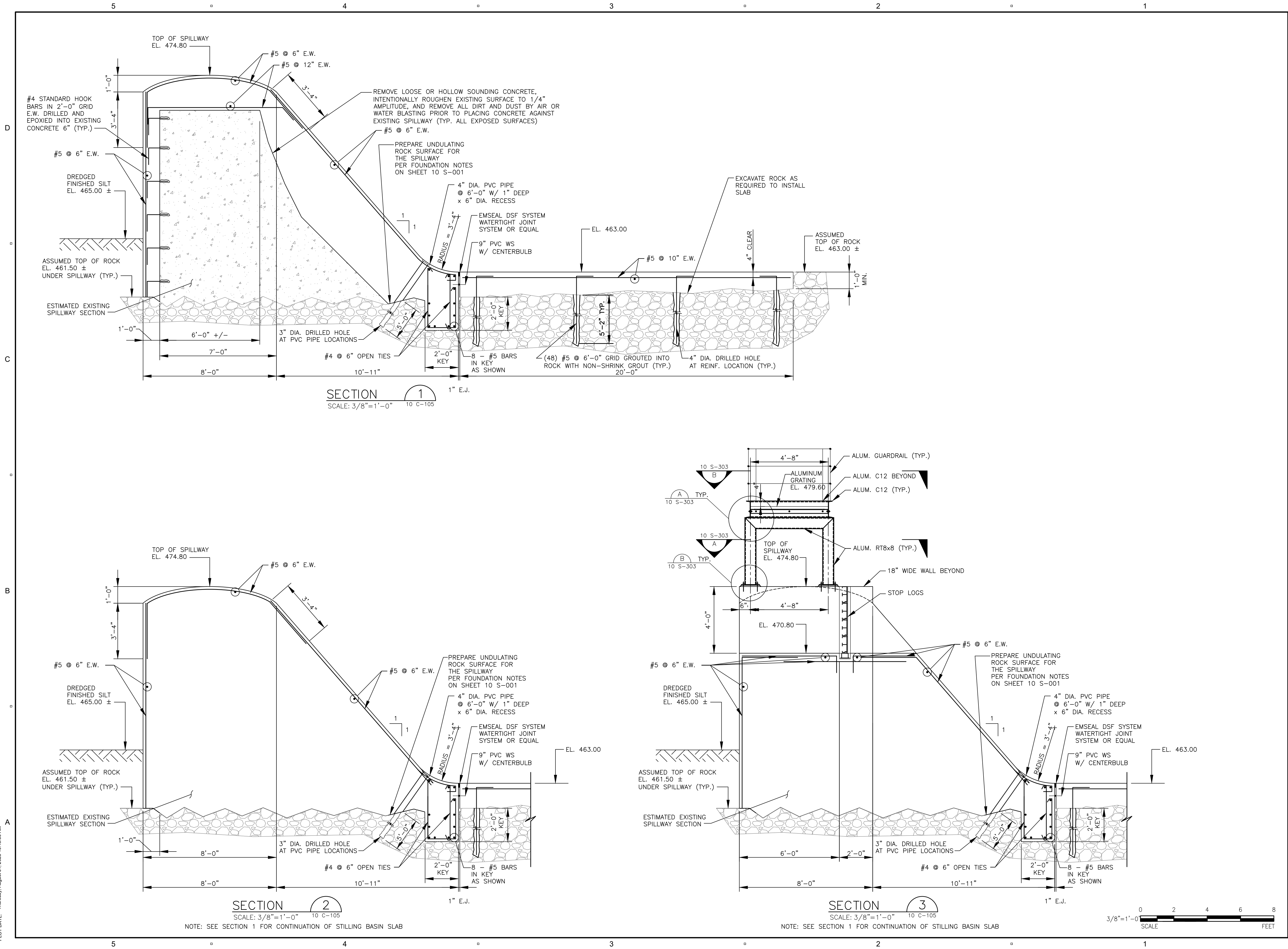
STRUCTURAL
SHEET TITLE

STRUCTURAL NOTES AND
STANDARD DETAILS

SHEET NUMBER

00 S-001

LAST UPDATE: Thursday, August 31, 2023 10:31:57 AM
PLOT DATE: Thursday, August 31, 2023 10:48:36 AM



AECOM

PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

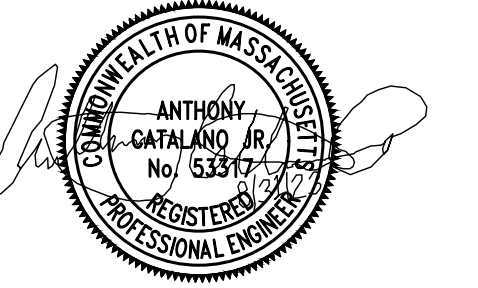
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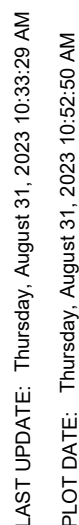
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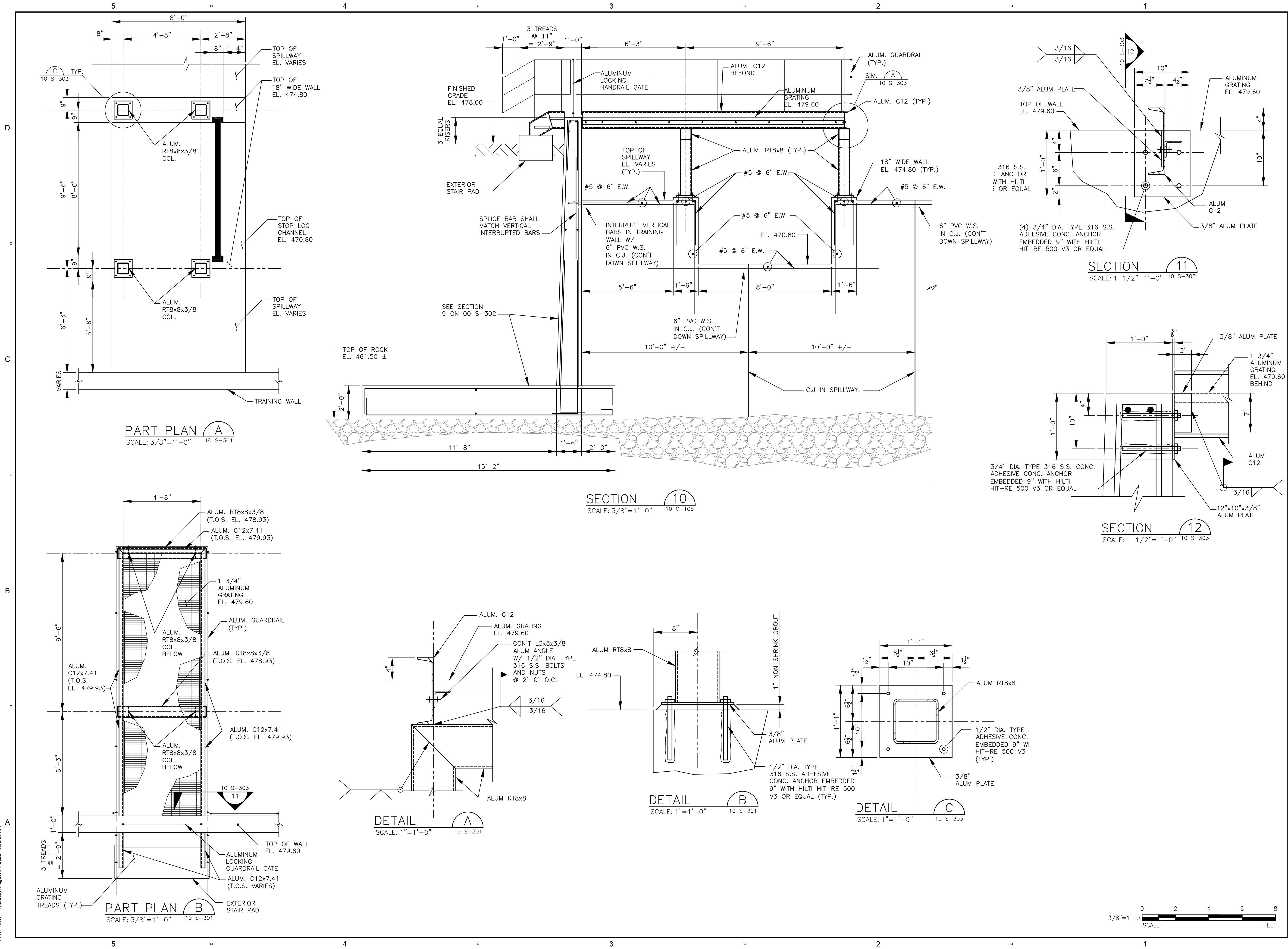
SHEET TITLE

SECTIONS I

SHEET NUMBER

10 S-301





PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
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Dept Check: M. MALENFANT

Proj Check: D. GOVE

Date: JUNE 2022

Scale: AS NOTED

DISCIPLINE

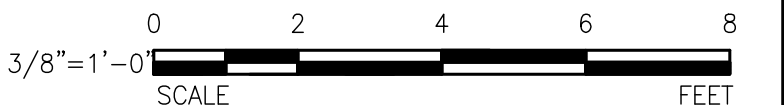
STRUCTURAL

SHEET TITLE

SECTIONS III

SHEET NUMBER

10 S-303



LAST UPDATE: Thursday, August 31, 2023 10:37:24 AM
PLOT DATE: Thursday, August 31, 2023 10:57:06 AM

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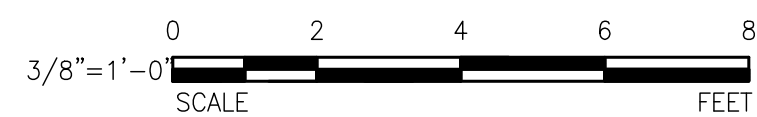
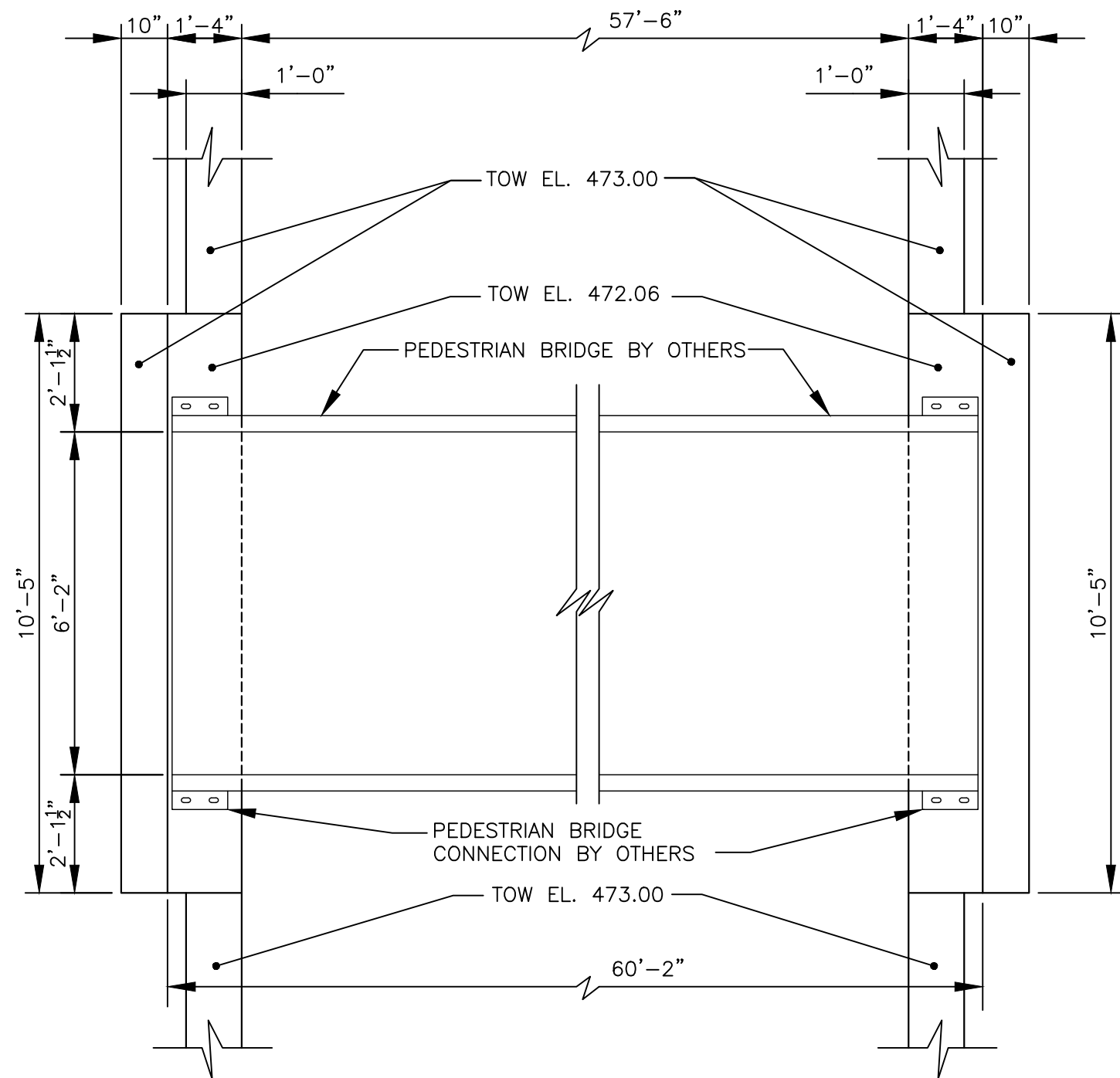
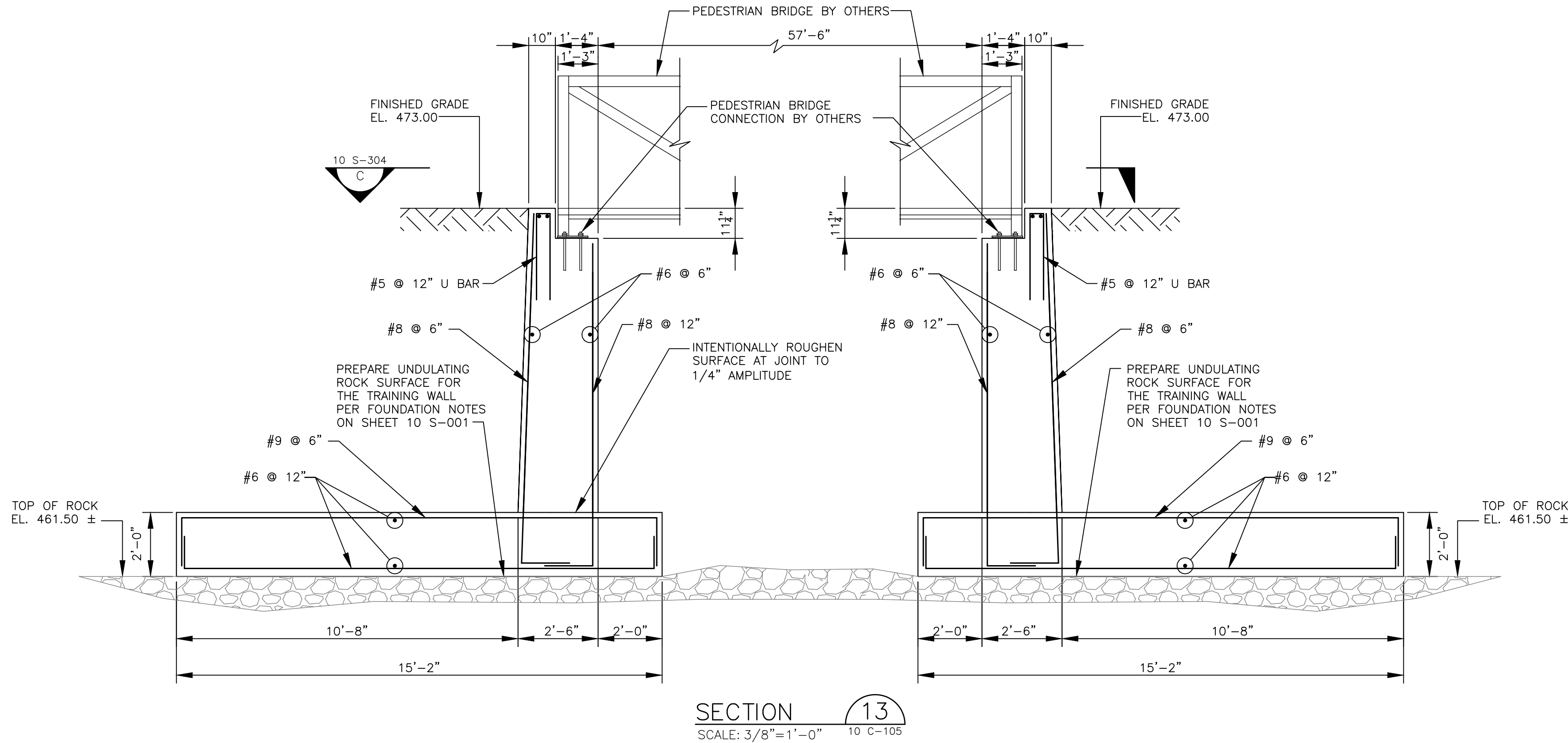
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PROJECT

MASS DCR
ABANDONED DAMS
LOWES POND DAM
CONTRACT NO.
P19-3264-D4A

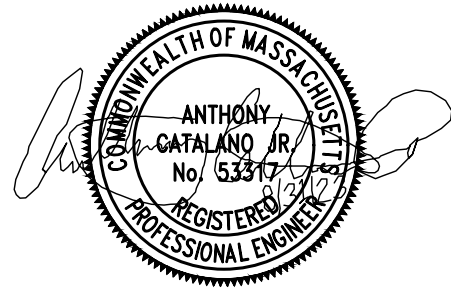
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DISCIPLINE

STRUCTURAL
SHEET TITLE

SECTIONS IV

SHEET NUMBER

10 S-304

D

C

B

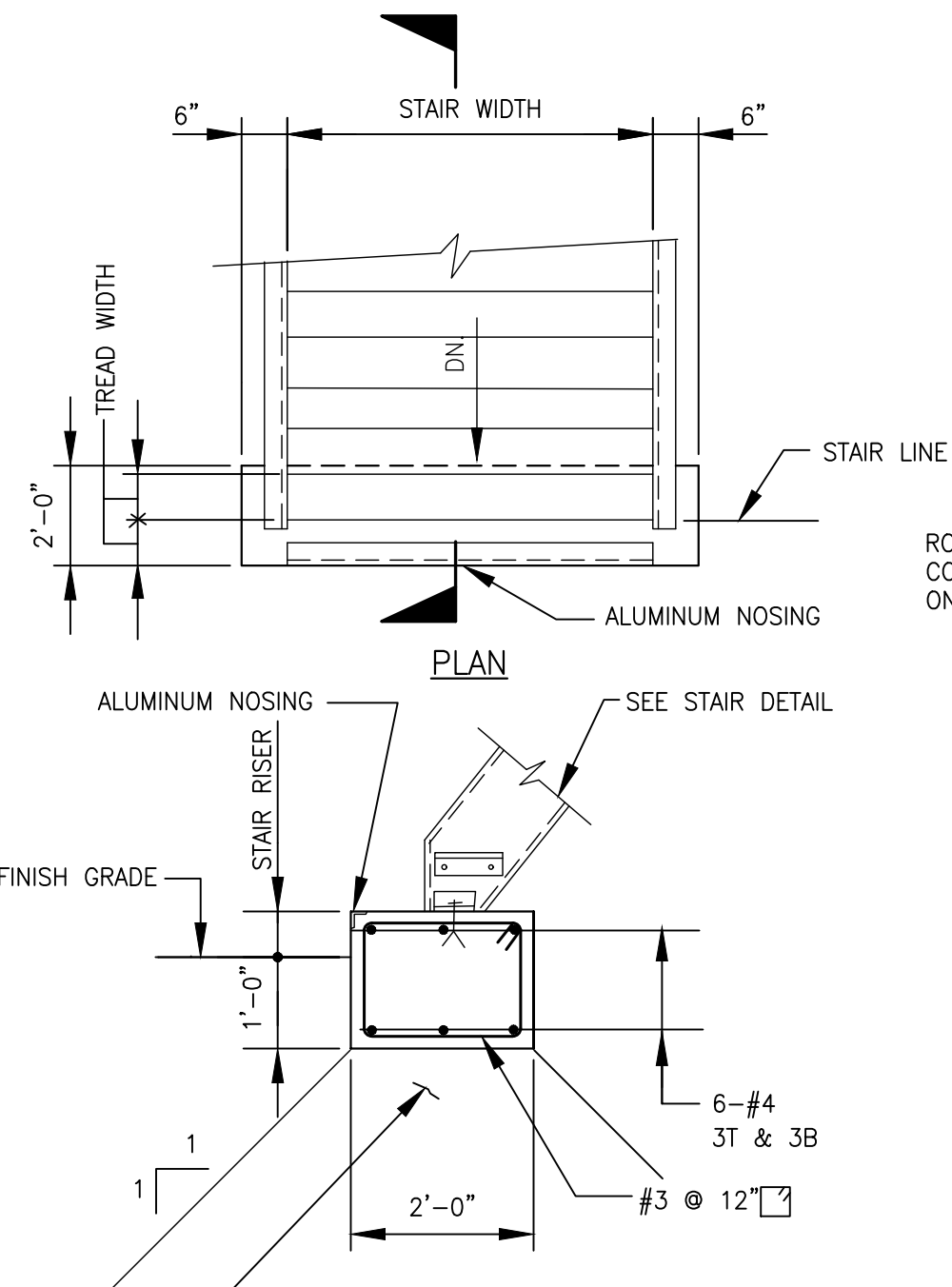
A

CLEAR CONCRETE COVER FOR CAST-IN-PLACE CONCRETE OVER REINFORCEMENT (INCHES)					
MEMBER	EXPOSURE CONDITIONS				
	AIR	WEATHER	AIR OVER LIQUID	EARTH OR STONE	LIQUIDS
FOOTINGS AND FOUNDATION MATS	2"	2"	—	2" * 3" •	2"
WALLS	2"	2"	2"	2"	2"

- * TOP FACE AND SIDES
- BOTTOM FACE

CONCRETE COVER FOR CAST-IN-PLACE CONCRETE OVER REINFORCEMENT

NTS

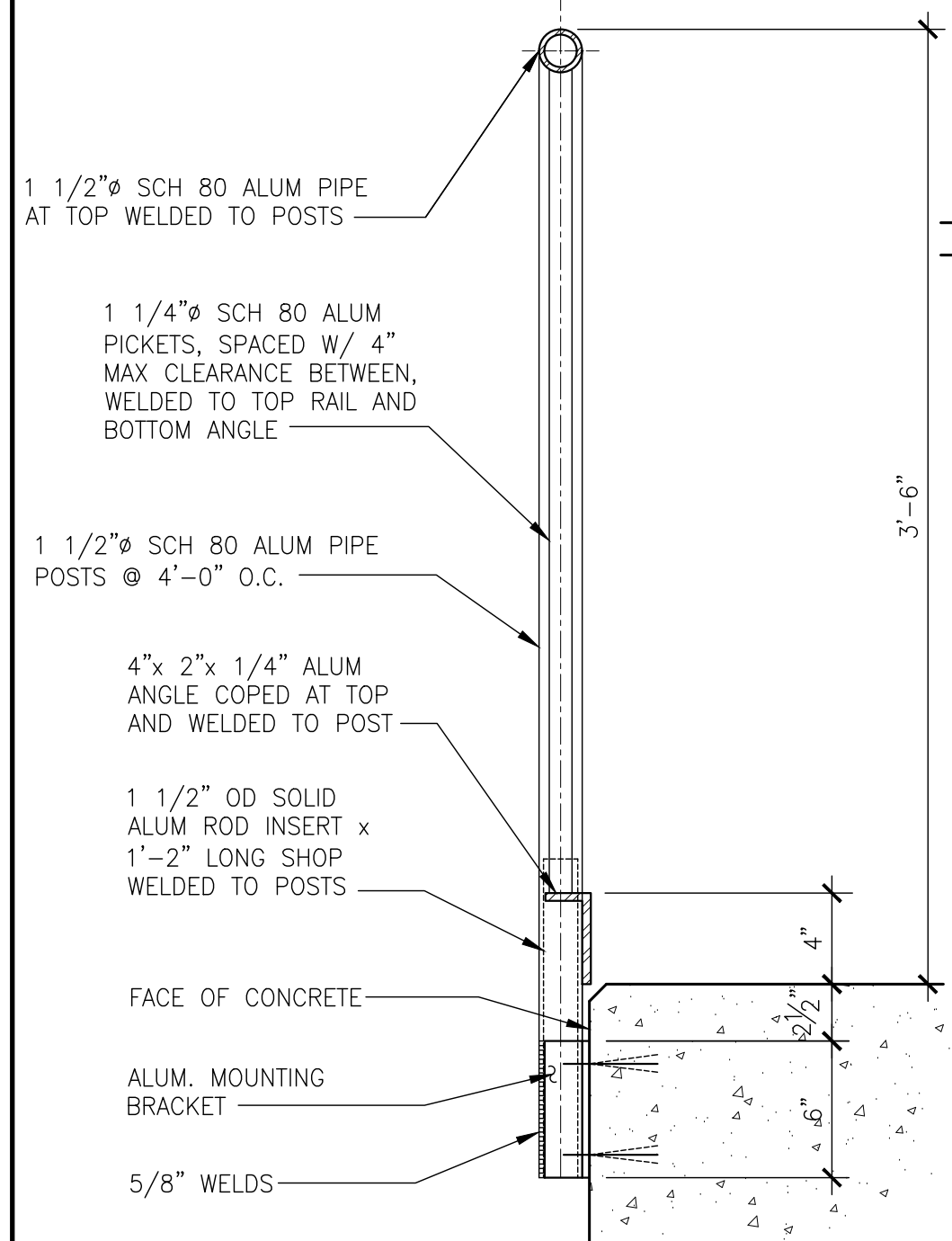


PROVIDE 4'-0" IN SIX 8" LAYERS OF FREE DRAINING, NON-FROST SUSCEPTIBLE GRAVEL BACKFILL HAVING NOT MORE THAN 5% BY WEIGHT PASSING NO.200 SIEVE. COMPACT EACH LAYER TO 95% OF MAXIMUM DENSITY.

SECTION

EXTERIOR STAIR PAD

NTS



SIDE MOUNTED ALUMINUM GUARDRAIL

SCALE: 1 1/2" = 1'-0"

REINFORCING BAR DEVELOPMENT PER ACI 318				
$f'_c = 4,500 \text{ psi}$		$f_y = 60,000 \text{ psi}$		
BAR SIZE	BASIC TENSION DEVELOPMENT	TOP BAR DEVELOPMENT	COMPRESSION DEVELOPMENT	STANDARD HOOK DEVELOPMENT
# 3 (10)	1'-2"	1'-6"	1'-0"	7"
# 4 (13)	1'-7"	2'-1"	1'-3"	9"
# 5 (16)	2'-0"	2'-7"	1'-7"	1'-0"
# 6 (19)	2'-4"	3'-1"	1'-11"	1'-2"
# 7 (22)	3'-5"	4'-6"	2'-2"	1'-5"
# 8 (25)	3'-11"	5'-2"	2'-6"	1'-7"
# 9 (29)	4'-5"	5'-10"	2'-10"	1'-9"

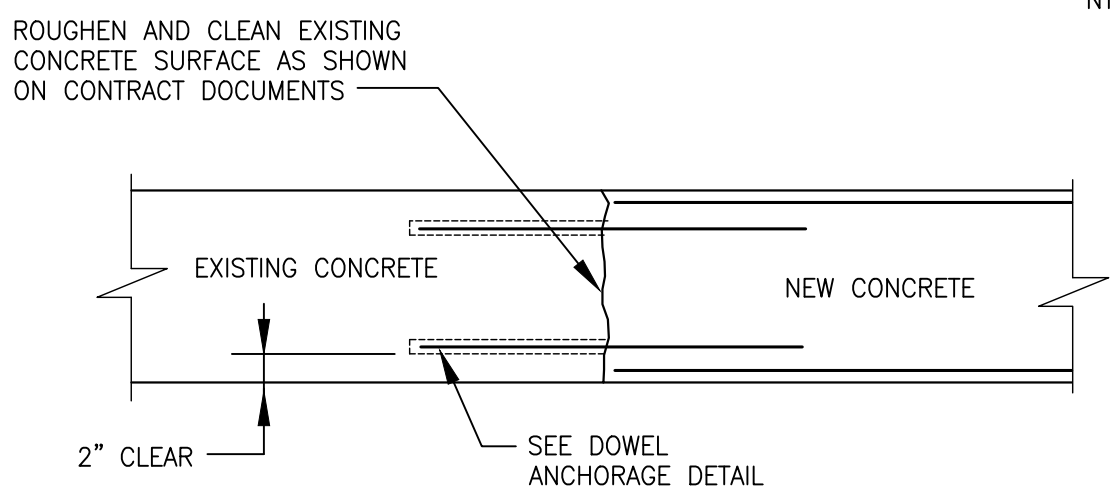
TABULATED VALUES ARE FOR UNCOATED BARS AND NORMAL WEIGHT CONCRETE.

TOP BARS ARE HORIZONTAL REINFORCEMENT PLACED SUCH THAT MORE THAN 12" OF CONCRETE IS PLACED BELOW THE BAR.

TABULATED VALUES ARE FOR BARS WHICH HAVE AT LEAST 1 1/4" OF CLEAR CONCRETE COVER AND ARE SPACED AT LEAST 3" ON CENTER. SPLICE LENGTHS FOR BARS NOT CONFORMING TO EITHER OF THESE CONDITIONS SHALL BE INCREASED 50%.

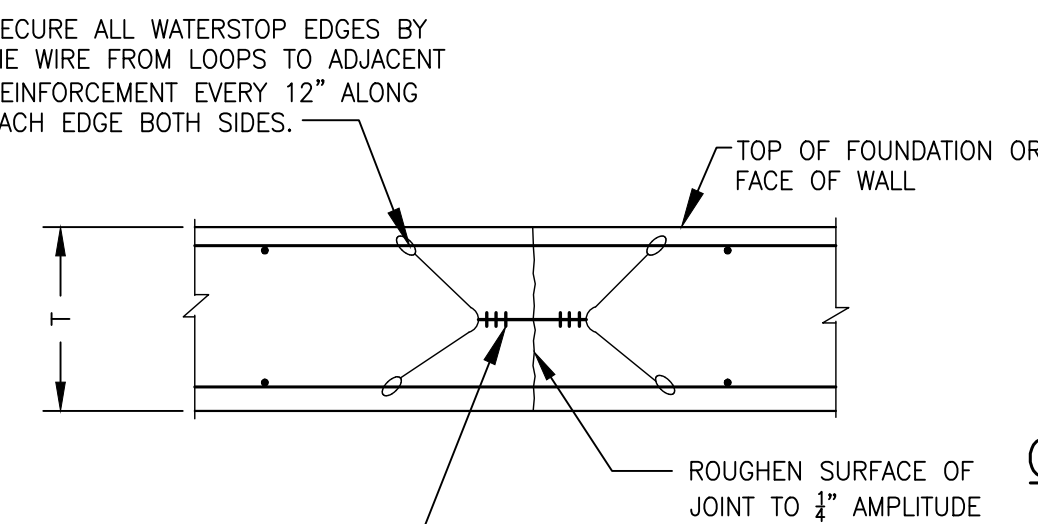
REINFORCING BAR DEVELOPMENT

NTS



BONDING NEW CONCRETE TO EXISTING CONCRETE

NTS



CONSTRUCTION JOINT WITH WATERSTOP

NTS

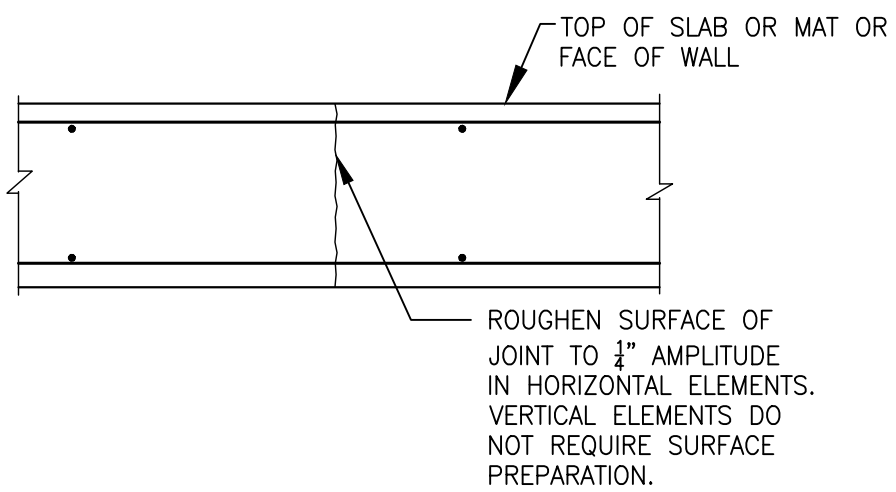
REINFORCING BAR SPLICES PER ACI 318			
$f'_c = 4,500 \text{ psi}$		$f_y = 60,000 \text{ psi}$	
BAR SIZE (METRIC)	CLASS "B" SPLICE		COMPRESSION SPLICE
	TOP BARS	OTHER BARS	
# 3 (10)	2'-0"	1'-6"	1'-0"
# 4 (13)	2'-8"	2'-1"	1'-3"
# 5 (16)	3'-4"	2'-7"	1'-7"
# 6 (19)	4'-0"	3'-1"	1'-11"
# 7 (22)	5'-10"	4'-6"	2'-2"
# 8 (25)	6'-8"	5'-2"	2'-6"
# 9 (29)	7'-7"	5'-10"	2'-10"

TABULATED VALUES ARE FOR NORMAL WEIGHT CONCRETE AND UNCOATED BARS THAT HAVE AT LEAST 1 1/4" OF CLEAR CONCRETE COVER AND ARE SPACED AT LEAST 3" ON CENTER.

TOP BARS ARE HORIZONTAL REINFORCEMENT PLACED SUCH THAT MORE THAN 12" OF CONCRETE IS PLACED BELOW THE BAR.

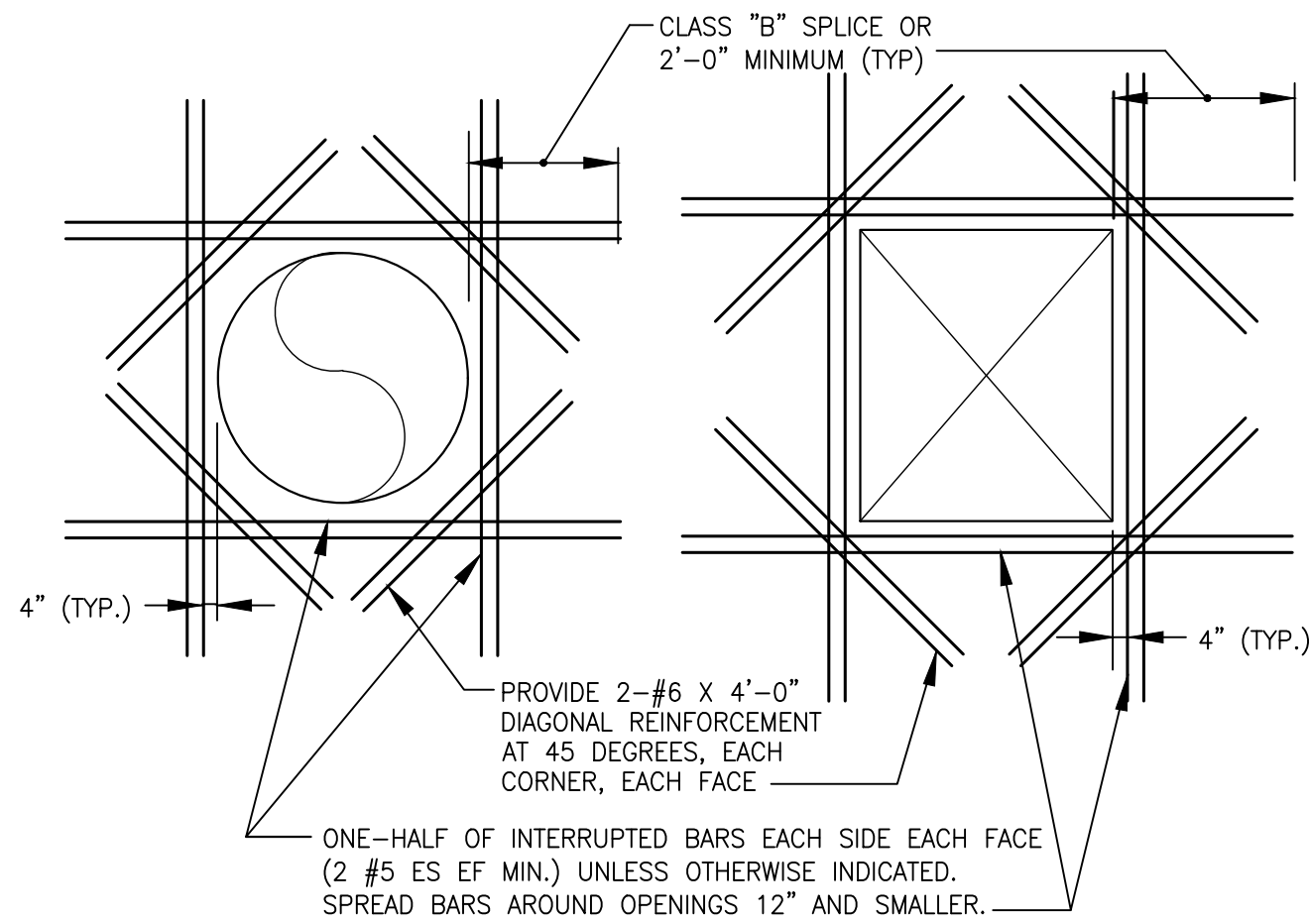
REINFORCING BAR SPLICES

NTS



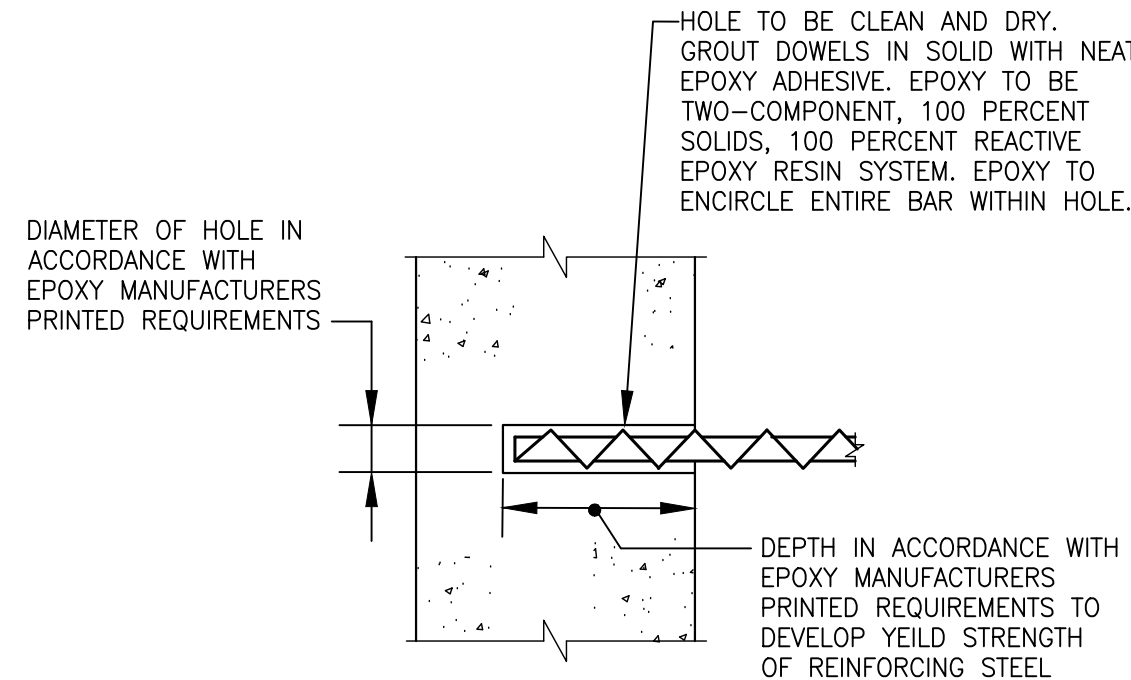
CONSTRUCTION JOINT WITHOUT WATERSTOP

NTS
(REV. 4-19-13)



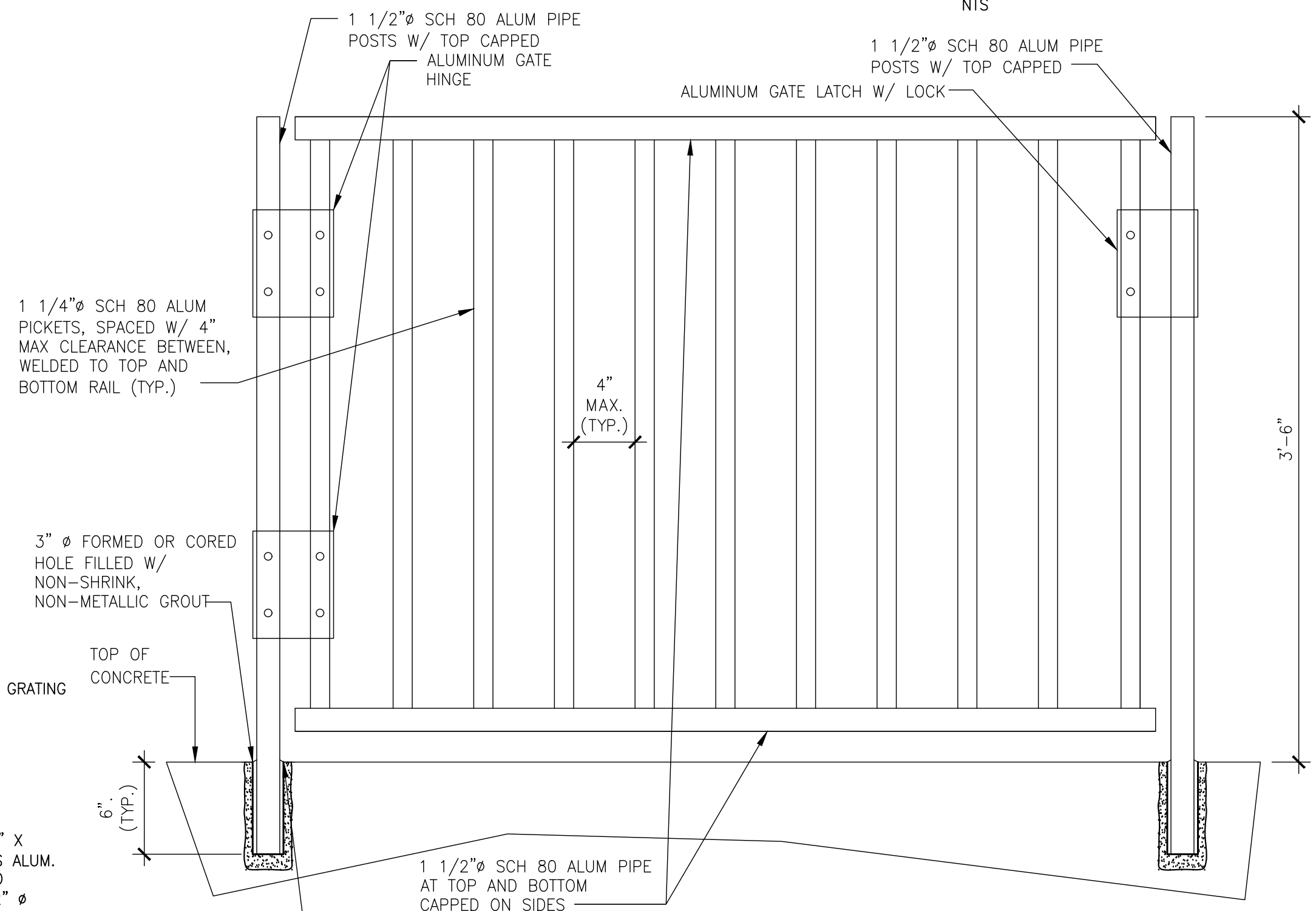
ADDITIONAL REINFORCEMENT FOR ROUND AND RECTANGULAR OPENINGS

NTS



DOWEL ANCHORAGE INTO EXISTING CONCRETE

NTS



ALUMINUM LOCKING GUARDRAIL GATE

NTS

3 RAIL ALUMINUM GUARDRAIL AT GRATING PLATFORM

NTS

AECOM

PROJECT

MASS DCR
ABANDONED DAMS
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DISCIPLINE

STRUCTURAL
SHEET TITLE

STRUCTURAL STANDARD
DETAILS I

SHEET NUMBER

99 S-501