The District Engineer has received a permit application to conduct work in waters of the United States from the Massachusetts Department of Transportation (MassDOT) – Highway Division, 10 Park Plaza, Boston, Massachusetts 02116. This work is proposed in the French River, Little River, Texas Pond, nine unnamed intermittent streams, and associated vegetated wetlands along an approximately 3.2 mile long stretch of Route 20 in Charlton and Oxford, Massachusetts, from the intersection with Richardson Corner Road in Charlton to the intersection with Route 12 in Oxford. The site coordinates are: Latitude 42.167587°N, Longitude 71.893884°W.

The work includes the discharge of fill material into waters of the United States, including 58,476 square feet (1.3 acres) of permanent impacts to vegetated wetlands, 27,765 square feet (0.6 acres) of temporary impacts to vegetated wetlands, 16,612 square feet (0.4 acres) of permanent stream impacts, and 1,150 square feet (0.03 acres) of temporary stream impacts, resulting from improvements to the roadway corridor. The purpose of this project is to improve safety, geometry, and traffic operations within the project corridor. The proposed work includes the following components:

- Widening of Route 20 to provide two, 11’ wide lanes with 2’ median shoulders and 4’ curbside shoulders in each direction (plus ten 12’ wide emergency pull-off areas)
- Realignment of Oxbow Road and reconstruction of its intersection with Route 20
- Construction of a shared-use path along the north side of the road between Route 12 and Oxbow Road
- Construction of a sidewalk along the south side of the road between Routes 12 and 56
- Replacement of the bridges over the Little River and French River, including installation of scour protection
- Replacement of seven existing cross culverts conveying intermittent streams/wetland flow

Permanent Section 404 impacts associated with this project would result primarily from roadway widening, realignment, and associated retaining wall construction, as well as bridge and culvert replacement, including installation of scour countermeasures. Temporary Section 404 impacts would result primarily from temporary work zones and construction access, as well as cofferdams and dewatering within streams.

The work is shown on the enclosed plans entitled “ROUTE 20 RECONSTRUCTION PROJECT MASSACHUSETTS DEPARTMENT OF TRANSPORTATION ROUTE 20 (BRIDGE NO. C-06-023) (BRIDGE NO. O-06-002) IN THE TOWNS OF CHARLTON – OXFORD WORCESTER COUNTY MASSACHUSETTS ACOE SECTION 404 PERMIT PLANS”, on 59 sheets, and dated “NOVEMBER 2021”.

The project has been designed to avoid and minimize impacts to waters of the United States, including wetlands, through the use of various best management practices, including the installation of erosion and
sedimentation controls at the project limits, and the use of steeper slopes (with guardrails) or retaining walls adjacent to wetlands to limit grading and encroachment into wetland areas. As mitigation for unavoidable impacts, the applicant proposes offsite preservation of a 42-acre parcel in Charlton and Oxford containing a mix of upland and wetland habitats, as well as the creation of a 1.61-acre wetland area within the larger preservation parcel.

AUTHORITY
Permits are required pursuant to:

   ____  Section 10 of the Rivers and Harbors Act of 1899
   ___  Section 404 of the Clean Water Act
   X   Section 103 of the Marine Protection, Research and Sanctuaries Act.

The decision whether to issue a permit will be based on an evaluation of the probable impact of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which may reasonably accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are: conservation, economics, aesthetics, general environmental concerns, wetlands, cultural value, fish and wildlife values, flood hazards, flood plain value, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers, New England District (Corps), is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. The Corps will consider all comments received to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Where the activity involves the discharge of dredged or fill material into waters of the United States or the transportation of dredged material for the purpose of disposing it in ocean waters, the evaluation of the impact of the activity in the public interest will also include application of the guidelines promulgated by the Administrator, U.S Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act, and/or Section 103 of the Marine Protection Research and Sanctuaries Act of 1972, as amended.

NATIONAL HISTORIC PRESERVATION ACT

The Federal Highway Administration (FHWA) is the lead federal agency responsible for coordination pursuant to Section 106 of the National Historic Preservation Act. MassDOT has concluded coordination with the State Historic Preservation Officer (SHPO) and relevant Tribal Historic Preservation Officers (THPOs) on behalf of the FHWA. Although FHWA has taken the lead on this consultation, based on his initial review, the District Engineer has determined that little likelihood exists for the proposed work to impinge upon properties with cultural or Native American significance, or listed in, or eligible for listing in, the National Register of Historic Places. The Corps will continue review and consultation as required to fulfill the requirements of the National
Historic Preservation Act as part of the permit review process.

ENDANGEROSED SPECIES CONSULTATION

FHWA is the lead federal agency responsible for coordination pursuant to Section 7 of the Endangered Species Act. Although FHWA is the lead federal agency, the Corps has reviewed the application for the potential impact on Federally-listed threatened or endangered species and their designated critical habitat pursuant to section 7 of the Endangered Species Act as amended. It is our preliminary determination that the proposed activity for which authorization is being sought is designed, situated or will be operated/used in such a manner that it is not likely to adversely affect a listed species or their critical habitat. FHWA is coordinating with the U.S. Fish and Wildlife Service on listed species under their jurisdiction and the ESA consultation will be concluded prior to the final decision.

OTHER GOVERNMENT AUTHORIZATIONS

The following authorizations have been applied for, or have been, or will be obtained:  
(X) Permit, license or assent from State.  
(X) Permit from local wetland agency or conservation commission.  
(X) Water Quality Certification in accordance with Section 401 of the Clean Water Act.

COMMENTS

In order to properly evaluate the proposal, we are seeking public comment. Anyone wishing to comment is encouraged to do so. Comments should be submitted in writing by the above date. If you have any questions, please contact Dan Vasconcelos at (978) 318-8653, (800) 343-4789 or (800) 362-4367, if calling from within Massachusetts.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for a public hearing shall specifically state the reasons for holding a public hearing. The Corps holds public hearings for the purpose of obtaining public comments when that is the best means for understanding a wide variety of concerns from a diverse segment of the public.

The initial determinations made herein will be reviewed in light of facts submitted in response to this notice. All comments will be considered a matter of public record. Copies of letters of objection will be forwarded to the applicant who will normally be requested to contact objectors directly in an effort to reach an understanding.

THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK.

Paul M. Maniccia  
Chief, Permits and Enforcement Branch  
Regulatory Division
If you would prefer not to continue receiving Public Notices by email, please contact Ms. Tina Chaisson at (978) 318-8058 or e-mail her at bettina.m.chaisson@usace.army.mil. You may also check here (   ) and return this portion of the Public Notice to: Bettina Chaisson, Regulatory Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751.

NAME: _____________________________________________
ADDRESS: __________________________________________
PHONE: _____________________________________________
GENERAL NOTES
1. COORDINATES, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, (NAD 83/2011), EPOCH 2010.00
2. ELEVATIONS, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN DATUM OF 1988 (NAVD 88)

ABBREVIATIONS

LEGEND

EXISTING

PROPOSED

DESCRIPTION

UTILITY POLE
BUSH
TREE
STUMP
WATER GATE
WETLAND FLAG
OVERHEAD CABLE/WIRE
CURBING
BALANCED STONE WALL
GUARD RAIL - STEEL POSTS
BR-2 BRIDGE RAIL
CHAIN LINK OR METAL FENCE
WOOD FENCE
EROSION CONTROL
TREE LINE
TOP OR BOTTOM OF SLOPE
PROPOSED RETAINING WALL
ORDINARY HIGH WATER
VEGETATED WETLAND
STATE HIGHWAY LAYOUT
TOWN OR TOWN LAYOUT
COUNTY LAYOUT
TOWN OR TOWN BOUNDARY LINE
APPROXIMATE PROPERTY LINE
100-YEAR FLOODWAY BOUNDARY
VEGETATED WETLANDS
WATERWAYS
PROPOSED MODIFIED ROCKFILL
PROPOSED CONSERVATION PARCEL
PROPOSED WETLAND REPLACEMENT AREA
PROPOSED WW REALIGNMENT
PERMANENT IMPACT (LOSS) TO WW = 422 LF
PERMANENT IMPACT TO WW = 423 LF
PERMANENT IMPACT TO WW = 1,430 LF
WITH IN-KIND RESTORATION
TEMPORARY IMPACT TO WW = 85 LF
PERMANENT IMPACT TO VW = 58,476 SF
TEMPORARY IMPACT TO VW = 27,765 SF

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

CHARLOTION - OXFORD

NOVEMBER 2021

SHEET TITLE
GENERAL NOTES, LEGEND, AND ABBREVIATION

SHEET# 2
TOTAL SHEETS 59
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
VICINITY MAP

SCALE: 1 = 2000'

TOTAL SHEETS
59
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT TITLE
CHARLTON - OXFORD

PROJECT LOCATION
PERMIT PLAN - 3

DATE
NOVEMBER 2021

SHEET TITLE
SHEET #
TOTAL SHEETS

SCALE: 1 = 50'
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
PERMIT PLAN - 11

TOTAL SHEETS
59

 SCALE: 1 = 50'
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
PERMIT PLAN - 18

SHEET# 26
TOTAL SHEETS 59

SCALE: 1 = 50'
PROPOSED RETAINING WALL
PROPOSED MEDIAN
PROPOSED GUARDRAIL
PROPOSED 8' SHARED USE PATH (TYP)
PROPOSED 5' SIDEWALK (TYP)
PROPOSED EROSION CONTROL (TYP)
PROPOSED UTILITY EASEMENT (TYP)
PROPOSED TEMP EASEMENT (TYP)

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
PERMIT PLAN - 20

SHEET# 28
TOTAL SHEETS 59

SCALE: 1 = 50'
1047+00 Proposed Route 20 Alignment

1048+50 Proposed Route 20 Alignment

NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

EXISTING ROADWAY
PROPOSED ROADWAY
VEGETATED WETLANDS
WATERWAYS
TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS (IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS
PERMANENT IMPACT (LOSS) TO WW

PROJECT TITLE: MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION: CHARLTON - OXFORD

DATE: NOVEMBER 2021
SHEET#: 32
TOTAL SHEETS: 59

SCALE: 1 = 20'
NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS (IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS
PERMANENT IMPACT (LOSS) TO WW
1079+50 Proposed Route 20 Alignment

1080+19.80 Proposed Route 20 Alignment (skew)

NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS (IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS
PERMANENT IMPACT (LOSS) TO WW

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
CROSS SECTION -5

SCALE: 1 = 20'
1087+00 Proposed Route 20 Alignment

1090+80 Proposed Route 20 Alignment

NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS (IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT TITLE
CHARLTON - OXFORD
DATE NOVEMBER 2021

SHEET TITLE CROSS SECTION -6

SCALE: 1 = 20'

TOTAL SHEETS 59

PROJECT LOCATION:
SHEET# 36

RETAINING WALL
WETLAND ROW
WETLAND BB
ROW
EROSION CONTROL
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

NOTE:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

PROJECT TITLE:
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

DATE:
NOVEMBER 2021

SHEET TITLE:
CROSS SECTION -7

PROJECT LOCATION:
CHARLTON - OXFORD

SHEET#:
37

TOTAL SHEETS:
59

SCALE: 1 = 20'
NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

SCALE: 1 = 20'

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
CROSS SECTION -8

SHEET# 38
TOTAL SHEETS 59
NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS
(IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT (LOSS) TO WW

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
CROSS SECTION -9

SCALE: 1 = 20'

SHEET# 39
TOTAL SHEETS 59
Notes:
Color is intended to convey horizontal extent of impacts and not intended to depict an impact depth.
502+07.55 Proposed Oxbow Road Alignment (skew)

NOTES:
COLOR IS INTENDED TO CONVEY HORIZONTAL EXTENT OF IMPACTS AND NOT INTENDED TO DEPICT AN IMPACT DEPTH.

TEMPORARY IMPACT TO WATERWAYS
TEMPORARY IMPACT TO WETLANDS
PERMANENT IMPACT TO WATERWAYS (IN-KIND RESTORATION)
PERMANENT IMPACT TO WETLANDS
PERMANENT IMPACT (LOSS) TO WW

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SCALE: 1 = 20'

SHEET TITLE
CROSS SECTION -11

TOTAL SHEETS
59

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

DATE
NOVEMBER 2021

SHEET TITLE
CROSS SECTION -11

TOTAL SHEETS
59
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION: CHARLTON - OXFORD

DATE: NOVEMBER 2021

SHEET TITLE: CONSERVATION PARCEL

SHEET#: 44
TOTAL SHEETS: 59

SCALE: 1 = 500'

TEMPORARY CONSTRUCTION ACCESS
PROPOSED WETLAND REPLICAATION AREA
PROPOSED 42 ACRE CONSERVATION PARCEL
PERMANENT PUBLIC ACCESS
PROPOSED CULVERT 4A
SEE SHEET 53 FOR DETAIL

PROPOSED CULVERT 4B
SEE SHEET 54 FOR DETAIL

PROPOSED GRAVEL BED
RIFFLE-POOL CHANNEL

PROPOSED COBBLE AND
WOOD STEP

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

CHARLTON - OXFORD

NOVEMBER 2021

STREAM RESTORATION
SECTIONS

SCALE: 1 = 20'
CULVERT 3

PROPOSED CB
ROUTE 20
EXISTING GRADE

APPROXIMATE
DRIVEWAY GRADE

PROPOSED DMH

APPROXIMATE
PROPOSED FINISHED
GRADE

PROPOSED RETAINING
WALL

PROPOSED RIPRAPH AND
OUTLET PROTECTION

APPROXIMATE OAK
DRIVE GRADE

START INVERT 596.04

583.5 585.8 587.0 589.8 591.0 592.4 594.2 594.4 595.1 597.4 599.0 600.5 601.7

PROPOSED CB

88 LF - 24" RCP

139 LF - 24" RCP

5.10%

67 LF - 24" RCP

115 LF - 24" RCP

5.10%

PROPOSED CULVERT 3 (TYP)
SEE SHEET 52 FOR DETAIL

596.04

667.00

0+00 1+00 2+00 3+00 4+00 5+00 6+00

PROPOSED DMH

PROPOSED CB

PROPOSED CB

NAVD 88
BASE ELEV
560.00

0 20 40 60 80

VER. SCALE IN FEET

0 100 200 300 400

HOR. SCALE IN FEET

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

CHARLTON - OXFORD

NOVEMBER 2021

48 59
TYPICAL CHANNEL RESTORATION
CROSS SECTION
NOT TO SCALE

PROJECT TITLE
MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20

PROJECT LOCATION:
CHARLTON - OXFORD

DATE
NOVEMBER 2021

SHEET TITLE
STREAMBED/BANK
RESTORATION DETAIL

SHEET# 49
TOTAL SHEETS 59
NOTES:
1. WALL, FLOOR, TOP SLAB THICKNESS, AND REINFORCING AS REQUIRED FOR H-25 LOADING.
2. THE STREAMBED RESTORATION SHALL REPLICATE THE EXISTING NATURAL CHANNEL BED FOUND OUTSIDE THE WORK AREA IN TERMS OF MATERIAL, ROUGHNESS, SHAPE, PROFILE, AND APPEARANCE.
3. EXISTING STREAMBED MATERIAL EXCAVATED FROM OUTLET PROTECTION AREAS AND THOSE LOCATIONS OF PERMANENT WATERWAY IMPACTS SHALL BE STOCKPILED TO FACILITATE REINSTALLATION AND REPLICATION OF THE NATURAL STREAMBED. THE EXCAVATED STREAMBED MATERIAL SHALL BE REUSED TO FILL THE VOIDS IN THE PROPOSED ARMORING MATERIAL.
4. ADDITIONAL STREAMBED MATERIAL SHALL BE LOCALLY SOURCED AND MATCH THE COMPOSITION OF THE EXISTING NATIVE RIVERBED.
5. THE PROPOSED CULVERT AND STREAMBED RESTORATION IS REQUIRED TO COMPLY WITH ALL ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.

CULVERT 1
CROSS SECTION
NOT TO SCALE
NOTES:
1. WALL, FLOOR, TOP SLAB THICKNESS, AND REINFORCING AS REQUIRED FOR H-25 LOADING.
2. THE STREAMBED RESTORATION SHALL REPLICATE THE EXISTING NATURAL CHANNEL BED FOUND OUTSIDE THE WORK AREA IN TERMS OF MATERIAL, ROUGHNESS, SHAPE, PROFILE, AND APPEARANCE.
3. EXISTING STREAMBED MATERIAL EXCAVATED FROM OUTLET PROTECTION AREAS AND THOSE LOCATIONS OF PERMANENT WATERWAY IMPACTS SHALL BE STOCKPILED TO FACILITATE REINSTALLATION AND REPLICAATION OF THE NATURAL STREAMBED. THE EXCAVATED STREAMBED MATERIAL SHALL BE REUSED TO FILL THE VOIDS IN THE PROPOSED ARMORING MATERIAL.
4. ADDITIONAL STREAMBED MATERIAL SHALL BE LOCALLY SOURCED AND MATCH THE COMPOSITION OF THE EXISTING NATIVE RIVERBED.
5. THE PROPOSED CULVERT AND STREAMBED RESTORATION IS REQUIRED TO COMPLY WITH ALL ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.

MASSDOT PROJECT 602659
RECONSTRUCTION OF ROUTE 20
CHARLTON - OXFORD
NOVEMBER 2021
CULVERT DETAIL - 2

CULVERT 2
CROSS SECTION
NOT TO SCALE
NOTES:
1. WALL, FLOOR, TOP SLAB THICKNESS, AND REINFORCING AS REQUIRED FOR H-25 LOADING.
2. THE STREAMBED RESTORATION SHALL REPLICATE THE EXISTING NATURAL CHANNEL BED FOUND OUTSIDE THE WORK AREA IN TERMS OF MATERIAL, ROUGHNESS, SHAPE, PROFILE, AND APPEARANCE.
3. EXISTING STREAMBED MATERIAL EXCAVATED FROM OUTLET PROTECTION AREAS AND THOSE LOCATIONS OF PERMANENT WATERWAY IMPACTS SHALL BE STOCKPILED TO FACILITATE REINSTALLATION AND REPICALATION OF THE NATURAL STREAMBED.
4. THE PROPOSED CULVERT AND STREAMBED RESTORATION IS REQUIRED TO COMPLY WITH ALL ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.
NOTES:
1. WALL, FLOOR, TOP SLAB THICKNESS, AND REINFORCING AS REQUIRED FOR H-25 LOADING.
2. THE STREAMBED RESTORATION SHALL REPLICATE THE EXISTING NATURAL CHANNEL BED FOUND OUTSIDE THE WORK AREA IN TERMS OF MATERIAL, ROUGHNESS, SHAPE, PROFILE, AND APPEARANCE.
3. EXISTING STREAMBED MATERIAL EXCAVATED FROM OUTLET PROTECTION AREAS AND THOSE LOCATIONS OF PERMANENT WATERWAY IMPACTS SHALL BE STOCKPILED TO FACILITATE REINSTALLATION AND REPLICATION OF THE NATURAL STREAMBED. THE EXCAVATED STREAMBED MATERIAL SHALL BE REUSED TO FILL THE VOIDS IN THE PROPOSED ARMORING MATERIAL.
4. ADDITIONAL STREAMBED MATERIAL SHALL BE LOCALLY SOURCED AND MATCH THE COMPOSITION OF THE EXISTING NATIVE RIVERBED.
5. THE PROPOSED CULVERT AND STREAMBED RESTORATION IS REQUIRED TO COMPLY WITH ALL ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.

CULVERT 4A
CROSS SECTION
NOT TO SCALE
NOTES:
1. WALL, FLOOR, TOP SLAB THICKNESS, AND REINFORCING AS REQUIRED FOR H-25 LOADING.
2. THE STREAMBED RESTORATION SHALL REPLICATE THE EXISTING NATURAL CHANNEL BED FOUND OUTSIDE THE WORK AREA IN TERMS OF MATERIAL, ROUGHNESS, SHAPE, PROFILE, AND APPEARANCE.
3. EXISTING STREAMBED MATERIAL EXCAVATED FROM OUTLET PROTECTION AREAS AND THOSE LOCATIONS OF PERMANENT WATERWAY IMPACTS SHALL BE STOCKPILED TO FACILITATE REINSTALLATION AND REPLICATION OF THE NATURAL STREAMBED. THE EXCAVATED STREAMBED MATERIAL SHALL BE REUSED TO FILL THE VOIDS IN THE PROPOSED ARMORING MATERIAL.
4. ADDITIONAL STREAMBED MATERIAL SHALL BE LOCALLY SOURCED AND MATCH THE COMPOSITION OF THE EXISTING NATIVE RIVERBED.
5. THE PROPOSED CULVERT AND STREAMBED RESTORATION IS REQUIRED TO COMPLY WITH ALL ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.
APPROPRIATE BRIDGE RAIL

FILL VOIDS IN RIPRAP WITH FINER AGGREGATE
(SEE NOTE 3)

PLACE BENCH AT OR SLIGHTLY ABOVE TOP OF BANK ELEVATION

EXISTING ROCK SLOPE

RIPRAPH

3-5'

ELEVATION PROFILE: MID-SLOPE WILDLIFE PASSAGE BENCH

APPROPRIATE BRIDGE RAIL

VARIES MATCH EXISTING BANK ON EAST ABUTMENTS

INSTALL WILDLIFE PASSAGE BENCH AT TOP OF BANK ADJACENT TO BRIDGE ABUTMENT
(SEE NOTE 4)

BANKFULL WIDTH

6" LAYER OF NATURAL STREAM BANK MATERIAL

COMPACTED SUBGRADE

FILL VOIDS IN RIPRAP WITH FINER AGGREGATE
(SEE NOTE 3)

ELEVATION PROFILE: ADJACENT TO ABUTMENT WILDLIFE PASSAGE BENCH

NOTES:

1. THIS IS A CONCEPTUAL DRAWING INTENDED TO ILLUSTRATE TYPICAL BANK DESIGNS.

2. ALL MATERIALS, DIMENSIONS, AND OTHER NOTATIONS SHOWN ON THIS DRAWING ARE FOR ILLUSTRATIVE PURPOSES. THE D-B ENTITY SHALL DETERMINE ACTUAL MATERIALS, DIMENSIONS, AND OTHER INFORMATION PERTINENT TO THE PROJECT LOCATION, CONDITIONS, AND SELECTED STRUCTURE COMPONENTS.

3. AGGREGATE USED TO FILL VOIDS IN RIPRAP CAN BE UNIFORM MIX OF GRAVEL, COBBLES, AND SMALL BOULDERS TO CONSTRUCT A WALKABLE SLOPE THAT REPLICAES A NATURAL BANK PROFILE.

4. WILDLIFE PASSAGE BENCH CONSTRUCTED OF NATURAL GRAVEL, COBBLE AND BOULDER MATERIAL IN ACCORDANCE WITH STREAMBED RESTORATION SPECIFICATIONS. THE BENCH SHALL BE A 6" THICK LAYER OF NATURAL BANK MATERIAL, AND SHALL PROVIDE A WALKABLE SLOPE THAT REPLICAES A NATURAL BANK PROFILE.