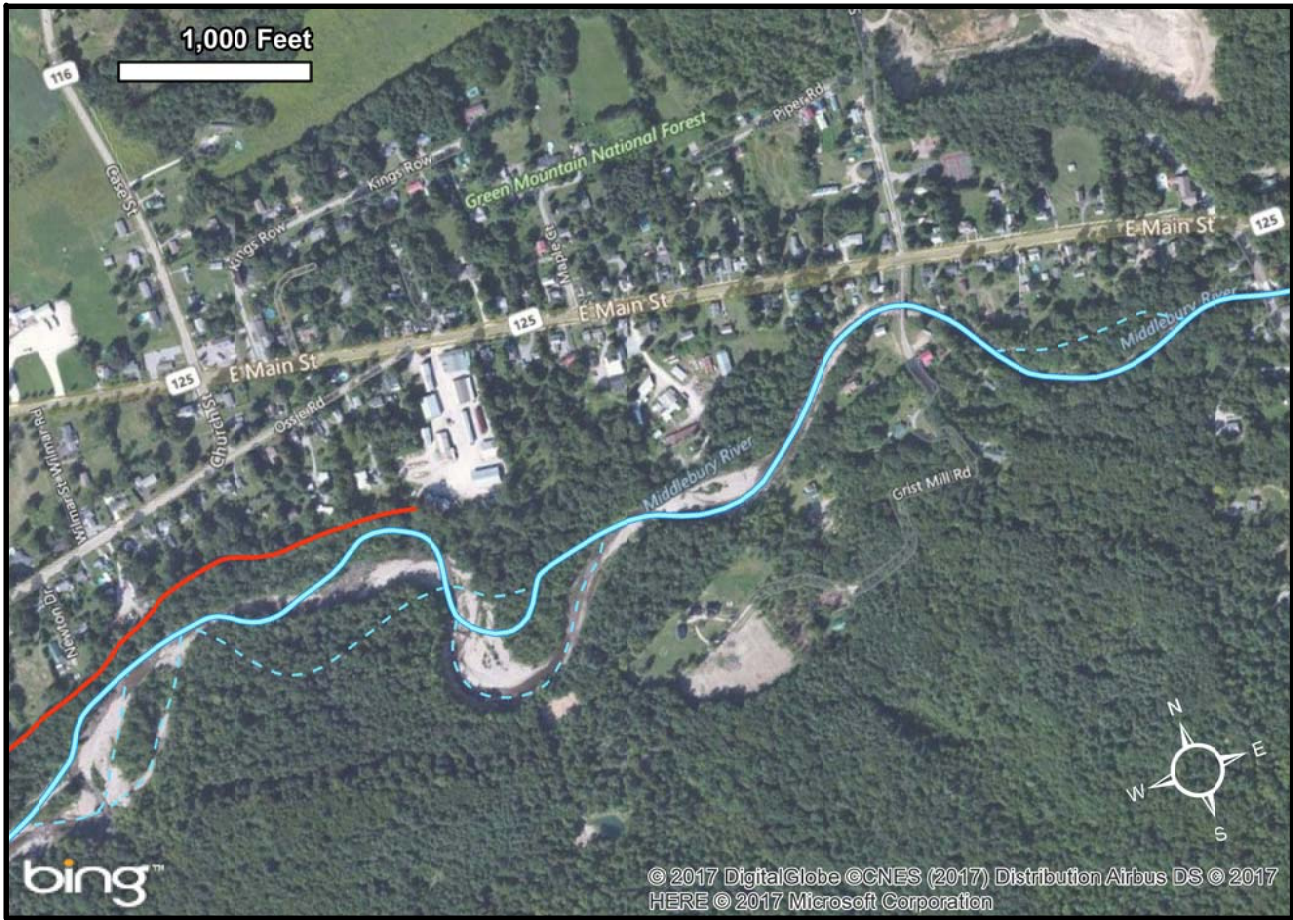


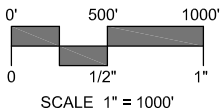
MIDDLEBURY RIVER FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

PRELIMINARY DESIGN
JANUARY 11, 2018

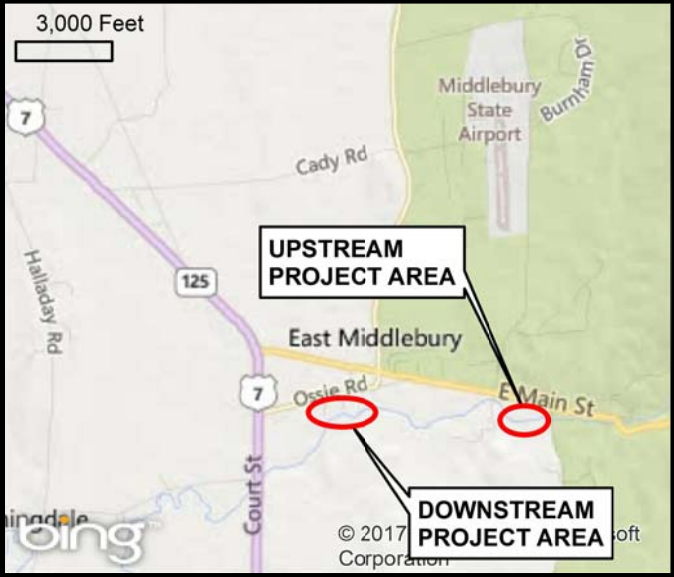


PROJECT SITE VICINITY MAP:



PREPARED BY:

 **MILONE & MACBROOM®**
1 South Main Street - 2nd Floor
Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mminc.com



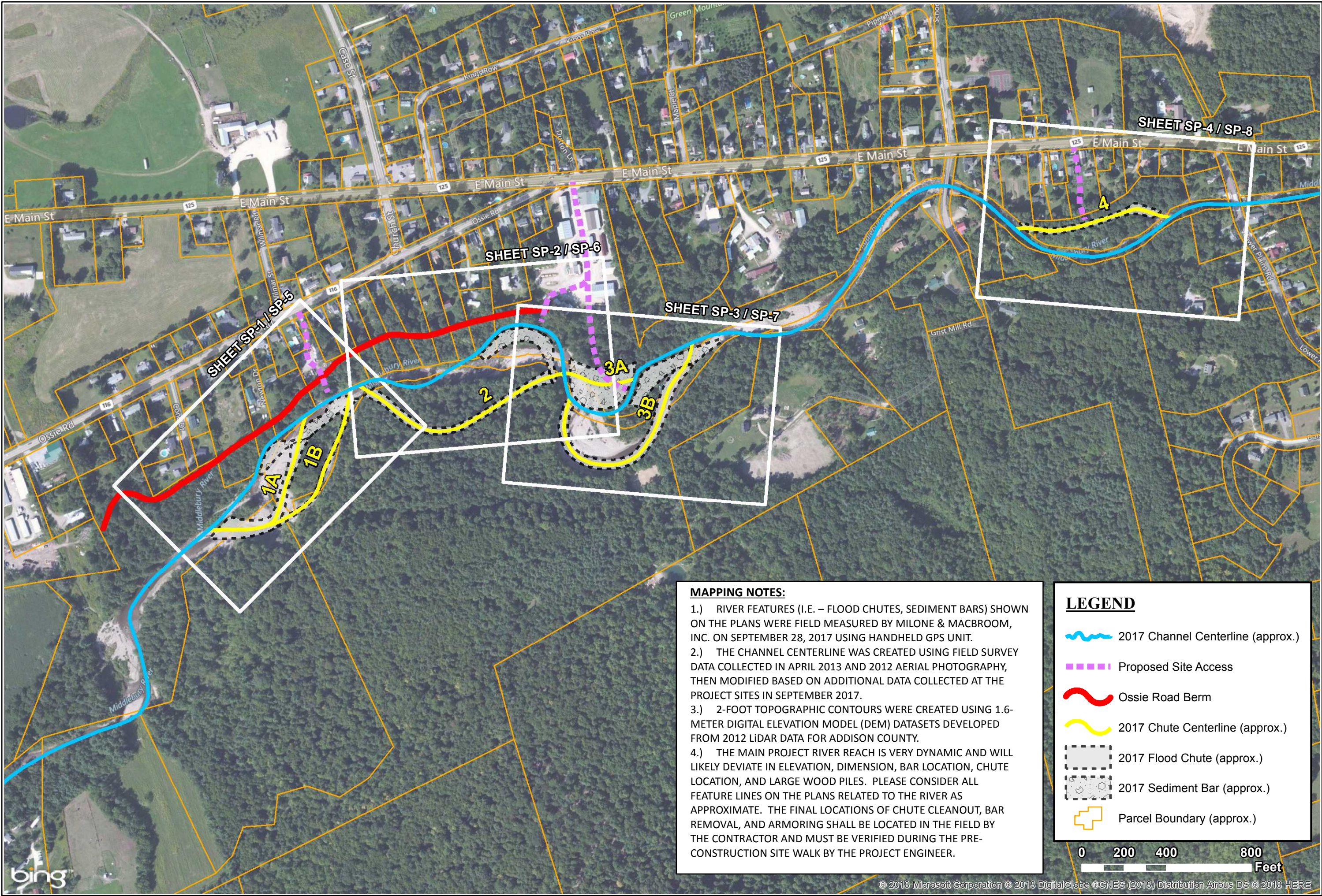
LOCATION MAP:
1" = 6,000 FT

PREPARED FOR:

TOWN OF MIDDLEBURY
94 MAIN STREET
MIDDLEBURY, VERMONT 05753

LIST OF DRAWINGS:








NO.	NAME	TITLE
01	---	TITLE SHEET
02	OV-1	OVERVIEW PLAN
03	SP-1	SITE PLAN - EXISTING CONDITIONS - CHUTE 1A / 1B
04	SP-2	SITE PLAN - EXISTING CONDITIONS - CHUTE 2
05	SP-3	SITE PLAN - EXISTING CONDITIONS - CHUTE 3A / 3B
06	SP-4	SITE PLAN - EXISTING CONDITIONS - CHUTE 4
07	SP-5	SITE PLAN - PROPOSED CONDITIONS - CHUTE 1A / 1B
08	SP-6	SITE PLAN - PROPOSED CONDITIONS - CHUTE 2
09	SP-7	SITE PLAN - PROPOSED CONDITIONS - CHUTE 3A / 3B
10	SP-8	SITE PLAN - PROPOSED CONDITIONS - CHUTE 4
11	DE-1	DETAILS



MAPPING NOTES:

- 1.) RIVER FEATURES (I.E. – FLOOD CHUTES, SEDIMENT BARS) SHOWN ON THE PLANS WERE FIELD MEASURED BY MILONE & MACBROOM, INC. ON SEPTEMBER 28, 2017 USING HANDHELD GPS UNIT.
- 2.) THE CHANNEL CENTERLINE WAS CREATED USING FIELD SURVEY DATA COLLECTED IN APRIL 2013 AND 2012 AERIAL PHOTOGRAPHY, THEN MODIFIED BASED ON ADDITIONAL DATA COLLECTED AT THE PROJECT SITES IN SEPTEMBER 2017.
- 3.) 2-FOOT TOPOGRAPHIC CONTOURS WERE CREATED USING 1.6-METER DIGITAL ELEVATION MODEL (DEM) DATASETS DEVELOPED FROM 2012 LIDAR DATA FOR ADDISON COUNTY.
- 4.) THE MAIN PROJECT RIVER REACH IS VERY DYNAMIC AND WILL LIKELY DEViate IN ELEVATION, DIMENSION, BAR LOCATION, CHUTE LOCATION, AND LARGE WOOD PILES. PLEASE CONSIDER ALL FEATURE LINES ON THE PLANS RELATED TO THE RIVER AS APPROXIMATE. THE FINAL LOCATIONS OF CHUTE CLEANOUT, BAR REMOVAL, AND ARMORING SHALL BE LOCATED IN THE FIELD BY THE CONTRACTOR AND MUST BE VERIFIED DURING THE PRE-CONSTRUCTION SITE WALK BY THE PROJECT ENGINEER.

LEGEND

-  2017 Channel Centerline (approx.)
-  Proposed Site Access
-  Ossie Road Berm
-  2017 Chute Centerline (approx.)
-  2017 Flood Chute (approx.)
-  2017 Sediment Bar (approx.)
-  Parcel Boundary (approx.)

0 200 400 800 Feet

PROJECT OVERVIEW MAP

**MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT**

EAST MIDDLEBURY, VERMONT

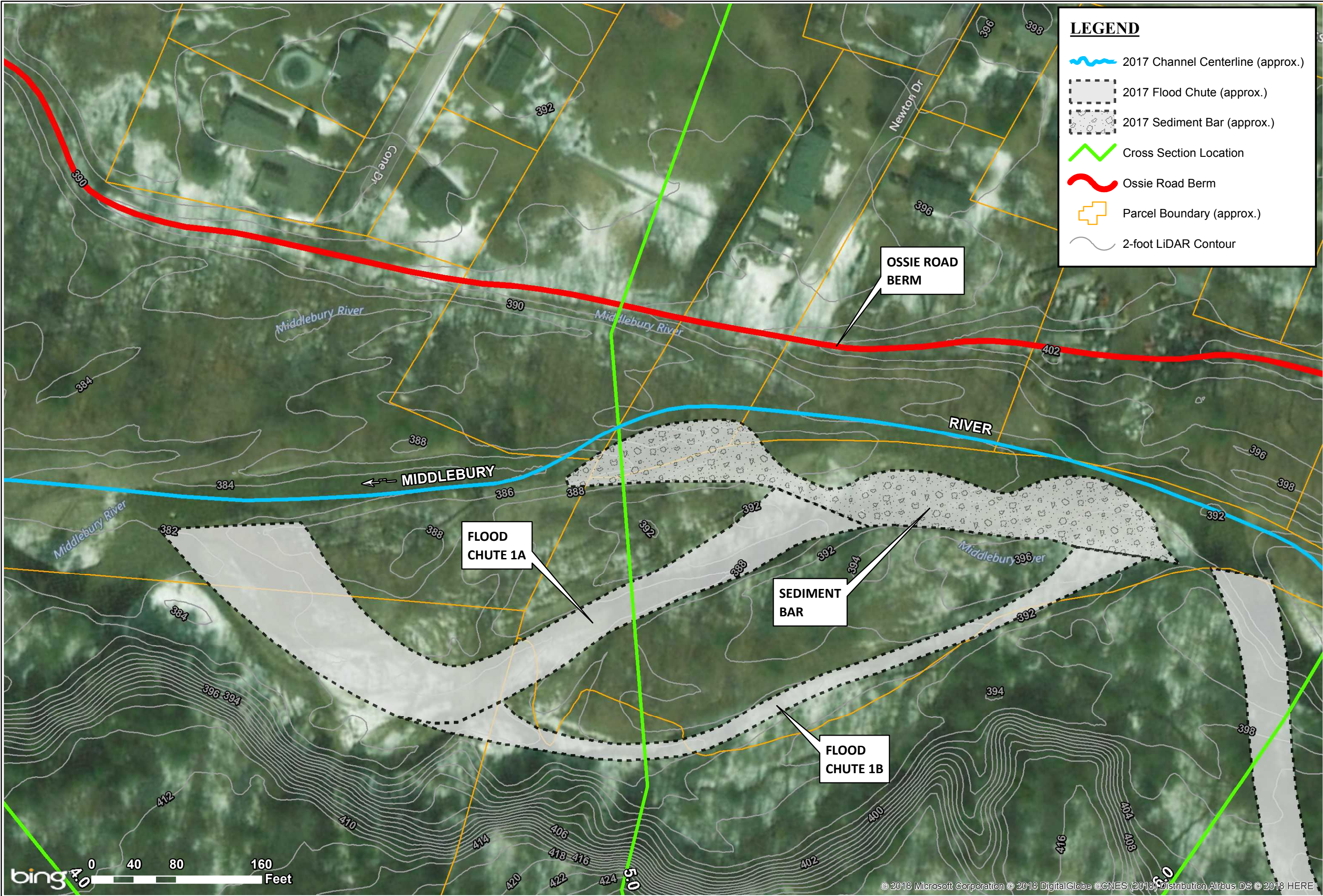
Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_OV1.mxd
1st Version: Jan. 11, 2018
Revision: ---
Scale: 1 in = 400 ft

OV-1

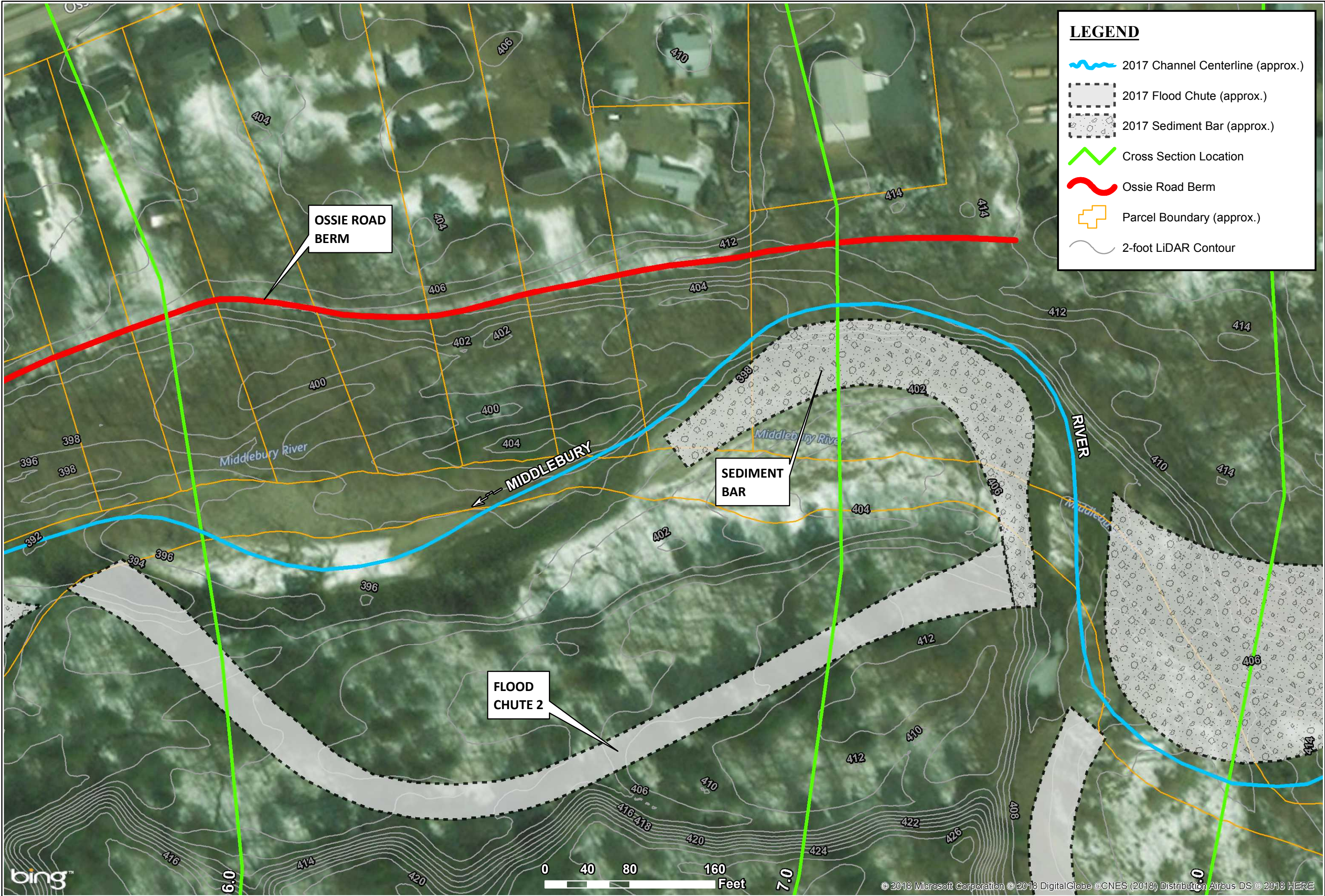
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Engineering, Architecture
and Environmental Science
1 South Main Street, 2nd Floor
Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mninc.com

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.6M LIDAR DEM





<p>SOURCE(S):</p> <p>Parcel Data - VCGI Aerial Photo - Bing Maps Contour Data - 2012 1.6M LiDAR DEM</p>		<p>SITE PLAN - EXISTING CONDITIONS - CHUTE 1A / 1B</p> <p>MIDDLEBURY RIVER</p> <p>FLOOD MITIGATION PROJECT</p> <p>EAST MIDDLEBURY, VERMONT</p>	<p>Map By: BMC MMI#: 5032-02-2 MXD: EMR-Prelim_SP1.mxd 1st Version: Jan. 11, 2018 Revision: --- Scale: 1 in = 80 ft</p>
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LEGEND

2017 Channel Centerline (approx.)

2017 Flood Chute (approx.)

2017 Sediment Bar (approx.)

Cross Section Location

Ossie Road Berm

Parcel Boundary (approx.)

2-foot LiDAR Contour

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and Environmental Science

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SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.6M LiDAR DEM

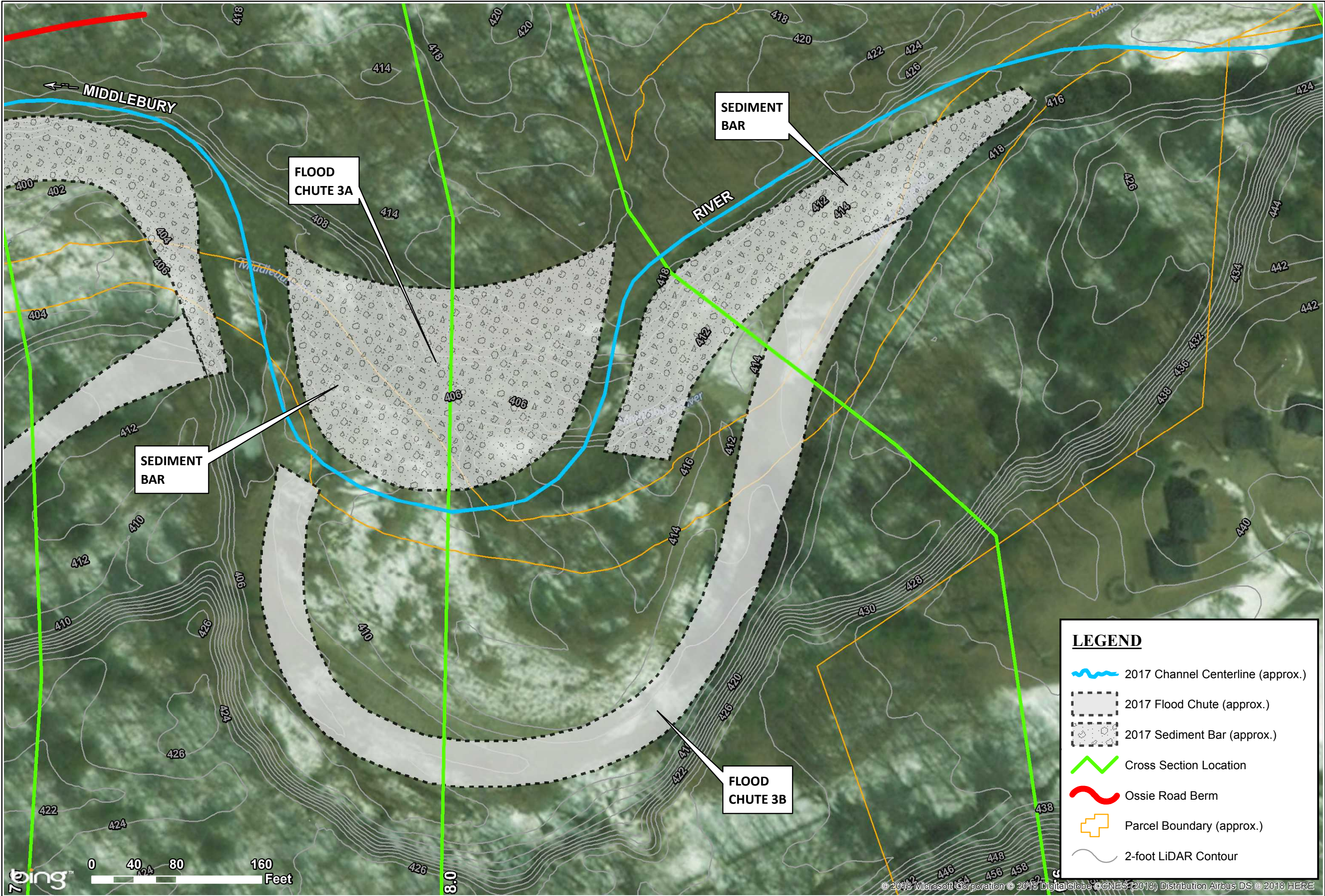
SITE PLAN - EXISTING CONDITIONS - CHUTE 2

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_SP2.mxd
1st Version: Jan. 11, 2018
Revision: ---
Scale: 1 in = 80 ft

SP-2



SITE PLAN - EXISTING CONDITIONS - CHUTE 3A / 3B	
MIDDLEBURY RIVER FLOOD MITIGATION PROJECT	
EAST MIDDLEBURY, VERMONT	
Map By: BMC MMI#: 5032-02-2 MXD: EMR-Prelim_SP3.mxd 1st Version: Jan. 11, 2018 Revision: --- Scale: 1 in = 80 ft	SP-3

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.6M LiDAR DEM

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SOURCE(S): Parcel Data - VCGI Aerial Photo - Bing Maps Contour Data - 2012 1.6M LiDAR DEM			MILONE & MACBROOM Engineering, Architecture and Environmental Science 1 South Main Street, 2nd Floor Waterbury, Vermont 05676 (802) 882-8335 Fax (802) 882-8346 www.mninc.com
SITE PLAN - EXISTING CONDITIONS - CHUTE 4			
MIDDLEBURY RIVER FLOOD MITIGATION PROJECT		EAST MIDDLEBURY, VERMONT	
Map By: BMC MMI#: 5032-02-2 MXD: EMR-Prelim_SP4.mxd 1st Version: Jan. 11, 2018 Revision: --- Scale: 1 in = 80 ft		SP-4	

PLANTING NOTES:

- 1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.
- 2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.
- 3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.

REINFORCE OSSIE ROAD BERM
WITH STONE ARMORNIG
-SEE DETAIL (STANDARD KEY)

SEDIMENT BAR REMOVAL
AREA = 5,500 SQ FT
AVG. CUT DEPTH = 2 FT

SEDIMENT BAR REMOVAL
AREA = 6,200 SQ FT
AVG. CUT DEPTH = 4 FT

PROPOSED TEMPORARY
RIVER CROSSING (TYP.)
-SEE DETAIL

REMOVE SEDIMENT AND
LARGE WOODY DEBRIS
OPENING ELEV. = 394.0 FT NAVD88
OPENING WIDTH = 95 FT

REMOVE SEDIMENT AND
LARGE WOODY DEBRIS
OPENING ELEV. = 391.0 FT NAVD88
OPENING WIDTH = 120 FT

SEDIMENT BAR REMOVAL
AREA = 4,300 SQ FT
AVG CUT DEPTH = 2.5 FT

LEGEND

- Proposed Site Access
- Proposed Stone Armor
- Proposed Bar Excavation
- Proposed Chute Cleanout



PLANTING NOTES:
1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.
2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.
3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.

REINFORCE OSSIE ROAD BERM
WITH STONE ARMORING
-SEE DETAIL (DEEP KEY)

PROPOSED TEMPORARY
RIVER CROSSING (TYP.)
-SEE DETAIL

SEDIMENT BAR REMOVAL
AREA = 15,700 SQ FT
AVG. CUT DEPTH = 4 FT

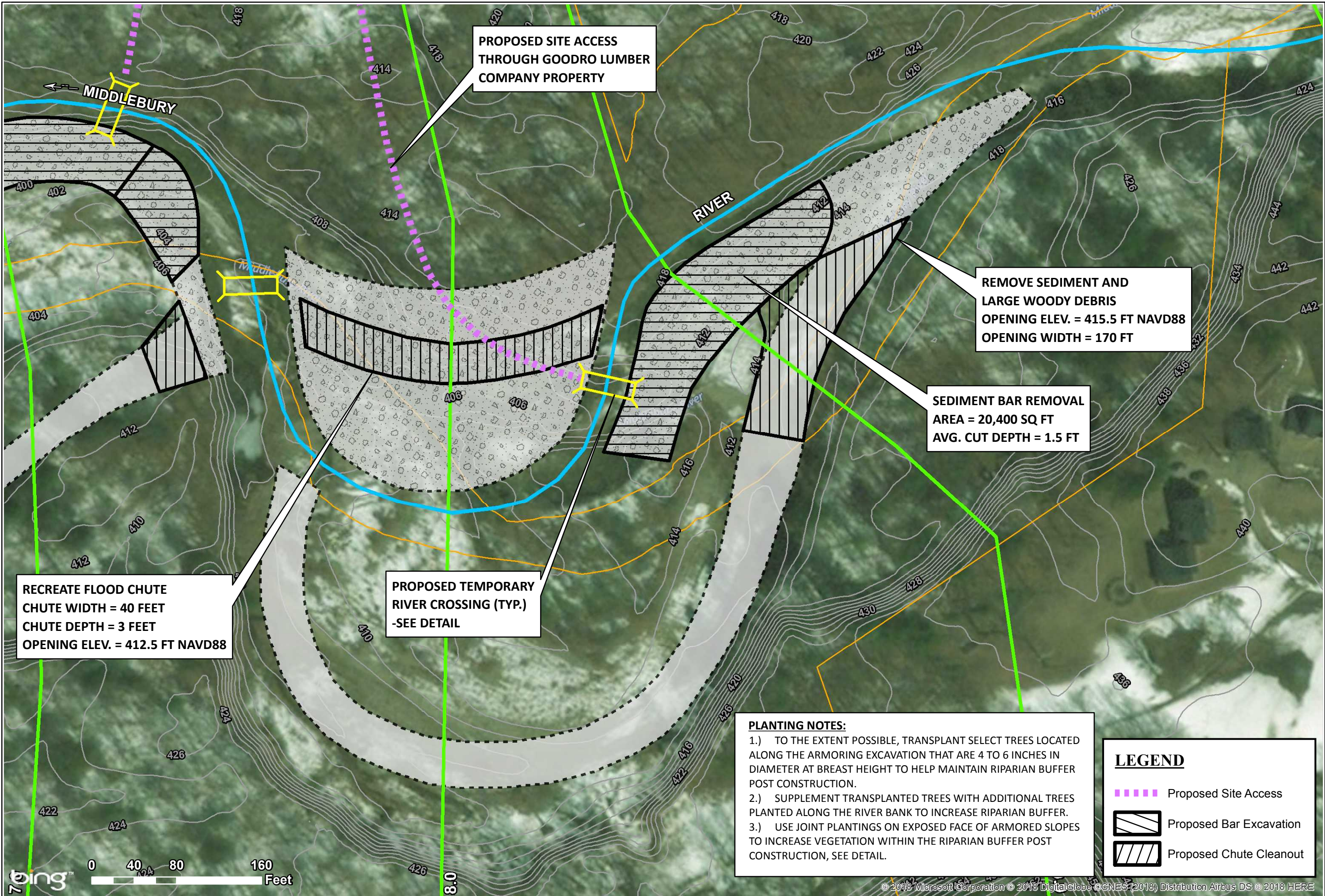
SEDIMENT BAR REMOVAL
AREA = 5,800 SQ FT
AVG CUT DEPTH = 1.5 FT

REMOVE SEDIMENT AND
LARGE WOODY DEBRIS
OPENING ELEV. = 406.5 FT NAVD88
OPENING WIDTH = 75 FT

Goodro Lumber
Company, Inc.

LEGEND

- Proposed Site Access
- Proposed Stone Armor
- Proposed Bar Excavation
- Proposed Chute Cleanout



RECREATE FLOOD CHUTE
CHUTE WIDTH = 40 FEET
CHUTE DEPTH = 3 FEET
OPENING ELEV. = 412.5 FT NAVD88

PROPOSED TEMPORARY
RIVER CROSSING (TYP.)
-SEE DETAIL

PROPOSED SITE ACCESS
THROUGH GOODRO LUMBER
COMPANY PROPERTY

REMOVE SEDIMENT AND
LARGE WOODY DEBRIS
OPENING ELEV. = 415.5 FT NAVD88
OPENING WIDTH = 170 FT

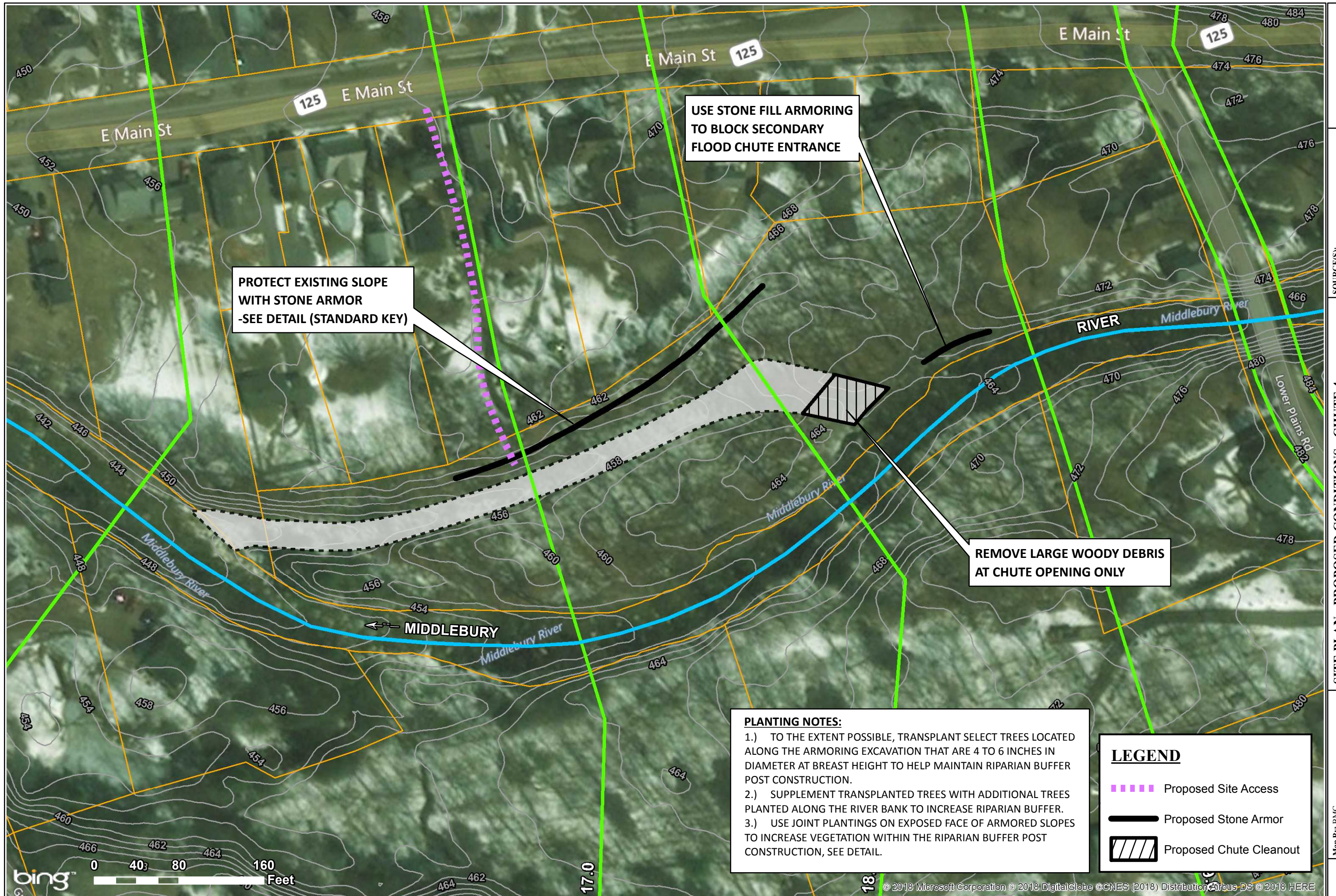
SEDIMENT BAR REMOVAL
AREA = 20,400 SQ FT
AVG. CUT DEPTH = 1.5 FT

PLANTING NOTES:
1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.
2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.
3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.

LEGEND

- Proposed Site Access
- Proposed Bar Excavation
- Proposed Chute Cleanout

SITE PLAN - PROPOSED CONDITIONS - CHUTE 3A / 3B	
MIDDLEBURY RIVER FLOOD MITIGATION PROJECT	
EAST MIDDLEBURY, VERMONT	
Map By: BMC MMI#: 5032-02-2 MXD: EMR-Prelim_SP7.mxd 1st Version: Jan. 11, 2018 Revision: --- Scale: 1 in = 80 ft	SP-7
SOURCE(S): Parcel Data - VCGI Aerial Photo - Bing Maps Contour Data - 2012 1.6M LiDAR DEM	
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PROTECT EXISTING SLOPE
WITH STONE ARMOR
-SEE DETAIL (STANDARD KEY)

USE STONE FILL ARMORING
TO BLOCK SECONDARY
FLOOD CHUTE ENTRANCE

REMOVE LARGE WOODY DEBRIS
AT CHUTE OPENING ONLY

PLANTING NOTES:

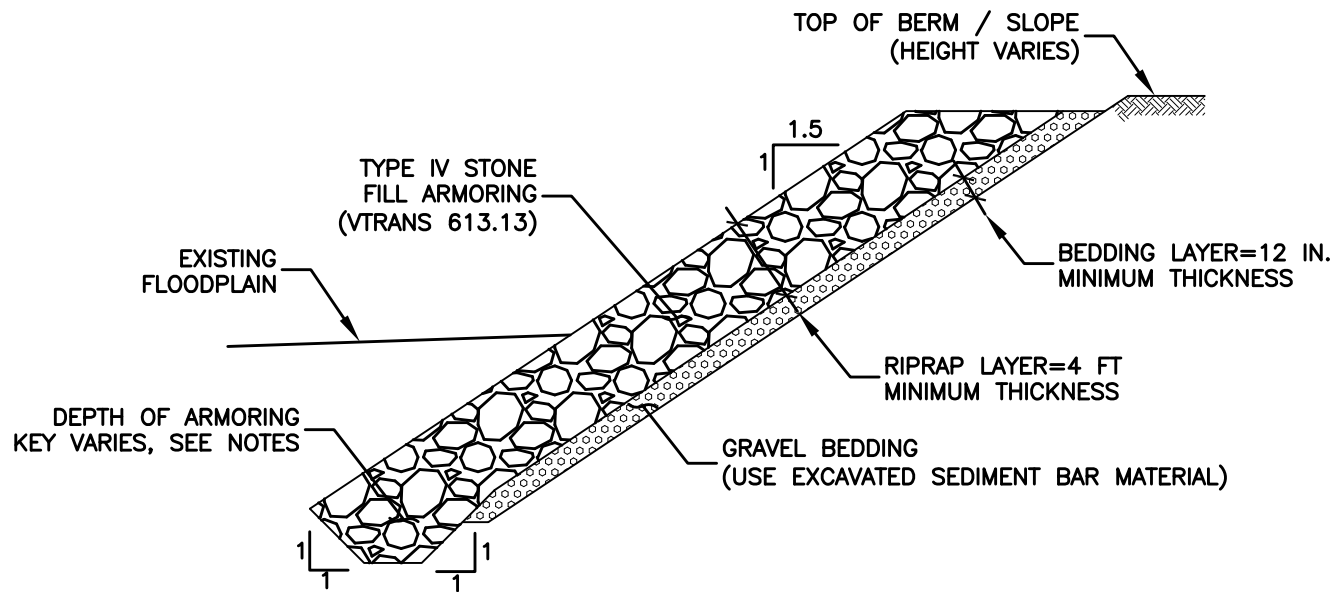
- 1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.
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LEGEND

- Proposed Site Access
- Proposed Stone Armor
- Proposed Chute Cleanout

Drawing: V:\DESIGN\5032-02-DE\CAD\DWG-DETAILS\01.DWG Layout: Table-1

Plotted by: BRANC On this date: Mon, 2018 January 15 - 8:45am

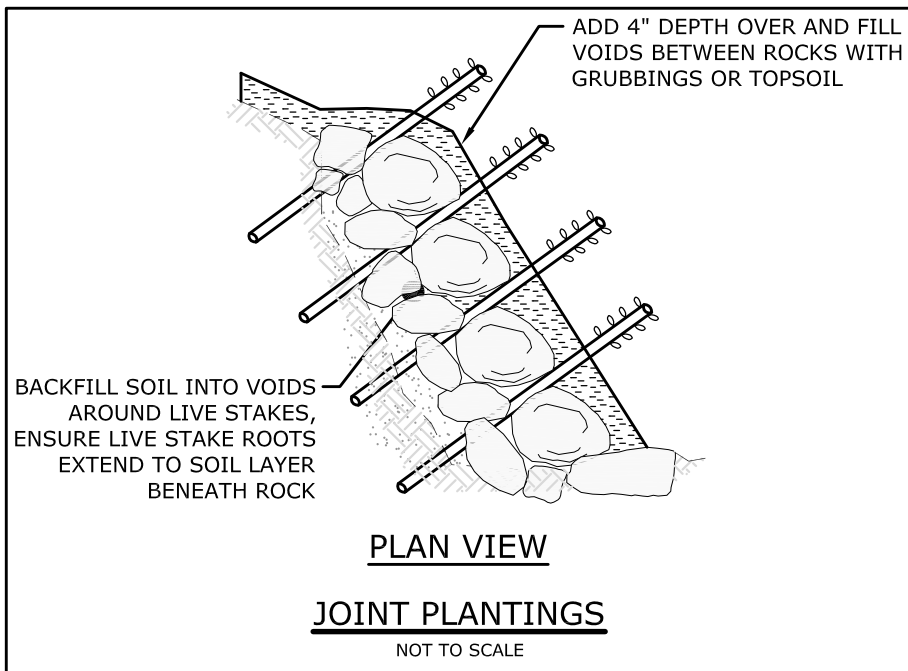


NOTES:

1. STONE ARMORING FOR DEEP KEY APPLICATION SHALL EXTEND SIX (6) FEET BELOW THE EXISTING CHANNEL INVERT.
2. STONE ARMORING FOR STANDARD KEY APPLICATION SHALL EXTEND TO THE EXISTING CHANNEL INVERT.

STONE ARMORING

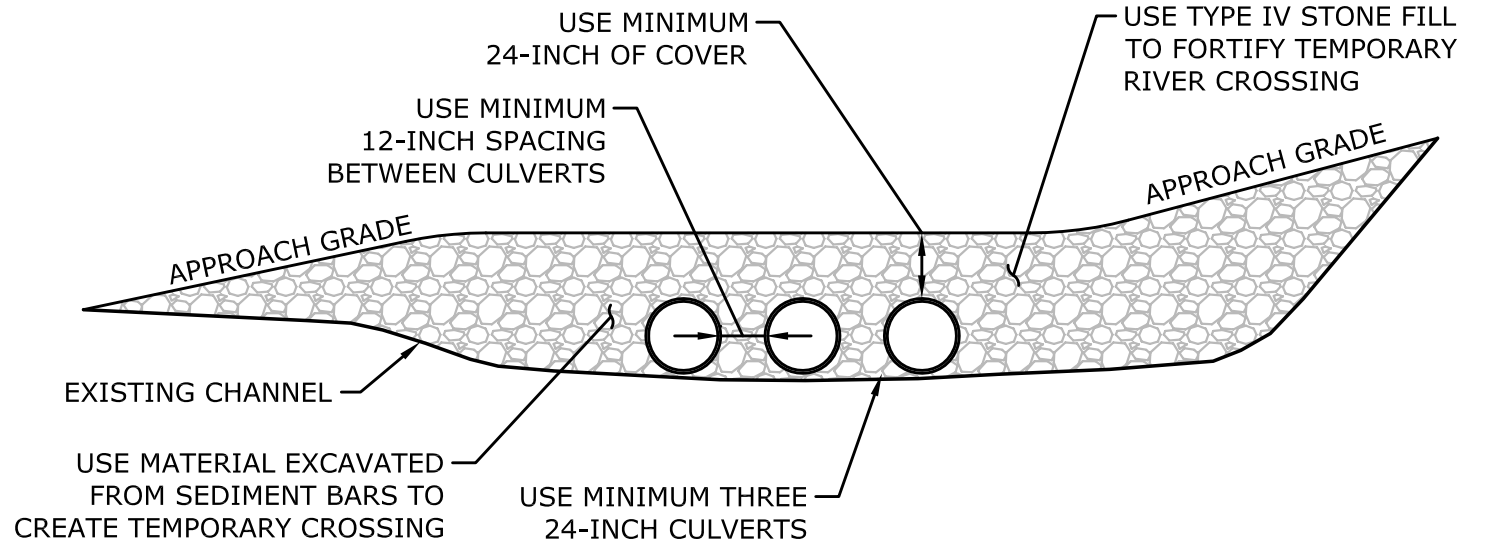
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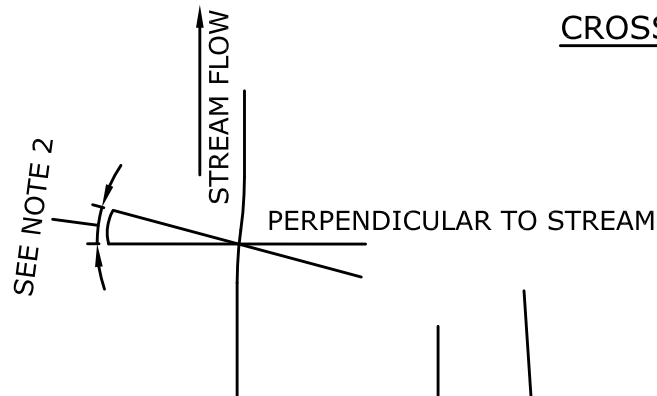
PLAN VIEW

JOINT PLANTINGS

NOT TO SCALE



CROSS SECTION A-A'



SEE NOTE 2

A
WATER BAR
(AS NEEDED)

TOP OF BANK

FLOW

A'
WATER BAR
(AS NEEDED)

TOP OF BANK

PLAN VIEW

NOTES:

1. CULVERT LENGTH SHALL NOT EXCEED 30 FEET. CROSSING DESIGNED TO CONVEY 75 CFS.
2. THE CENTER OF THE STREAM CROSSING SHALL BE ALIGNED SO THAT IT IS NO GREATER THAN 15° FROM A LINE PERPENDICULAR TO THE STREAM FLOW.
3. ALL MATERIAL PLACED TO CREATE TEMPORARY RIVER CROSSING SHALL BE REMOVED TO RESTORE PRE-EXISTING CHANNEL CAPACITY.
4. ONLY MATERIAL EXCAVATED FROM SEDIMENT BAR REMOVAL AREAS AND TYPE IV STONE FILL USED FOR SLOPE ARMORING SHALL BE USED TO CREATE TEMPORARY CROSSING. USE OF BOULDERS, COBBLE, OR GRAVEL FROM CHANNEL SHALL NOT BE ALLOWED.
5. CONTRACTOR MAY SUBMIT ALTERNATIVE TEMPORARY CROSSING FOR REVIEW AND APPROVAL.

TEMPORARY RIVER CROSSING

NOT TO SCALE



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REVISIONS

DETAILS

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

BMC DESIGNED	BMC DRAWN	RKS CHECKED
SCALE AS SHOWN		
DATE JAN. 11, 2018		
PROJECT NO. 5032-02		

DE-1

SHEET NO.