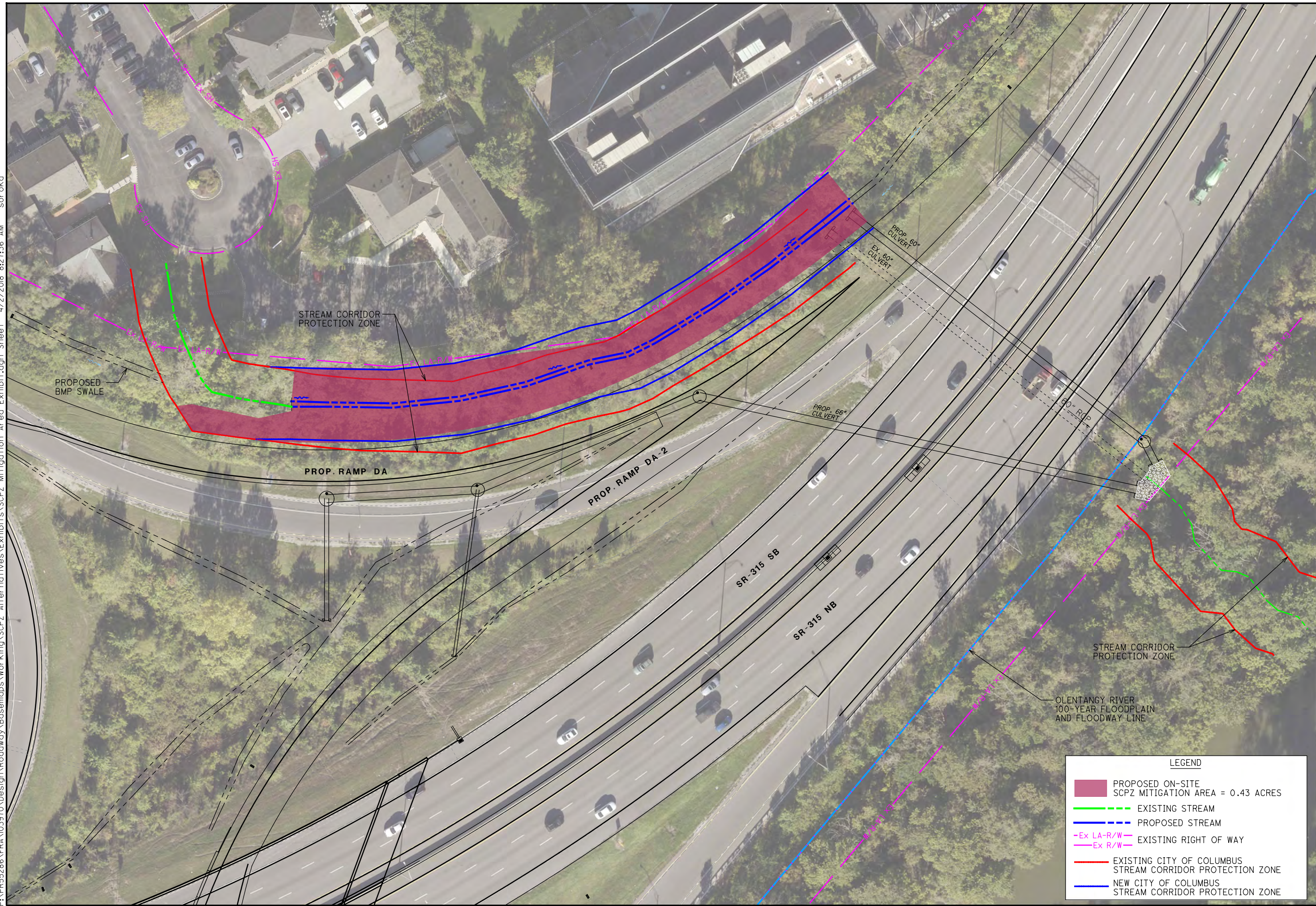


**APPENDIX G**

Proposed Stream Mitigation Exhibits

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CALCULATED 0 15 30 60  
 DSS  
 CHECKED  
 KEF

15  
 HORIZONTAL  
 SCALE IN FEET

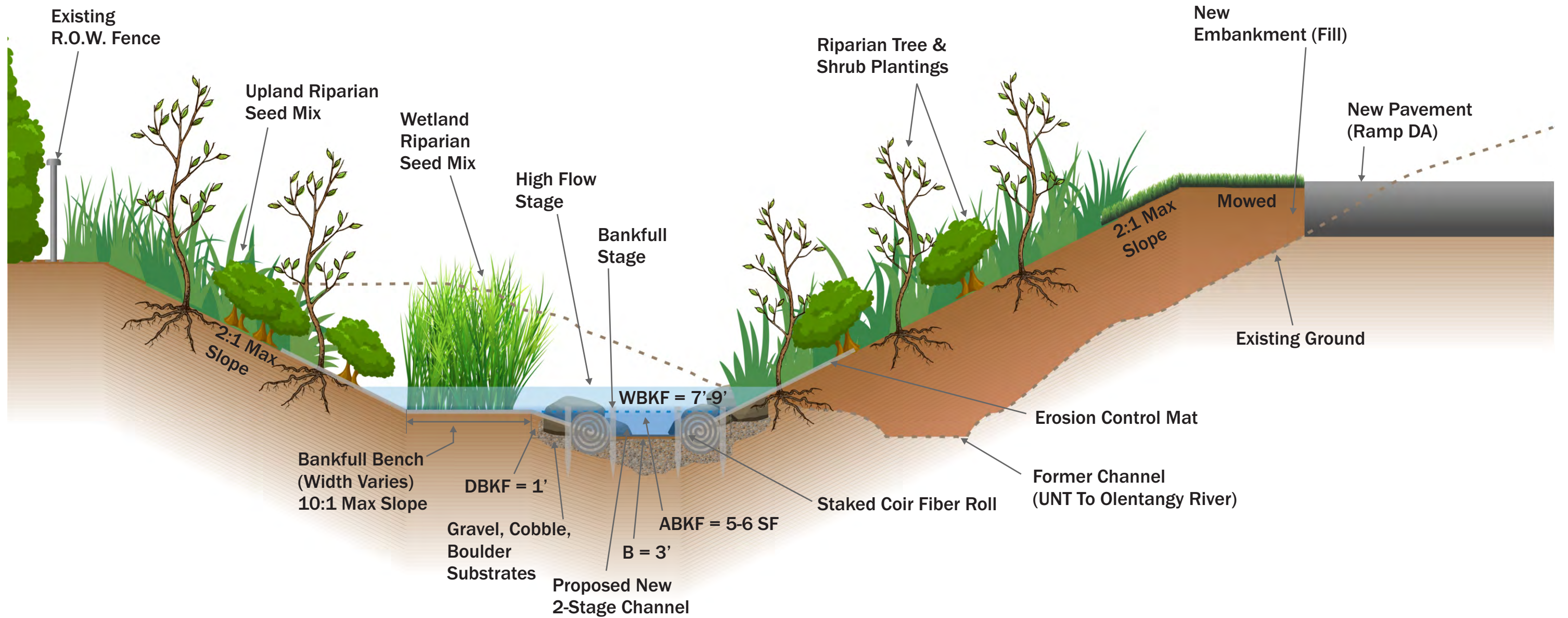
**SR-315 INTERCHANGE**  
**SCPZ PROPOSED ON-SITE MITIGATION**

**SCPZ VARIANCE**

**LEGEND**

- PROPOSED ON-SITE SCPZ MITIGATION AREA = 0.43 ACRES
- EXISTING STREAM
- PROPOSED STREAM
- Ex LA-R/W
- EXISTING RIGHT OF WAY
- EXISTING CITY OF COLUMBUS STREAM CORRIDOR PROTECTION ZONE
- NEW CITY OF COLUMBUS STREAM CORRIDOR PROTECTION ZONE

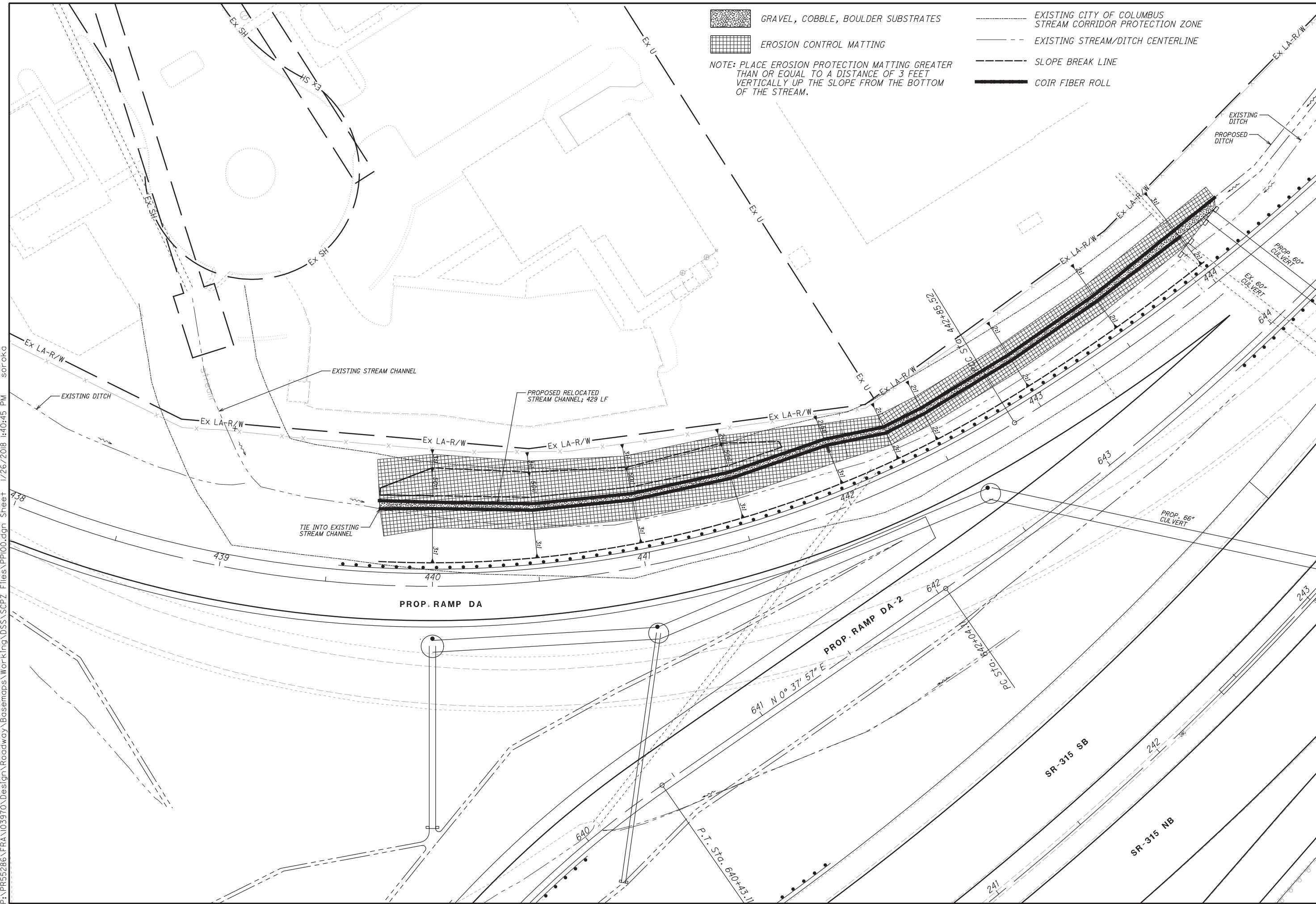




FRA-315-06.37  
 Proposed SCPZ Stream Mitigation  
 Typical Section

Not To Scale

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GRAVEL, COBBLE, BOULDER SUBSTRATES  
EROSION CONTROL MATTING  
NOTE: PLACE EROSION PROTECTION MATTING GREATER THAN OR EQUAL TO A DISTANCE OF 3 FEET VERTICALLY UP THE SLOPE FROM THE BOTTOM OF THE STREAM.

EXISTING CITY OF COLUMBUS STREAM CORRIDOR PROTECTION ZONE  
EXISTING STREAM/DITCH CENTERLINE  
SLOPE BREAK LINE  
COIR FIBER ROLL

CALCULATED DSS CHECKED KEF  
10 HORIZONTAL SCALE IN FEET

PROPOSED STREAM CHANNEL STABILIZATION  
SR-315 INTERCHANGE AT OHIOHEALTH




FRA-315-06.37



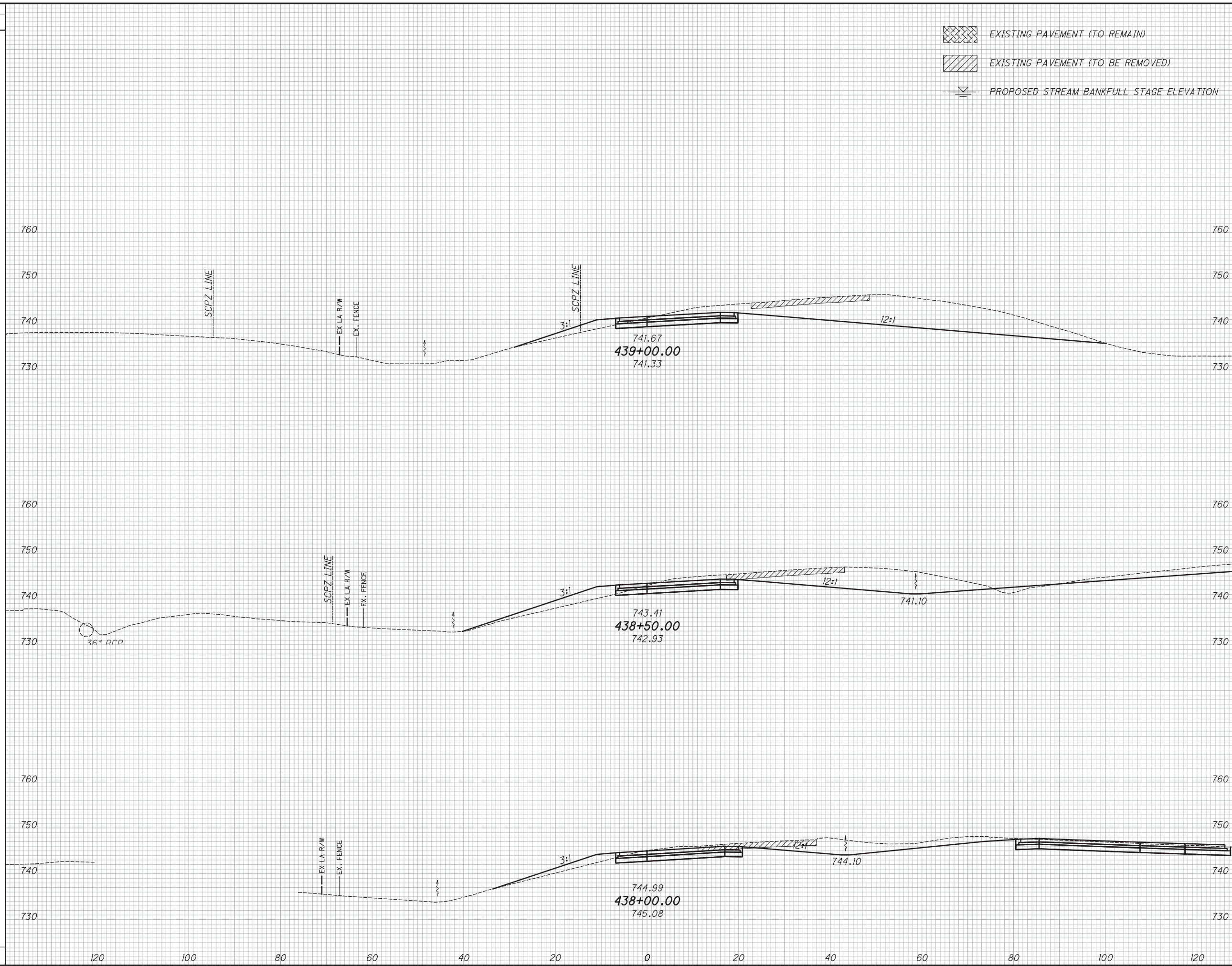
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SEEDING

END WIDTH	SO. YDS.

-  EXISTING PAVEMENT (TO REMAIN)
-  EXISTING PAVEMENT (TO BE REMOVED)
-  PROPOSED STREAM BANKFULL STAGE ELEVATION

END AREA		VOLUME		CALCULATED	DSS	CHECKED	MRT
CUT	FILL	CUT	FILL				






**CROSS SECTIONS - RAMP DA**  
**STA. 437+00.00 TO STA. 438+00.00**

**FRA -315-06.37**  
**PROJECT 2**

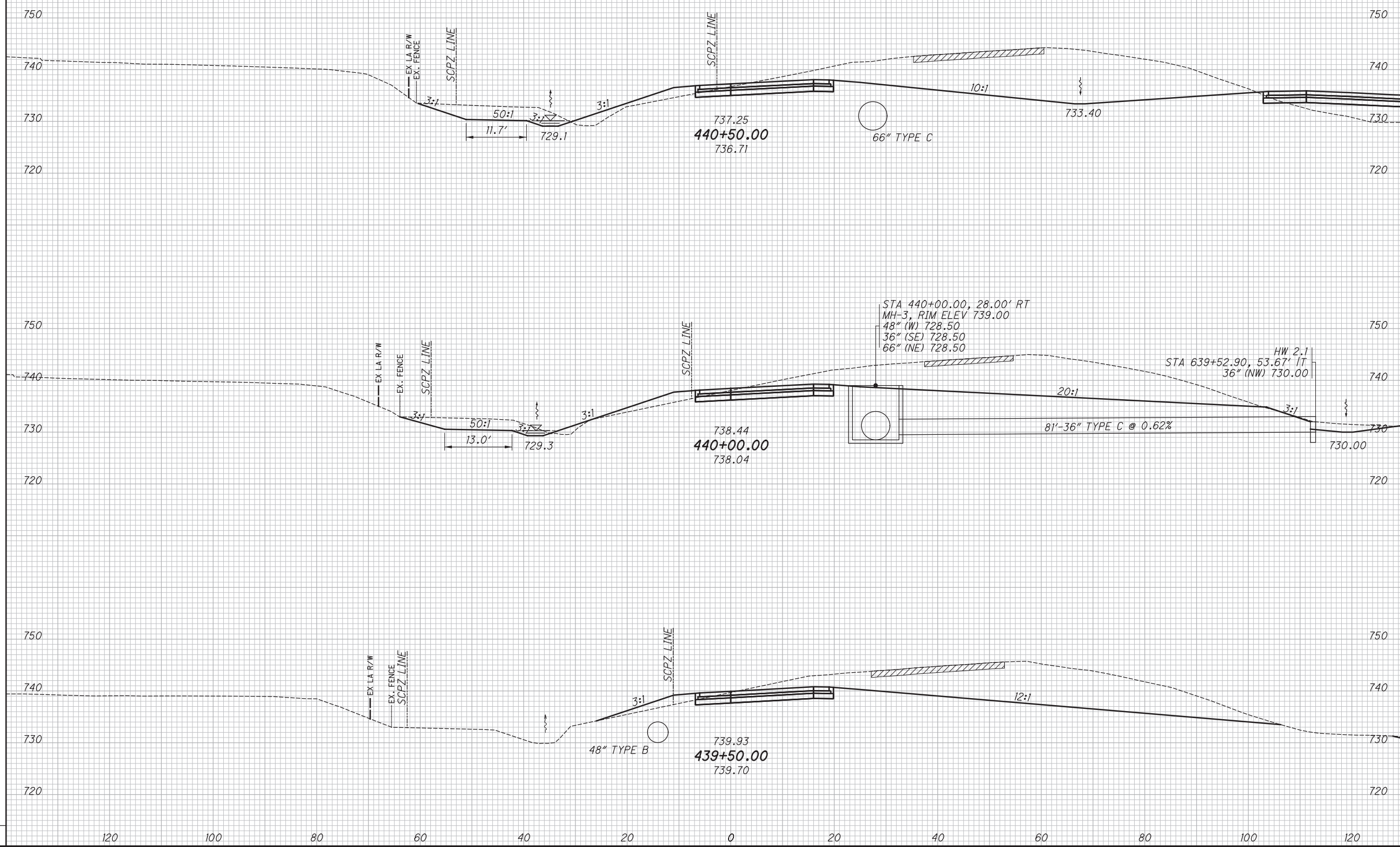
3  
 7

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SEEDING	
END WIDTH	SO. YDS.

-  EXISTING PAVEMENT (TO REMAIN)
-  EXISTING PAVEMENT (TO BE REMOVED)
-  PROPOSED STREAM BANKFULL STAGE ELEVATION

END AREA	VOLUME	CALCULATED	DSS	CHECKED	MRT



**CROSS SECTIONS - RAMP DA**  
**STA. 438+50.00 TO STA. 439+50.00**




**FRA-315-06.37**  
**PROJECT 2**



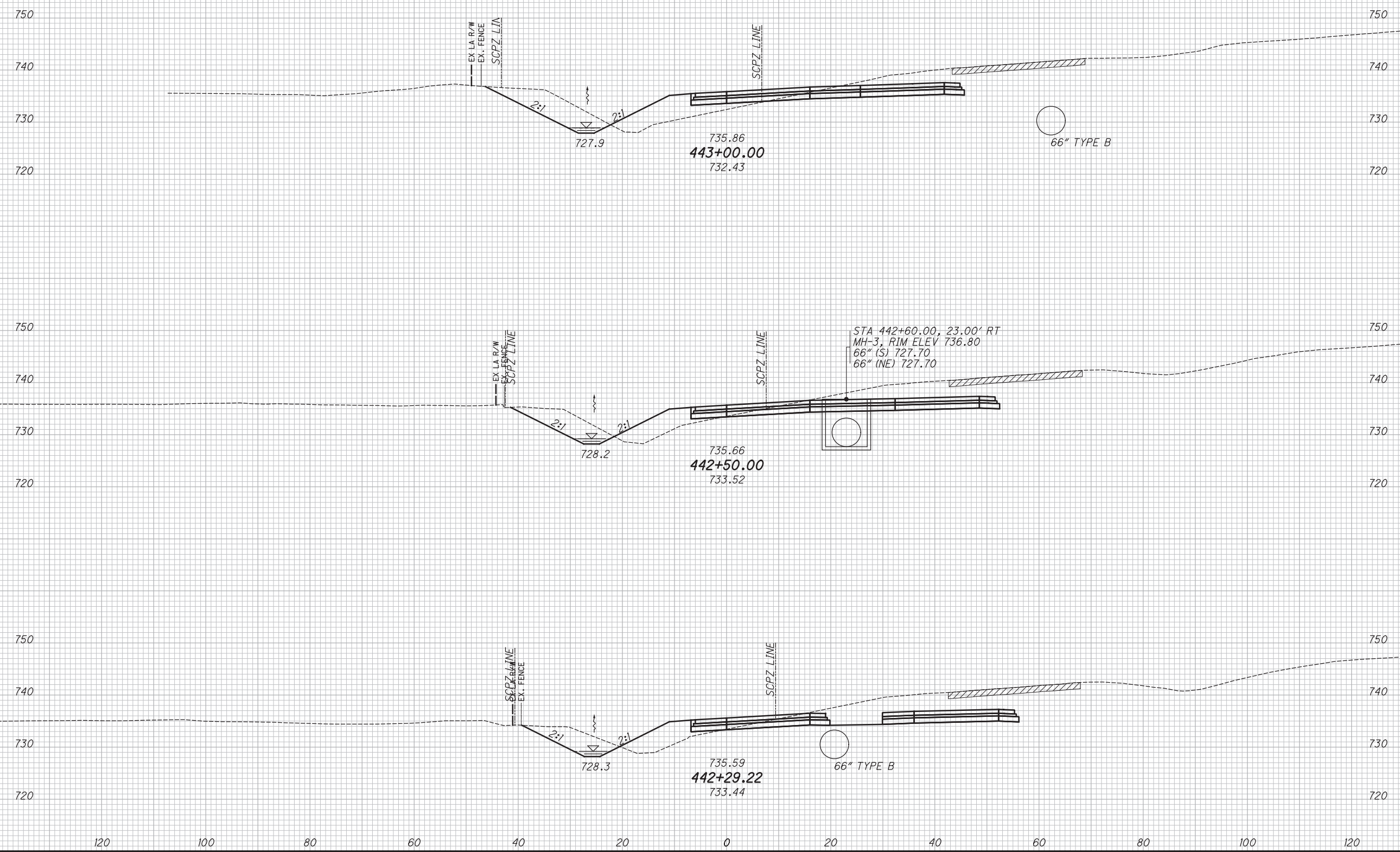


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SEEDING	
END WIDTH	SO. YDS.

-  EXISTING PAVEMENT (TO REMAIN)
-  EXISTING PAVEMENT (TO BE REMOVED)
-  PROPOSED STREAM BANKFULL STAGE ELEVATION

END AREA	VOLUME	CALCULATED	DSS	CHECKED	MRT






**CROSS SECTIONS - RAMP DA**  
**STA. 441+50.00 TO STA. 442+29.22**

**FRA-315-06.37**  
**PROJECT 2**

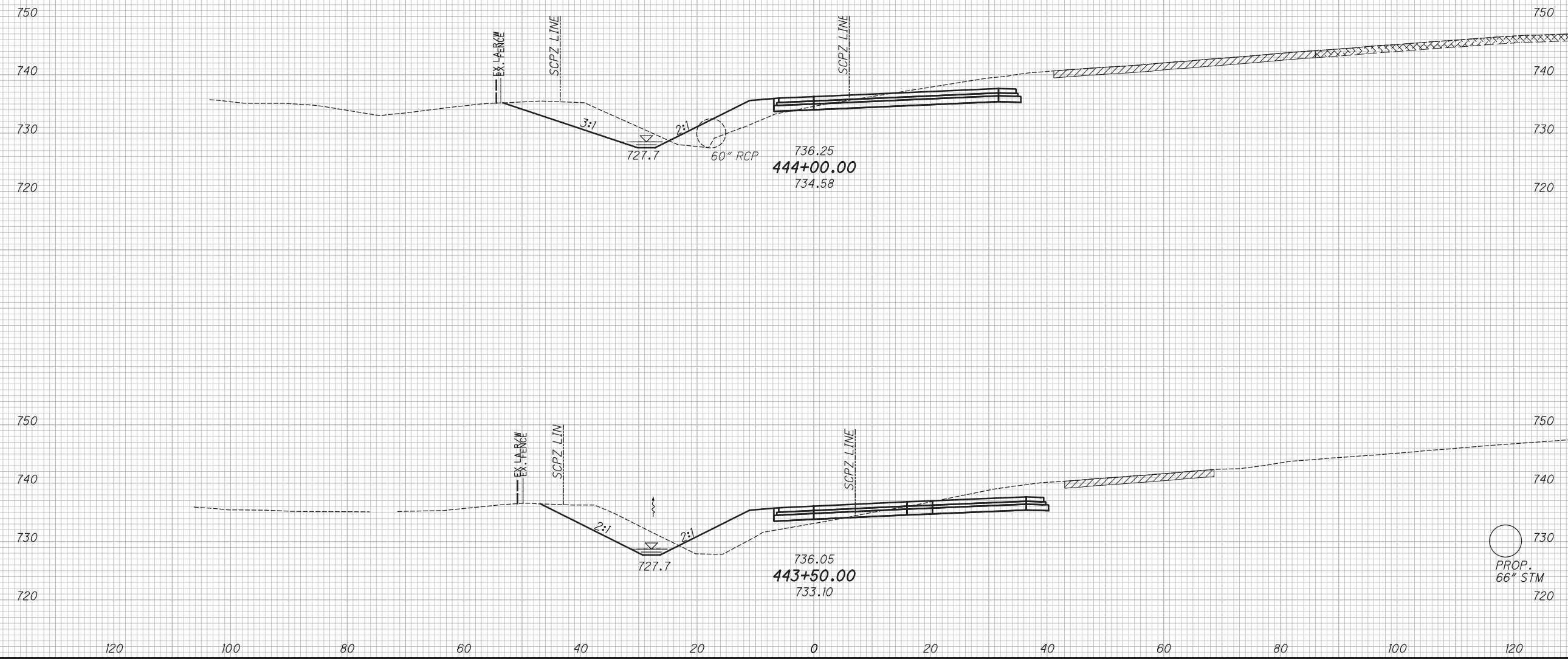
6  
7

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SEEDING	
END WIDTH	SO. YDS.

-  EXISTING PAVEMENT (TO REMAIN)
-  EXISTING PAVEMENT (TO BE REMOVED)
-  PROPOSED STREAM BANKFULL STAGE ELEVATION

END AREA	VOLUME	CALCULATED	DSS	CHECKED	MRT

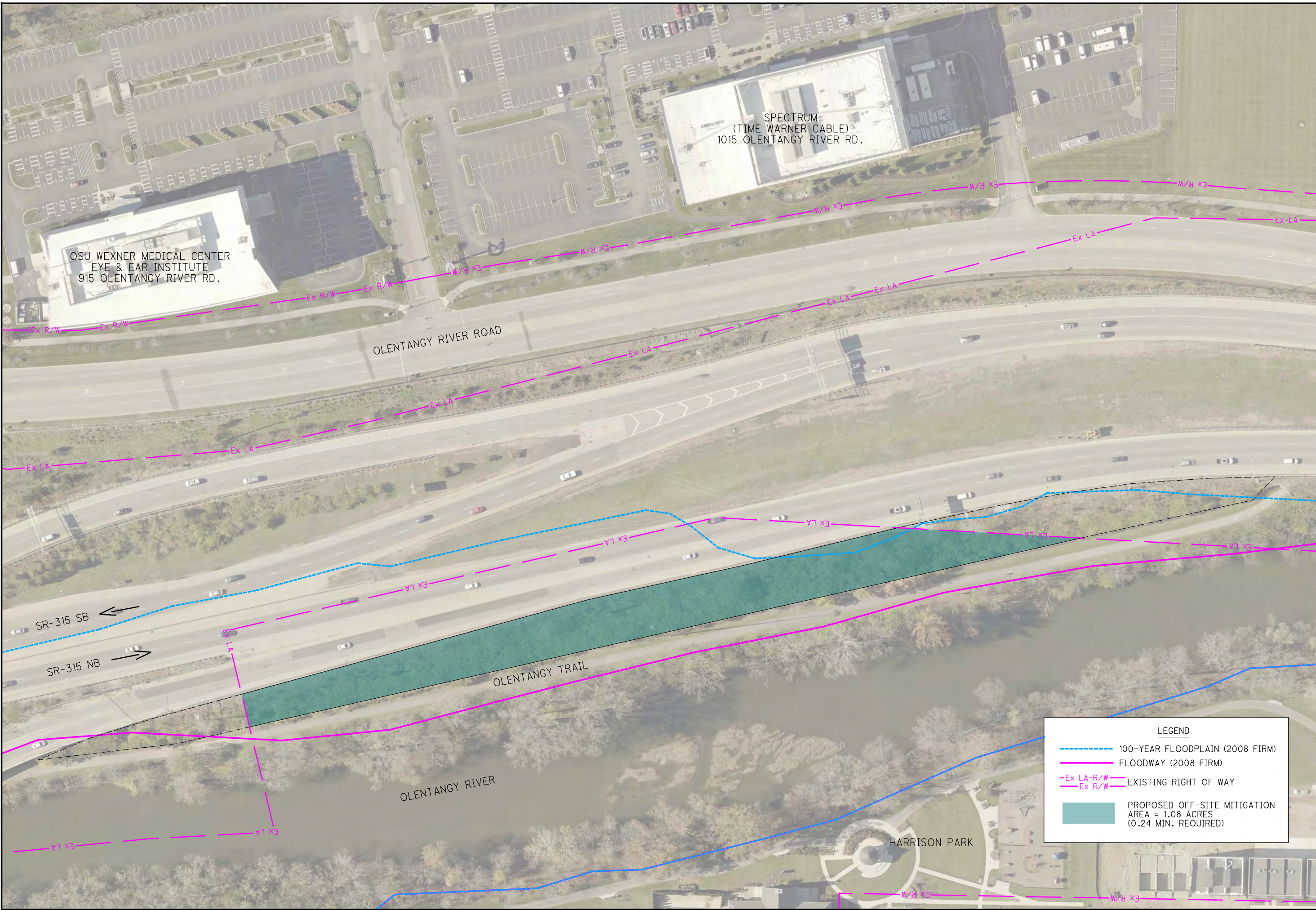


**CROSS SECTIONS - RAMP DA**  
**STA. 442+50.00 TO STA. 443+50.00**

**FRA-315-06.37**  
**PROJECT 2**

7  
7

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OSU WEXNER MEDICAL CENTER  
EYE & EAR INSTITUTE  
915 OLENTANGY RIVER RD.

SPECTRUM  
(TIME WARNER CABLE)  
1015 OLENTANGY RIVER RD.

OLENTANGY RIVER ROAD

SR-315 SB ←  
SR-315 NB →

OLENTANGY TRAIL  
OLENTANGY RIVER

HARRISON PARK

LEGEND	
	100-YEAR FLOODPLAIN (2008 FIRM)
	FLOODWAY (2008 FIRM)
	EXISTING RIGHT OF WAY
	PROPOSED OFF-SITE MITIGATION AREA = 1.08 ACRES (0.24 MIN. REQUIRED)



SR-315 INTERCHANGE  
SCPZ OFF-SITE MITIGATION AREA

SCPZ VARIANCE



**CITY OF COLUMBUS**  
**SR 315 & N. BROADWAY INTERCHANGE IMPROVEMENTS**  
**PROPOSED STREAM RELOCATION**  
**RIPARIAN TREE & SHRUB SPECIES FOR PLANTING**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Planting Zone(s)</b>
<b>TREES</b>		
<i>Acer rubrum</i>	Red maple	Bench/Upland
<i>Acer saccharinum</i>	Silver maple	Bench/Upland
<i>Cercis canadensis</i>	Eastern redbud	Upland
<i>Juglans nigra</i>	Black walnut	Bench/Upland
<i>Platanus occidentalis</i>	American sycamore	Bench/Upland
<i>Quercus macrocarpa</i>	Bur oak	Bench/Upland
<i>Quercus palustris</i>	Pin oak	Bench/Upland
<i>Salix nigra</i>	Black willow	Bench
<b>SHRUBS</b>		
<i>Cornus amomum</i>	Silky dogwood	Bench
<i>Cornus racemosa</i>	Gray dogwood	Bench/Upland
<i>Cornus sericea</i>	Red osier dogwood	Bench
<i>Ilex verticillata</i>	Winterberry	Bench/Upland
<i>Physiocarpis opulifolius</i>	Ninebark	Upland
<i>Viburnum dentatum</i>	Arrowwood Viburnum	Bench/Upland
<i>Sambucus canadensis</i>	Elderberry	Bench
<i>Salix interior</i>	Sandbar willow	Bench



## Ernst Conservation Seeds

8884 Mercer Pike  
Meadville, PA 16335  
(800) 873-3321 Fax (814) 336-5191  
[www.ernstseed.com](http://www.ernstseed.com)

Date: January 23, 2018

### Seasonally Flooded Wildlife Food Mix - ERNMX-128

Botanical Name	Common Name	Price/lb
22.00 % <i>Panicum clandestinum</i> , 'Tioga'	Deertongue, 'Tioga'	17.01
20.00 % <i>Elymus virginicus</i> , PA Ecotype	Virginia Wildrye, PA Ecotype	9.56
17.00 % <i>Andropogon gerardii</i> , 'Niagara'	Big Bluestem, 'Niagara'	12.25
15.00 % <i>Echinochloa crusgalli</i> var. <i>frumentacea</i>	Japanese Millet	1.20
10.00 % <i>Carex vulpinoidea</i> , PA Ecotype	Fox Sedge, PA Ecotype	24.00
8.00 % <i>Panicum virgatum</i> , 'Shawnee'	Switchgrass, 'Shawnee'	6.49
3.00 % <i>Chamaecrista fasciculata</i> , PA Ecotype	Partridge Pea, PA Ecotype	10.00
1.70 % <i>Heliopsis helianthoides</i> , PA Ecotype	Oxeye Sunflower, PA Ecotype	42.00
1.00 % <i>Desmodium paniculatum</i> , PA Ecotype	Panicledleaf Ticktrefoil, PA Ecotype	40.00
1.00 % <i>Verbena hastata</i> , PA Ecotype	Blue Vervain, PA Ecotype	32.00
0.50 % <i>Eupatorium fistulosum</i> , PA Ecotype	Joe Pye Weed, PA Ecotype	228.00
0.50 % <i>Juncus tenuis</i> , PA Ecotype	Path Rush, PA Ecotype	66.00
0.30 % <i>Asclepias incarnata</i> , PA Ecotype	Swamp Milkweed, PA Ecotype	240.00

**100.00 %**

**Mix Price/lb Bulk: \$14.76**

**Seeding Rate:** 20 lb per acre, or 1/2 lb per 1,000 sq ft

Wet Meadows & Wetlands

This combination of annual and perennial grasses, forbs and grass-like plants provide food and cover in wet or flooded riparian areas, as well as in draw-down areas in retention basins or wetlands. Seed from October-May. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

PROPOSED FOR BANKFULL BENCH SEEDING ZONE

**Price quotes guaranteed for 30 days.**  
**All prices are FOB Meadville, PA.**  
**Please check our web site at [www.ernstseed.com](http://www.ernstseed.com)**  
**for current pricing when placing orders.**



## Ernst Conservation Seeds

8884 Mercer Pike  
 Meadville, PA 16335  
 (800) 873-3321 Fax (814) 336-5191  
[www.ernstseed.com](http://www.ernstseed.com)

Date: January 23, 2018

### Riparian Buffer Mix - ERNMX-178

Botanical Name	Common Name	Price/lb
30.00 % <i>Panicum clandestinum</i> , 'Tioga'	Deertongue, 'Tioga'	17.01
16.00 % <i>Sorghastrum nutans</i> , PA Ecotype	Indiangrass, PA Ecotype	12.60
15.00 % <i>Elymus riparius</i> , PA Ecotype	Riverbank Wildrye, PA Ecotype	7.44
10.00 % <i>Andropogon gerardii</i> , 'Niagara'	Big Bluestem, 'Niagara'	12.25
7.00 % <i>Panicum virgatum</i> , 'Carthage', NC Ecotype	Switchgrass, 'Carthage', NC Ecotype	5.17
3.00 % <i>Chamaecrista fasciculata</i> , PA Ecotype	Partridge Pea, PA Ecotype	10.00
3.00 % <i>Rudbeckia hirta</i> , Coastal Plain NC Ecotype	Blackeyed Susan, Coastal Plain NC Ecotype	20.00
3.00 % <i>Verbena hastata</i> , PA Ecotype	Blue Vervain, PA Ecotype	32.00
2.00 % <i>Asclepias incarnata</i> , PA Ecotype	Swamp Milkweed, PA Ecotype	240.00
2.00 % <i>Heliopsis helianthoides</i> , PA Ecotype	Oxeye Sunflower, PA Ecotype	42.00
2.00 % <i>Juncus effusus</i>	Soft Rush	40.00
2.00 % <i>Juncus tenuis</i> , PA Ecotype	Path Rush, PA Ecotype	66.00
1.50 % <i>Aster puniceus</i> , PA Ecotype	Purplestem Aster, PA Ecotype	320.00
1.00 % <i>Eupatorium perfoliatum</i> , PA Ecotype	Boneset, PA Ecotype	300.00
0.80 % <i>Vernonia noveboracensis</i> , PA Ecotype	New York Ironweed, PA Ecotype	220.00
0.50 % <i>Aster novae-angliae</i> , PA Ecotype	New England Aster, PA Ecotype	360.00
0.50 % <i>Eupatorium fistulosum</i> , PA Ecotype	Joe Pye Weed, PA Ecotype	228.00
0.50 % <i>Monarda fistulosa</i> , Fort Indiantown Gap-PA Ecotype	Wild Bergamot, Fort Indiantown Gap-PA Ecotype	160.00
0.20 % <i>Pycnanthemum tenuifolium</i>	Narrowleaf Mountainmint	140.00
<b>100.00 %</b>	<b>Mix Price/lb Bulk:</b>	<b>\$33.02</b>

**Seeding Rate:** 20 lb per acre with a cover crop at 30 lb per acre  
 (dry sites - grain oats, Jan 1-Aug 1; or, grain rye,  
 Aug 1-Jan 1; moist sites - grain rye year-round)

#### Riparian Sites

A diverse mix of upland and wetland grasses, forbs and shrubs with extensive wildlife and pollinator value. Provides food and cover for many of our songbirds, pheasants, deer and turkey. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

### PROPOSED FOR UPLAND RIPARIAN SEEDING ZONE

**Price quotes guaranteed for 30 days.**  
**All prices are FOB Meadville, PA.**  
**Please check our web site at [www.ernstseed.com](http://www.ernstseed.com)**  
**for current pricing when placing orders.**



# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION \_\_\_\_\_  
 \_\_\_\_\_ SITE NUMBER \_\_\_\_\_ RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_  
 LENGTH OF STREAM REACH (ft) \_\_\_\_\_ LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_  
 DATE \_\_\_\_\_ SCORER \_\_\_\_\_ COMMENTS \_\_\_\_\_

**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions**

**STREAM CHANNEL MODIFICATIONS:**

NONE / NATURAL CHANNEL  RECOVERED  RECOVERING  RECENT OR NO RECOVERY

**1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.**

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	_____
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

### HHEI Metric Points

Substrate Max = 40

A + B

**2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):**

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters):

Pool Depth Max = 30

**3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):**

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters):

Bankfull Width Max=30

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream ☆

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

**FLOW REGIME (At Time of Evaluation) (Check ONLY one box):**

<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

**SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):**

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

**STREAM GRADIENT ESTIMATE**

Flat (0.5 ft/100 ft)  Flat to Moderate  Moderate (2 ft/100 ft)  Moderate to Severe  Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

**QHEI PERFORMED?** -  Yes  No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

- WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_
- CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_
- EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: \_\_\_\_\_ NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order \_\_\_\_\_

County: \_\_\_\_\_ Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): \_\_\_\_\_ Date of last precipitation: \_\_\_\_\_ Quantity: \_\_\_\_\_

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): \_\_\_\_\_ Canopy (% open): \_\_\_\_\_

Were samples collected for water chemistry? (Y/N): \_\_\_\_\_ (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) \_\_\_\_\_ If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/N): \_\_\_\_\_ (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

FLOW 