

PROJECT DESCRIPTION: CHANNEL REGRADING WITH DEPOSITION REMOVAL AND BANK REINFORCEMENT

NOTES:

1. WORK THIS SHEET WITH DETAIL SHEETS 2 AND 3.
2. PERFORM ALL WORK WITHIN EXISTING RIGHT-OF-WAY, CHANNEL EASEMENTS, AND WORK AGREEMENT AREAS.
3. CONTACT UTILITIES AND PRIVATE UTILITY COMPANIES TO MARK EXISTING UTILITIES PRIOR TO START OF THE WORK.
4. PRIOR TO CONSTRUCTING IMPROVEMENTS, INSTALL TEMPORARY AGGREGATE CHECK DAM AT DOWNSTREAM PROJECT LIMITS FOR CONSTRUCTION SEDIMENT CONTROL. MAINTAIN THE CHECK DAM DURING CONSTRUCTION. REMOVE CHECK DAM AND ANY ACCUMULATED SEDIMENT AFTER STABILIZATION OF THE WORK AREA.
5. IF NECESSARY, USE TEMPORARY DEMAINTENING PUMP TO PERFORM WORK IN A DRY CONDITION.
6. PORTIONS OF THE EXISTING GUARDRAIL MAY REQUIRE REMOVAL AND REPLACEMENT TO ALLOW ACCESS TO THE WORK AREA.
7. CONSTRUCT THE CHANNEL IMPROVEMENTS IN PHASES STARTING WITH THE SOUTH BANK. DEMOLISH THE WORK AREA, STRIP AND STOCKPILE TOPSOIL MATERIALS. EXCAVATE AND STOCKPILE SUBSOIL MATERIALS. PLACE FILL MATERIAL IN HORIZONTAL LIFTS NOT TO EXCEED 6 INCHES TO ACHIEVE THE PROPOSED CHANNEL LINE AND GRADE INDICATED ON THE PLANS. COMPACT FILL MATERIAL LOCATED OUTSIDE THE USACE FLOWAGE EASEMENT. RESPADE MINIMUM 6 INCHES OF TOPSOIL TO ADHERE FINAL GRADE. AVOID UNNECESSARY VEHICLE TRAVEL ACROSS PLACED TOPSOIL.
8. INSTALL CROSS WAVES TO DIRECT STREAM FLOW TO CENTER OF CHANNEL. REFER TO DETAILS.
9. STABILIZE STREAM BANKS WITH NATIVE GRASS SEEDING AND MULCHING CLASS 4B AND TEMPORARY EROSION CONTROL MAT, TYPE C. STABILIZE ROADSIDE DISTURBED AREAS WITH SEEDING AND MULCHING CLASS 2. MULCH SHALL CONSIST OF STRAW.

FLOODPLAIN DESCRIPTION:
ACCORDING TO FEMA FLOOD INSURANCE RATE MAP PANEL 39050C0225E DATED 08/18/2009, THE PROJECT IS LOCATED IN A ZONE A SPECIAL FLOOD HAZARD AREA.

ENVIRONMENTAL NOTES:

1. TREES SHALL ONLY BE FILLED BETWEEN OCTOBER 1 AND MARCH 31.

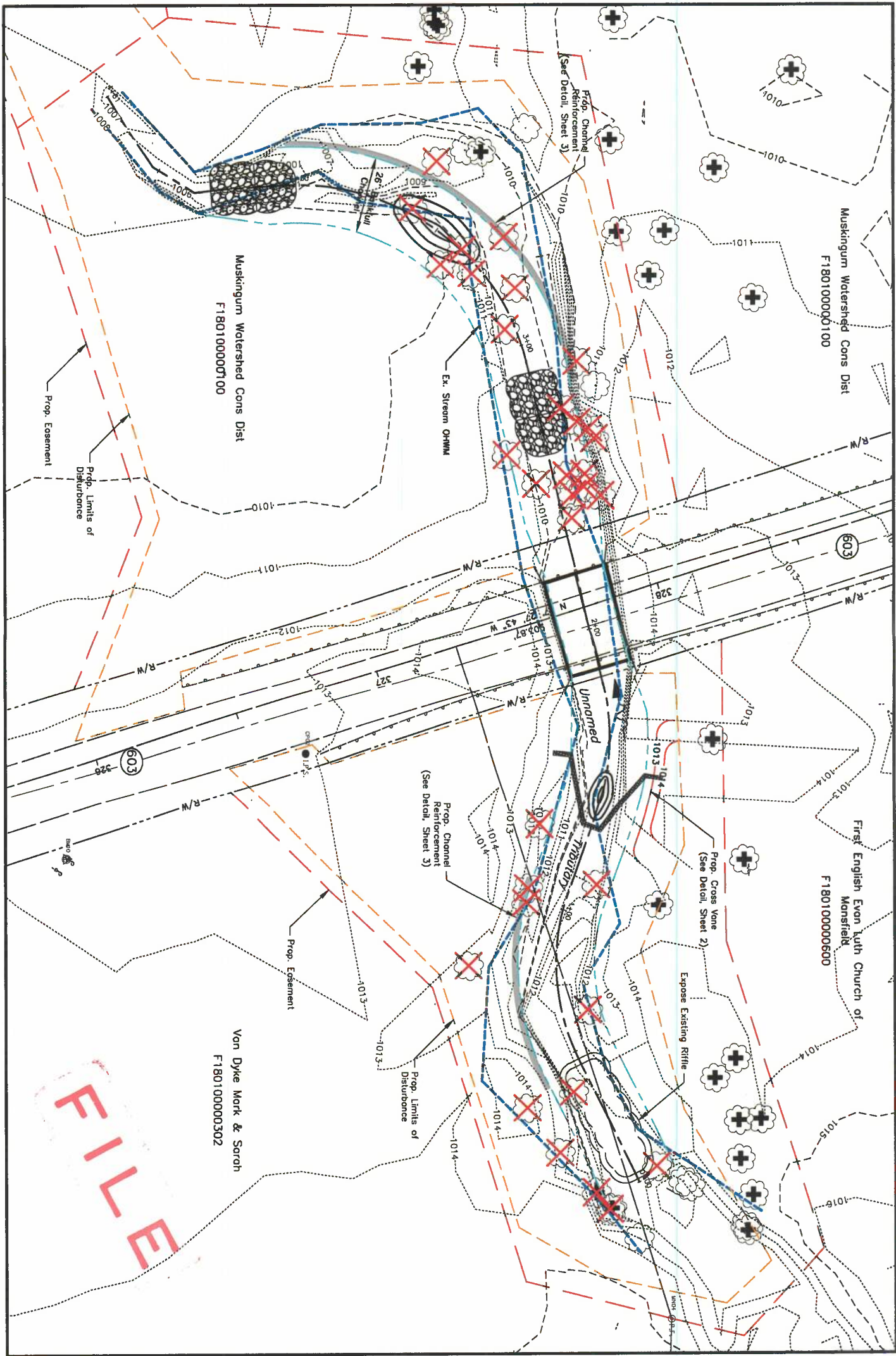
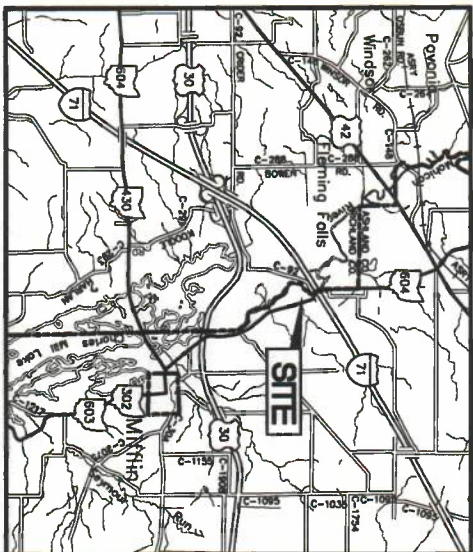
EXISTING EASEMENT NOTE:

THE ENTIRE LIMITS OF THE PROPOSED RIGHT-OF-WAY AND PROJECT AREA ARE LOCATED WITHIN AN EXISTING FLOWAGE EASEMENT FOR THE CHARLES MILL RESERVOIR.

SITE DATA

Latitude 40°47'33.16" N
Longitude 82°23'5.70" W
Drainage Area 2.37 sq. mi.
Slope (10-85) 108 ft/mi
Bankfull Width 26 ft
Bankfull Depth (Mean) 2.1 ft

LOCATION MAP
Scale: 1" = 6,000'



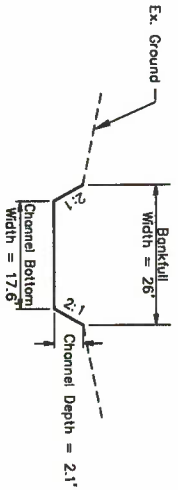
BENCH MARKS
(NAVD 1988)

Bm/1	5/8" Rubber with yellow plastic cap marked "0007 TRM, FT."	NK4120161833, E22000563.0057, Elev. = 1013.17
Bm/2	Brass spike set in telephone / F.E.C. power pole# DE-14	NK4120827000, 28000550.8000, Elev. = 1015.62
Bm/3	5/8" Rubber with yellow plastic cap marked "0007 TRM, FT."	NK4121741038, E22000513.5997, Elev. = 1013.21
Bm/4	5/8" Rubber with yellow plastic cap marked "0007 TRM, FT."	NK4123848013, E22000553.3853, Elev. = 1009.23

PROPOSED WETLAND AND STREAM IMPACTS

FEATURE	IMPACT
Stream	481'
Wetlands	No Wetlands

TYPICAL CHANNEL SECTION
Not to Scale



GRAPHIC SCALE
1 inch = 20 feet

LEGEND

- Ex. Major Contour
- Ex. Minor Contour
- Ex. Right of Way
- Ex. Parcel
- Ex. Edge of Pavement
- Ex. Road Centerline
- Ex. Stream OHWM
- Ex. Guardrail
- Ex. Tree Line
- Ex. Bridge Limits
- Ex. Utility Pole
- Ex. Tree
- Ex. Bot Tree
- Ex. Tree Removed
- Prop. Stream Centerline
- Prop. Bankfull
- Prop. Grading Contour
- Prop. Easement
- Prop. Limits of Disturbance
- Prop. Channel Reinforcement
- Prop. Cross Vane
- Prop. Riffle
- Prop. Pool

SOURCE:

Cadastral: 0007
Elevation: Onele Survey and OSIP UDAR (MAD 88)(06-26-2008)
Imagery: OSIP (04-2013)
FEMA: FEMA DFIRM (08-18-2008)

PREPARED BY:

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Registered Engineer No. 74380 Date

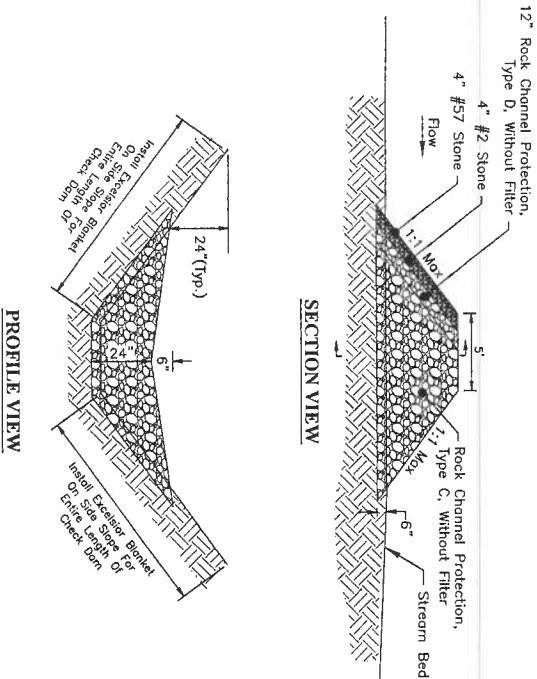
MUSKINGUM WATERSHED, ASHLAND COUNTY, OHIO
DISTRICT 3
STREAM MAINTENANCE PLAN
FOR
ASD-603-6.14
SITE PLAN

PRELIMINARY
NOT TO BE USED FOR
CONSTRUCTION
PLAN SET DATE
February, 2015

EMHHT
ENGINEERING, ARCHITECTURE & DESIGN, INC.
5800 New Albany Road, Columbus, OH 43254
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Date: March, 2015
Scale: 1" = 20'
Job No: 2013-1502
Sheet: 1 of 3

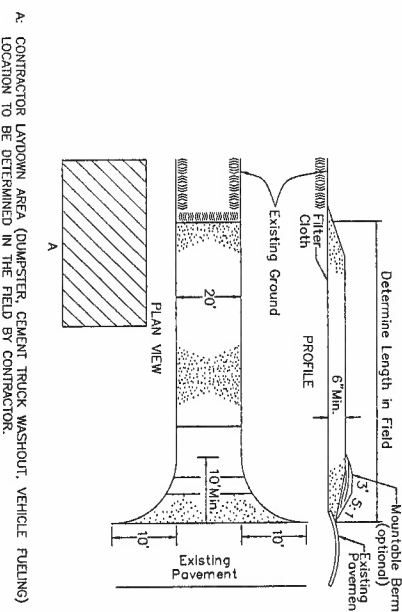
TEMPORARY AGGREGATE CHECK DAM NOTES:

1. INSTALL TEMPORARY AGGREGATE CHECK DAM PRIOR TO EARTH DISTURBANCE WITHIN THE STREAM CHANNEL.
2. INSPECT THE CHECK DAM DAILY. LOOK FOR DAMAGE TO THE AGGREGATE STRUCTURE, EROSION ON THE STREAM BANK, AND UNDERCUTTING BENEATH THE DAM. REPAIR DAMAGE PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH RAINFALL AND AFTER SEDIMENT EXCEEDS 1/4 CHECK DAM HEIGHT. DRESS SEDIMENT INTO THE PROPOSED WORK IF SUITABLE, OTHERWISE LEGALLY DISPOSE OF SEDIMENT OFFSITE.
4. REMOVE TEMPORARY AGGREGATE CHECK DAM UPON STABILIZATION OF THE WORK AREA WITHIN THE STREAM CHANNEL.
5. USE QUARRIED Limestone FOR ROCK CHANNEL PROTECTION (NO CONSTRUCTION RUBBLE OR RECYCLED CONCRETE).
6. EXCESSIVE BLANKET SHALL SATISFY THE REQUIREMENTS OF ITEM 671, EROSION CONTROL MAT, TYPE C.



STABILIZED CONSTRUCTION ENTRANCE NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWENTY (20) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAYS. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

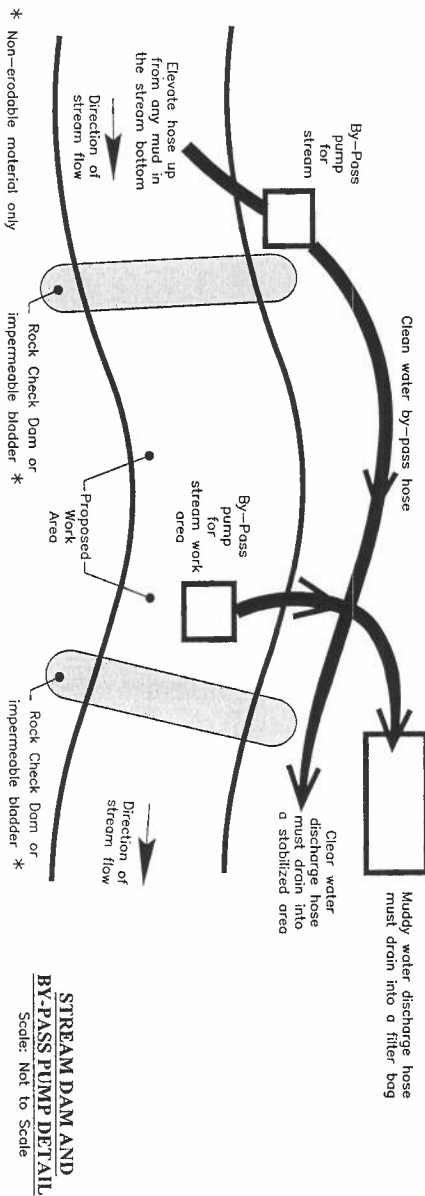


TEMPORARY AGGREGATE CHECK DAM DETAIL

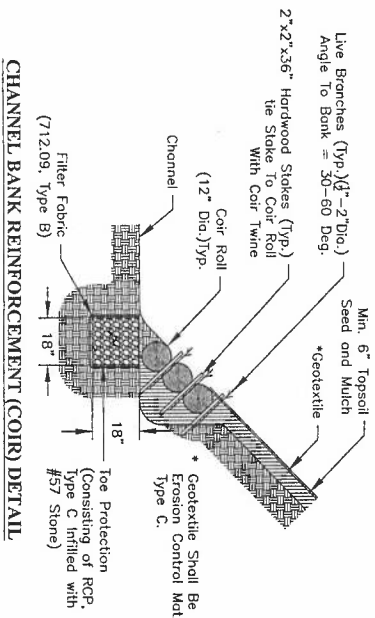
Scale: Not to Scale

STABILIZED CONSTRUCTION ENTRANCE DETAIL

Scale: Not to Scale



- CHANNEL BANK REINFORCEMENT (COIR) NOTES:
1. BOULDER TOE SHALL CONSIST OF ROCK CHANNEL PROTECTION, TYPE C ENCASED IN #57 AGGREGATE. WRAP BOTTOM AND SIDES OF BOULDER TOE WITH FILTER FABRIC PER CMS 712.09, TYPE B. USE QUARRIED Limestone FOR ROCK CHANNEL PROTECTION (NO CONSTRUCTION RUBBLE OR RECYCLED CONCRETE).
 2. THE BOULDER TOE SHALL BE IMBEDDED INTO THE CHANNEL. BOTTOM AND BANK TO THE DIMENSIONS SHOWN ON THE DETAIL. OVER-EXCAVATION OF THE CHANNEL BANK TO INSTALL THE BOULDER TOE SHALL BE BACKFILLED WITH COMPACTABLE MATERIAL THAT IS PLACED IN LIFTS AND GRADED TO CONFORM TO THE PLANS.
 3. COIR ROLL SHALL CONSIST OF BIODEGRADABLE MATERIAL 12-INCHES IN DIAMETER WITH A DENSITY OF 7 LBS/FT² (POLYLANA PRODUCTS OR APPROVED EQUAL). THE COIR ROLL OUTER NETTING SHALL CONSIST OF A COIR TWINE WITH A BREAKING STRENGTH OF 90 LBS. HARDWOOD STAKES TO ANCHOR THE COIR ROLLS SHALL BE 2"x2"x36" IN SIZE. THE SPECIFIED LENGTH IS A MINIMUM AND MAY NEED TO BE FIELD ADJUSTED TO ALLOW FOR SUFFICIENT ANCHORING.
 4. INSTALL COIR ROLLS AFTER THE BOULDER TOE AND BEFORE LIVE STAKE MATERIAL IS IN PLACE. BEND THE UPSTREAM AND DOWNSTREAM ENDS OF THE COIR ROLLS BACK INTO THE CHANNEL BANK TO PREVENT STREAM FLOW FROM CUTTING BEHIND THE ROLLS. THE ENDS OF ABUTTING COIR ROLLS SHALL BE JOINED WITH TWINE. HARDWOOD STAKES SHALL BE DRIVEN INTO THE NATIVE, UNDISTURBED SOIL BEHIND THE ROLLS. THE ROLLS SHALL BE TIED TO THE STAKES WITH TWINE. STAKES SHALL BE PLACED AT THE BEGINNING AND END OF EACH ROLL AND AT A MAXIMUM SPACING OF 2 FEET.
 5. LIVE BRANCH MATERIAL SHALL BE DOMINANT AND PURCHASED FROM A REPUTABLE COMMERCIAL SUPPLIER. THE MATERIAL SHALL BE PLANTED ONLY DURING ITS NATURAL DOMINANCE PERIOD, EXTENDING FROM NOVEMBER 15 THROUGH MARCH 1. BRANCHES SHALL BE 3/4 - 2 INCHES IN DIAMETER, 2-3 FEET IN LENGTH, AND LIVING BASED ON THE PRESENCE OF YOUNG BUDS AND GREEN BARK. PRIOR TO INSTALLATION, THE BRANCHES SHALL BE CUT SO THAT THEY ARE ANGLED ON THE BOTTOM AND GREEN BARK ON THE TOP. ALL LIVE BRANCH MATERIAL SHALL BE PRESERVED IN A DORMANT STATE PRIOR TO INSTALLATION. PLANT MATERIAL THAT HAS BEEN ALLOWED TO DRY OUT OR IS NOT PRESERVED IN A DORMANT STATE PRIOR TO INSTALLATION SHALL BE DISCARDED.



CHANNEL BANK REINFORCEMENT (COIR) DETAIL

Scale: Not to Scale

ROCK RIFLES:

ONLY EMBEDDED (NOT VISIBLE) SUPPORT AND CREST STONE MAY BE QUARRIED Limestone MATERIAL. NO CONSTRUCTION RUBBLE IS PERMISSIBLE. ALL OTHER MATERIAL USED TO CONSTRUCT THE ROCK RIFLE (ALL VISIBLE ROCK) SHALL BE RIVER ROCK, CONSISTING OF ROUNDED STONE WITH NATURAL SURFACES. THE RIFLE CONSTRUCTION SHALL RESEMBLE THE CONSTRUCTION OF THIS MATERIAL WITH THE GUT OF DUBIN FOR APPROVAL PRIOR TO DELIVERY OF MATERIAL. SEE RIFLE MATERIALS TABLE FOR DESCRIPTIONS AND SIZES OF MATERIALS.

- 1.0 CREST STONE
THE CREST STONE SHALL BE PLACED TO THE ELEVATION SHOWN AND LABELED ON THE STREAM PROFILE. THE CREST ELEVATION MUST POOL WATER BACK TO THE BASE OF THE UPSTREAM RIFLE.

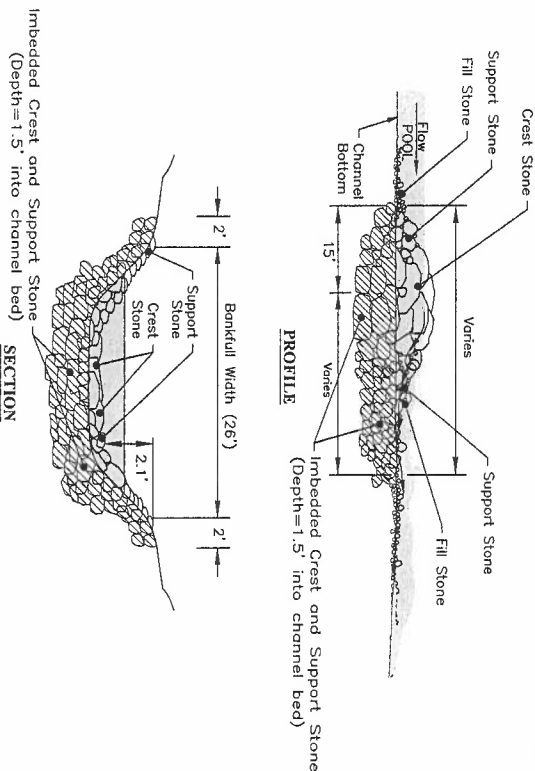
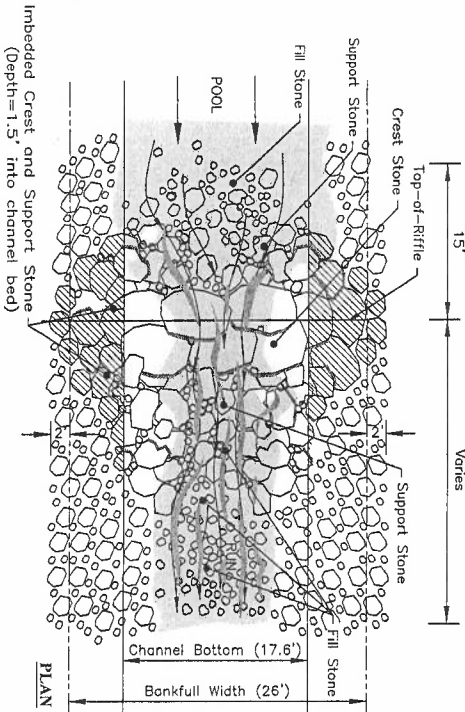
INSTALLATION:
THE CREST ELEVATION MUST BE DETERMINED AND THE CENTER STONE INSTALLED FIRST. TRENCH INTO THE STREAM BED APPROXIMATELY 1.5' FEET AND PLACE THE STONE(S) SO THAT THE CENTER STONE REACHES THE CREST ELEVATION. TRENCH AND INSTALL THE REMAINING CREST STONES ACROSS THE STREAM, ELEVATING THEM INTO THE BANKS THE SPECIFIED DISTANCE. FINISHED ELEVATIONS OF THE CREST STONE MUST CONSERVATIVE FLOWS THROUGH THE CENTER OF THE RIFLE.

2.0 SUPPORT STONE

INSTALLATION:
SUPPORT STONE MUST BE PLACED TIGHTLY ON BOTH SIDES OF THE CREST STONE PAYING CLOSE ATTENTION TO FIT ON THE DOWNSTREAM SIDE. PROPER ELEVATION OF THE SUPPORT STONE MUST BE MAINTAINED AND MUST BE AS HIGH AS THE CREST STONE. AT THE END OF THE RIFLE, THE DOWNSTREAM END MUST BE FINISHED WITH THE CREST STONE. THE CENTER STONE MUST BE EXACTLY 1.5 FEET. FINISHED ELEVATIONS OF THE SUPPORT STONE MUST CONSERVATIVE FLOWS ACROSS THE CENTER OF THE RIFLE AND CREATE NON-LAMINAR (TURBULENT) FLOW. SUPPORT STONES WILL CONTINUE UP THE BANKS TO THE FINAL ELEVATION. SUPPORT STONE WILL BE TRENCHED INTO THE BANKS TO SUPPORT THE CREST STONE.

- 3.0 FILL STONE
INSTALLATION:
AFTER THE INSTALLATION OF THE LARGER CREST AND SUPPORT STONES, FILL ALL Voids WITH FILL STONE. FINAL GRADING AND TRANSITION WITH THE UPPER BANK AREA CAN BE ACCOMPLISHED USING THIS STONE SIZE.

4.0 PAYMENT
THE PRICE OF ALL LABOR AND MATERIALS ASSOCIATED WITH THE CONSTRUCTION OF ROCK RIFLES AS SHOWN ON THIS PLAN INCLUDING CREST, SUPPORT AND FILL STONE, SHALL BE INCLUDED IN THE PRICE BID FOR ITEM SPEC., ROCK RIFLE, AS PER PLAN.



ROCK RIFLE DETAIL

Scale: Not to Scale

- INSTALLATION:
1. THE CONTRACTOR SHALL PUMP MUDDY WATER ENCOUNTERED WITHIN THE EXCAVATED AREAS INTO A FILTER FABRIC BAG. THE BAG SHALL BE PLACED WITHIN A LEVEL UNDISTURBED AREA AS FAR AWAY FROM THE STORMWATER OUTFALL AS POSSIBLE. THE BAG SHALL BE PLACED ON TOP OF A AGGREGATE PAD. ADDITIONALLY, A PERIMETER FENCE SHALL BE INSTALLED AROUND THE BAG. THE PERIMETER FENCE SHALL BE UTILIZED ALONG THE DOWNSTREAM SIDE OF THE BAG. THE PERIMETER CONTROLS SHALL BE INSTALLED TO ENSURE THAT THE WATER FLOWING OUT OF THE BAG DOES NOT COME AROUND THE ENDS OF THE PERIMETERS. FROM AWAY FROM THE STORMWATER OUTFALL AND OPENED. THE ACCUMULATED SEDIMENT SHALL BE SPREAD OUT TO ALLOW TO DRY AND STABILIZED WITH VEGETATION. FILTERBAG SHALL BE AND ENVIRONMENT-PROTECTION FILTER BAG, SIZE IS 15'X15' OR EQUAL.

- MAINTENANCE:
1. THE FILTER BAG SHALL BE REPLACED WHEN THE BAG IS HALF FILLED WITH SEDIMENT.
 2. THE CONTRACTOR SHALL CONTACT THE PROJECT INSPECTOR/ENGINEER FOR CONSULTATIVE SERVICES IF DRAINAGE/ENGINEERING ACTIVITIES OVERWHELM THE FILTER BAG AND PERIMETER CONTROLS.

MIFFLIN TOWNSHIP, ASHLAND COUNTY, OHIO

FOR

ASD-603-6-14
DETAIL SHEET

PRELIMINARY
NOT TO BE USED FOR
CONSTRUCTION

PLAN SET DATE
February, 2015

DEWA FERRING THE FILTER BAG

Scale: Not to Scale

EMHIT

Revised: 5/15/2015
Author: 5/15/2015
Checked: 5/15/2015
Drawn: 5/15/2015
Project: ASD-603-6-14
Sheet: 3 of 3

Date: March, 2015

Scale: As Shown

Job No: 2013-1502

Sheet: 3 of 3

ODOT District: 3

County: Ashland

Route: State Route 603

Bridge No.: ASD-603-0614

Estimate Prepared By: H. Yaryan Hall

Date: 3/6/2015

D.A. (mi²): 2.37

Stream length (ft.): 480

Wbkf (ft.): 26

Abkf (ft.²): 46

Project Description: Reconstruction of the existing aggraded channel to create hydraulic capacity and a stable profile through the existing bridge; assuming one cross-vane and three riffles

Dist from Quarry (mi): 27

National Lime and Stone Quarry in Wooster (1455 Timken Road)

Dist from Concrete Supplier (mi): 12

Moritz Materials in Ashland (869 Faultless Drive)

Item	Materials	Qty	Final Qty	Unit	Unit Cost	Ext Cost	COMMENTS
1	Channel Excavation (Realignment)	1050	1050	CYD	\$ -	\$ -	
2	Cross Vanes (Use Wbkf = 30 ft Min.)	30	30	Wbkf (FT)	\$ 146.30	\$ 4,389.14	
3	Erosion Control Mat, Type C	190	190	SYD	\$ 2.30	\$ 437.00	
4	Hauling, 25 MPH, 10 mile cycle, 15minute loading	30	30	CYD	\$ -	\$ -	
5	Seeding and Mulching, Type 4B	290	290	SYD	\$ 2.88	\$ 833.75	
6	Toe Protection / Live Stakes	230	230	LF	\$ 39.70	\$ 9,131.13	
7	Riffles	2	2	EA	\$ 7,500.00	\$ 15,000.00	
8							
9							
10							
11							
12							
13							
14							
15							
SUBTOTAL MATERIALS						\$ 29,791.02	

Item	Labor	Qty	Final Qty	Unit	Unit Cost	Ext Cost	Assumes Highway Tech 2
16	Labor Required by Materials Entered	224	224	HR	\$ 33.30	\$ 7,459.20	
17	Surveying (hours per person)	40	40	HR	\$ 37.78	\$ 1,511.20	
18	Additional Labor 2	120	120	HR	\$ 33.30	\$ 3,996.00	
19	Additional Labor 3	40	40	HR	\$ 33.30	\$ 1,332.00	Miscellaneous
SUBTOTAL LABOR						\$ 14,298.40	

Item	Equipment	Qty	Final Qty	Unit	Unit Cost	Ext Cost
20	Heavy Excavator Required by Materials Entered	96	96	HR	\$ 39.23	\$ 3,766.08
21	Front End Loader Req'd by Materials Entered	0	0	HR	\$ 36.12	\$ -
22	Roller Required by Materials Entered	0	0	HR	\$ 32.34	\$ -
23	Flatbed Truck Required by Materials Entered	8	16	HR	\$ 41.63	\$ 666.00
24	Dump Truck Required by Materials Entered	8	16	HR	\$ 86.53	\$ 1,384.40
25	Additional Equipment (per hour):			HR		\$ -
SUBTOTAL EQUIPMENT						\$ 5,816.48

Item	Mileage	Qty	Final Qty	Unit	Unit Cost	Ext Cost	Seems to be a standard item on maintenance projects
27	Mileage 1: 3/4 Ton Pick-up Truck	400	400	MI	\$ 0.72	\$ 288.00	
28	Mileage 2: Dump Truck (2500-3500)	300	300	MI	\$ 2.08	\$ 624.00	Hauling embankment material to site
SUBTOTAL MILEAGE						\$ 912.00	

TOTAL							\$ 50,817.90
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Item	Description	Qty	Unit	Notes
659	Seeding and Mulching, Class 4B	290	SYD	
671	Erosion Control Mat, Type C	190	SYD	
712.09	Geotextile for Cross Vane	110	SYD	Type B
712.09	Geotextile for Toe Reinforcement	358	SYD	Type B
SPEC	2'x2'x3' Concrete Blocks for Cross Vane	5	EACH	Includes 1 extra 3' block
SPEC	2'x2'x6' Concrete Blocks for Cross Vane	24	EACH	Includes 2 extra 6' blocks
SPEC	Native Stone Backfill for Cross Vane	0	CYD	2'-4" cobbles (use excavated depositional material)
SPEC	Boulder Toe	20	CYD	RCP, Type C with #5/7 stone
SPEC	Coir Roll	460	LF	RoLanka BioRoll D 30L
SPEC	Live Stakes	260	EACH	2 rows at 0.5 ft spacing along the full length of the toe protection; from Ernst Conservation Seeds
SPEC	Crest Stone for Riffles	46	CYD	Type C Size
SPEC	Support Stone for Riffles	18	CYD	Type D Size
SPEC	Fill Stone for Riffles	0	CYD	Cobbles (use excavated depositional material)

Notes:
Cross vane volumes are scaled down 20% for using the 2'x2'x6' concrete units in lieu of 2.5' minimum structure stone