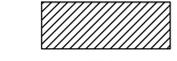
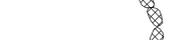
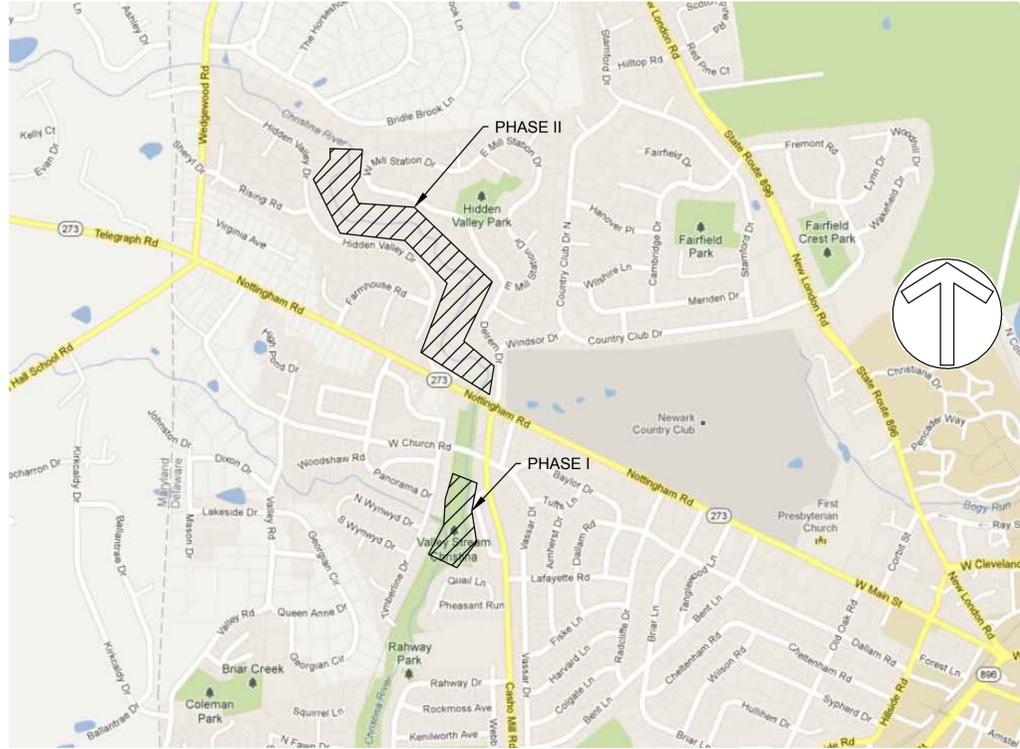


UPPER CHRISTINA STREAM RESTORATION

LEGEND

EXISTING	PROPOSED	
— · — · — · —	— 425 —	CONTOUR
— 48 —	— — —	THALWEG
— 100YR FP —	— LOD — LOD —	LIMIT OF DISTURBANCE
— · — · — · —	— SF — SF —	SILT FENCE
— · — · — · —	— BOF — BOF —	BLAZE ORANGE FENCE
— x — x — x — x —		STABILIZED CONSTRUCTION ENTRANCE
— SAN —		STAGING AND STOCKPILE AREA
— >> —	X 93.5	SPOT ELEVATION
— OHP —		BOULDER BANK PROTECTION
— OHW —		ROCK CROSS VANE
		ROCK J-VANE
		ROCK VANE
		LOG TOE PROTECTION
		MULCH ACCESS PATH



SCALE: 1" = 1000'

VICINITY MAP

GENERAL NOTES (CON'T):

OWNER / DEVELOPER IS NOT THE SAME OWNER / DEVELOPER OF TWO OR MORE CONTIGUOUS LOTS BEING DEVELOPED.

GRADING SHALL NOT IMPAIR SURFACE DRAINAGE, CREATE AN EROSION HAZARD OR CREATE A SOURCE OF SEDIMENT TO ANY ADJACENT WATERCOURSE OR PROPERTY OWNER.

APPROVAL OF A SEDIMENT & STORMWATER PLANS DOES NOT GRANT OR IMPLY A RIGHT OF DISCHARGE STORMWATER RUNOFF. THE OWNER/DEVELOPER IS RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS, EASEMENTS, ETC. AS NECESSARY TO COMPLY WITH STATE DRAINAGE AND OTHER APPLICABLE LAWS.

ANY SEDIMENT TRANSPORTED OFF-SITE TO ROADS OR RIGHTS OF WAY INCLUDING DITCHES, SHALL BE REMOVED IMMEDIATELY. ANY DAMAGE TO DITCHES SHALL BE REPAIRED AND STABILIZED TO ORIGINAL CONDITION.

FOLLOWING SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 14 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER SEDIMENT CONTROLS, TOPSOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO INSPECT PERIODICALLY, AND AFTER EACH RAINFALL, ALL EROSION AND SEDIMENT CONTROL MEASURES MAINTENANCE MUST BE PERFORMED BY THE CONTRACTOR AFTER EACH INSPECTION AS NECESSARY.

ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE CURRENT DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK.

IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY THE CITY OF NEWARK.

GENERAL NOTES (CON'T):

UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. COMPLETENESS OR CORRECTNESS THEREOF IS NOT GUARANTEED. IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES INVOLVED IN ORDER TO SECURE THE MOST ACCURATE INFORMATION AVAILABLE AS TO UTILITY LOCATION AND ELEVATION. NO CONSTRUCTION AROUND OR ADJACENT TO UTILITIES SHALL BEGIN WITHOUT NOTIFYING THEIR OWNERS AT LEAST TWO WORKING DAYS IN ADVANCE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO THE CONTRACTORS' NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT CONTRACTORS' EXPENSE. TO LOCATE EXISTING UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA (TELEPHONE 800-282-8555).

THE CONTRACTOR SHALL NOT REMOVE ANY TREE LARGER THAN 5 INCHES DBH WITHOUT PRIOR APPROVAL FROM DNREC. ANY TREES THAT ARE REMOVED OR DAMAGED DUE TO THE CONTRACTORS' NEGLIGENCE WITHOUT PRIOR APPROVAL SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.

THE EXISTING ELEVATIONS AND CONTOURS SHOWN ON THE PLANS, CROSS SECTIONS, AND PROFILES WERE SURVEYED IN MARCH 2011 IN AN ARBITRARY COORDINATE SYSTEM ON ASSUMED DATUM. THE SURVEY WAS THEN RECTIFIED VIA GLOBAL POSITIONING SYSTEM (GPS) TO NAD83 DELAWARE STATE PLANE, NAVD88. DUE TO THE POTENTIAL ERROR INVOLVED WITH THIS PROCESS, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM EXISTING GRADES, STAKEOUT THE PROPOSED CHANNEL AND STRUCTURE LOCATIONS, AND TO COORDINATE A CONSTRUCTION STAKEOUT REVIEW OF THE SITE TO RESOLVE ANY ISSUES WITH THE SURVEY.

DUE TO THE LIMITS OF AVAILABLE SURVEY, PROPOSED GRADING TIE IN'S AND TIE OUT'S MAY NOT PRECISELY MATCH WITH THE GIS CONTOURS THAT ARE SHOWN ON THE PLANS.

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- 03 GRADING PLAN PHASE I
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- 11 TYPICAL CROSS SECTIONS
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- 16 DETAILS
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- 21 EROSION AND SEDIMENT CONTROL NOTES
- 22 CERTIFICATIONS PHASE I
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- 31 PLANTING PLAN PHASE II
- 32 PLANTING DETAILS

GENERAL DATA:

PHASE I:
SITE GROSS ACREAGE = 1.78 AC.
TOTAL DISTURBED AREA = 1.78 AC.
VOLUME OF CUT: 380 CY
VOLUME OF FILL: 222 CY

PHASE II:
SITE GROSS ACREAGE = 4.17AC.
TOTAL DISTURBED AREA = 4.17 AC.
VOLUME OF CUT: 2253 CY
VOLUME OF FILL: 2421 CY

TAX PARCEL #:
PHASE I;
1801200279,1801200096,1801200097,
1801200098,1801200099,1801200100,
1801200101,1801200102,1801200103,
1801200095
PHASE II;
1804800007,1804800006,1804800005,
1804800004,1804800003,1804800002,
1804800001,1800500043,1800500044,
1800500045,1800500046,1800500047,
1800500048,1800500049,1800600174,
1800600173,1800600172,1800600171,
1800600170,1800600169, 900730039,
1804800054,1804800055,1804800056,
1804800057,1804800058,1800200179,
1800200180,1800200181,1800600184,
1800600185,1800600186,1800600187,
1800600188,1800600189

GENERAL NOTES:

DRAINAGE, EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT SHALL BE IN ACCORDANCE WITH THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, AS AMENDED.

REVIEW AND APPROVAL OF THE GENERAL PLAN SUBMISSION SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE SEDIMENT AND STORMWATER REGULATIONS, AS AMENDED, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS ON THE APPROVED PLAN.

PHASE I:
ACREAGE OF DISTURBED AREA = 1.78 AC
1.00 AC LANDWARD
0.79 AC SUBAQUEOUS
1.78 AC TOTAL

PHASE II:
ACREAGE OF DISTURBED AREA = 4.17 AC
2.44 AC LANDWARD
1.73 AC SUBAQUEOUS
4.17 AC TOTAL

TOTAL CONTRIBUTING DRAINAGE AREA = 4,454.4 AC

LIMITS OF DISTURBANCE MUST BE DELINEATED IN THE FIELD.

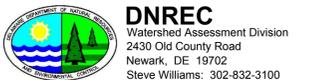
THE APPLICANT SHALL NOTIFY THE DELEGATED INSPECTION AGENCY AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

INITIAL EARTH DISTURBANCE SHALL BE LIMITED TO THOSE AREAS NECESSARY TO INSTALL SEDIMENT AND EROSION CONTROL MEASURES.

CLIENT

STEVE WILLIAMS
DNREC
2430 OLD COUNTY ROAD
NEWARK, DE 19702

DATE:	ISSUES / REVISIONS
2/28/2014	100% DESIGN
3/31/2014	CITY OF NEWARK E&S REVISION
5/12/2014	CITY OF NEWARK E&S REVISION



DNREC
Watershed Assessment Division
2430 Old County Road
Newark, DE 19702
Steve Williams: 302-832-3100



The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
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Restore the Earth & Inspire Ecological Stewardship

UPPER CHRISTINA STREAM RESTORATION

TITLE SHEET

PROJECT NO.:	12012.01	SCALE:	N/A
SEAL:	BY: TB	CHECK:	MT/DS
		DWG. NO.:	
		01 OF 32	

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STEVE WILLIAMS
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**UPPER CHRISTINA
STREAM
RESTORATION**

**GRADING PLAN
PHASE II**

PROJECT NO.: 12012.01 SCALE: 1" = 20'

SEAL: BY: TB CHECK: MT/DS
DWG. NO.:



07 OF 32

LEGEND

- LOD — LOD — LIMIT OF DISTURBANCE
- SF — SF — SILT FENCE
- BOF — BOF — BLAZE ORANGE FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- STAGING AND STOCKPILE AREA
- MULCH ACCESS PATH

MATCHLINE SHEET 6

WNENCHAK RAYMOND M & LYNN R 1804800056

206+00

207+00

208+00

209+00

MATCHLINE SHEET 8

BOULDER BANK PROTECTION
BELOW BRIDGE.
TOP ELEVATION TO BE
DETERMINED IN FIELD

TOP ELEVATION 145'

INVERT -7.2" PIPE
ELEV. = 142.39 APPROX.
TOP ELEV. = 147.89
SANITARY MANHOLE

TIE INTO EXISTING GRADE. DO
NOT DISTURB EXISTING GABIONS

CULLEY JAMES D & MARY M 1804800004

DUPLESSIS BERNARD L III & 1804800003

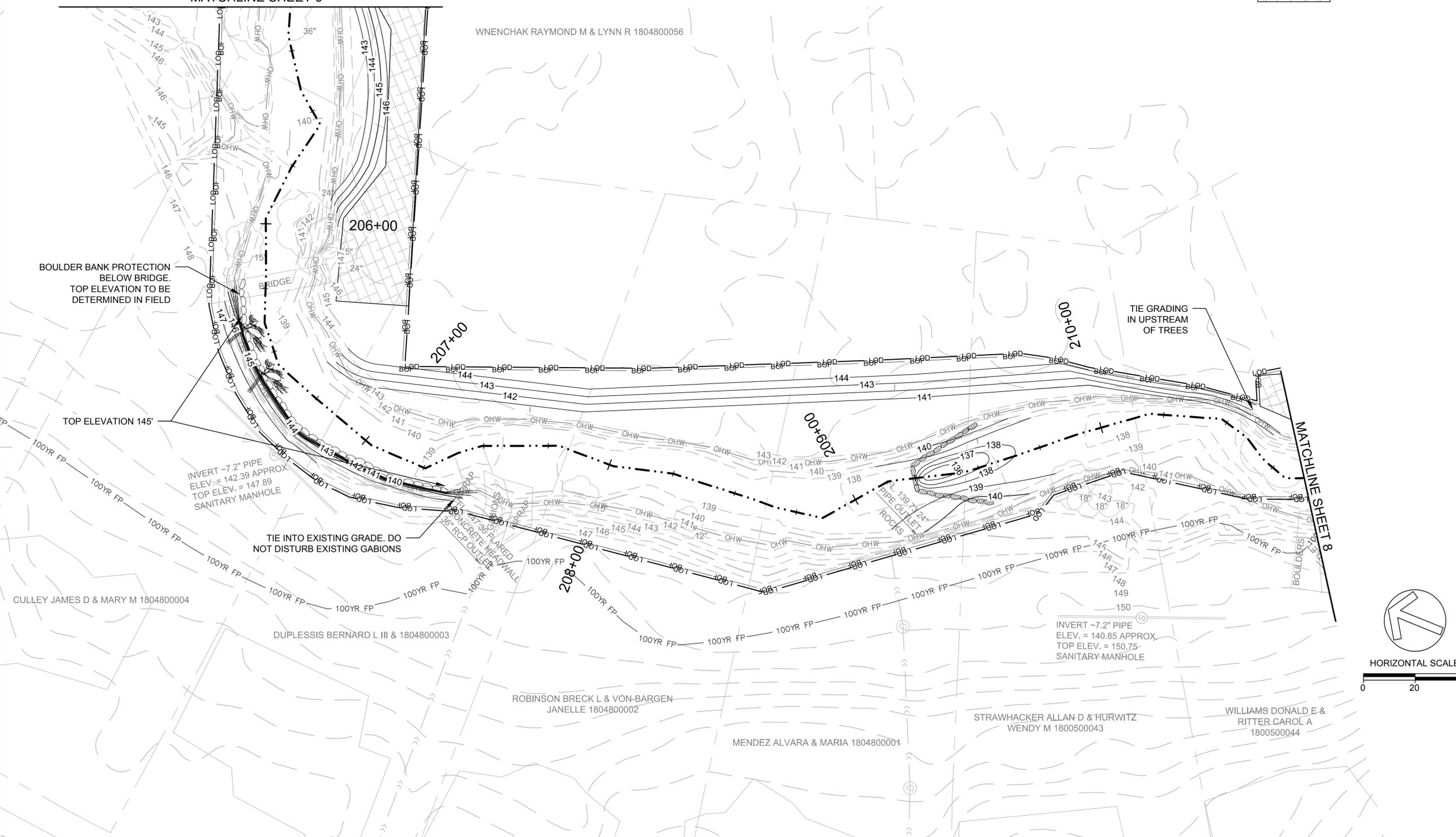
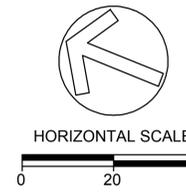
ROBINSON BRECK L & VON-BARGEN
JANELLE 1804800002

MENDEZ ALVARA & MARIA 1804800001

STRAWHACKER ALLAN D & HURWITZ
WENDY M 1800500043

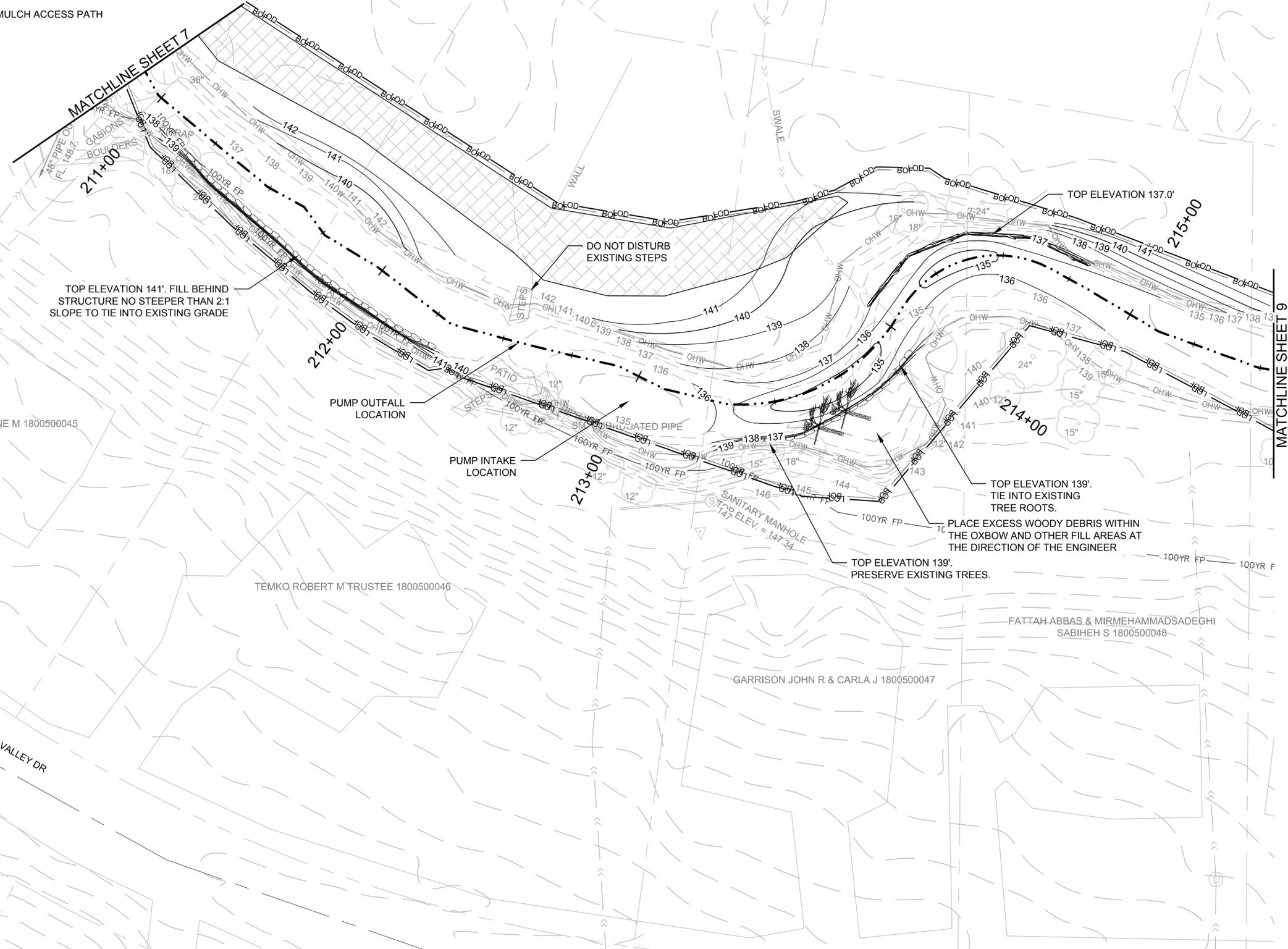
WILLIAMS DONALD E &
RITTER CAROL A
1800500044

INVERT -7.2" PIPE
ELEV. = 140.85 APPROX.
TOP ELEV. = 150.75-
SANITARY-MANHOLE



LEGEND

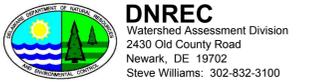
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**UPPER CHRISTINA
 STREAM
 RESTORATION**

**GRADING PLAN
 PHASE II**

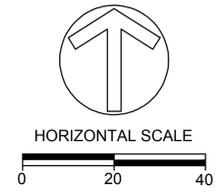
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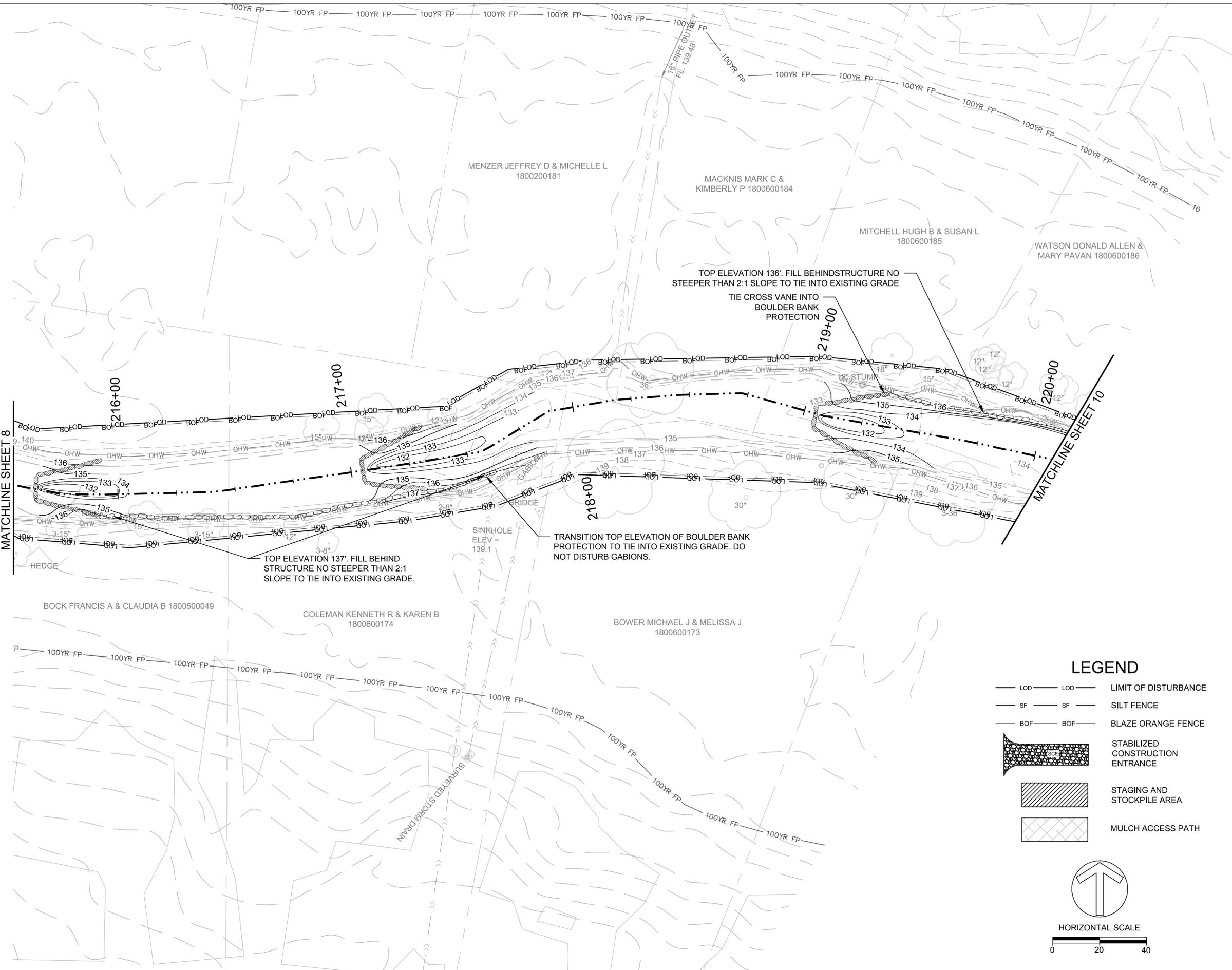
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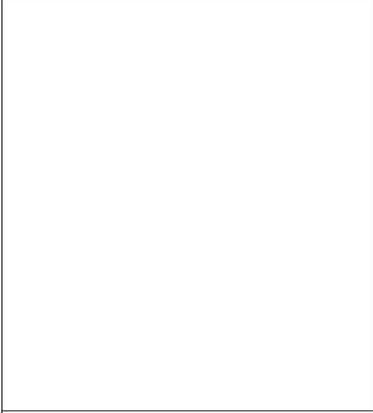
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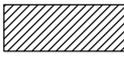
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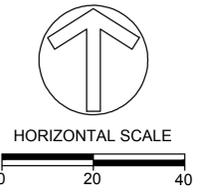
**UPPER CHRISTINA
 STREAM
 RESTORATION**

**GRADING PLAN
 PHASE II**

PROJECT NO.:	12012.01	SCALE:	1" = 20'
SEAL:	BY: TB	CHECK:	MT/DS
		DWG. NO.: 09 OF 32	

LEGEND

— LOD —	— LOD —	LIMIT OF DISTURBANCE
— SF —	— SF —	SILT FENCE
— BOF —	— BOF —	BLAZE ORANGE FENCE
		STABILIZED CONSTRUCTION ENTRANCE
		STAGING AND STOCKPILE AREA
		MULCH ACCESS PATH



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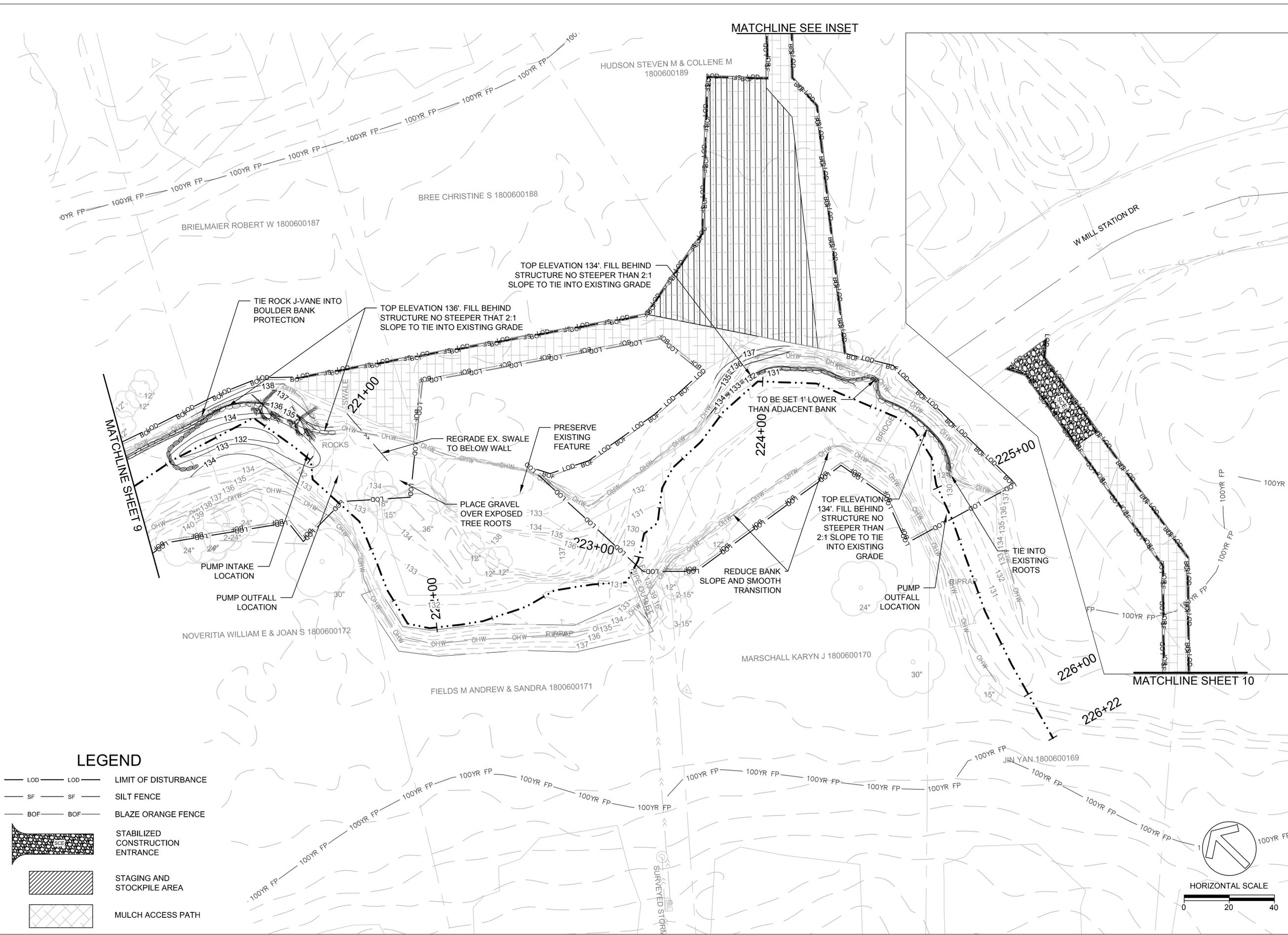
**UPPER CHRISTINA
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**GRADING PLAN
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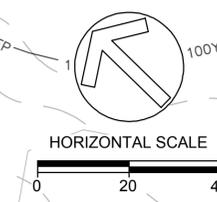


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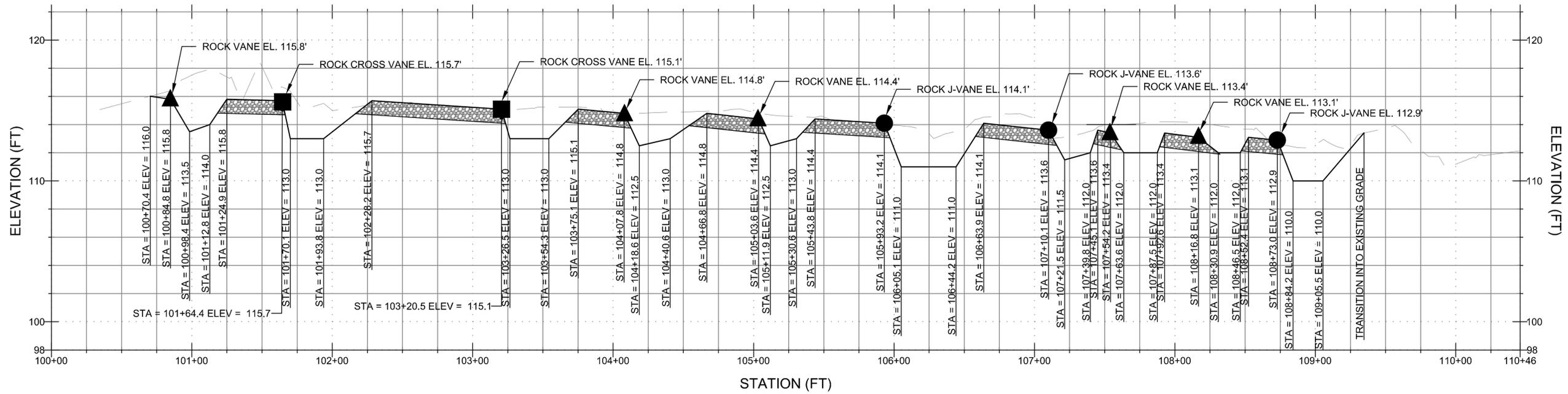


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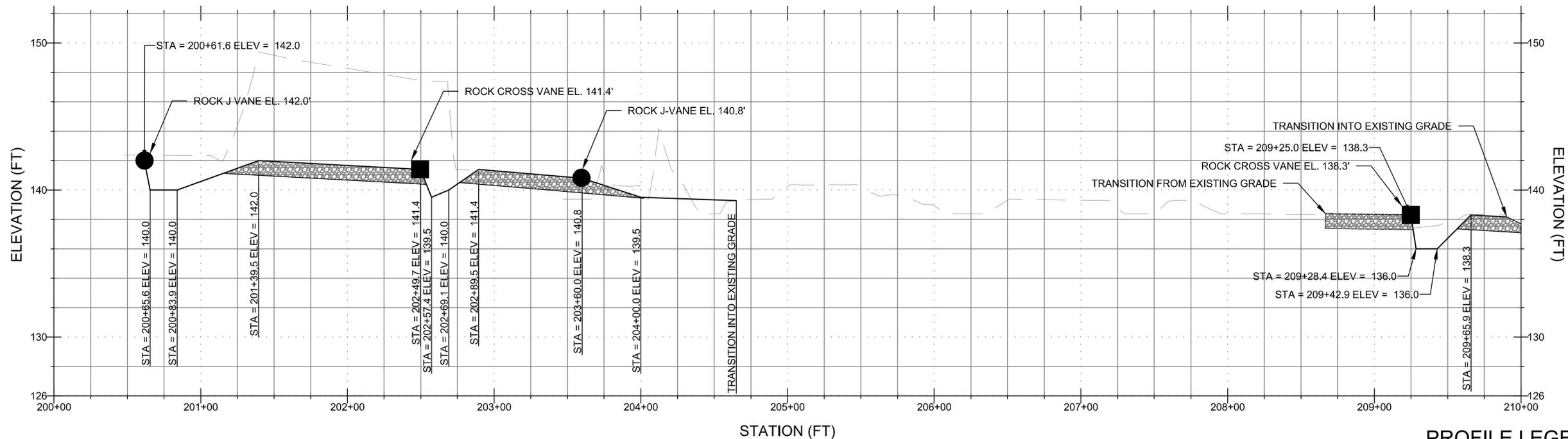
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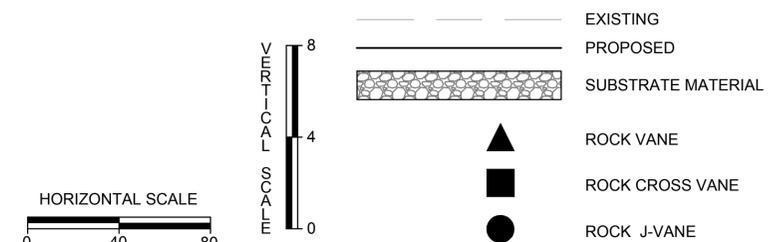
PROFILE OF UPPER CHRISTINA RIVER - PHASE I



PROFILE OF UPPER CHRISTINA RIVER - PHASE II



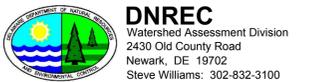
PROFILE LEGEND



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UPPER CHRISTINA STREAM RESTORATION

PROFILES

PROJECT NO.:	12012.01	SCALE:	AS SHOWN
SEAL:		BY:	TB
		CHECK:	MT/DS
		DWG. NO.:	



12 OF 32

CODORUS SERIES (CH AND HW)

THE CODORUS SERIES CONSISTS OF VERY DEEP, MODERATELY WELL DRAINED AND SOMEWHAT POORLY DRAINED SOILS. THESE SOILS FORMED IN RECENTLY DEPOSITED ALLUVIAL MATERIALS DERIVED FROM UPLAND SOILS MATERIALS WEATHERED FROM MOSTLY METAMORPHIC AND CRYSTALLINE ROCKS. THEY ARE ON FLOODPLAINS WITH SMOOTH, NEARLY LEVEL SLOPES OF 0 TO 3 PERCENT. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH TO HIGH. MEAN ANNUAL PRECIPITATION IS 42 INCHES, AND MEAN ANNUAL TEMPERATURE IS 52 DEGREES F.

TAXONOMIC CLASS: FINE-LOAMY, MIXED, ACTIVE, MESIC FLUVAQUENTIC DYSTRUDEPTS

TYPICAL PEDON: CODORUS SILT LOAM, 0 TO 3 PERCENT NORTHWEST FACING SLOPE IN A CULTIVATED FIELD. (COLORS ARE FOR MOIST SOIL.)

AP-0 TO 9 INCHES; BROWN (10YR 4/3) SILT LOAM; WEAK FINE GRANULAR STRUCTURE; FRIABLE, NONSTICKY, NONPLASTIC; 5 PERCENT SUBROUNDED GRAVEL; STRONGLY ACID; ABRUPT SMOOTH BOUNDARY. (6 TO 9 INCHES THICK)

BW1-9 TO 18 INCHES; DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM; WEAK FINE SUBANGULAR BLOCKY STRUCTURE; FRIABLE, SLIGHTLY STICKY, NONPLASTIC; 5 PERCENT SUBROUNDED GRAVEL; STRONGLY ACID; CLEAR WAVY BOUNDARY. (4 TO 10 INCHES THICK)

BW2-18 TO 30 INCHES; BROWN (10YR 5/3) LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON FINE FAINT LIGHT BROWNISH GRAY (10YR 6/2) MASSES OF REDUCED IRON AND COMMON FINE DISTINCT STRONG BROWN (7.5YR 5/6) MASSES OF OXIDIZED IRON; MANY MICA FLAKES; STRONGLY ACID; GRADUAL SMOOTH BOUNDARY. (9 TO 20 INCHES THICK)

C1-30 TO 54 INCHES; LIGHT YELLOWISH BROWN (10YR 6/4) LOAM; MASSIVE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON MEDIUM FAINT LIGHT BROWNISH GRAY (10YR 6/2) MASSES OF REDUCED IRON AND COMMON MEDIUM DISTINCT BROWN (7.5YR 5/4) MASSES OF OXIDIZED IRON; MANY MICA FLAKES; STRONGLY ACID; CLEAR SMOOTH BOUNDARY.

C2-54 TO 65 INCHES; LIGHT YELLOWISH BROWN (10YR 6/4) LOAM, STRATIFIED WITH SAND AND GRAVEL; MASSIVE; FRIABLE, NONSTICKY, NONPLASTIC; 40 PERCENT SUBROUNDED GRAVEL IN INDIVIDUAL STRATA; COMMON FAINT LIGHT BROWNISH GRAY (10YR 6/2) MASSES OF OXIDIZED IRON; STRONGLY ACID.

TYPE LOCATION: MONTGOMERY COUNTY, PENNSYLVANIA; LOWER MERION TOWNSHIP, 1-1/2 MILES NORTHEAST ON ROBERTS ROAD FROM INTERSECTION WITH ROUTE 30, 250 FEET NORTH OF ROAD IN CULTIVATED FIELD ALONG MILL CREEK.

RANGE IN CHARACTERISTICS: SOLUM THICKNESS RANGES FROM 30 TO 60 INCHES. DEPTH TO SAND AND STRATIFIED MATERIAL IS MORE THAN 40 INCHES. DEPTH TO BEDROCK IS MORE THAN 6 FEET. CONTENT OF WATER ROUNDED GRAVEL RANGES FROM 0 TO 15 PERCENT IN THE SOLUM, 0 TO 25 PERCENT IN THE C HORIZON ABOVE 40 INCHES AND 0 TO 70 PERCENT IN THE C HORIZON BELOW 40 INCHES. MICA FLAKES MAY BE EVIDENT THROUGHOUT THE SOIL BUT QUANTITIES GENERALLY INCREASE IN THE LOWER PART OF THE SOLUM AND C HORIZON. REACTION RANGES FROM VERY STRONGLY ACID THROUGH MODERATELY ACID IN THE UPPER PART OF THE SOLUM AND FROM STRONGLY ACID THROUGH SLIGHTLY ACID IN THE LOWER PART OF THE SOLUM AND IN THE C HORIZON, UNLESS LIMED.

THE A HORIZON HAS HUE OF 10YR, VALUE OF 3 THROUGH 6, AND CHROMA OF 2 THROUGH 6. TEXTURE IS LOAM OR SILT LOAM IN THE FINE-EARTH FRACTION.

THE BW HORIZON HAS HUE OF 7.5YR OR 10YR, VALUE OF 4 OR 5, AND CHROMA OF 3 OR 4. TEXTURES ARE LOAM, SILT LOAM, CLAY LOAM, OR SILTY CLAY LOAM IN THE FINE-EARTH FRACTION. REDOX DEPLETIONS WITH CHROMA OF 2 OR LESS ARE WITHIN A DEPTH OF 24 INCHES. SOME PEDONS HAVE A BG HORIZON WITH CHROMAS OF 1 OR 2 OCCURRING IN THE LOWER PART OF THE SOLUM.

THE C HORIZON HAS HUE OF 7.5YR THROUGH 2.5Y, VALUE OF 3 THROUGH 6, AND CHROMA OF 1 THROUGH 4, OR IS NEUTRAL. FINE-EARTH TEXTURES ARE LOAM, SILT LOAM, CLAY LOAM, OR SILTY CLAY LOAM. THE C HORIZON OF SOME PEDONS HAS LAYERS OF STRATIFIED SAND AND GRAVEL BELOW 40 INCHES.

GEOGRAPHIC SETTING: CODORUS SOILS ARE ON NEARLY LEVEL SLOPES OF FLOODPLAINS. SLOPES RANGE FROM 0 TO 3 PERCENT. THEY FORMED IN ALLUVIAL MATERIALS CONTAINING MEDIUM TO LARGE QUANTITIES OF MICA DERIVED FROM SCHIST, GNEISS, PHYLLITE AND OTHER METAMORPHIC ROCKS. THE CLIMATE IS HUMID AND TEMPERATE. MEAN ANNUAL PRECIPITATION RANGES FROM 38 TO 46 INCHES. MEAN ANNUAL TEMPERATURE RANGES FROM 54 TO 57 DEGREES F. THE GROWING SEASON RANGES FROM 140 TO 200 DAYS.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: MODERATELY WELL DRAINED AND SOMEWHAT POORLY DRAINED. RUNOFF IS LOW. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH ABOVE 40 INCHES AND MODERATELY HIGH TO HIGH BELOW 40 INCHES.

USE AND VEGETATION: APPROXIMATELY 75 PERCENT OF THE CODORUS SOILS ARE CULTIVATED OR IN PASTURE. ABOUT 20 PERCENT ARE WOODED, MOSTLY MIXED HARDWOODS, AND 5 PERCENT ARE IN NON-AGRICULTURAL USES.

DISTRIBUTION AND EXTENT: NORTHERN PIEDMONT OF PENNSYLVANIA, DELAWARE, NEW JERSEY, MARYLAND, NORTH CAROLINA, AND VIRGINIA. THE SERIES IS OF SMALL EXTENT.

HATBORO (HW)

THE HATBORO SERIES CONSISTS OF VERY DEEP AND POORLY DRAINED SOILS FORMED IN ALLUVIUM DERIVED FROM METAMORPHIC AND CRYSTALLINE ROCK. THEY ARE ON FLOOD PLAINS. SLOPES RANGE FROM 0 TO 3 PERCENT. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH TO HIGH. MEAN ANNUAL PRECIPITATION IS 42 INCHES AND MEAN ANNUAL TEMPERATURE IS 52 DEGREES F NEAR THE TYPE LOCATION.

TAXONOMIC CLASS: FINE-LOAMY, MIXED, ACTIVE, NONACID, MESIC FLUVAQUENTIC ENDOAQUEPTS

TYPICAL PEDON: HATBORO SILT LOAM ON 0 TO 3 PERCENT SLOPES-WOODS. (COLORS ARE FOR MOIST INTERIOR SOIL UNLESS OTHERWISE NOTED.)

A-0 TO 9 INCHES; DARK GRAYISH BROWN (10YR 4/2) SILT LOAM; WEAK FINE GRANULAR STRUCTURE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; MANY FINE AND MEDIUM ROOTS AND COMMON COARSE ROOTS THROUGHOUT; COMMON COARSE PORES; FEW FINE FAINT YELLOWISH BROWN (10YR 5/4) MASSES OF OXIDIZED IRON ON FACES OF PEDS; 4 PERCENT ANGULAR CHANNERS; MODERATELY ACID; ABRUPT SMOOTH BOUNDARY. (8 TO 12 INCHES THICK)

BG1-9 TO 27 INCHES; GRAY (10YR 5/1) SILT LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON FINE, MEDIUM AND FEW COARSE ROOTS THROUGHOUT; FEW COARSE PORES; COMMON MEDIUM DISTINCT DARK YELLOWISH BROWN (10YR 4/4) MASSES OF OXIDIZED IRON ON HORIZONTAL FACES OF PEDS AND COMMON MEDIUM DISTINCT GRAYISH BROWN (2.5Y 5/2) IRON DEPLETIONS ON FACES OF PEDS; COMMON MICA FLAKES; 2 PERCENT ANGULAR CHANNERS AND 5 PERCENT ROUNDED GRAVEL; MODERATELY ACID; CLEAR SMOOTH BOUNDARY.

BG2-27 TO 44 INCHES; GRAYISH BROWN (2.5Y 5/2) SILT LOAM; WEAK MEDIUM SUBANGULAR BLOCKY STRUCTURE; FIRM, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON MEDIUM AND COARSE ROOTS THROUGHOUT; FEW MEDIUM PROMINENT GRAY (N 6/0) MANGANESE MASSES ON VERTICAL FACES OF PEDS AND COMMON MEDIUM DISTINCT STRONG BROWN (7.5YR 5/6) MASSES OF OXIDIZED IRON ON FACES OF PEDS; COMMON MICA FLAKES; 4 PERCENT ANGULAR CHANNERS AND 6 PERCENT ROUNDED GRAVEL; MODERATELY ACID; CLEAR SMOOTH BOUNDARY. (COMBINED THICKNESS OF THE BG HORIZON IS 28 TO 48 INCHES)

CG1-44 TO 56 INCHES; LIGHT BROWNISH GRAY (10YR 6/2) SANDY CLAY LOAM; MASSIVE; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON MEDIUM DISTINCT YELLOWISH BROWN (10YR 5/8) MASSES OF OXIDIZED IRON THROUGHOUT AND COMMON MEDIUM FAINT GRAY (10YR 5/1) IRON DEPLETIONS THROUGHOUT; FEW MICA FLAKES; 2 PERCENT ANGULAR CHANNERS AND 10 PERCENT ROUNDED GRAVEL; STRONGLY ACID; CLEAR SMOOTH BOUNDARY.

CG2-56 TO 70 INCHES; GRAY (10YR 6/1) GRAVELLY SANDY LOAM; STRUCTURELESS SINGLE GRAIN; FRIABLE, SLIGHTLY STICKY, SLIGHTLY PLASTIC; COMMON MEDIUM DISTINCT STRONG BROWN (7.5YR 5/6) MASSES OF OXIDIZED IRON THROUGHOUT AND COMMON MEDIUM FAINT GRAYISH BROWN (10YR 5/2) IRON DEPLETIONS THROUGHOUT; 2 PERCENT ANGULAR CHANNERS AND 20 PERCENT ROUNDED GRAVEL; STRONGLY ACID; CLEAR SMOOTH BOUNDARY.

CG3-70 TO 78 INCHES; LIGHT BROWNISH GRAY (10YR 6/2) STRATIFIED GRAVELLY SAND; STRUCTURELESS SINGLE GRAIN; FRIABLE, NONSTICKY, NONPLASTIC; MEDIUM DISTINCT GRAY (10YR 5/1) IRON DEPLETIONS THROUGHOUT; 3 PERCENT ANGULAR CHANNERS AND 25 PERCENT SUBROUNDED GRAVEL; MODERATELY ACID.

TYPE LOCATION: MONTGOMERY COUNTY, PENNSYLVANIA; UPPER MORELAND TOWNSHIP, 1 MILE SOUTH OF HATBORO ALONG PENNYPACK CREEK, 1600 FEET NORTH OF JUNCTION OF PENNYPACK ROAD AND CREEK ROAD, 300 FEET SOUTHWEST OF BUSINESS OFFICE, 20 FEET EAST OF PENNYPACK CREEK IN WOODS. HATBORO QUAD; LATITUDE, 40 DEGREES, 9 MINUTES, 17.9 SECONDS NORTH, LONGITUDE, 75 DEGREES, 4 MINUTES, 34.1 SECONDS WEST

RANGE IN CHARACTERISTICS: SOLUM THICKNESS RANGES FROM 20 TO 60 INCHES. DEPTH TO BEDROCK RANGES FROM 5 TO 10 FEET OR MORE. ORGANIC CARBON DECREASES IRREGULARLY WITH DEPTH OR IS GREATER THAN 0.2 PERCENT DIRECTLY ABOVE ANY STRONGLY CONTRASTING C HORIZON. THE DEPTH TO STRONGLY CONTRASTING SAND AND GRAVEL IS MORE THAN 40 INCHES OR THE TRANSITION IS GREATER THAN 5 INCHES. CONTENT OF GRAVEL RANGES FROM 0 TO 10 PERCENT IN THE SOLUM AND FROM 0 TO 80 PERCENT IN THE C HORIZON. MICA FLAKES ARE COMMON IN THE SOLUM, AND THE C HORIZON CONTAINS THIN LENSES OF MICA. REACTION RANGES FROM VERY STRONGLY ACID THROUGH NEUTRAL TO A DEPTH OF 30 INCHES AND FROM MODERATELY ACID THROUGH SLIGHTLY ACID BELOW 30 INCHES. DEPTH TO LOW CHROMA REDOX DEPLETIONS IS 0 TO 10 INCHES.

THE AP OR A HORIZON HAS HUE OF 10YR OR 2.5Y, VALUE OF 3 OR 4, AND CHROMA OF 1 THROUGH 4. IT IS SANDY LOAM, LOAM, SILT LOAM OR FINE SANDY LOAM.

THE B HORIZON HAS HUE OF 10YR THROUGH 5Y, VALUE OF 4 THROUGH 7, AND CHROMA OF 1 OR 2, OR IS NEUTRAL WITH VALUE OF 4 THROUGH 7. TEXTURE IS SANDY CLAY LOAM, CLAY LOAM, SILTY CLAY LOAM, OR SILT LOAM, LOAM, OR FINE SANDY LOAM. STRUCTURE IS WEAK, FINE OR MEDIUM SUBANGULAR BLOCKY.

THE C HORIZON HAS HUE OF 10YR THROUGH 5Y VALUE OF 4 THROUGH 7, AND CHROMA OF 1 OR 2, OR IS NEUTRAL WITH VALUE OF 4 THROUGH 7. FINE-EARTH TEXTURE IS SANDY CLAY LOAM, SANDY LOAM, CLAY LOAM, SILTY CLAY LOAM, SILT LOAM, FINE SANDY LOAM, OR SAND IN THE UPPER PART AND CONTAINS THIN LENSES OF PRIMARILY MICA FLAKES. THE LOWER PART IS STRATIFIED SAND, SILT AND CLAY SEDIMENTS AND GRAVEL.

GEOGRAPHIC SETTING: HATBORO SOILS ARE ON NEARLY LEVEL FLOOD PLAINS. SLOPE GRADIENTS ARE BETWEEN 0 AND 3 PERCENT. THEY FORMED IN ALLUVIUM LARGELY FROM SCHIST, GNEISS AND OTHER METAMORPHIC AND CRYSTALLINE ROCKS. CLIMATE IS HUMID AND TEMPERATE; MEAN ANNUAL PRECIPITATION RANGES FROM 40 TO 44 INCHES; MEAN ANNUAL TEMPERATURE RANGES FROM 52 TO 55 DEGREES F.; THE GROWING SEASON RANGES FROM 170 TO 190 DAYS.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: POORLY DRAINED. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH TO HIGH. INDEX SURFACE RUNOFF CLASS IS HIGH OR VERY HIGH. THESE SOILS ARE SUBJECT TO PERIODIC STREAM OVERFLOW, WHICH USUALLY OCCURS DURING THE WINTER AND SPRING MONTHS.

USE AND VEGETATION: ABOUT 50 PERCENT OF THE HATBORO SOILS ARE IN PASTURE, 35 PERCENT IN WOODLAND, AND THE REMAINDER IN CROPLAND. WOODLAND AREAS ARE IN MIXED HARDWOODS.

DISTRIBUTION AND EXTENT: SOUTHEASTERN PENNSYLVANIA, NORTHERN DELAWARE, MARYLAND, NORTH CAROLINA, NORTHEAST TENNESSEE AND VIRGINIA. THE SERIES IS OF MODERATE EXTENT.

GLENELG (GHB & GHC)

THE GLENELG SERIES CONSISTS OF VERY DEEP, WELL DRAINED SOILS FORMED IN RESIDUUM WEATHERED FROM MICACEOUS SCHIST ON UPLANDS OF THE BLUE RIDGE AND THE NORTHERN PIEDMONT. SLOPES RANGE FROM 0 TO 55 PERCENT. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH IN THE SUBSOIL AND MODERATELY HIGH TO HIGH IN THE SUBSTRATUM. MEAN ANNUAL TEMPERATURE IS 53 DEGREES F., AND MEAN ANNUAL PRECIPITATION IS 40 INCHES.

TAXONOMIC CLASS: FINE-LOAMY, MIXED, SEMIACTIVE, MESIC TYPIC HAPLUDULTS

TYPICAL PEDON: GLENELG LOAM, 3 TO 8 PERCENT SLOPES, LOCATED IN A CROP FIELD. (COLORS ARE FOR MOIST SOIL UNLESS OTHERWISE STATED.) AP1-0 TO 6 INCHES; BROWN (10YR 4/3) LOAM; MODERATE MEDIUM SUBANGULAR BLOCKY PARTING TO STRONG FINE GRANULAR STRUCTURE; FRIABLE; COMMON FINE, MANY FINE AND FEW MEDIUM ROOTS; 5 PERCENT SCHIST CHANNERS; SLIGHTLY ACID; CLEAR SMOOTH BOUNDARY.

AP2-6 TO 10 INCHES; BROWN (7.5YR 4/4) CLAY LOAM; MODERATE MEDIUM SUBANGULAR BLOCKY PARTING TO STRONG COARSE GRANULAR STRUCTURE; FRIABLE; MANY FINE AND FEW MEDIUM ROOTS; COMMON FINE AND COARSE TUBULAR PORES; 8 PERCENT SCHIST CHANNERS; SLIGHTLY ACID; ABRUPT SMOOTH BOUNDARY.

BT1-10 TO 18 INCHES; STRONG BROWN (7.5YR 5/8) CLAY LOAM; MODERATE COARSE SUBANGULAR BLOCKY PARTING TO MODERATE MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; MANY FINE AND FEW MEDIUM ROOTS; MANY FINE AND COMMON COARSE TUBULAR AND COMMON MEDIUM VESICULAR PORES; COMMON DISTINCT BROWN (7.5YR 5/4) ORGANIC COATINGS; 3 PERCENT SCHIST CHANNERS; MODERATELY ACID; CLEAR WAVY BOUNDARY.

BT2-18 TO 25 INCHES; STRONG BROWN (7.5YR 5/6) CLAY LOAM; WEAK COARSE SUBANGULAR BLOCKY PARTING TO MODERATE MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; COMMON FINE ROOTS; MANY FINE TUBULAR AND COMMON FINE VESICULAR PORES; COMMON DISTINCT BROWN (7.5YR 5/4) ORGANIC COATINGS ON FACES OF PEDS AND IN POOR LININGS; 8 PERCENT SCHIST CHANNERS; MODERATELY ACID; CLEAR SMOOTH BOUNDARY.

BT3-25 TO 30 INCHES; YELLOWISH BROWN (10YR 5/6) CLAY LOAM; MODERATE VERY THICK PLATY PARTING TO MODERATE MEDIUM SUBANGULAR BLOCKY STRUCTURE; FRIABLE; COMMON FINE ROOTS; FEW FINE TUBULAR PORES; COMMON PROMINENT YELLOWISH RED (5YR 5/8) LITHOCHROMIC MOTTLES; 5 PERCENT SCHIST CHANNERS; MODERATELY ACID; CLEAR SMOOTH BOUNDARY.

BCT-30 TO 42 INCHES; YELLOWISH RED (5YR 5/6) AND YELLOWISH BROWN (10YR 5/6) LOAM; MODERATE VERY THICK PLATY PARTING TO WEAK MEDIUM SUBANGULAR BLOCKY; FRIABLE; FEW FINE ROOTS; COMMON FINE TUBULAR PORES; 5 PERCENT SCHIST CHANNERS; STRONGLY ACID; CLEAR WAVY BOUNDARY.

CBT-42 TO 54 INCHES; YELLOWISH RED (5YR 5/6) AND YELLOWISH BROWN (10YR5/6) LOAM; MODERATE THICK PLATY STRUCTURE; FRIABLE; FEW FINE ROOTS; MANY FINE, FEW MEDIUM AND COARSE TUBULAR AND COMMON FINE VESICULAR PORES; 5 PERCENT SCHIST CHANNERS AND 2 PERCENT QUARTZ GRAVELS; STRONGLY ACID; CLEAR WAVY BOUNDARY.

C-54 TO 76 INCHES; STRONG BROWN (7.5YR 5/8), BROWNISH YELLOW (10YR 6/8) AND YELLOW (10YR 7/6) EXTREMELY CHANNERY SANDY LOAM; WEAK THICK PLATY STRUCTURE INHERITED FROM THE ROCK; FRIABLE; FEW FINE ROOTS; 50 PERCENT SCHIST CHANNERS; VERY STRONGLY ACID.

TYPE LOCATION: HOWARD COUNTY, MARYLAND. 0.5 MILES SOUTH OF ROUTE 144 ON ST. MICHAELS ROAD AND 0.25 MILES SOUTHEAST OF THE INTERSECTION OF ST. MICHAELS ROAD AND HARDY ROAD IN HOWARD COUNTY. LAT. 39 DEGREES, 20 MINUTES, 09 SECONDS AND LONG. 77 DEGREES, 6 MINUTES, 12 SECONDS.

RANGE IN CHARACTERISTICS: DEPTH TO THE BASE OF THE ARGILLIC HORIZON RANGES FROM 18 TO 35 INCHES. DEPTH TO BEDROCK IS 6 TO 10 OR MORE FEET. ROCK FRAGMENTS RANGE FROM 0 TO 35 PERCENT THROUGHOUT THE SOLUM AND 5 TO 55 PERCENT IN THE C HORIZON. FRAGMENTS ARE MOSTLY HARD WHITE QUARTZITE OR SCHIST AND RANGE FROM GRAVEL OR CHANNERS TO STONES IN SIZE. STONE CONTENT RANGES FROM 0 TO 5 PERCENT. MICA CONTENT INCREASES SHARPLY IN THE LOWER PART OF THE SOLUM AND SUBSTRATUM. UNLIMED REACTION RANGES FROM VERY STRONGLY ACID TO SLIGHTLY ACID.

THE A OR AP HORIZON HAS HUE OF 7.5YR OR 10YR, VALUE OF 3 TO 5, AND CHROMA OF 1 TO 4. IT IS LOAM, SILT LOAM OR CLAY LOAM IN THE FINE EARTH FRACTION. SILT CONTENT IS CLOSE TO 50 PERCENT.

THE E HORIZON, WHERE PRESENT, HAS HUE OF 7.5YR OR 10YR, VALUE OF 3 TO 5 AND CHROMA OF 2 TO 4. IT IS LOAM OR SILT LOAM IN THE FINE EARTH FRACTION, WITH SILT CONTENT CLOSE TO 50 PERCENT.

THE BT HORIZON AND (BCT WHERE PRESENT) HAS HUE OF 5YR TO 10YR, VALUE OF 4 OR 5 AND CHROMA OF 4 TO 8. IT IS LOAM, SILT LOAM, SILTY CLAY LOAM OR CLAY LOAM IN THE FINE EARTH FRACTION. THE PARTICLE-SIZE CONTROL SECTION IS 20 TO 35 PERCENT CLAY.

THE C HORIZON AND (CBT WHERE PRESENT) HAS HUE OF 2.5YR TO 10YR, VALUE OF 4 TO 6, AND CHROMA OF 2 TO 8. IT COMMONLY IS VARIEGATED DUE TO VARIATIONS IN THE SAPROLITE. THE C HORIZON IS LOAM, SANDY LOAM OR LOAMY SAND IN THE FINE EARTH FRACTION. IN SOME PEDONS, THE C HORIZON HAS SILT LOAM TEXTURES IN THE LOWER PART WHERE VEINS OF QUARTZ REMAIN FROM WEATHERING PROCESSES.

GEOGRAPHIC SETTING: GLENELG SOILS ARE NEARLY LEVEL TO VERY STEEP SOILS IN WELL DISSECTED UPLANDS OF THE NORTHERN PIEDMONT PLATEAU AND THE BLUE RIDGE. SLOPE RANGES FROM 0 TO 55 PERCENT. THE SOILS FORMED IN RESIDUUM (SAPROLITE) FROM MICACEOUS SCHIST. THE CLIMATE IS TEMPERATE AND HUMID WITH A MEAN ANNUAL TEMPERATURE OF 47 TO 55 DEGREES F. AND MEAN ANNUAL PRECIPITATION OF ABOUT 40 INCHES NEAR THE TYPE LOCATION.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: WELL DRAINED. SATURATED HYDRAULIC CONDUCTIVITY IS MODERATELY HIGH IN THE SUBSOIL AND MODERATELY HIGH TO HIGH IN THE SUBSTRATUM. RUNOFF CLASS RANGES FROM LOW ON LEVEL SLOPES TO VERY HIGH ON STEEP OR VERY STEEP SLOPES.

USE AND VEGETATION: MOST AREAS OF GLENELG SOILS ARE IN CROPS INCLUDING CORN, SOYBEANS, SMALL GRAINS, HAY, AND TO A LIMITED EXTENT, PASTURE. NATIVE VEGETATION IS RED OAK, WHITE OAK, HICKORY, AND TULIP POPLAR.

DISTRIBUTION AND EXTENT: MARYLAND, DELAWARE, PENNSYLVANIA, AND VIRGINIA. THE SERIES IS OF LARGE EXTENT, ESTIMATED TO BE GREATER THAN 500,000 ACRES.

WHEATON (GHB AND GHC)

THE WHEATON SERIES CONSISTS OF VERY DEEP, WELL DRAINED SOILS WITH MODERATE PERMEABILITY. THEY FORMED IN RESIDUUM THAT HAS BEEN GRADED FROM THE ORIGINAL WEATHERING OF SCHIST AND GNEISS IN THE PIEDMONT PLATEAU. SLOPES RANGE FROM 0 TO 15 PERCENT. MEAN ANNUAL TEMPERATURE IS ABOUT 51 DEGREES F AND MEAN ANNUAL PRECIPITATION IS ABOUT 40 INCHES.

TAXONOMIC CLASS: FINE-LOAMY, MIXED, SEMIACTIVE, ACID, MESIC TYPIC UDORTHENTS

TYPICAL PEDON: WHEATON CHANNERY SILT LOAM IN A CEMETERY AREA ON A 2 TO 8 PERCENT SLOPE. (COLORS ARE FOR MOIST SOIL.)

AP-0 TO 6 INCHES; VERY DARK GRAYISH BROWN (10YR 3/2) CHANNERY SILT LOAM; MODERATE MEDIUM GRANULAR STRUCTURE; FRIABLE; MANY FINE ROOTS; 15 PERCENT ROCK FRAGMENTS; STRONGLY ACID; ABRUPT SMOOTH BOUNDARY. (2 TO 10 INCHES THICK.)

C1-6 TO 13 INCHES; STRONG BROWN (7.5YR 5/6) LOAM; MASSIVE; FRIABLE; COMMON FINE ROOTS; FEW FINE PORES; 10 PERCENT ROCK FRAGMENTS; STRONGLY ACID; CLEAR WAVY BOUNDARY.

C2-13 TO 20 INCHES; BROWN (7.5YR 4/2) LOAM; MASSIVE; FRIABLE; 10 PERCENT ROCK FRAGMENTS; VERY STRONGLY ACID; GRADUAL WAVY BOUNDARY.

C3-20 TO 38 INCHES; STRONG BROWN (7.5YR 5/8) CHANNERY LOAM; MASSIVE; FRIABLE; 15 PERCENT ROCK FRAGMENTS; VERY STRONGLY ACID; GRADUAL WAVY BOUNDARY.

C4-38 TO 68 INCHES; YELLOWISH RED (5YR 5/8) LOAM; MASSIVE; FRIABLE; 10 PERCENT ROCK FRAGMENTS; VERY STRONGLY ACID.

TYPE LOCATION: MONTGOMERY COUNTY, MARYLAND; 1 MILE WEST OF WHEATON; 1/4 MILE EAST ON VEIRS MILL ROAD FROM THE INTERSECTION WITH ASPEN HILL ROAD, THEN 2000 FEET SOUTH ON UNNAMED ROAD TO PARKLAWN CEMETERY AND 750 FEET WEST OF ROAD.

RANGE IN CHARACTERISTICS: THE THICKNESS OF THE A HORIZON RANGES FROM 2 TO 10 INCHES. DEPTH TO ROCK IS GREATER THAN 5 FEET. ROCK FRAGMENTS, MOSTLY OF HARD QUARTZITE OR FLAT SCHIST, RANGE FROM 2 TO 15 PERCENT THROUGHOUT. THE FINE-EARTH FRACTION HAS GREATER THAN 50 PERCENT SILT AND VERY FINE SAND. SOIL REACTION RANGES FROM MODERATELY ACID TO VERY STRONGLY ACID.

THE A OR AP HORIZON HAS HUE OF 10YR, 7.5YR, OR 5YR, VALUE OF 3 THROUGH 5 AND CHROMA OF 2 THROUGH 6. IT IS SILT LOAM, LOAM, OR FINE SANDY LOAM IN THE FINE-EARTH FRACTION.

THE C HORIZONS HAVE HUE OF 10YR, 7.5YR, OR 5YR, VALUE OF 4 OR 5, AND CHROMA OF 4 THROUGH 8. THEY ARE SILT LOAM, LOAM, OR FINE SANDY LOAM IN THE FINE-EARTH FRACTION.

GEOGRAPHIC SETTING: WHEATON SOILS ARE NEARLY LEVEL TO SLOPING ON UPLANDS IN THE NORTHERN PIEDMONT PLATEAU, WITH SLOPES RANGING FROM 0 TO 15 PERCENT. THE CLIMATE IS TEMPERATE AND HUMID WITH A MEAN ANNUAL TEMPERATURE OF 45 TO 55 DEGREES F AND MEAN ANNUAL PRECIPITATION OF 38 TO 44 INCHES.

DRAINAGE AND PERMEABILITY: WELL DRAINED; MEDIUM TO RAPID RUNOFF; MODERATE PERMEABILITY.

USE AND VEGETATION: MOST OF THE AREAS ARE USED FOR URBAN AND RECREATIONAL PURPOSES.

DISTRIBUTION AND EXTENT: PIEDMONT AREA OF MARYLAND, POSSIBLY VIRGINIA AND DISTRICT OF COLUMBIA.

URBAN LAND (GHB AND GHC)

URBAN LAND CONSIST OF AREAS OF ROADS, COMMERCIAL BUILDINGS, INDUSTRIES, SCHOOLS, CHURCHES, PARKINGS LOTS, STREETS, SHOPPING CENTERS AND OTHER IMPERVIOUS SURFACES.

CLIENT

STEVE WILLIAMS
DNREC
2430 OLD COUNTY ROAD
NEWARK, DE 19702

DATE: ISSUES / REVISIONS

2/28/2014 100% DESIGN

3/31/2014 CITY OF NEWARK E&S REVISION

5/12/2014 CITY OF NEWARK E&S REVISION



DNREC
Watershed Assessment Division
2430 Old County Road
Newark, DE 19702
Steve Williams: 302-832-3100



The Stables Building 2081 Clipper Park Road
Baltimore, MD 21211 / ph: 410.554.0156
fx: 410.554.0168 / www.biohabitats.com

Restore the Earth & Inspire Ecological Stewardship

UPPER CHRISTINA STREAM RESTORATION

TITLE: EROSION AND SEDIMENT CONTROL DETAILS

PROJECT NO.: 12012.01 SCALE: N/A

SEAL: BY: TB CHECK: MT/DS

DWG. NO.:



19 OF 32

OWNER'S CERTIFICATION (signed and dated)

I, CAROL HOUCK, TOWN MANAGER, CITY OF NEWARK, HEREBY CERTIFY THAT THE CITY OF NEWARK IS THE OWNER OF THE PROPERTY, WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION.

DATE

OWNER'S CERTIFICATION (signed and dated)

WE, MATTHEW D & NICOLE E MATHIAS, HEREBY CERTIFY THAT WE ARE THE OWNERS OF THE PROPERTY, WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT OUR DIRECTION.

DATE

OWNER'S CERTIFICATION (signed and dated)

I, STEPHEN WILLIAMS, HEREBY CERTIFY THAT THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL IS THE DEVELOPER OF THE PROPERTY WHICH IS THE SUBJECT OF THIS PLAN AND THAT THE LAND USE ACTION PROPOSED BY THIS PLAN IS MADE AT MY DIRECTION. ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL BE DONE PURSUANT TO THE APPROVED PLANS AND THAT RESPONSIBLE PERSONNEL INVOLVED WILL HAVE A CERTIFICATE OF TRAINING FROM DNREC. THE CITY OF NEWARK AND DNREC PERSONNEL SHALL HAVE THE RIGHT TO CONDUCT ON-SITE INSPECTIONS.

DATE

I, DOUGLAS STREAKER, CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE WITH A BACKGROUND IN CIVIL ENGINEERING. TO THE BEST OF MY KNOWLEDGE AND BELIEF, I CERTIFY THAT THE PROPOSED CONSTRUCTION AS SHOWN ON THIS PLAN COMPLIES WITH APPLICABLE LAWS, REGULATIONS AND THE LATEST REVISION OF THE GENERAL PLAN SUBMISSION CRITERIA.

DOUGLAS STREAKER DATE

CLIENT

STEVE WILLIAMS
DNREC
2430 OLD COUNTY ROAD
NEWARK, DE 19702

DATE:	ISSUES / REVISIONS
2/26/2014	100% DESIGN
3/31/2014	CITY OF NEWARK E&S REVISION
5/12/2014	CITY OF NEWARK E&S REVISION



DNREC
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Restore the Earth & Inspire Ecological Stewardship

UPPER CHRISTINA STREAM RESTORATION

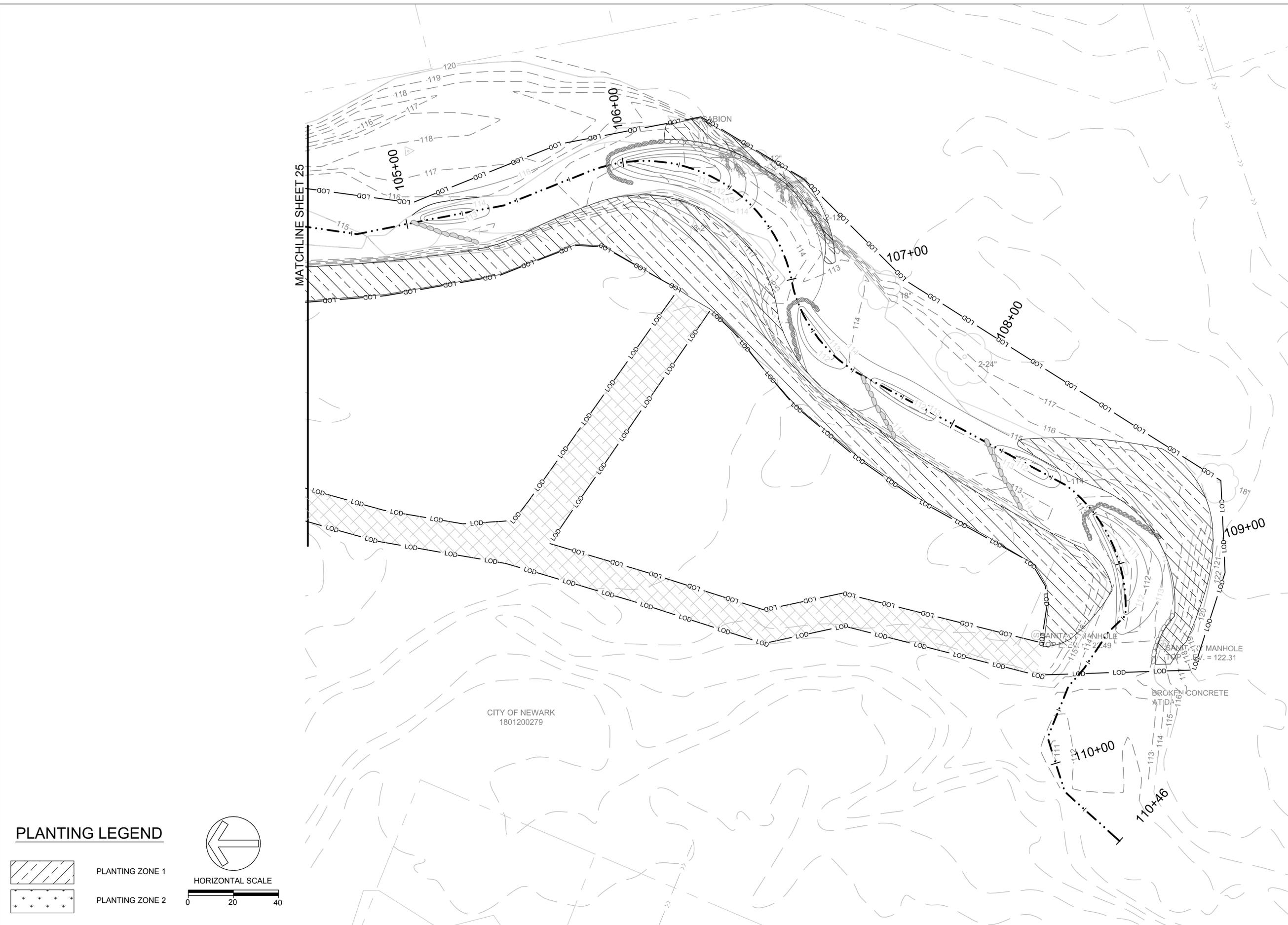
CERTIFICATIONS PHASE I

PROJECT NO.: 12012.01 SCALE: N/A

SEAL: BY: TB CHECK: MT/DS

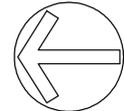
DWG. NO.:





PLANTING LEGEND

 PLANTING ZONE 1
 PLANTING ZONE 2


 HORIZONTAL SCALE


CLIENT

STEVE WILLIAMS
 DNREC
 2430 OLD COUNTY ROAD
 NEWARK, DE 19702

DATE:	ISSUES / REVISIONS
2/26/2014	100% DESIGN
3/31/2014	CITY OF NEWARK E&S REVISION
5/12/2014	CITY OF NEWARK E&S REVISION



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Restore the Earth & Inspire Ecological Stewardship

**UPPER CHRISTINA
 STREAM
 RESTORATION**

**PLANTING PLAN
 PHASE I**

PROJECT NO.: 12012.01 SCALE: 1" = 20'

SEAL:  BY: TB CHECK: MT/DS

DWG. NO.: 26 OF 32

MATCHLINE SHEET 27

CASSEL CLEVERSON 900730039

MURPHY CHRISTOPHER J & HALEY VIRGINIA D 1804800054

JONES JOSEPH M & VICTORIA A 1804800055

OKIN SHERYL H & IRWIN G 900730037

DEBRIS PILE WITH STUMP

TABASSO JOSEPH N & CALLIHAN-TABASSO REBECCA A 1804800005

EMORY JAMES W SR & JUNE L 1804800006

REEVES DIANNE L 1804800007

W MILL STATION DR

FL 144 02 1" H T 5W RCP OUTLET

200+00

201+00

202+00

203+00

204+00

205+00

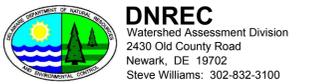
MATCHLINE SHEET 28

MATCHLINE SEE INSET

CLIENT

STEVE WILLIAMS
DNREC
2430 OLD COUNTY ROAD
NEWARK, DE 19702

DATE:	ISSUES / REVISIONS
2/26/2014	100% DESIGN
3/31/2014	CITY OF NEWARK E&S REVISION
5/12/2014	CITY OF NEWARK E&S REVISION



UPPER CHRISTINA
STREAM
RESTORATION

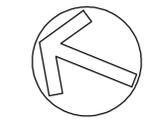
PLANTING PLAN
PHASE II

PROJECT NO.: 12012.01 SCALE: 1" = 20'

SEAL: BY: TB CHECK: MT/DS



DWG. NO.: 27 OF 32

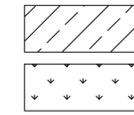


HORIZONTAL SCALE
0 20 40

PLANTING LEGEND

-  PLANTING ZONE 1
-  PLANTING ZONE 2

PLANTING LEGEND



PLANTING ZONE 1

PLANTING ZONE 2

CLIENT

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DNREC
Watershed Assessment Division
2430 Old County Road
Newark, DE 19702
Steve Williams: 302-832-3100



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fx: 410.554.0168 / www.biohabitats.com
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**UPPER CHRISTINA
STREAM
RESTORATION**

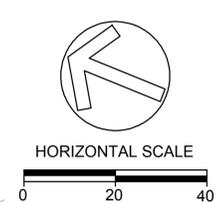
**PLANTING PLAN
PHASE II**

PROJECT NO.: 12012.01 SCALE: 1" = 20'

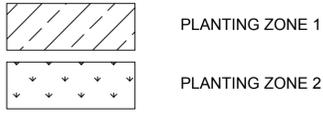
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DWG. NO.:



28 OF 32



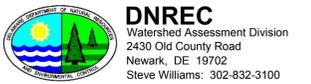
PLANTING LEGEND



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**UPPER CHRISTINA
STREAM
RESTORATION**

**PLANTING PLAN
PHASE II**

PROJECT NO.:	12012.01	SCALE:	1" = 20'
SEAL:		BY:	TB
		CHECK:	MT/DS
		DWG. NO.:	



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