EXTEND 15" STORM SEWER AND LOWER OUTLET TO MATCH ELEVATION OF RAINGARDEN

USE TRAIL PATH FOR EQUIPMENT ACCESS CORRIDOR REPLACE TRAIL NEAR END OF CONSTRUCTION

TOE PROTECTION AND SLOPE REPAIR

RIFFLE DAM

TOE PROTECTION

SLOPE REPAIR

TOE PROTECTION AND SLOPE REPAIR

RIFFLE DAM

TOE PROTECTION AND SLOPE REPAIR

PHASE 1(b)

RIFFLE DAM

RIFFLE DAM

PHASE 1(b)

POTENTIAL RAINGARDEN AREA CONSTRUCTED OVER EXTENDED PIPE GRADE WILL BE RAISED 9-11 FEET TO LIMIT TREE REMOVAL AND PROVIDE MORE STABLE SLOPES

HIGHLAND OAKS DRIVE

RIFFLE DAM

EXTEND 54" STORM SEWER AND LOWER OUTLET TO MATCH CHANNEL GRADE

TOE PROTECTION

LONG MEADOW DRIVE

STORM SEWER INTAKE TC=915.57' 12" RCP FL(N)=909.92

SYMBOLS LEGEND

- SEVERE EROSION
- MODERATE EROSION
- FALLEN TREES, LARGE LOGS, DEBRIS
- EXISTING STREAM
- PROPOSED POND WATER SURFACE
- DEAD OR IMPAIRED STANDING TREES
- CONSTRUCTION FENCE (PRELIMINARY)

NORTH

50' 0 25'

SCALE: 1" = 50'

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: CONCEPT PLAN – PHASE 1

NAI No.:	12118
DATE:	06/25/13
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SCALE:	AS NOTED
DWG No.:	CP–1
SHEET No.:	1

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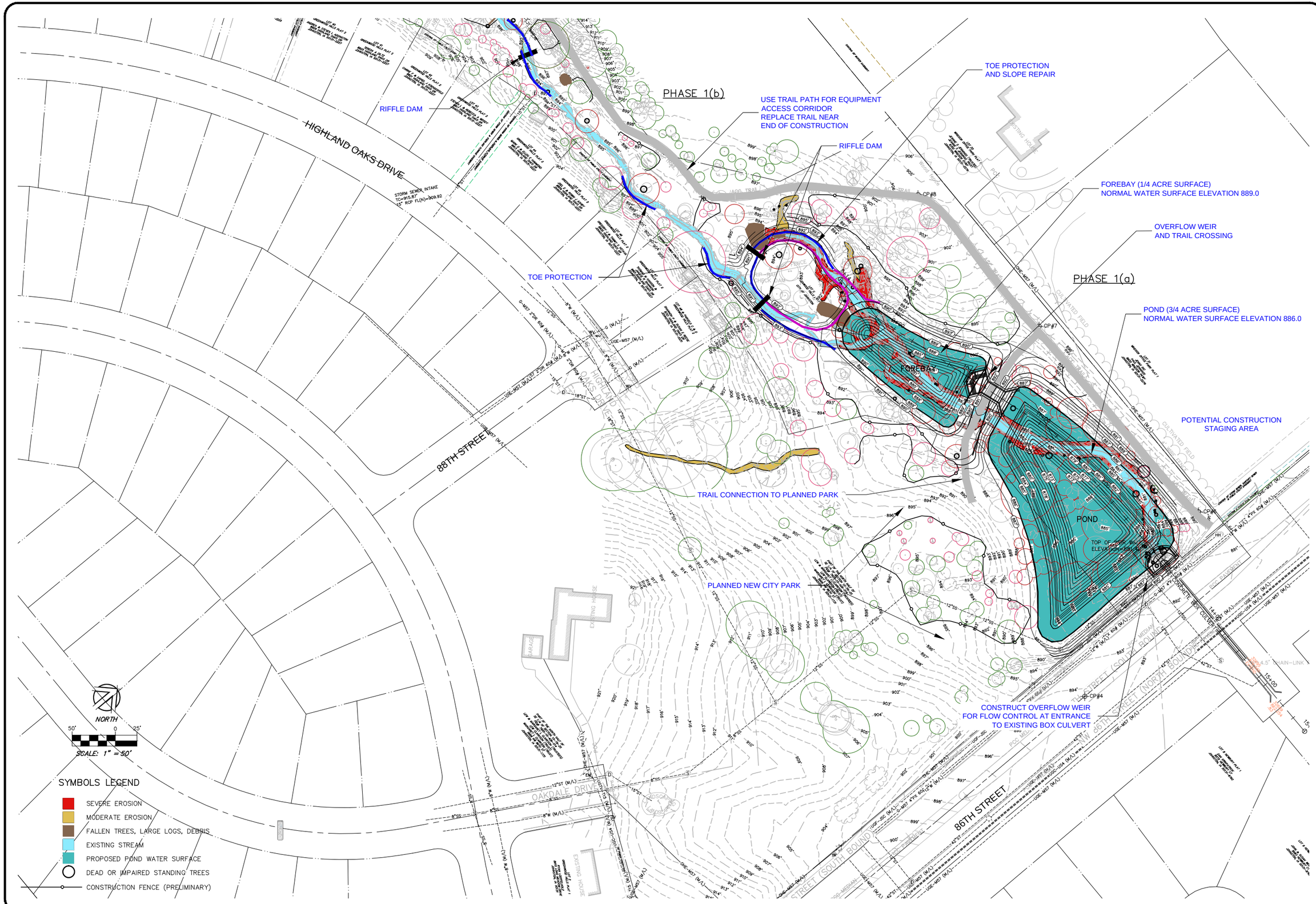

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: CONCEPT PLAN – PHASE 1

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SHEET No.:	2

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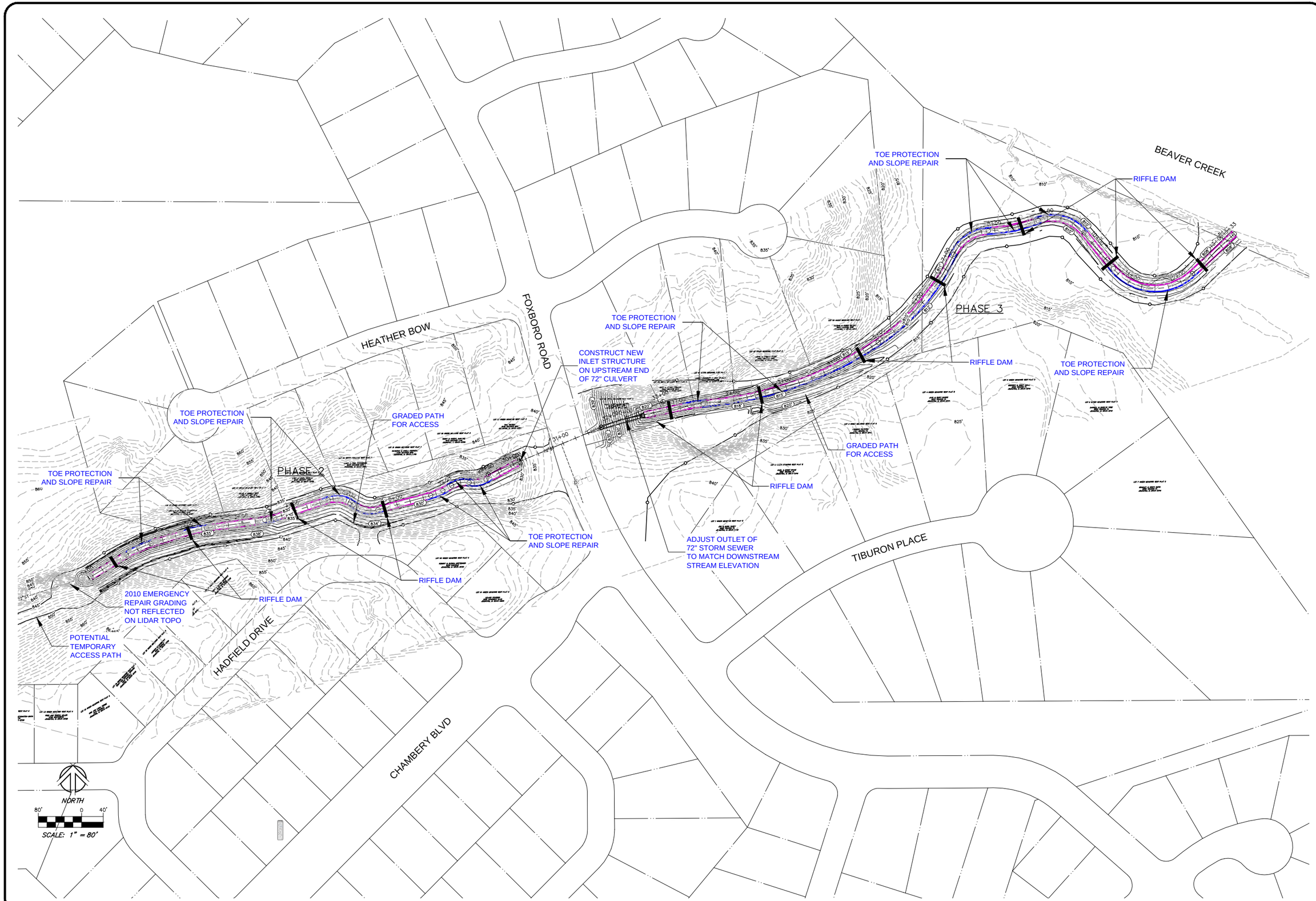

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: CONCEPT PLAN PHASE 2/3

NAI No.:	12118
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DWG No.:	CP-3
SHEET No.:	3

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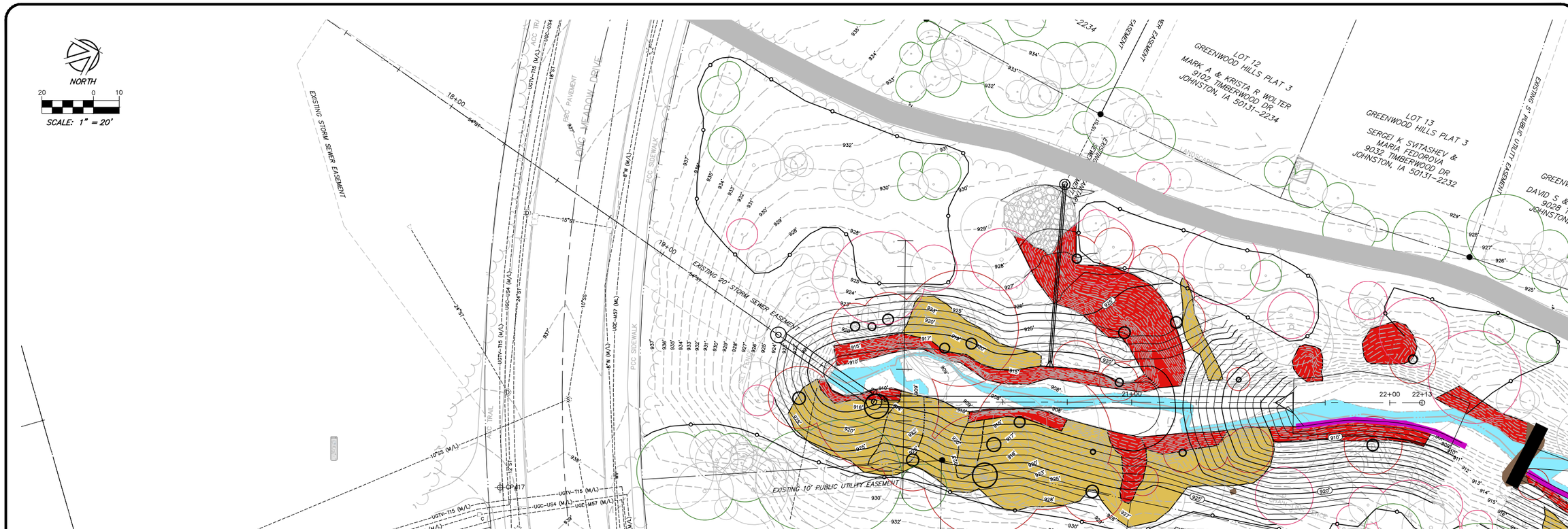

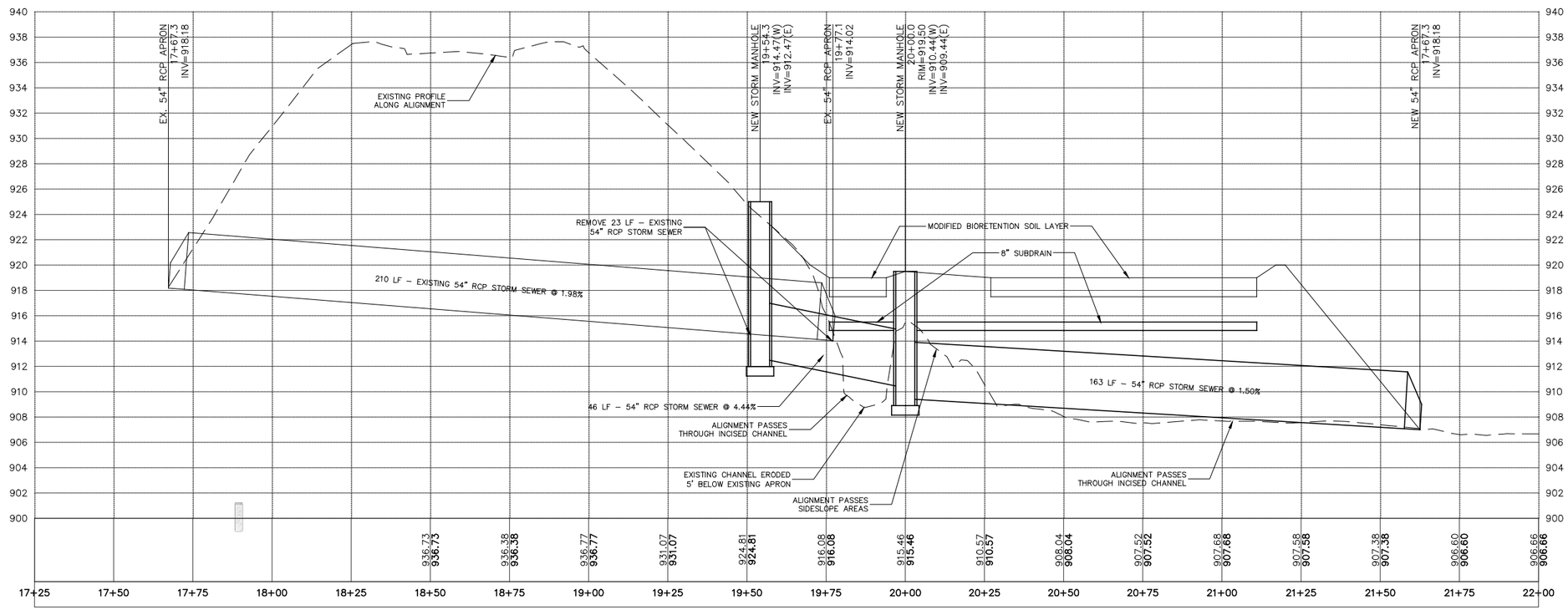

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PROJECT:
GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE:
LONG MEADOW DRIVE OUTLET

NAI No.:	12118
DATE:	08/30/13
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SHEET No.:	4

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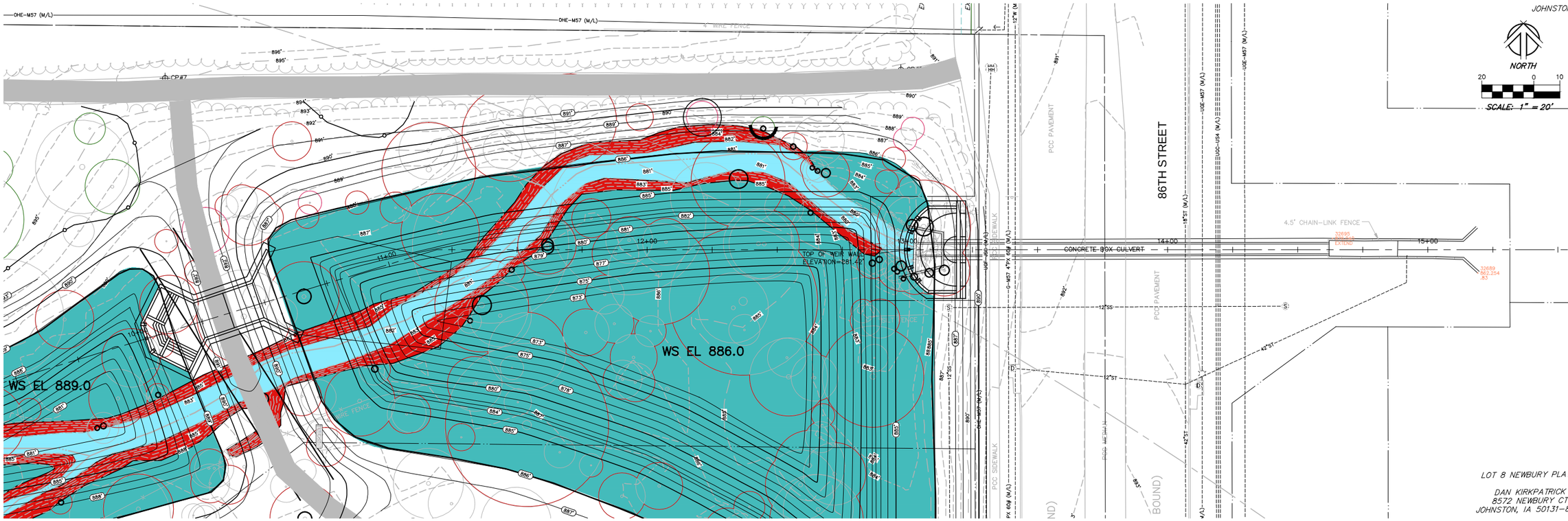

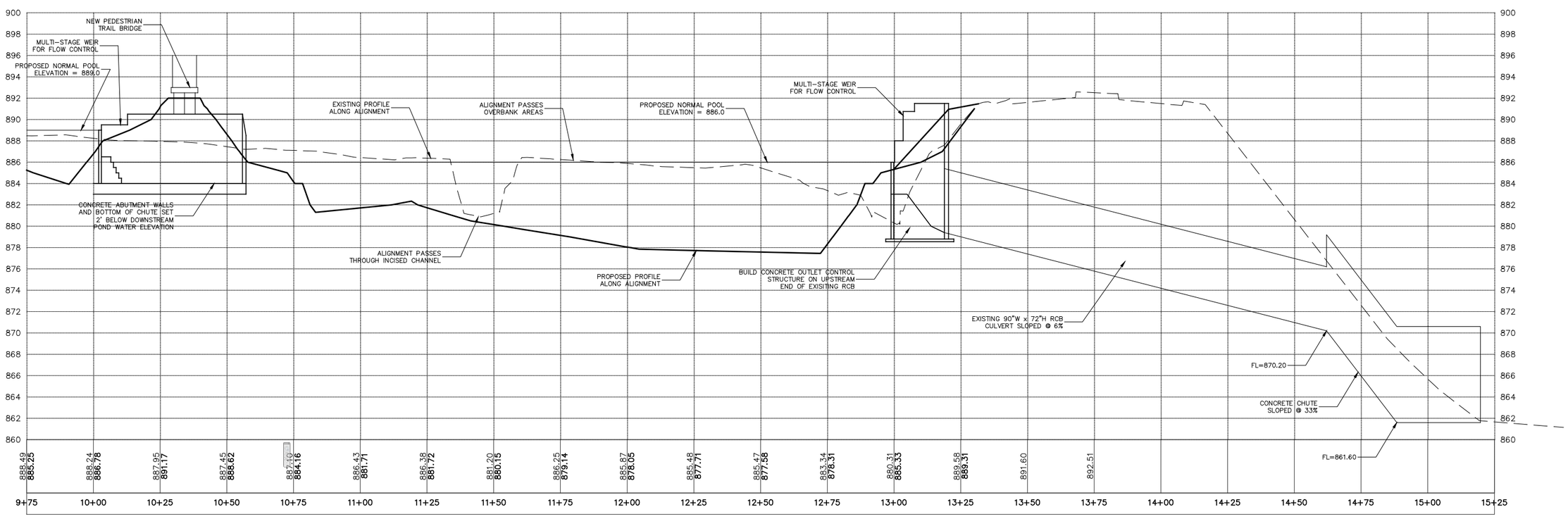

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: POND OUTLETS AT NW 86TH STREET

NAI No.:	12118
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SHEET No.:	5

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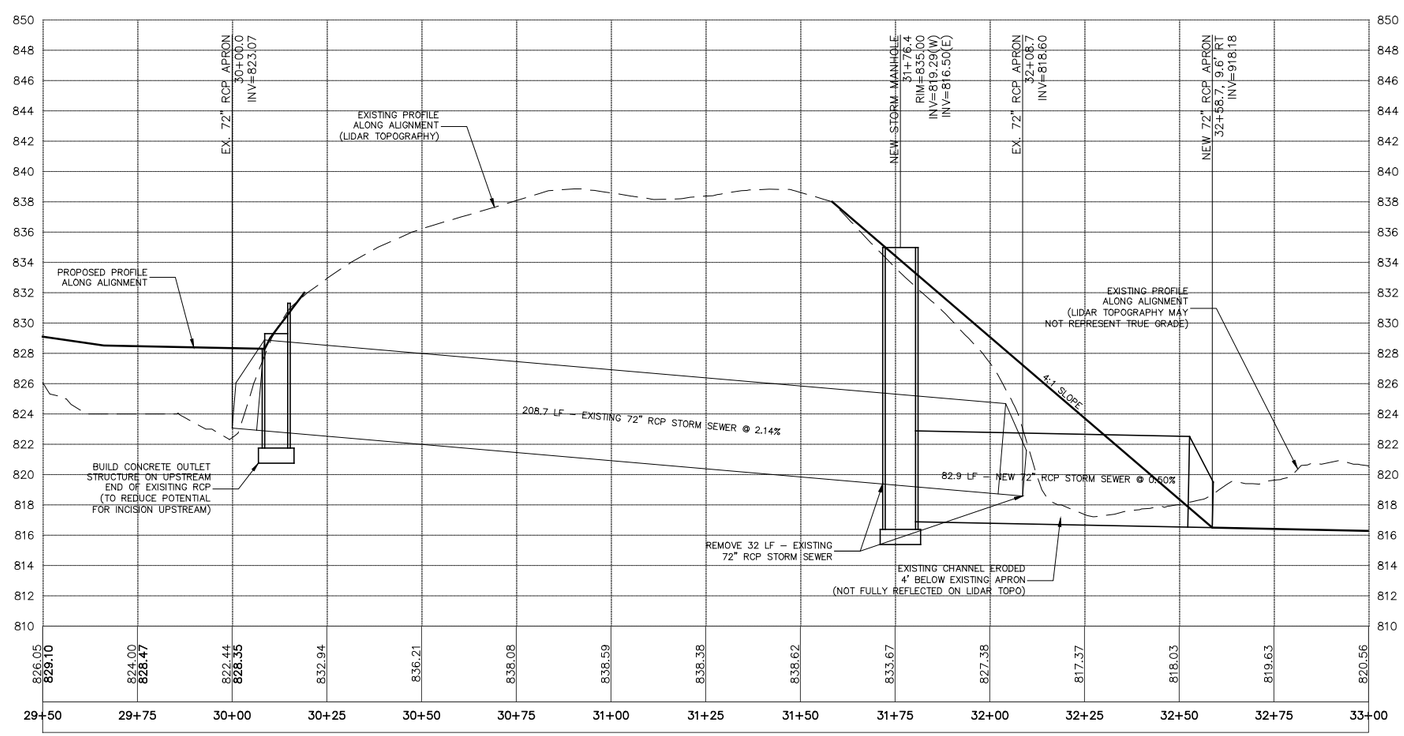

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PROJECT:
GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE:
FOXBORO ROAD IMPROVEMENTS

NAI No.:	12118
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SHEET No.:	6

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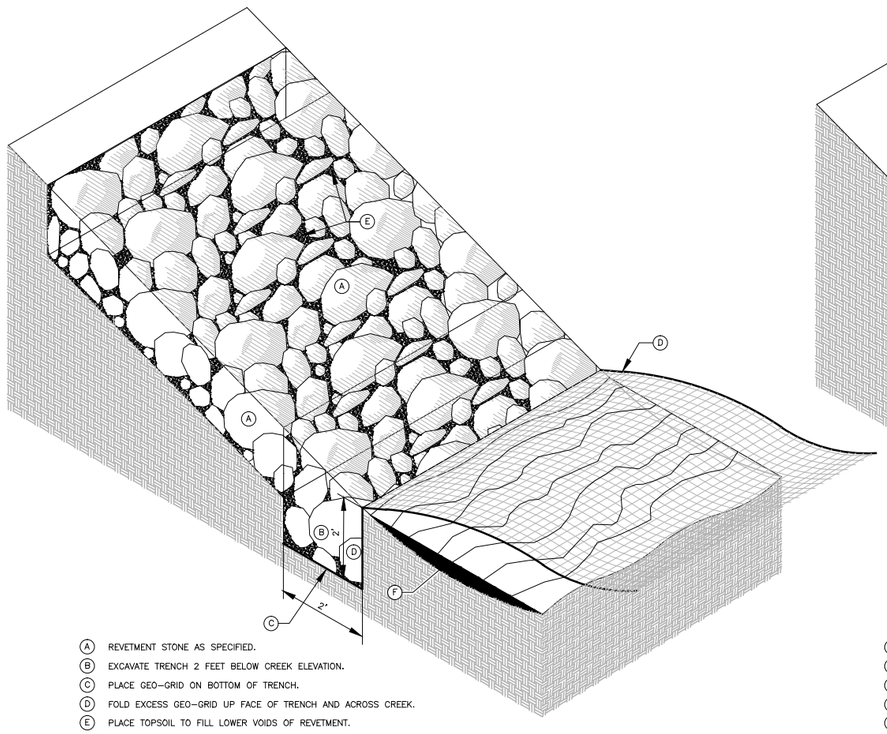
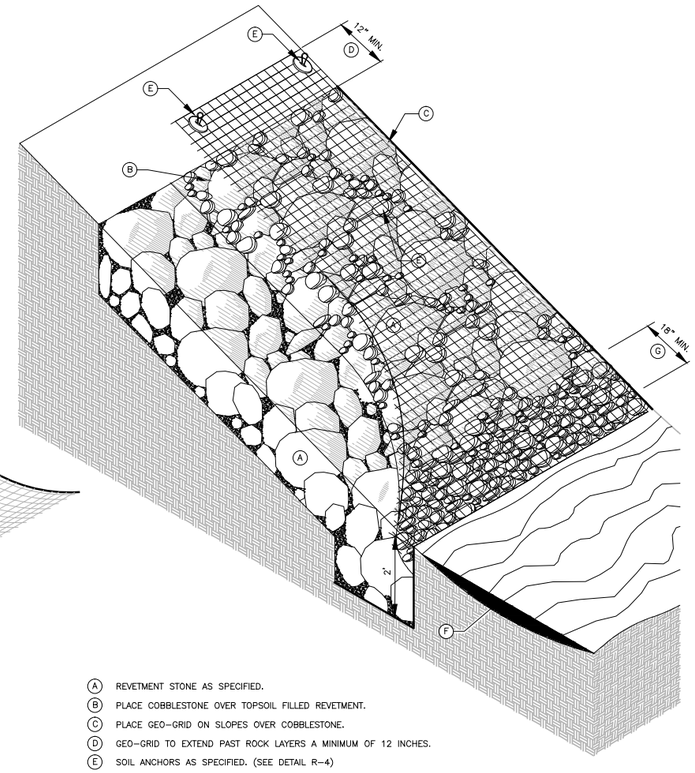


(A) REVETMENT STONE AS SPECIFIED.
(B) EXCAVATE TRENCH 2 FEET BELOW CREEK ELEVATION.
(C) PLACE GEO-GRID ON BOTTOM OF TRENCH.
(D) FOLD EXCESS GEO-GRID UP FACE OF TRENCH AND ACROSS CREEK.
(E) PLACE TOPSOIL TO FILL LOWER VOIDS OF REVETMENT.
(F) CREEK AT BASE FLOW ELEVATION.

R-1 REINFORCED REVETMENT, STEP 1 – ISOMETRIC

NOT TO SCALE

REFER TO SPECIFICATION SECTION 02630

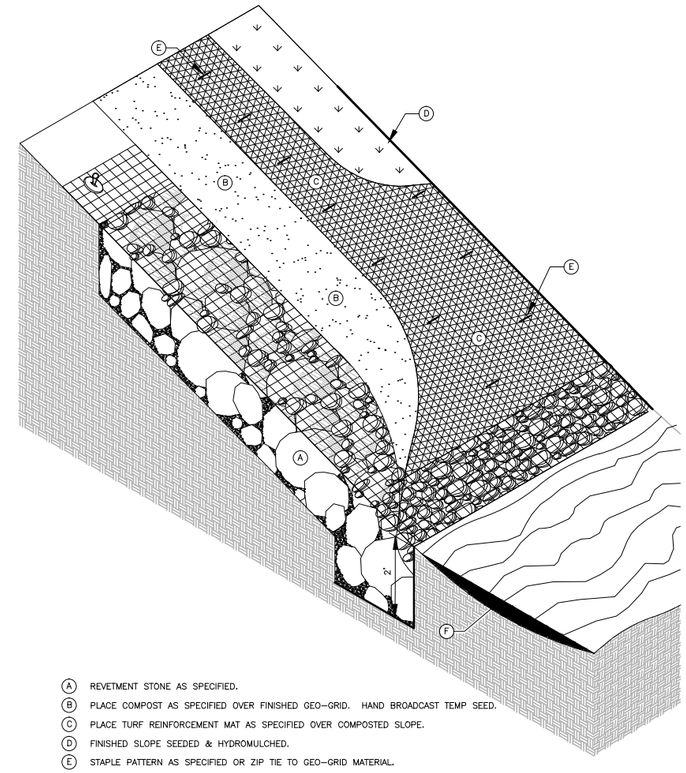


(A) REVETMENT STONE AS SPECIFIED.
(B) PLACE COBBLESTONE OVER TOPSOIL FILLED REVETMENT.
(C) PLACE GEO-GRID ON SLOPES OVER COBBLESTONE.
(D) GEO-GRID TO EXTEND PAST ROCK LAYERS A MINIMUM OF 12 INCHES.
(E) SOIL ANCHORS AS SPECIFIED. (SEE DETAIL R-4)
(F) CREEK AT BASE FLOW ELEVATION.
(G) PLACE COBBLESTONE IN A CONTINUOUS LAYER BETWEEN TOE OF SLOPE AND 18 INCHES ABOVE BASE FLOW.

R-2 REINFORCED REVETMENT, STEP 2 – ISOMETRIC

NOT TO SCALE

REFER TO SPECIFICATION SECTION 02630

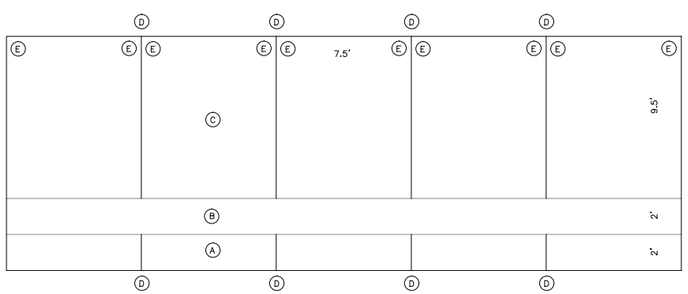


(A) REVETMENT STONE AS SPECIFIED.
(B) PLACE COMPOST AS SPECIFIED OVER FINISHED GEO-GRID. HAND BROADCAST TEMP SEED.
(C) PLACE TURF REINFORCEMENT MAT AS SPECIFIED OVER COMPOSTED SLOPE.
(D) FINISHED SLOPE SEEDED & HYDROMULCHED.
(E) STAPLE PATTERN AS SPECIFIED OR ZIP TIE TO GEO-GRID MATERIAL.
(F) CREEK AT BASE FLOW ELEVATION.

R-3 REINFORCED REVETMENT, STEP 3 – ISOMETRIC

NOT TO SCALE

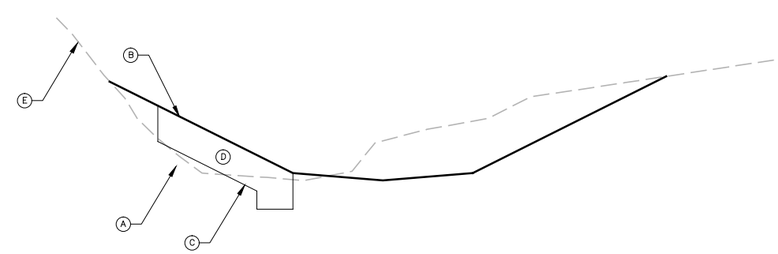
REFER TO SPECIFICATION SECTION 02630



(A) PORTION FOR TRENCH BOTTOM
(B) PORTION FOR VERTICAL FACE OF TRENCH (DO NOT CUT THIS PORTION)
(C) PORTION FOR FINISHED GRADE ABOVE REVETMENT MIX MATERIAL
(D) CUT LINES TO ALLOW MATERIAL TO BE SPREAD AROUND STREAM BENDS
(E) WHEN INSTALLING, PLACE SOIL ANCHORS THROUGH UPPER CORNERS OF "FLAPS"

R-4 TENSAR MATERIAL CUT TEMPLATE

SCALE: 1" = 1'-0"



(A) REMOVE EXISTING REVETMENT MATERIALS ONLY AS NEEDED TO PERFORM ROUGH GRADING
(B) PERFORM ROUGH GRADING TO FINISHED GRADE
(C) EXCAVATE DEPTH FOR PLACEMENT OF REVETMENT MATERIALS (OR LEAVE LOW WHILE ROUGH GRADING)
(D) INSTALL REINFORCED REVETMENT SECTIONS AS PER OTHER DETAILS
(E) DO NOT DISTURB SLOPE AREAS OR EXISTING REVETMENT ON SLOPES ABOVE EXTENT OF ROUGH GRADING

R-5 REINFORCED REVETMENT PLACEMENT IN FILL SECTIONS

SCALE: 1" = 1'-0"

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: STABILIZATION TECHNIQUE OPTIONS

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SHEET No.:	7

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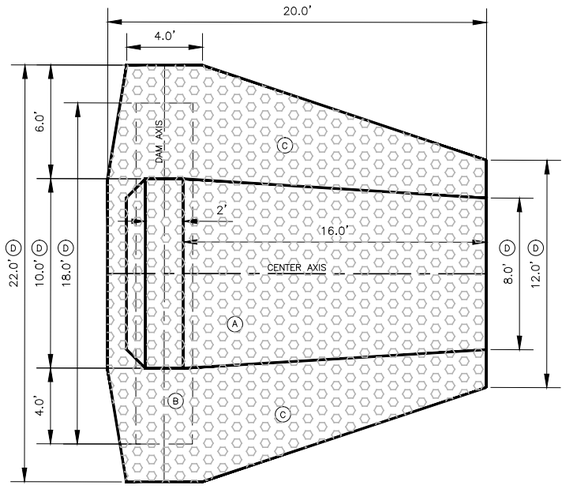
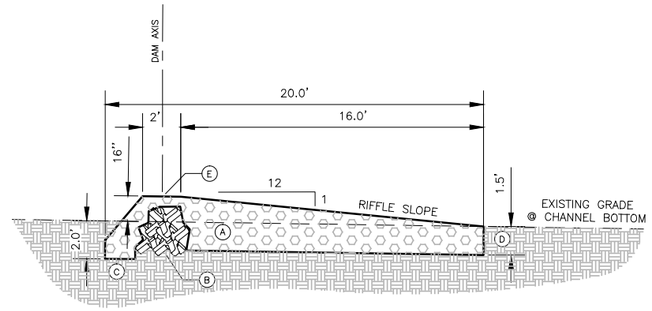


(A) RIFFLE ZONE – REVETMENT STONE AS SPECIFIED
(B) 24" A–JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION.
(C) APRON ZONE – REVETMENT STONE AS SPECIFIED.
(D) STANDARD WIDTH OF DAM CREST IS 10 FEET. FOR WIDER DAMS ADD THE UNIFORM UNIFORM WIDTH TO THE NOTED DIMENSIONS.

R–6 RIFFLE DAM (PLAN VIEW)

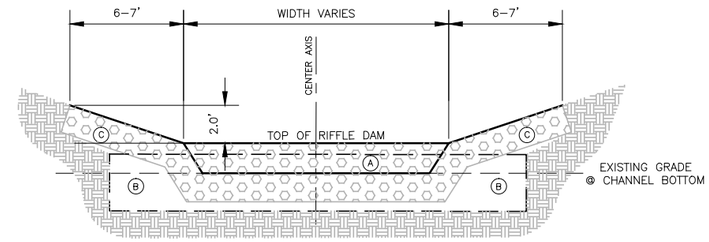
SCALE: 1" = 4'–0"



(A) REVETMENT STONE AS SPECIFIED
(B) 24" A–JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION. BURY TO MID–POINT OF TOP ROW (24" BELOW EXISTING GRADE @ CHANNEL BOTTOM)
(C) BURY REVETMENT STONE WITHIN EXCAVATED TRENCH 2 FEET BELOW EXISTING GRADE @ CHANNEL BOTTOM.
(D) BURY REVETMENT STONE 1.5 FEET BELOW EXISTING GRADE @ CHANNEL BOTTOM.
(E) REVETMENT STONE SHALL BE HAND PLACED OVER AND AROUND A–JACKS UNITS TO PREVENT DAMAGE.

R–7 RIFFLE DAM (CENTER AXIS SECTION)

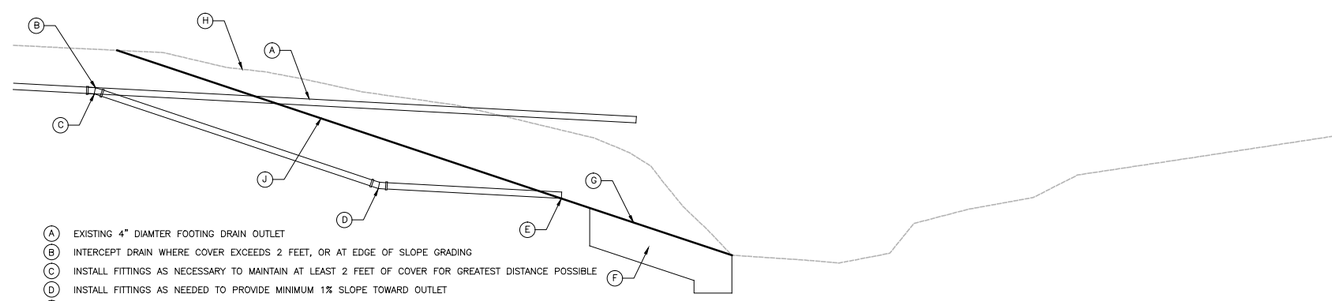
SCALE: 1" = 4'–0"



(A) REVETMENT STONE AS SPECIFIED
(B) 24" A–JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION. KEY INTO SIDE SLOPES 4 FEET BEYOND RIFFLE WIDTH (BOTH SIDES)
(C) REVETMENT STONE APRON AREA TO PROTECT 2 FEET ABOVE RIFFLE DAM.

R–8 RIFFLE DAM (DAM AXIS SECTION) – ALL WIDTHS

SCALE: 1" = 4'–0"



(A) EXISTING 4" DIAMTER FOOTING DRAIN OUTLET
(B) INTERCEPT DRAIN WHERE COVER EXCEEDS 2 FEET, OR AT EDGE OF SLOPE GRADING
(C) INSTALL FITTINGS AS NECESSARY TO MAINTAIN AT LEAST 2 FEET OF COVER FOR GREATEST DISTANCE POSSIBLE
(D) INSTALL FITTINGS AS NEEDED TO PROVIDE MINIMUM 1% SLOPE TOWARD OUTLET
(E) DAYLIGHT NEW 4" PVC FOOTING DRAIN TO SURFACE, INSTALL RODENT GUARD (IDOT 4143.01.B.4)
(F) TYPICAL LOCATION OF REINFORCED REVETMENT SECTIONS (WHERE APPLICABLE)
(G) BELOW OUTLET, ENSURE TRM SURFACE COVERAGE FROM OUTLET TO EDGE OF WATER
(H) EXISTING GRADE
(J) FINISHED GRADE

U–1 FOOTING DRAINLINE REDIRECTION

SCALE: 1" = 4'–0"

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PROJECT: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

TITLE: STABILIZATION TECHNIQUE OPTIONS

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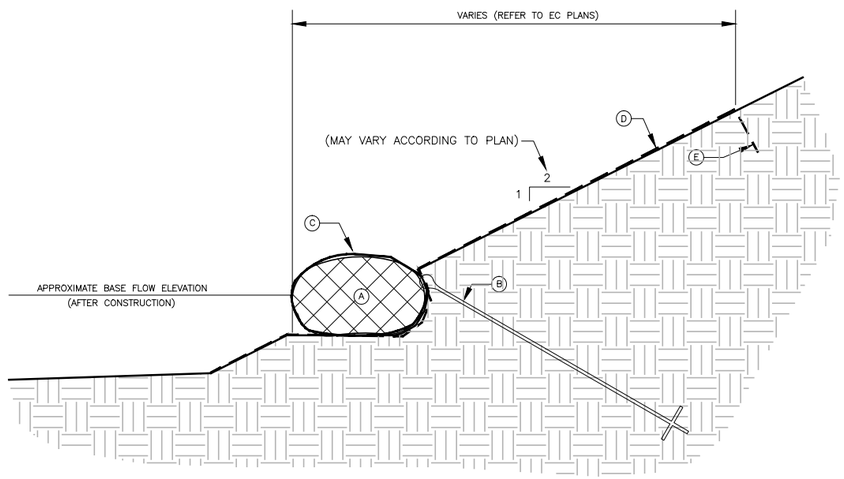
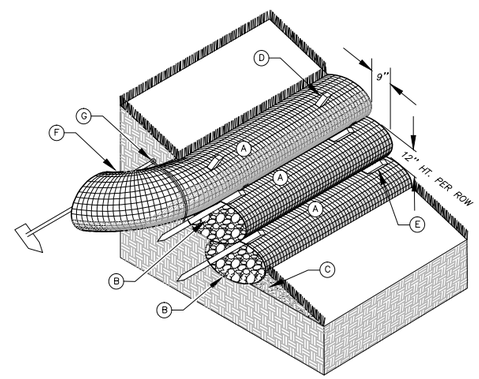


(A) 18" SOIL LOG AS SPECIFIED. PLACE ON LEVEL SHELF 6" ABOVE TOE OF SLOPE.
(B) SOIL ANCHOR AS SPECIFIED SPACED AT 30 FOOT INTERVALS.
(C) STRAP AS SPECIFIED.
(D) TRM AS SPECIFIED.
(E) BURY TOP EDGE OF TRM 8"

S-1 SOIL LOG TOE PROTECTION DETAIL (SECTION)

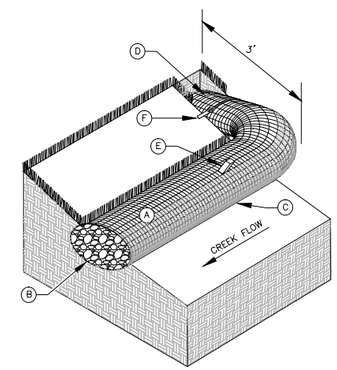
SCALE: 1" = 1'-0" REFER TO SPECIFICATION SECTION 02632



(A) 18" SOIL LOG AS SPECIFIED.
(B) REFER TO SPECIFICATIONS FOR FILL.
(C) FILL 3-6" ABOVE BOTTOM OF LOWEST SOIL LOG ALONG FACE.
(D) STAKES AS SPECIFIED IN TOP ROW THROUGH MIDDLE OF LOG.
(E) STAKES AS SPECIFIED IN LOWER ROWS ANGLED TO PROVIDE BRACE FOR FACE OF LOG COURSE ABOVE.
(F) WRAP COURSE AS REQUIRED TO MATCH PLAN LAYOUT & SLOPE TAPER.
(G) SOIL ANCHOR AS SPECIFIED AT EACH END WITH STRAP AROUND LOGS.

S-2 SOIL LOG SLOPE TREATMENT – ISOMETRIC

NOT TO SCALE REFER TO SPECIFICATION SECTION 02632



(A) 18" SOIL LOGS SOCK AS SPECIFIED.
(B) REFER TO SPECIFICATIONS FOR FILL.
(C) EDGE OF BASE FLOW AT TOE OF SLOPE.
(D) TRENCH UPPER END INTO SLOPE 3 FEET.
(E) STAKES AS SPECIFIED THROUGH MIDDLE OF LOG.
(F) PROVIDE SOIL ANCHOR AS SPECIFIED AT UPPER END AND EVERY 30 FEET ALONG LOG.

S-3 WATERLINE SOIL LOG PROTECTION – ISOMETRIC

NOT TO SCALE REFER TO SPECIFICATION SECTION 02632

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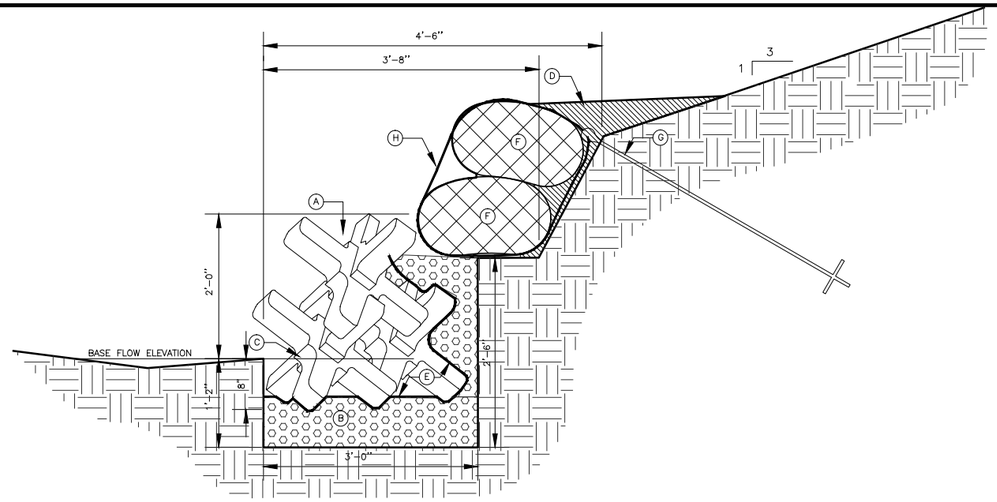
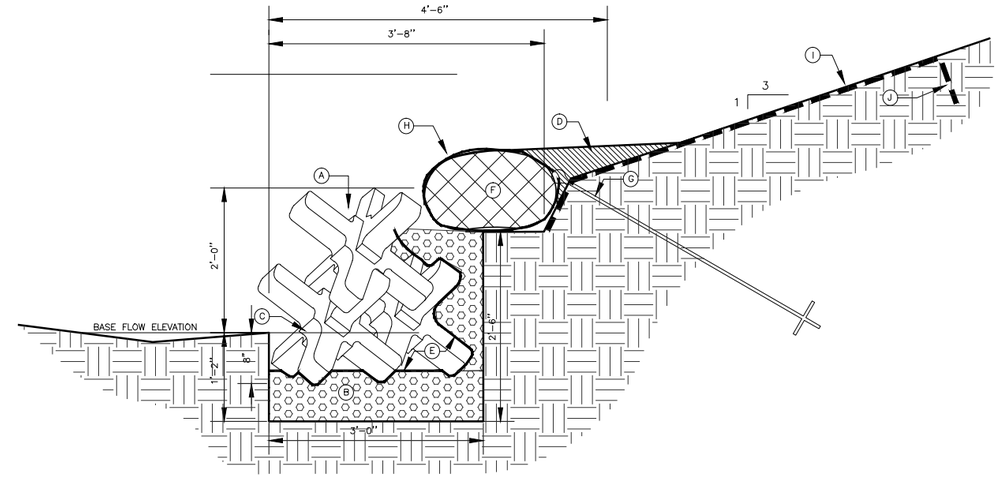
DWG No.:	EX-3
SHEET No.:	9



(A) 24" A-JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION.
(B) 6" DEPTH ROCK BASE & BACKFILL AS SPECIFIED.
(C) BURY BOTTOM COURSE OF A-JACKS TO MID POINT OF UNIT.
(D) TOPSOIL BACKFILL.
(E) ENGINEERING FABRIC AS SPECIFIED.
(F) 18" "FILTREXX" EDGE SAVER FILTER SOCK AS SPECIFIED.
(G) SOIL ANCHOR AS SPECIFIED SPACED AT 30 FOOT INTERVALS.
(H) BINDER STRAP AS SPECIFIED.

D-2 A-JACKS PLUS DOUBLE SOCK ARMOR DETAIL (SECTION)

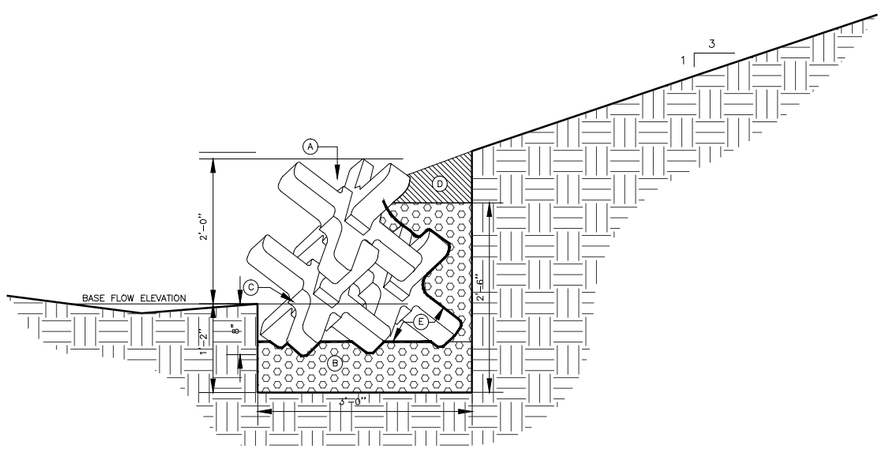
SCALE: 1" = 1'-0"



(A) 24" A-JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION.
(B) 6" DEPTH ROCK BASE & BACKFILL AS SPECIFIED.
(C) BURY BOTTOM COURSE OF A-JACKS TO MID POINT OF UNIT.
(D) TOPSOIL BACKFILL.
(E) ENGINEERING FABRIC AS SPECIFIED.
(F) 18" "FILTREXX" EDGE SAVER FILTER SOCK AS SPECIFIED.
(G) SOIL ANCHOR AS SPECIFIED SPACED AT 30 FOOT INTERVALS.
(H) BINDER STRAP AS SPECIFIED.
(I) TRM AS SPECIFIED.
(J) BURY TOP EDGE OF TRM 8"

D-3 A-JACKS PLUS SINGLE SOCK ARMOR WITH TRM DETAIL (SECTION)

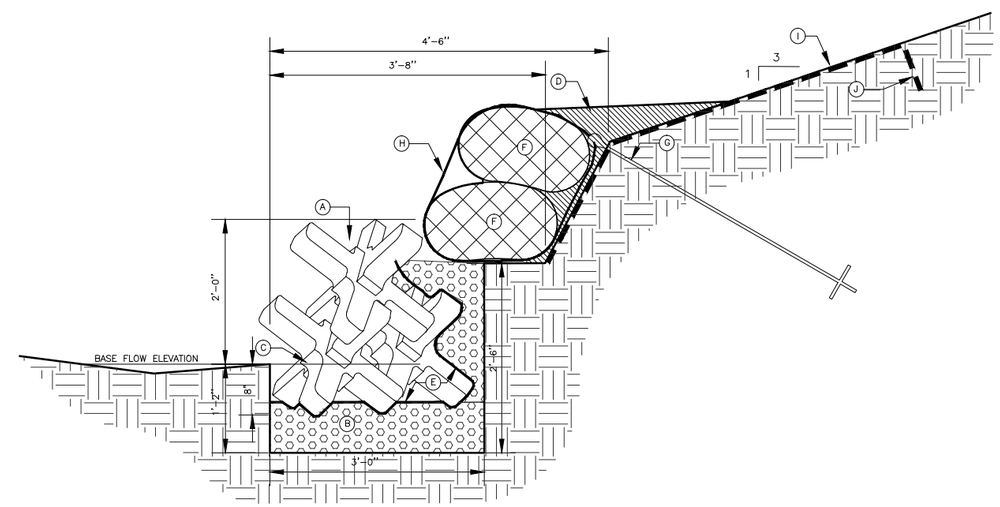
SCALE: 1" = 1'-0"



(A) 24" A-JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION.
(B) 6" DEPTH ROCK BASE & BACKFILL AS SPECIFIED.
(C) BURY BOTTOM COURSE OF A-JACKS TO MID POINT OF UNIT.
(D) TOPSOIL BACKFILL.
(E) ENGINGEERING FABRIC AS SPECIFIED.

D-1 A-JACKS ONLY ARMOR DETAIL (SECTION)

SCALE: 1" = 1'-0"



(A) 24" A-JACKS CONCRETE ARMOR UNITS IN A 2 & 1 STACK CONFIGURATION.
(B) 6" DEPTH ROCK BASE & BACKFILL AS SPECIFIED.
(C) BURY BOTTOM COURSE OF A-JACKS TO MID POINT OF UNIT.
(D) TOPSOIL BACKFILL.
(E) ENGINEERING FABRIC AS SPECIFIED.
(F) 18" "FILTREXX" EDGE SAVER FILTER SOCK AS SPECIFIED.
(G) SOIL ANCHOR AS SPECIFIED SPACED AT 30 FOOT INTERVALS.
(H) BINDER STRAP AS SPECIFIED.
(I) TRM AS SPECIFIED.
(J) BURY TOP EDGE OF TRM 8"

D-4 A-JACKS PLUS DOUBLE SOCK ARMOR WITH TRM DETAIL (SECTION)

SCALE: 1" = 1'-0"

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Civil Engineering - Land Surveying
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PROJECT NAME: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

DESCRIPTION: STABILIZATION TECHNIQUE OPTIONS

NAI NO.:	12118
DATE:	08/30/13
DRAWN BY:	GMP
CHECKED BY:	GMP
SCALE:	AS NOTED
SHEET TITLE:	EX-4
SHEET NO.:	10/11

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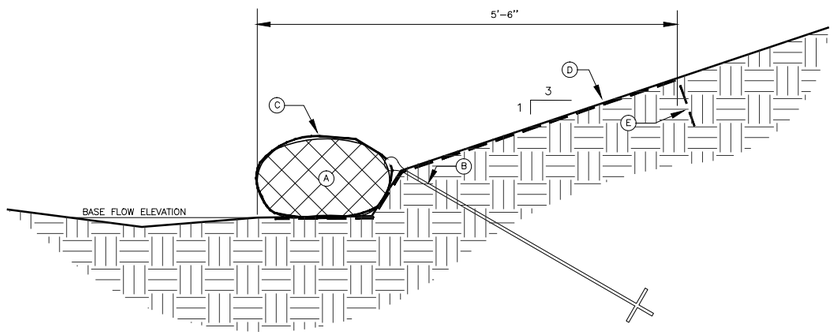
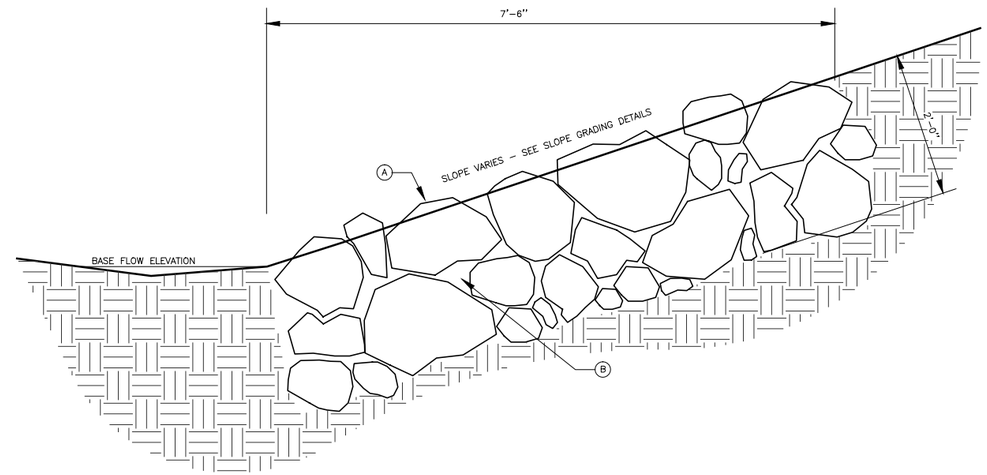


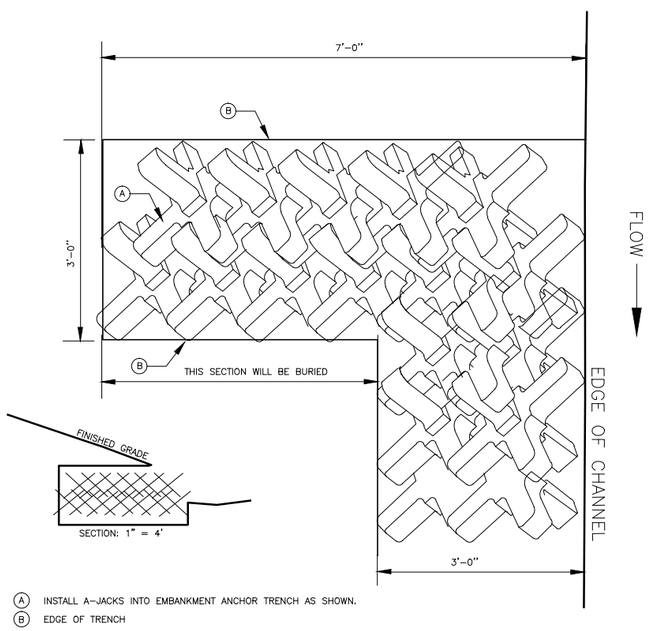
(A) 18" "FILTREXX" EDGE SAVER FILTER SOCK AS SPECIFIED.
(B) SOIL ANCHOR AS SPECIFIED SPACED AT 30 FOOT INTERVALS.
(C) STRAP AS SPECIFIED.
(D) TRM AS SPECIFIED.
(E) BURY TOP EDGE OF TRM 8"

D-5 SINGLE SOCK AND TRM TOE PROTECTION DETAIL (SECTION)
SCALE: 1" = 1'-0"



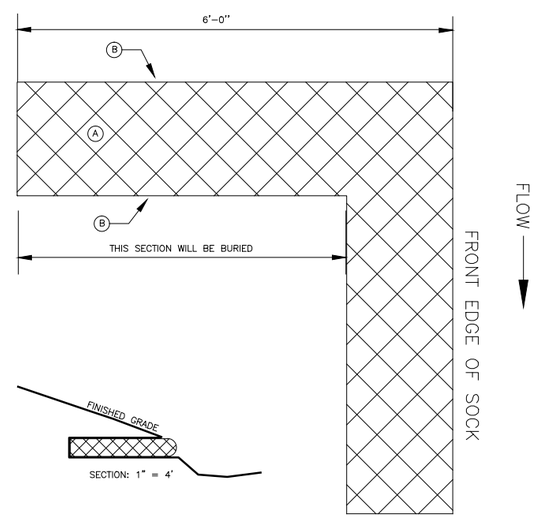
(A) CLASS 'D' REVETMENT STONE
(B) SOIL/COMPOST FILL VOIDS AS SPECIFIED

D-6 REVETMENT STONE ARMOR DETAIL (SECTION)
SCALE: 1" = 1'-0"



(A) INSTALL A-JACKS INTO EMBANKMENT ANCHOR TRENCH AS SHOWN.
(B) EDGE OF TRENCH

D-7 A-JACKS EMBANKMENT ANCHOR TRENCH DETAIL (PLAN VIEW)
SCALE: 1" = 1'-0"



(A) INSTALL A-JACKS INTO EMBANKMENT ANCHOR TRENCH AS SHOWN.
(B) EDGE OF TRENCH

D-8 SOCK EMBANKMENT ANCHOR TRENCH DETAIL (PLAN VIEW)
SCALE: 1" = 1'-0"

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PROJECT NAME: GREENWOOD HILLS GREENBELT
JOHNSTON, IOWA

DESCRIPTION: STABILIZATION TECHNIQUE OPTIONS

NAI NO.:	12118
DATE:	08/30/13
DRAWN BY:	GMP
CHECKED BY:	GMP
SCALE:	AS NOTED
SHEET TITLE:	EX-5
SHEET NO.:	11/11

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