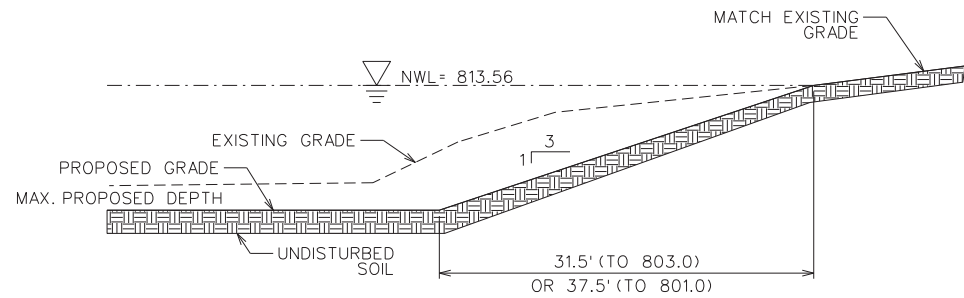
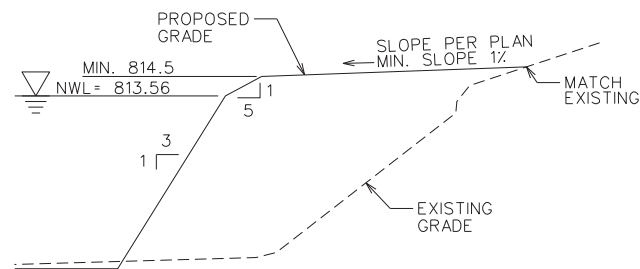


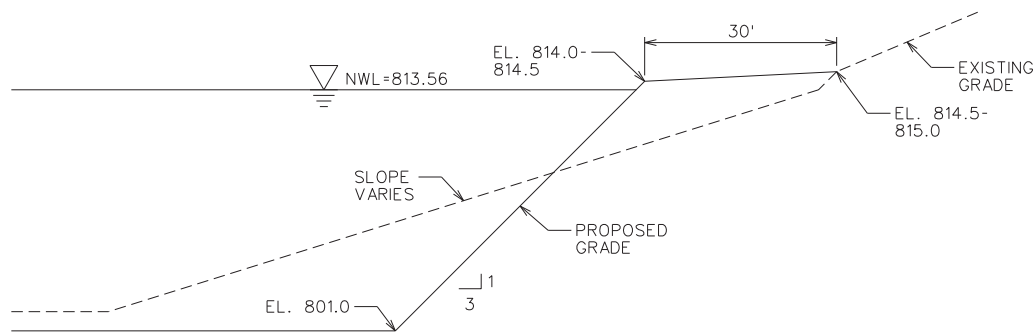
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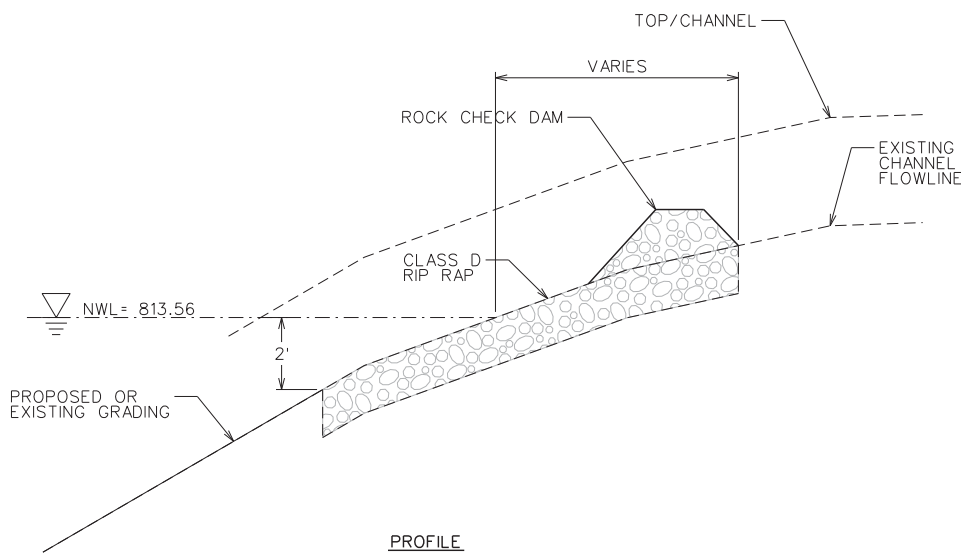
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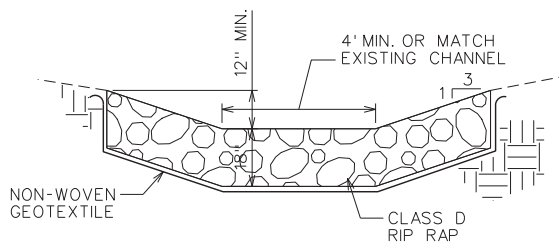
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C.13 NOT TO SCALE



3 TYPICAL SHORELINE SECTION C-C
C.13 NOT TO SCALE

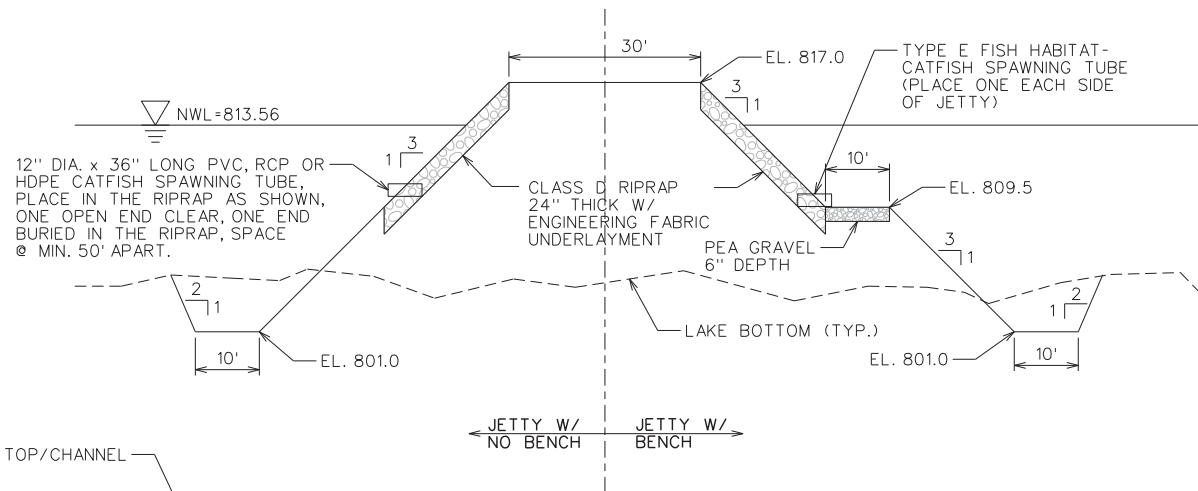


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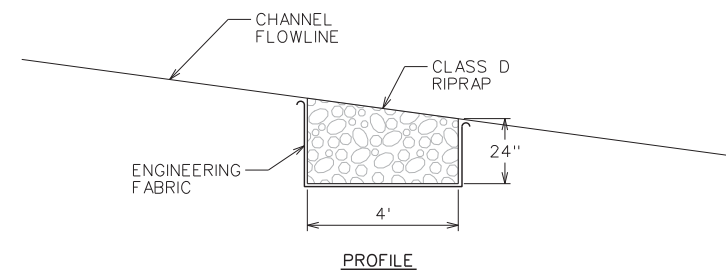


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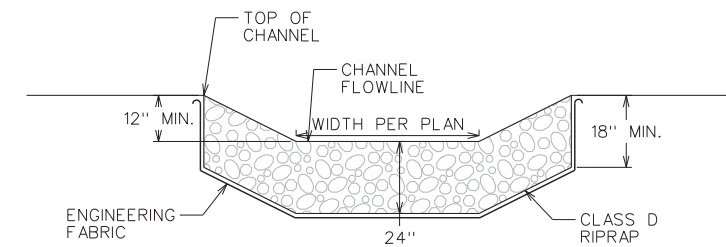
7 RIP RAP LETDOWN
C.13 NO SCALE



4 TYPICAL JETTY SECTION
C.13 NOT TO SCALE



PROFILE

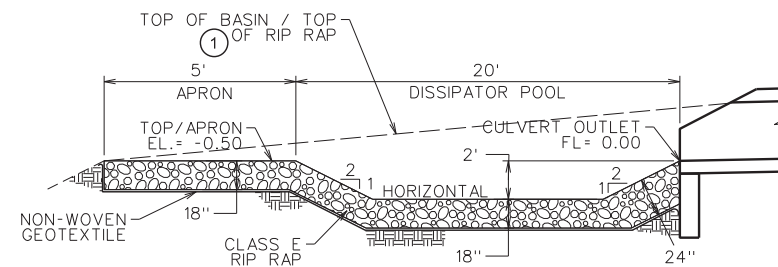


SECTION

5 ROCK GRADE CONTROL
C.13 NOT TO SCALE

NOTES:

- 1 EXTEND RIP RAP TO 2' BELOW N.W.L.



NOTES:

- 1 SEE SITE PLAN FOR PROPOSED BASIN GRADING. MIN. SIDE SLOPE OF 2:1.

6 STILLING BASIN
C.13 NOT TO SCALE

EASTER LAKE RESTORATION - CONTRACT 3

GRADING DETAILS

POLK COUNTY, IOWA

2727 S.W. SNYDER BLVD.
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SNYDER & ASSOCIATES, INC.

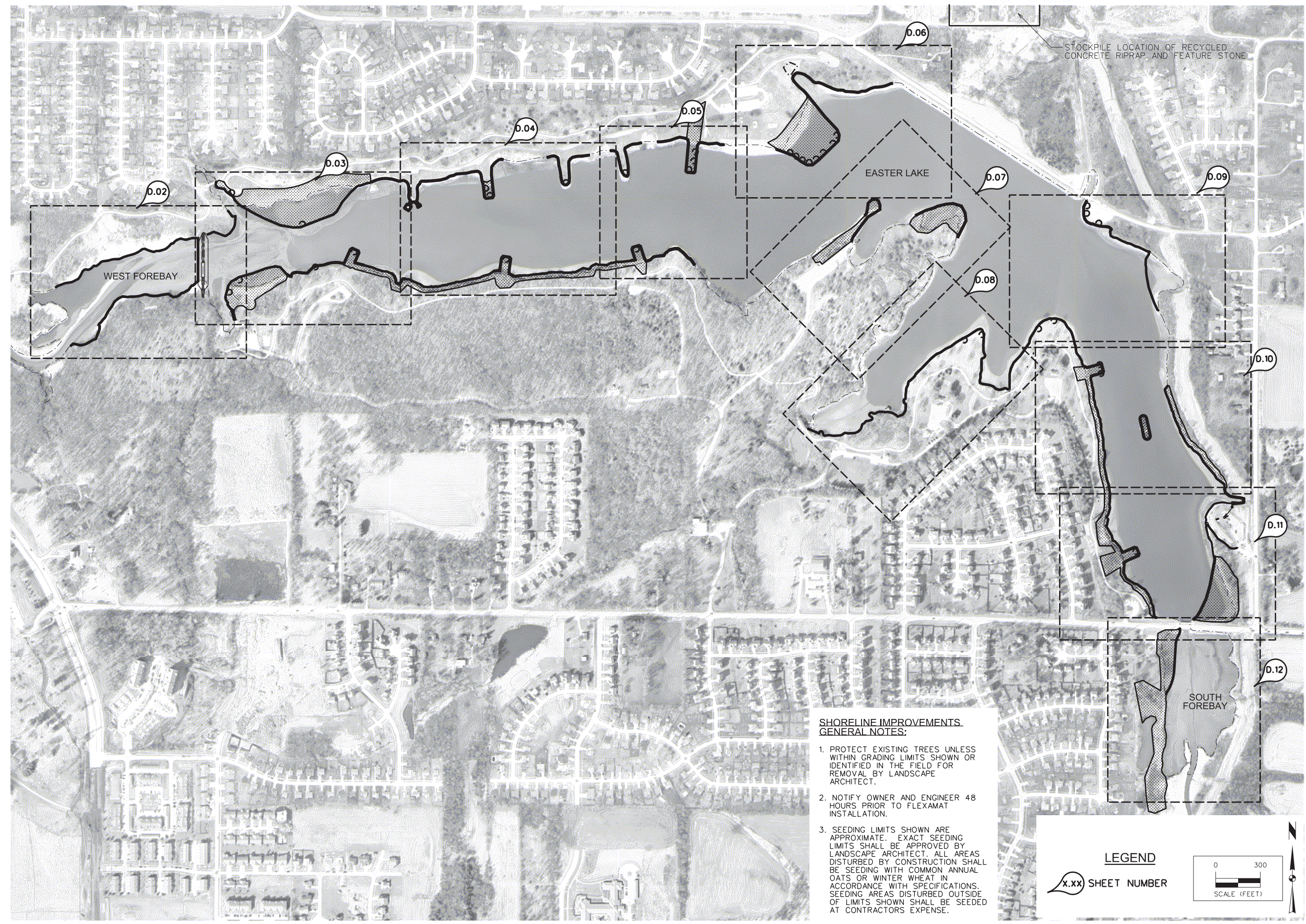
Project No: 1140546

Sheet C.13

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Technician: DFM	Date: 10/25/2017	Field Bk:	Page: C.13
Project No:	1140546	Sheet	C.13



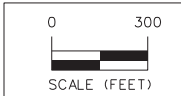
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SHORELINE IMPROVEMENTS GENERAL NOTES:

1. PROTECT EXISTING TREES UNLESS WITHIN GRADING LIMITS SHOWN OR IDENTIFIED IN THE FIELD FOR REMOVAL BY LANDSCAPE ARCHITECT.
2. NOTIFY OWNER AND ENGINEER 48 HOURS PRIOR TO FLEXAMAT INSTALLATION.
3. SEEDING LIMITS SHOWN ARE APPROXIMATE. EXACT SEEDING LIMITS SHALL BE APPROVED BY LANDSCAPE ARCHITECT. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDING WITH COMMON ANNUAL OATS OR WINTER WHEAT IN ACCORDANCE WITH SPECIFICATIONS. SEEDING AREAS DISTURBED OUTSIDE OF LIMITS SHOWN SHALL BE SEEDING AT CONTRACTORS EXPENSE.

 SHEET NUMBER



STOCKPILE LOCATION OF RECYCLED CONCRETE RIPRAP AND FEATURE STONE

EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVEMENTS - OVERALL MAP

SNYDER & ASSOCIATES, INC.

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 ANKENY, IOWA 50023
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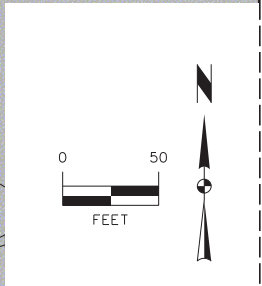
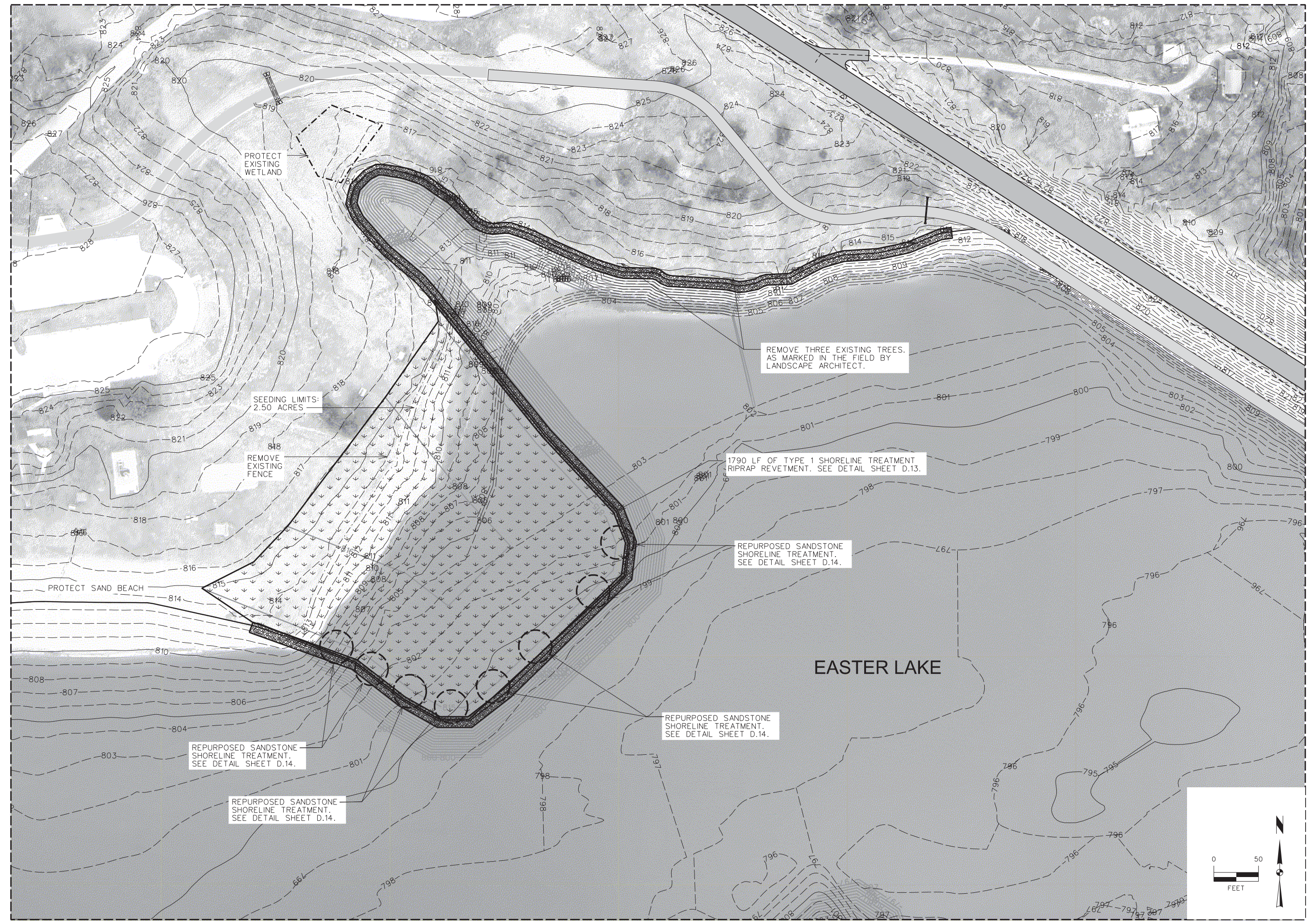
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EASTER LAKE RESTORATION - CONTRACT 3
SHORELINE IMPROVEMENT SITE PLAN

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
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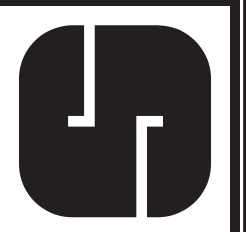
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EASTER LAKE RESTORATION - CONTRACT 3
SHORELINE IMPROVEMENT SITE PLAN
SNYDER & ASSOCIATES, INC.
 POLK COUNTY, IOWA
 2727 S.W. SNYDER BLVD.
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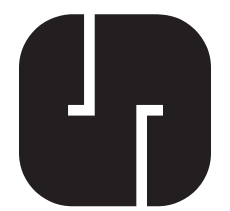


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EASTER LAKE RESTORATION - CONTRACT 3
SHORELINE IMPROVEMENT SITE PLAN

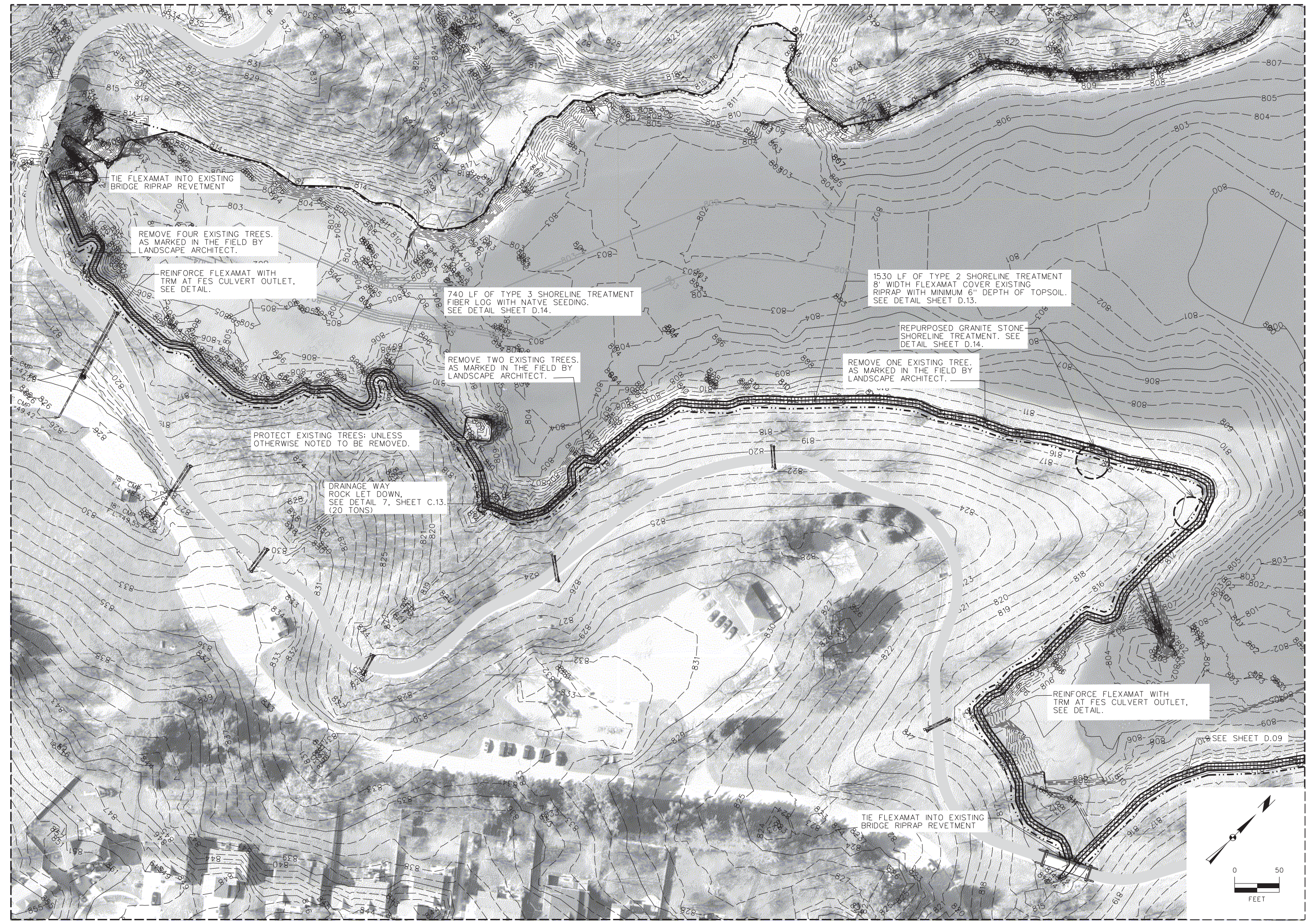


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SNYDER & ASSOCIATES, INC.

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TIE FLEXAMAT INTO EXISTING BRIDGE RIPRAP REVETMENT

REMOVE FOUR EXISTING TREES. AS MARKED IN THE FIELD BY LANDSCAPE ARCHITECT.

REINFORCE FLEXAMAT WITH TRM AT FES CULVERT OUTLET, SEE DETAIL.

740 LF OF TYPE 3 SHORELINE TREATMENT FIBER LOG WITH NATIVE SEEDING. SEE DETAIL SHEET D.14.

REMOVE TWO EXISTING TREES. AS MARKED IN THE FIELD BY LANDSCAPE ARCHITECT.

PROTECT EXISTING TREES; UNLESS OTHERWISE NOTED TO BE REMOVED.

DRAINAGE WAY ROCK LET DOWN, SEE DETAIL 7, SHEET C.13. (20 TONS)

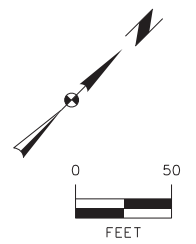
1530 LF OF TYPE 2 SHORELINE TREATMENT 8" WIDTH FLEXAMAT COVER EXISTING RIPRAP WITH MINIMUM 6" DEPTH OF TOPSOIL. SEE DETAIL SHEET D.13.

REPURPOSED GRANITE STONE SHORELINE TREATMENT. SEE DETAIL SHEET D.14.

REMOVE ONE EXISTING TREE. AS MARKED IN THE FIELD BY LANDSCAPE ARCHITECT.

REINFORCE FLEXAMAT WITH TRM AT FES CULVERT OUTLET, SEE DETAIL.

TIE FLEXAMAT INTO EXISTING BRIDGE RIPRAP REVETMENT



EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVEMENT SITE PLAN

POLK COUNTY, IOWA

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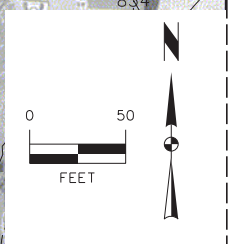
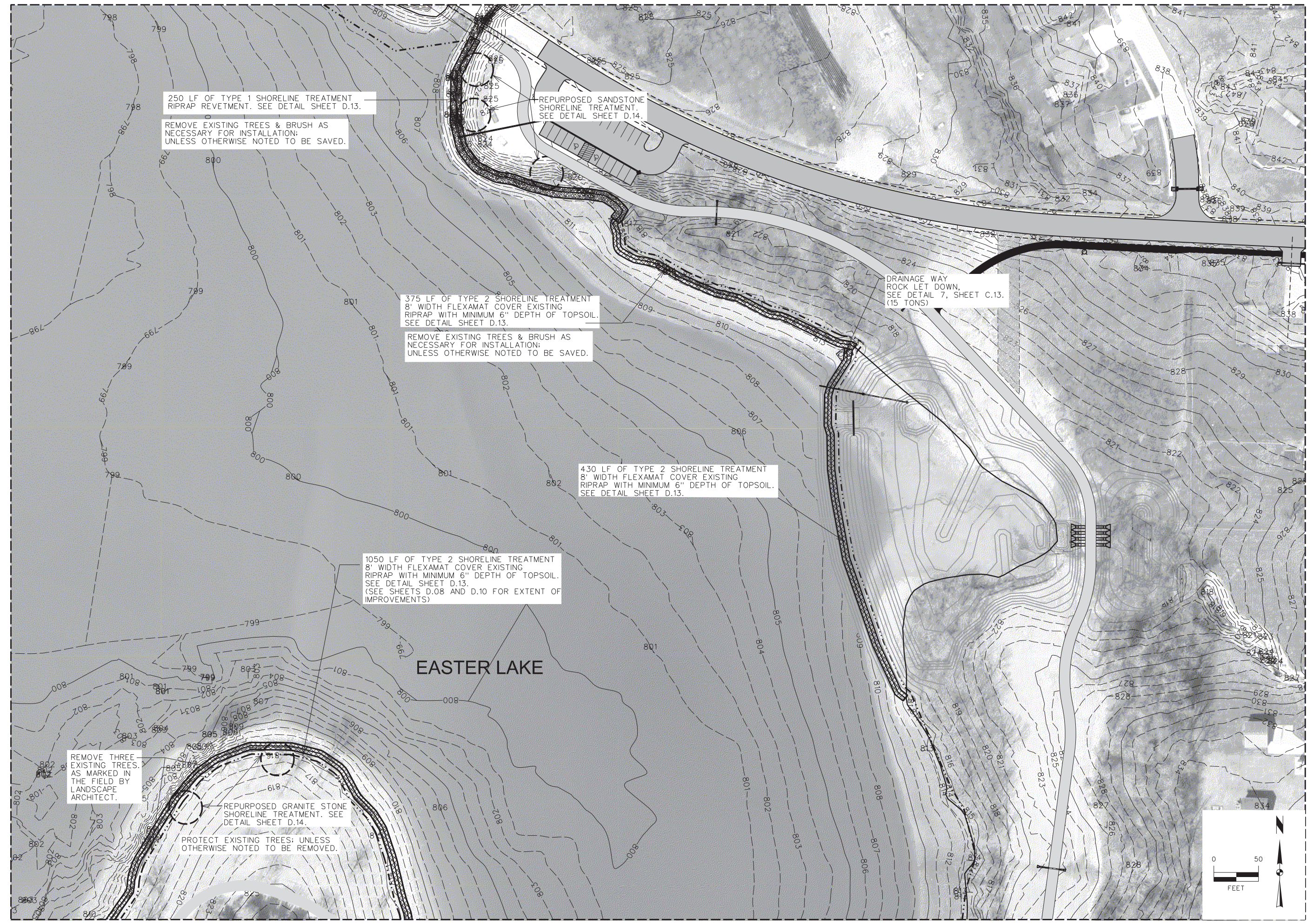
SNYDER & ASSOCIATES, INC.

Project No: 1140546

Sheet D.08

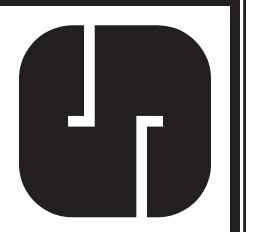
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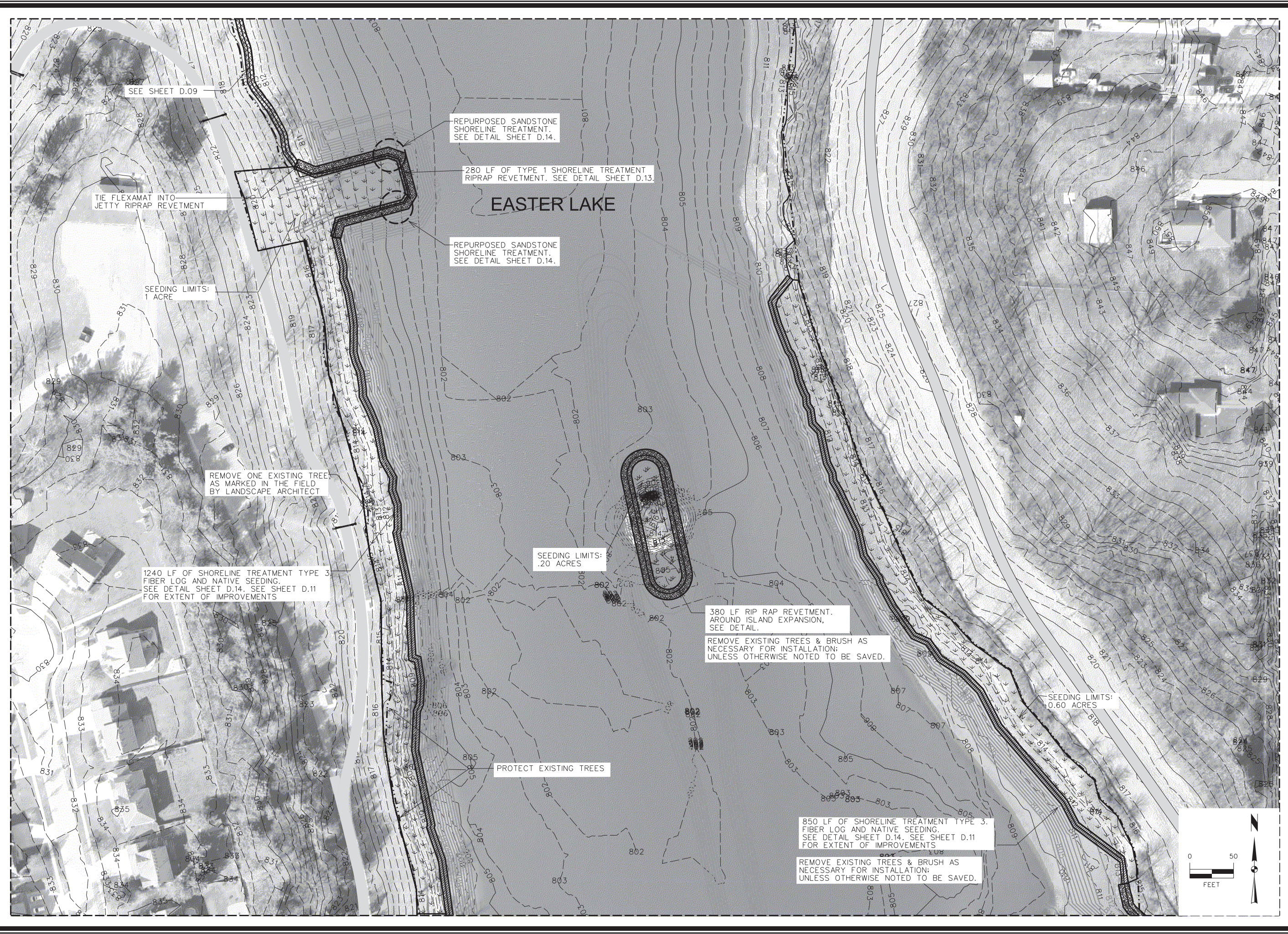
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Technician: DFM	Date: 10/25/2017	Field Bk:	Project No: 1140546
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EASTER LAKE RESTORATION - CONTRACT 3
SHORELINE IMPROVEMENT SITE PLAN
SNYDER & ASSOCIATES, INC.
POLK COUNTY, IOWA
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Sheet D.09

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SEE SHEET D.09

TIE FLEXAMAT INTO JETTY RIPRAP REVETMENT

SEEDING LIMITS: 1 ACRE

REMOVE ONE EXISTING TREE AS MARKED IN THE FIELD BY LANDSCAPE ARCHITECT

1240 LF OF SHORELINE TREATMENT TYPE 3 FIBER LOG AND NATIVE SEEDING. SEE DETAIL SHEET D.14. SEE SHEET D.11 FOR EXTENT OF IMPROVEMENTS

REPURPOSED SANDSTONE SHORELINE TREATMENT. SEE DETAIL SHEET D.14.

280 LF OF TYPE 1 SHORELINE TREATMENT RIPRAP REVETMENT. SEE DETAIL SHEET D.13.

REPURPOSED SANDSTONE SHORELINE TREATMENT. SEE DETAIL SHEET D.14.

SEEDING LIMITS: .20 ACRES

PROTECT EXISTING TREES

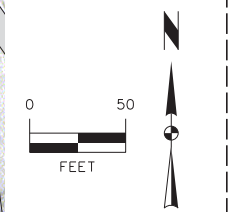
380 LF RIP RAP REVETMENT. AROUND ISLAND EXPANSION, SEE DETAIL.

REMOVE EXISTING TREES & BRUSH AS NECESSARY FOR INSTALLATION; UNLESS OTHERWISE NOTED TO BE SAVED.

850 LF OF SHORELINE TREATMENT TYPE 3. FIBER LOG AND NATIVE SEEDING. SEE DETAIL SHEET D.14. SEE SHEET D.11 FOR EXTENT OF IMPROVEMENTS

REMOVE EXISTING TREES & BRUSH AS NECESSARY FOR INSTALLATION; UNLESS OTHERWISE NOTED TO BE SAVED.

SEEDING LIMITS: 0.60 ACRES



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Engineer: DJJ	Checked By: ARB	Scale: 1" = 50'	
Technician: DFM	Date: 10/25/2017	Field Bk:	Pt:
Project No: 1140546	Sheet	D.10	

EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVEMENT SITE PLAN

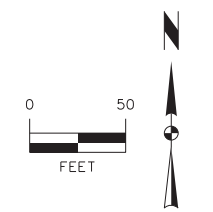
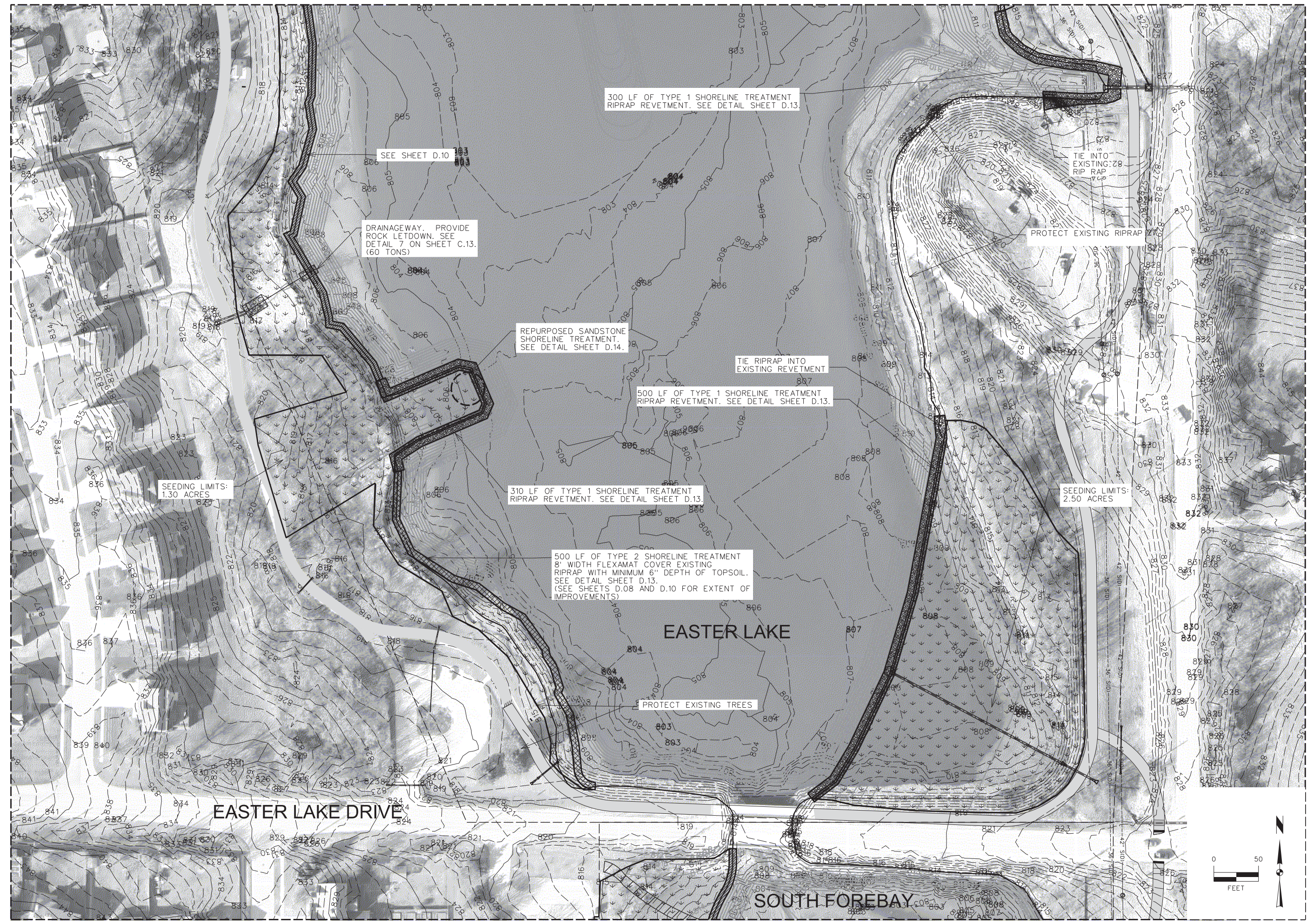
SNYDER & ASSOCIATES, INC.

POLK COUNTY, IOWA

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Project No: 1140546
Sheet D.10

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EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVMENT SITE PLAN

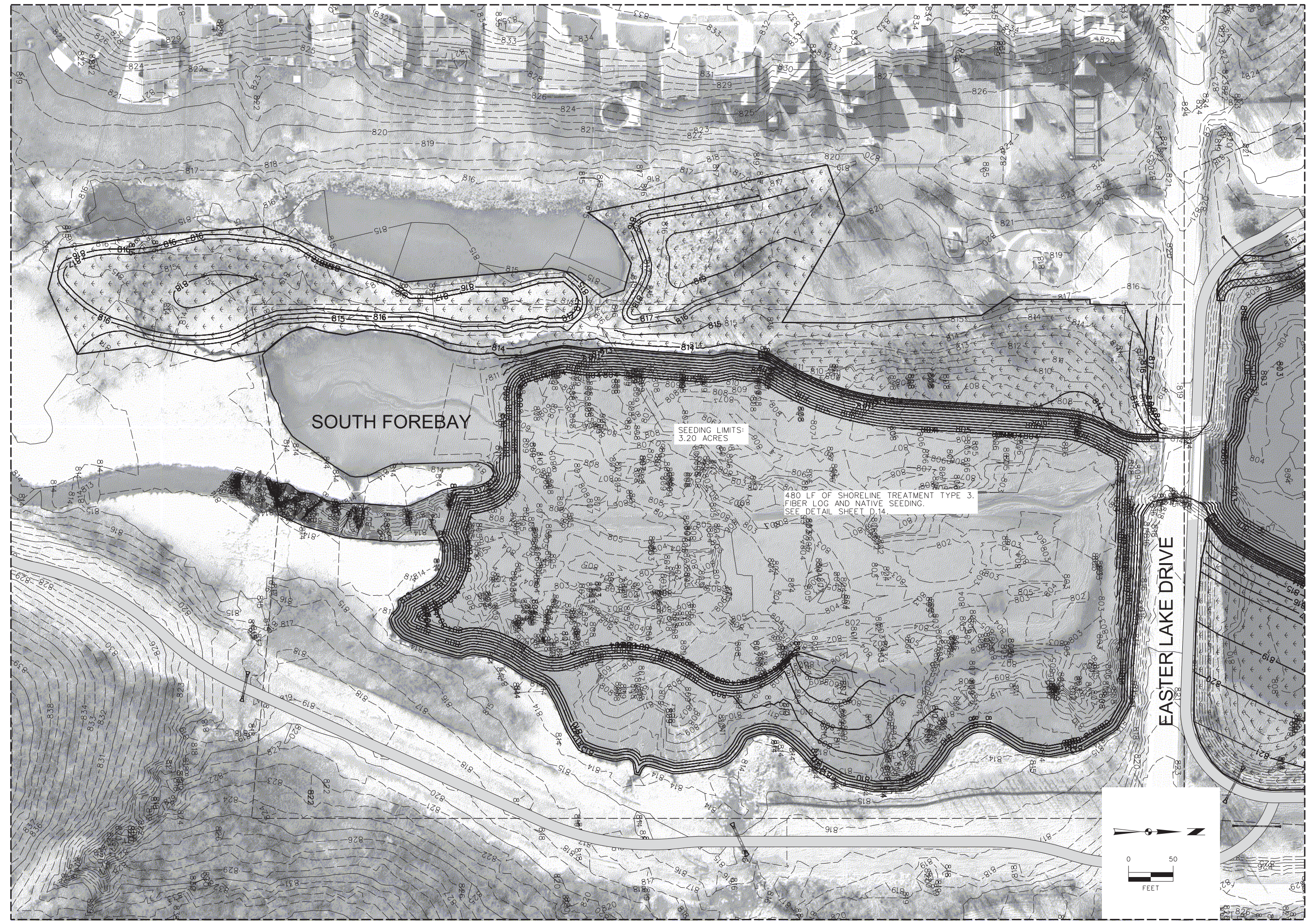
SNYDER & ASSOCIATES, INC.

POLK COUNTY, IOWA

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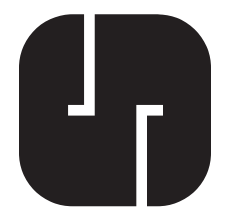
EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVMENT SITE PLAN

POLK COUNTY, IOWA

2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES, INC.



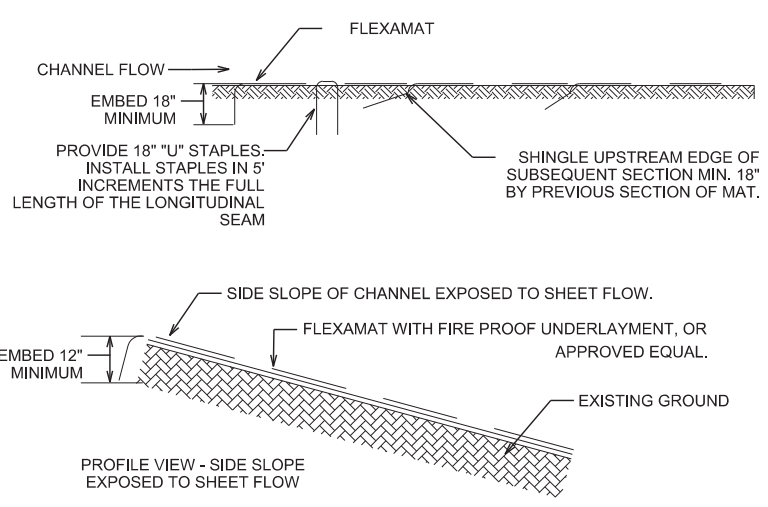
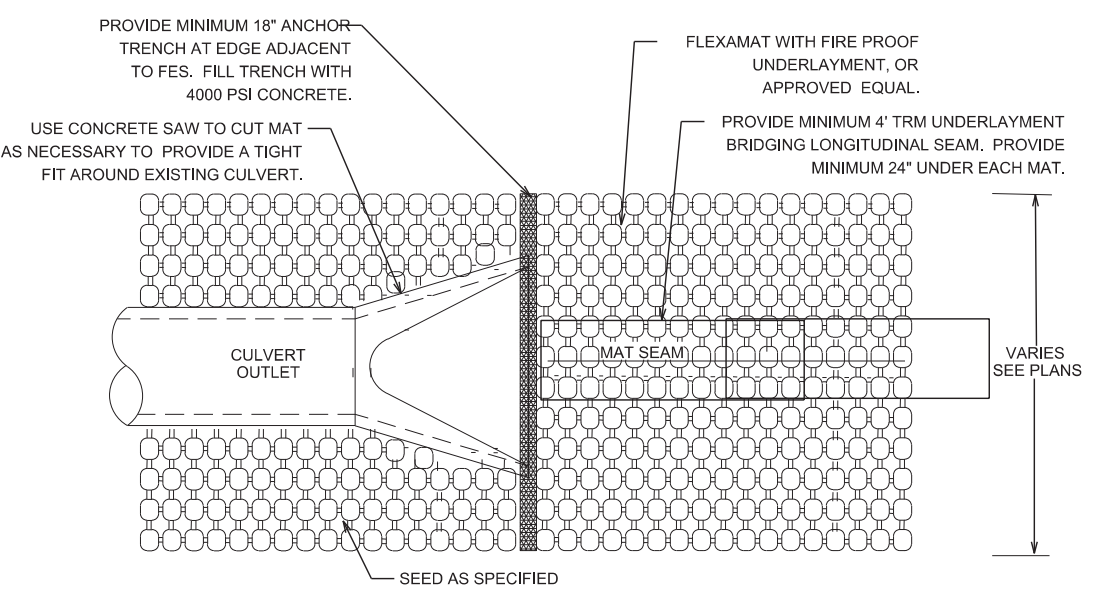
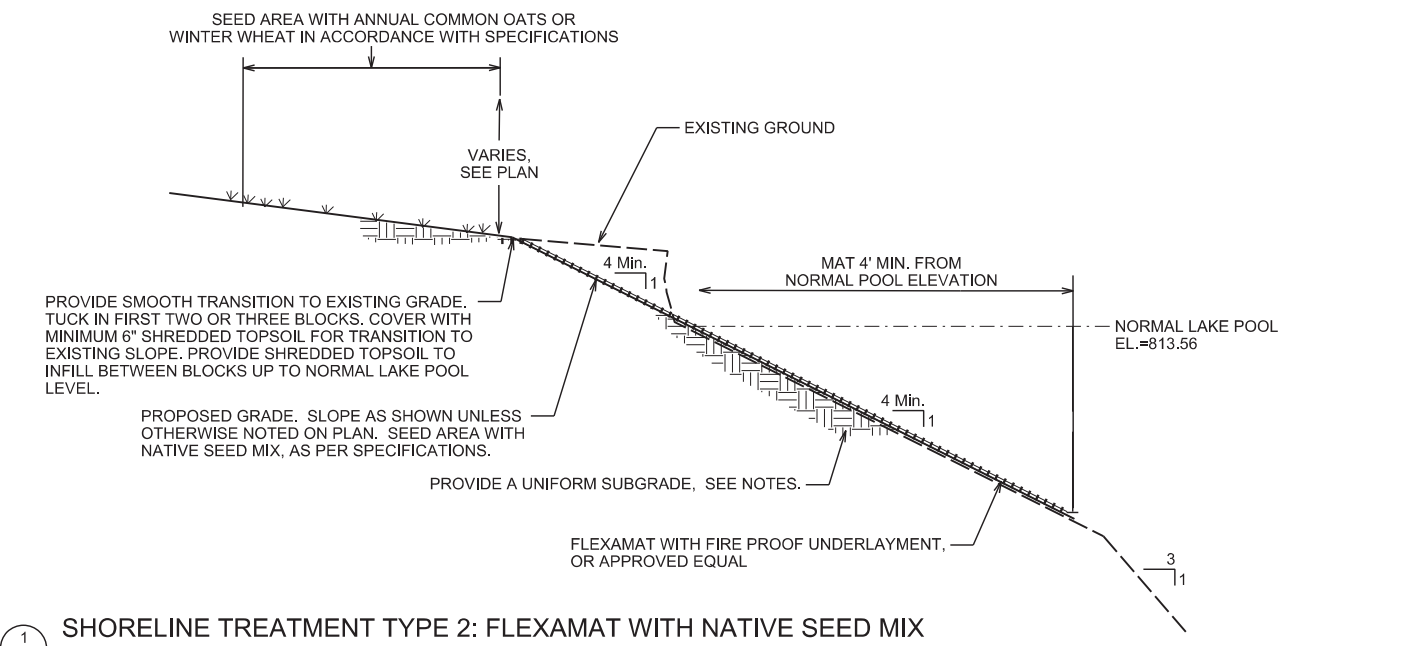
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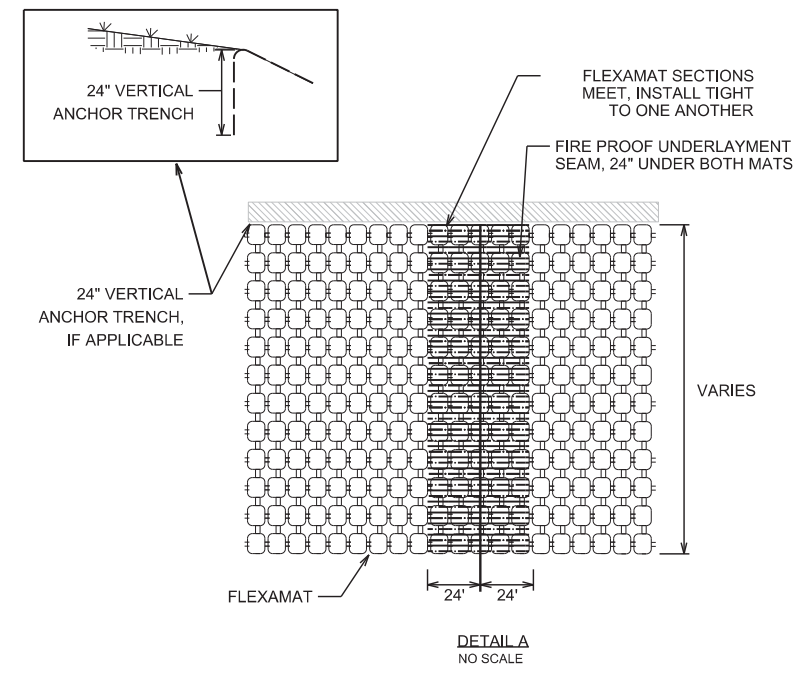
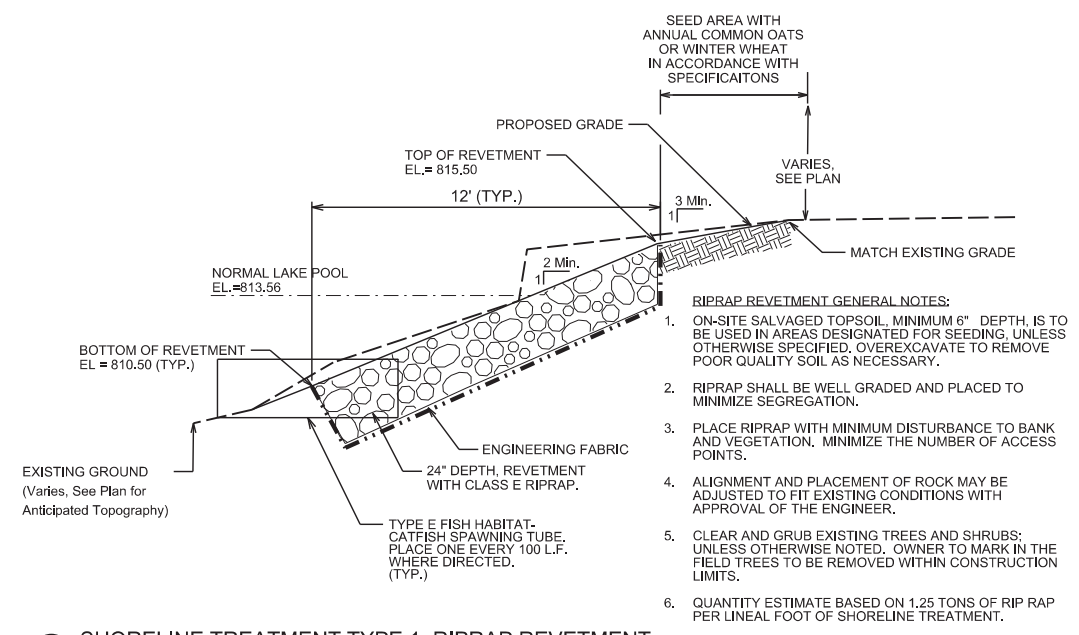
FLEXAMAT CONSTRUCTION GENERAL NOTES:

1. REMOVE EXISTING VEGETATION. CLEAR AND GRUB EXISTING TREES AND SHRUBS; UNLESS OTHERWISE NOTED. OWNER TO MARK IN THE FIELD TREES TO BE PROTECTED WITHIN CONSTRUCTION LIMITS.
2. PREPARE SURFACE IN ACCORDANCE WITH SPECIFICATIONS SECTIONS 31 23 99 AND 31 25 53. GRADE A UNIFORM SUBGRADE, SEE PLANS AND DETAILS FOR GRADING LIMITS. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS WITH NO SHARP OR ABRUPT BREAKS IN THE GRADE. TOP OF MAT SHALL BE BURIED IN A 24" ANCHOR TRENCH AT ALL CHANNEL CROSSINGS OR CULVERT OUTLETS, SEE DETAIL 1, SHEET H.07.
3. APPLY SEED SPECIFIED DIRECTLY TO THE PREPARED SOIL PRIOR TO INSTALLATION OF MATS. SEED ALL AREAS DISTURBED BY CONSTRUCTION. AFTER SEEDING APPLY EARTHGUARD FUSION TRM HYDRAULIC GROWTH MEDIUM AND MULCH, OR APPROVED EQUAL, IN ACCORDANCE WITH THE SPECIFICATIONS PRIOR TO INSTALLATION OF MATS.
4. INSTALL TIED CONCRETE BLOCK EROSION CONTROL MATTING TO THE WIDTH AND GRADE SHOWN ON THE PLANS. MAT TO BE FLEXAMAT, MANUFACTURED BY MOTZ ENTERPRISES, INC. OR APPROVED EQUAL. MATS SHALL BE INSTALLED SO THAT THE MAT EXTENDS 4'-0" BELOW NORMAL LAKE POOL WATER ELEVATION.
5. AT ANY SEAMS IN THE MAT, THE MAT SHALL BE MANUALLY FLIPPED BACK 3' THE LENGTH OF THE SEAM ON BOTH ADJACENT MATS. 4' SECTION OF THE FIRE PROOF UNDERLAYMENT SHALL BE INSTALLED UNDER THE SEAM, WITH 2' OF THE FIRE PROOF UNDERLAYMENT UNDER EITHER SIDE OF THE SEAM, SEE DETAIL. MAT SHALL THEN BE MANUALLY FLIPPED BACK INTO PLACE SO THAT THE FLEXAMAT SECTIONS FIT TIGHTLY. A CONCRETE SAW SHALL BE USED TO CUT MAT TO FIT TIGHTLY TO ADJACENT SECTION OF MAT OR TO FIT AROUND CULVERTS, STRUCTURES OR TREES.



3
D.13 NO SCALE

SHORELINE TREATMENT TYPE 1: RIPRAP REVETMENT



EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVEMENTS DETAILS

POLK COUNTY, IOWA

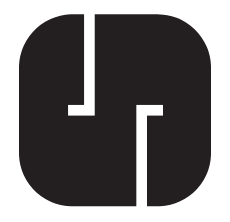
2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES, INC.

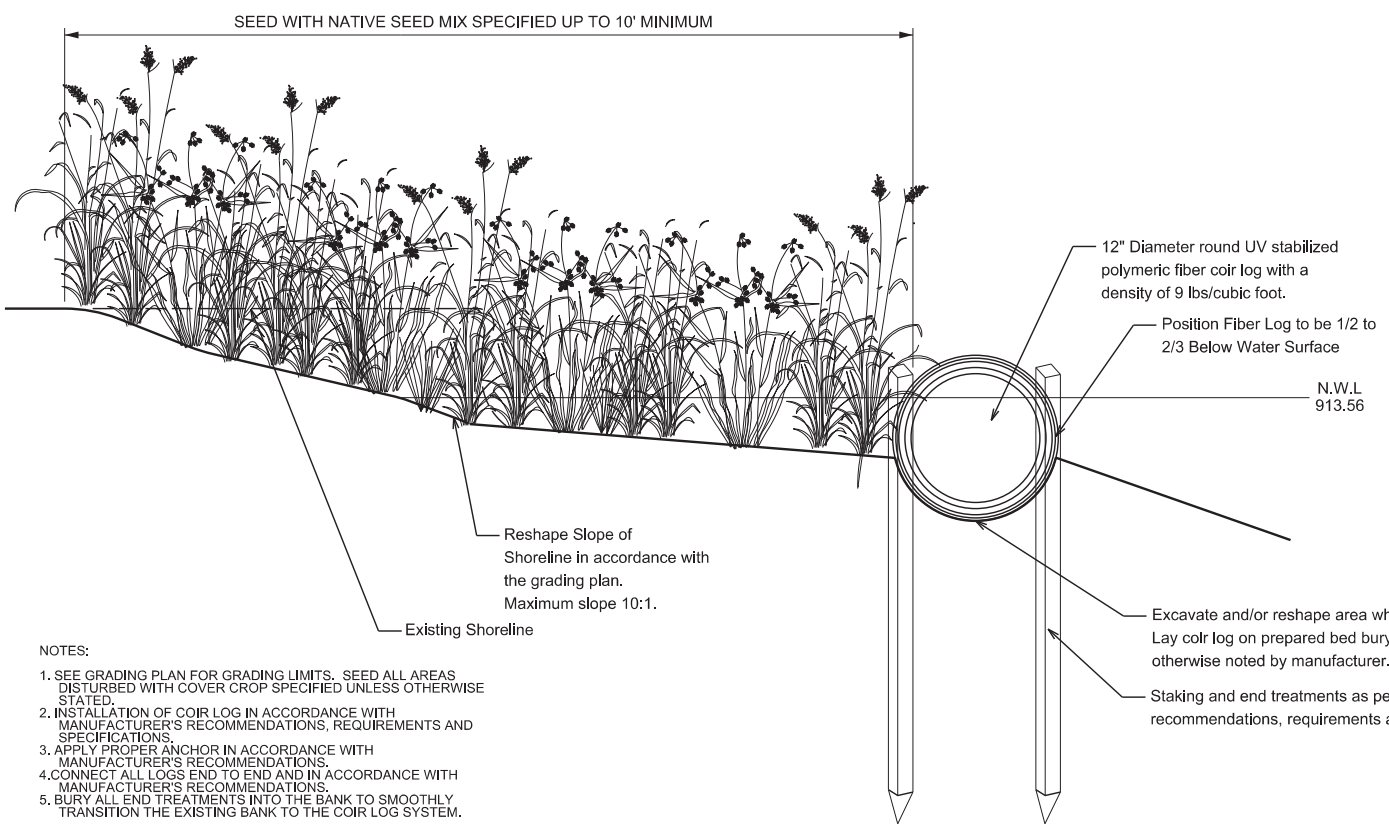
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Project No:	1140546		

Project No: 1140546

Sheet D.13

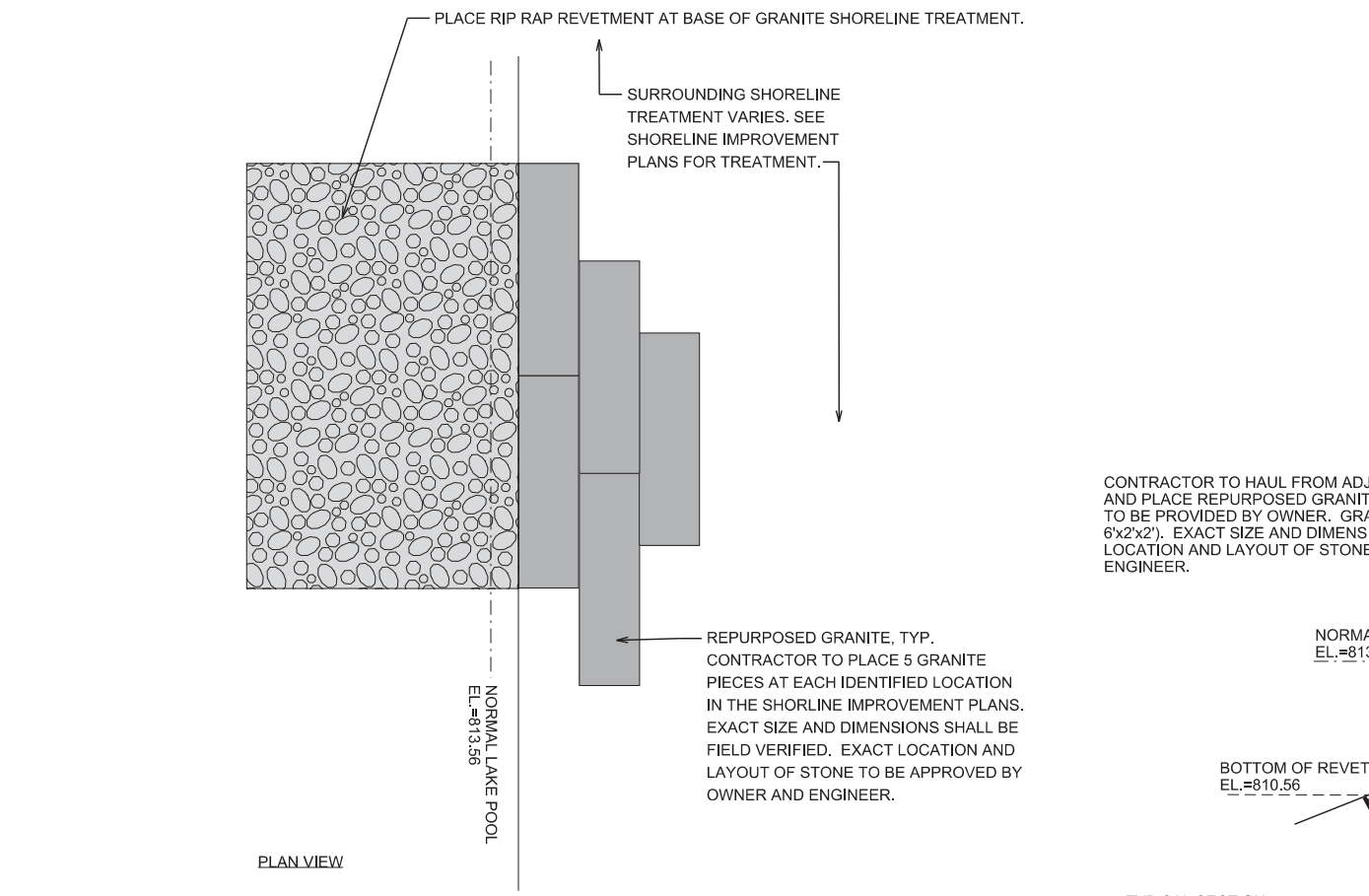


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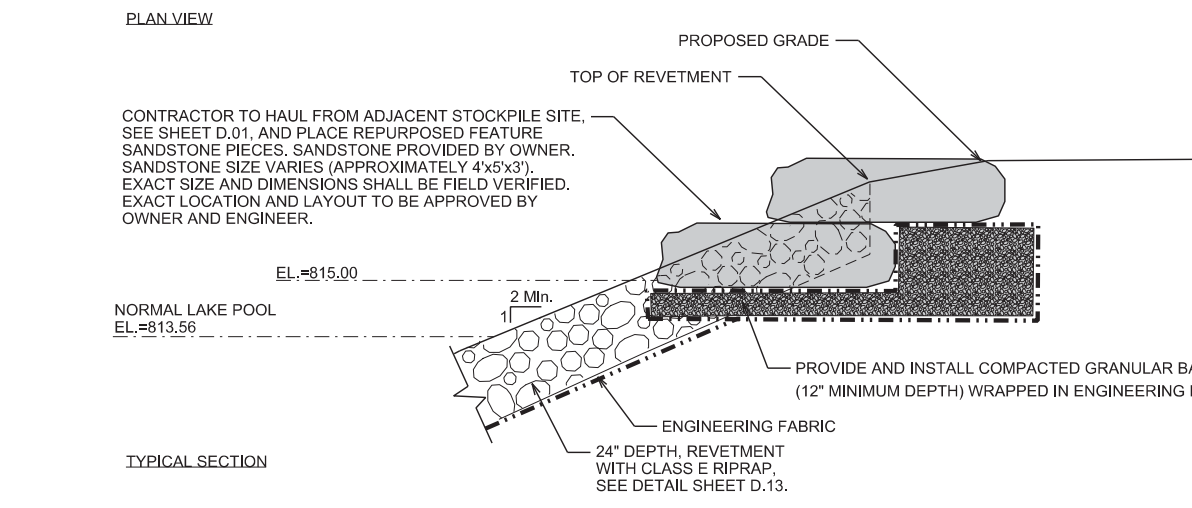
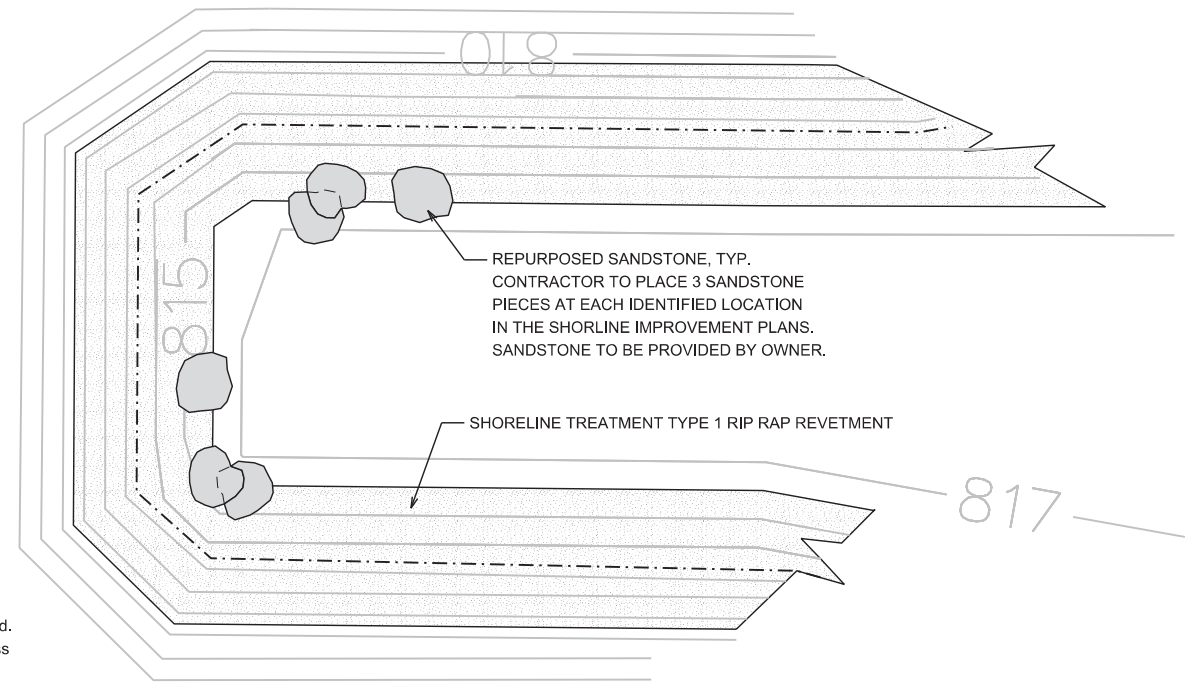
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SHORELINE TREATMENT TYPE 3: FIBER LOG WITH NATIVE SEEDING



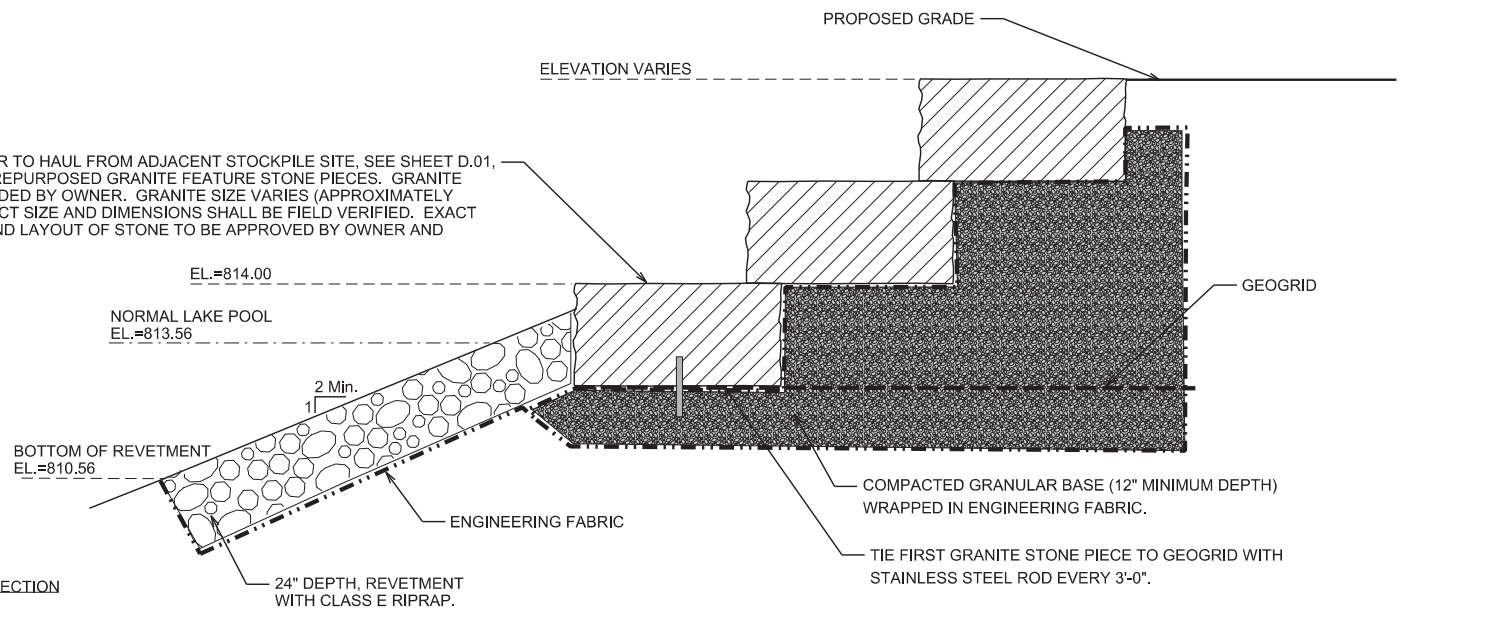
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D.14 NO SCALE

REPURPOSED GRANITE SHORELINE TREATMENT DETAIL



3
D.14 NO SCALE

SANDSTONE SHORELINE TREATMENT AND RIPRAP REVETMENT TYPICAL DETAIL



MARK	REVISION	DATE	BY
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Technician: DFM	Date: 10/25/2017	Project No: 1140546	Sheet D.14

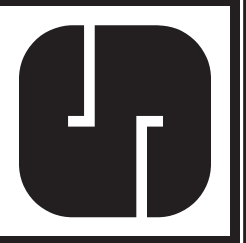
EASTER LAKE RESTORATION - CONTRACT 3

SHORELINE IMPROVEMENTS DETAILS

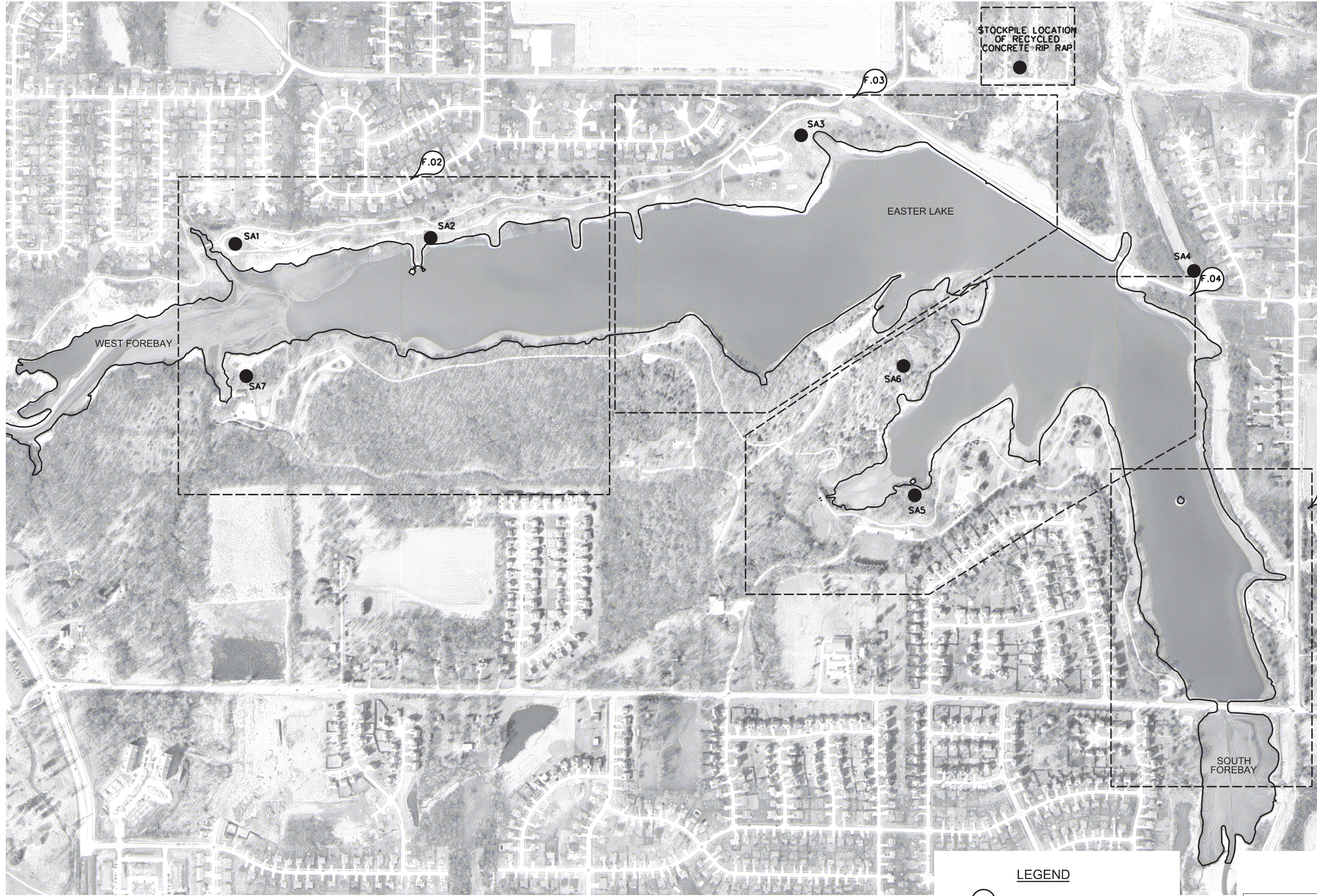
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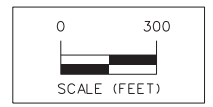
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STOCKPILE LOCATION OF RECYCLED CONCRETE RIP RAP

LEGEND

- X.XX SHEET NUMBER
- STOCKPILE LOCATION OF CONCRETE STRUCTURES FOR FISH HABITAT



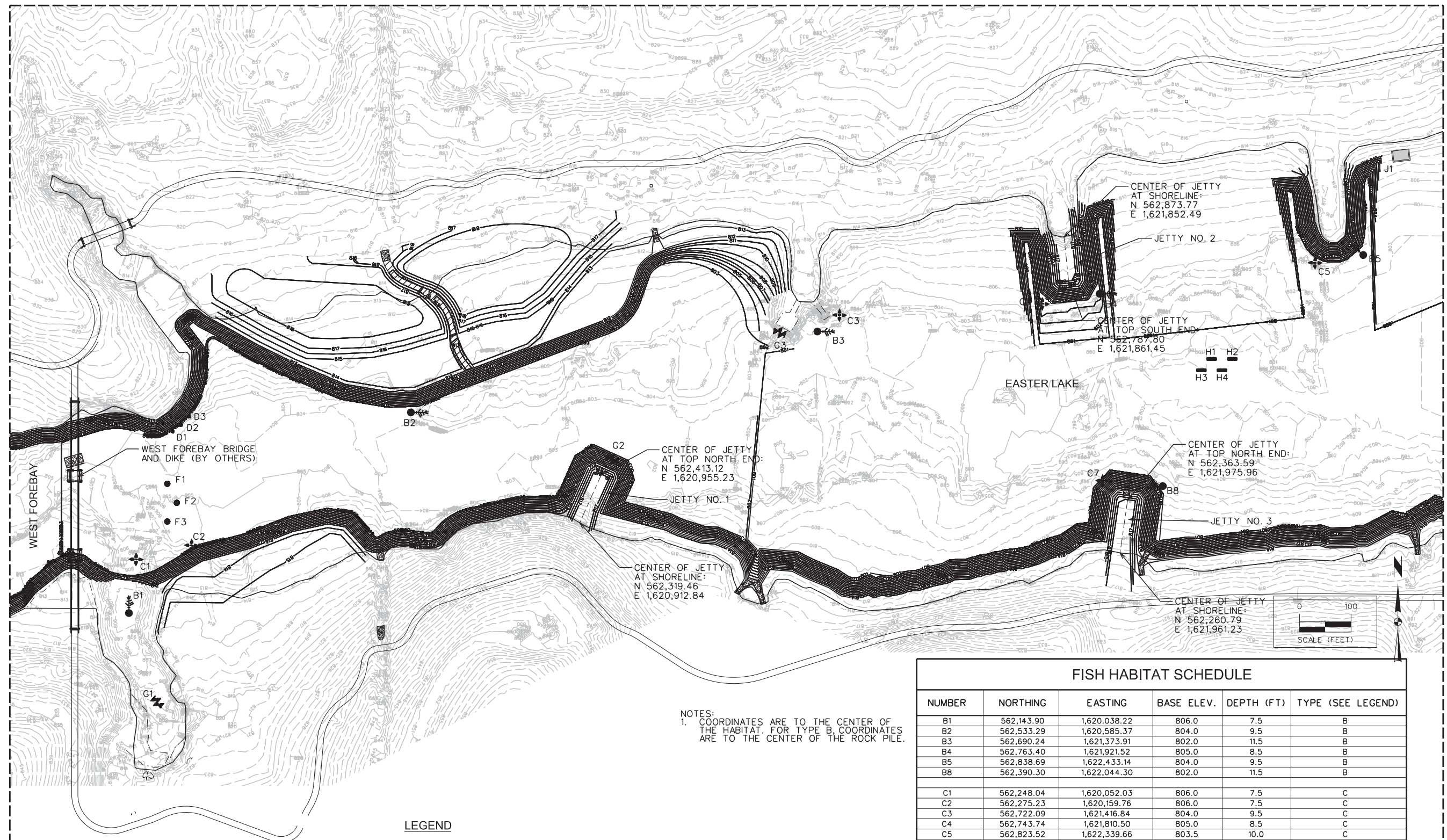
EASTER LAKE RESTORATION - CONTRACT 3
FISH HABITAT OVERALL MAP
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MARK	REVISION	DATE	BY
Engineer: DJJ	Checked By: ARB	Scale: 1" = 300'	
Technician: DFM	Date: 10/25/2017	Field Bk:	Pt:
Project No: 1140546		Sheet	F.01

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Sheet F.01

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NOTES:
 1. COORDINATES ARE TO THE CENTER OF THE HABITAT. FOR TYPE B, COORDINATES ARE TO THE CENTER OF THE ROCK PILE.

- LEGEND**
- (TYPE A) ROCK & ROOT BALL FISH HABITAT
 - (TYPE B) ROCK PILE & HARDWOOD TREE FISH HABITAT
 - ⊕ (TYPE C) CEDAR TREE FISH HABITAT
 - ▲ (TYPE D) CEDAR TREE & CMU FISH HABITAT
 - (TYPE F) ROCK PILE FISH HABITAT
 - ⚓ (TYPE G) ANCHORED CABLE CEDAR TREE HABITAT
 - ▬ (TYPE H) ROCK REEF FISH HABITAT
 - (TYPE J) GRAVEL SPAWNING BEDS

FISH HABITAT SCHEDULE					
NUMBER	NORTHING	EASTING	BASE ELEV.	DEPTH (FT)	TYPE (SEE LEGEND)
B1	562,143.90	1,620,038.22	806.0	7.5	B
B2	562,533.29	1,620,585.37	804.0	9.5	B
B3	562,690.24	1,621,373.91	802.0	11.5	B
B4	562,763.40	1,621,921.52	805.0	8.5	B
B5	562,838.69	1,622,433.14	804.0	9.5	B
B8	562,390.30	1,622,044.30	802.0	11.5	B
C1	562,248.04	1,620,052.03	806.0	7.5	C
C2	562,275.23	1,620,159.76	806.0	7.5	C
C3	562,722.09	1,621,416.84	804.0	9.5	C
C4	562,743.74	1,621,810.50	805.0	8.5	C
C5	562,823.52	1,622,339.66	803.5	10.0	C
C7	562,400.71	1,621,927.38	802.0	11.5	C
D1	561,902.38	1,620,124.02	805.0	8.5	D
D2	561,926.00	1,620,119.44	805.0	8.5	D
D3	561,946.30	1,620,118.94	806.0	7.5	D
F1	562,394.85	1,620,112.71	803.0	10.5	F
F2	562,357.87	1,620,131.19	803.0	10.5	F
F3	562,321.55	1,620,112.71	803.0	10.5	F
G1	561,970.63	1,620,093.13	806.0	7.5	G
G2	562,442.86	1,620,975.92	808.0	5.5	G
G3	562,688.73	1,621,300.86	802.0	11.5	G
H1	562,637.10	1,622,139.01	802.4	11.1	H
H2	562,637.10	1,622,179.01	802.3	11.2	H
H3	562,615.10	1,622,119.01	802.4	11.1	H
H4	562,615.10	1,622,159.01	802.3	11.2	H
J1	563,031.52	1,622,506.25	810.5	3.0	J

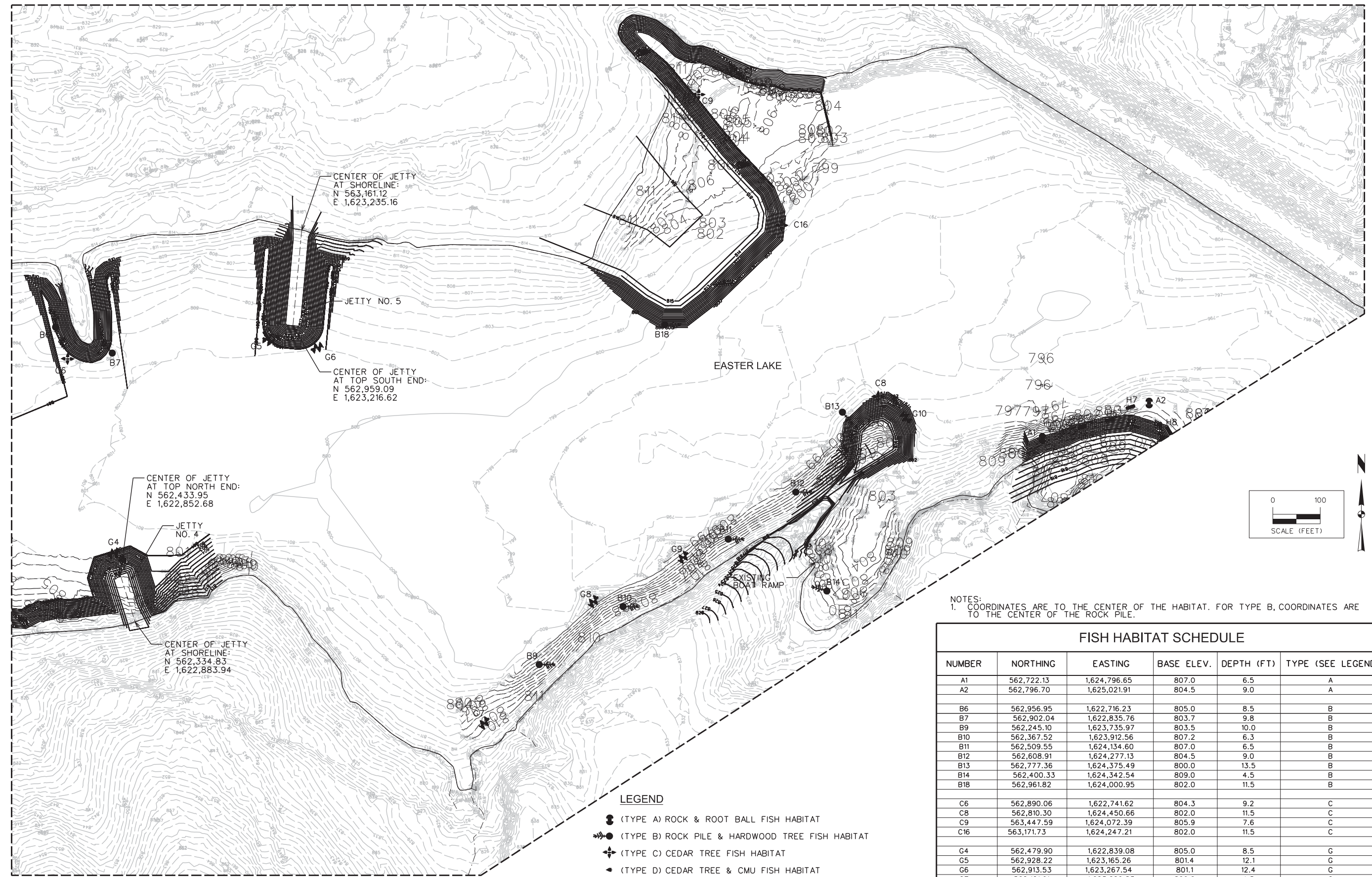
EASTER LAKE RESTORATION - CONTRACT 3
FISH HABITAT SITE PLAN
SNYDER & ASSOCIATES, INC.

POLK COUNTY, IOWA
 2727 S.W. SNYDER BLVD.
 ANKENY, IOWA 50023
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MARK	REVISION	DATE	BY
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DFM <td>Date: 10/25/2017 <td>Field Bk: <td>Pj: </td></td></td>	Date: 10/25/2017 <td>Field Bk: <td>Pj: </td></td>	Field Bk: <td>Pj: </td>	Pj:
Technician:	1140546	Sheet	F.02

Project No: 1140546
 Sheet F.02

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- LEGEND**
- (TYPE A) ROCK & ROOT BALL FISH HABITAT
 - (TYPE B) ROCK PILE & HARDWOOD TREE FISH HABITAT
 - ◆ (TYPE C) CEDAR TREE FISH HABITAT
 - ◆ (TYPE D) CEDAR TREE & CMU FISH HABITAT
 - (TYPE F) ROCK PILE FISH HABITAT
 - ◆ (TYPE G) ANCHORED CABLE CEDAR TREE HABITAT
 - (TYPE H) ROCK REEF FISH HABITAT
 - (TYPE J) GRAVEL SPAWNING BEDS

NOTES:
 1. COORDINATES ARE TO THE CENTER OF THE HABITAT. FOR TYPE B, COORDINATES ARE TO THE CENTER OF THE ROCK PILE.

FISH HABITAT SCHEDULE					
NUMBER	NORTHING	EASTING	BASE ELEV.	DEPTH (FT)	TYPE (SEE LEGEND)
A1	562,722.13	1,624,796.65	807.0	6.5	A
A2	562,796.70	1,625,021.91	804.5	9.0	A
B6	562,956.95	1,622,716.23	805.0	8.5	B
B7	562,902.04	1,622,835.76	803.7	9.8	B
B9	562,245.10	1,623,735.97	803.5	10.0	B
B10	562,367.52	1,623,912.56	807.2	6.3	B
B11	562,509.55	1,624,134.60	807.0	6.5	B
B12	562,608.91	1,624,277.13	804.5	9.0	B
B13	562,777.36	1,624,375.49	800.0	13.5	B
B14	562,400.33	1,624,342.54	809.0	4.5	B
B18	562,961.82	1,624,000.95	802.0	11.5	B
C6	562,890.06	1,622,741.62	804.3	9.2	C
C8	562,810.30	1,624,450.66	802.0	11.5	C
C9	563,447.59	1,624,072.39	805.9	7.6	C
C16	563,171.73	1,624,247.21	802.0	11.5	C
G4	562,479.90	1,622,839.08	805.0	8.5	G
G5	562,928.22	1,623,165.26	801.4	12.1	G
G6	562,913.53	1,623,267.54	801.1	12.4	G
G7	562,121.91	1,623,620.83	809.0	4.5	G
G8	562,377.96	1,623,850.89	800.0	13.5	G
G9	562,471.36	1,624,040.25	801.0	12.5	G
G10	562,765.70	1,624,509.04	805.4	8.1	G
H5	562,746.24	1,624,880.80	806.5	7.0	H
H6	562,760.81	1,624,938.74	806.0	7.5	H
H7	562,788.17	1,624,982.68	800.5	13.0	H
H8	562,737.51	1,625,064.21	806.0	7.5	H

EASTER LAKE RESTORATION - CONTRACT 3

FISH HABITAT SITE PLAN

POLK COUNTY, IOWA

SNYDER & ASSOCIATES, INC.

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Project No: 1140546

Sheet F.03

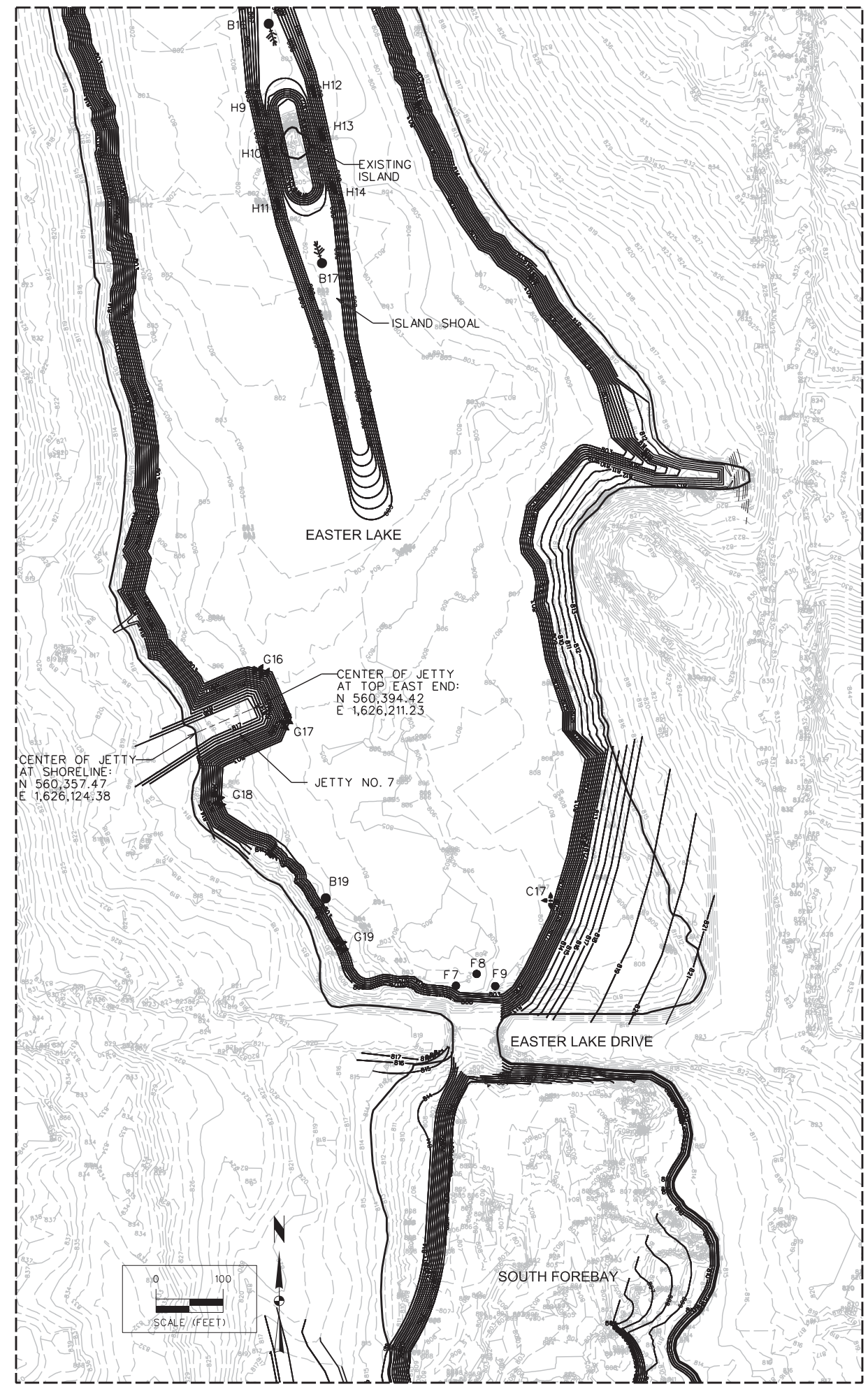
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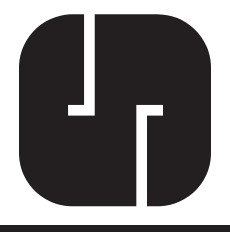
- LEGEND**
- (TYPE A) ROCK & ROOT BALL FISH HABITAT
 - (TYPE B) ROCK PILE & HARDWOOD TREE FISH HABITAT
 - (TYPE C) CEDAR TREE FISH HABITAT
 - (TYPE D) CEDAR TREE & CMU FISH HABITAT
 - (TYPE F) ROCK PILE FISH HABITAT
 - (TYPE G) ANCHORED CABLE CEDAR TREE HABITAT
 - (TYPE H) ROCK REEF FISH HABITAT
 - (TYPE J) GRAVEL SPAWNING BEDS

NOTES:
 1. COORDINATES ARE TO THE CENTER OF THE HABITAT. FOR TYPE B, COORDINATES ARE TO THE CENTER OF THE ROCK PILE.

FISH HABITAT SCHEDULE					
NUMBER	NORTHING	EASTING	BASE ELEV.	DEPTH (FT)	TYPE (SEE LEGEND)
B16	561,414.97	1,626,233.52	804.9	8.6	B
B17	561,058.11	1,626,312.95	805.5	8.0	B
B19	560,111.20	1,626,318.61	805.0	8.5	B
C17	560,107.67	1,626,653.73	808.0	5.5	C
F7	559,980.86	1,626,512.71	804.5	9.0	F
F8	559,998.38	1,626,543.59	804.5	9.0	F
F9	559,980.28	1,626,571.29	806.0	7.5	F
G16	560,450.18	1,626,221.74	805.8	7.7	G
G17	560,374.89	1,626,259.94	806.6	6.9	G
G18	560,257.83	1,626,158.38	809.0	4.5	G
G19	560,041.70	1,626,341.00	808.0	5.5	G
H9	561,292.08	1,626,215.83	805.8	7.7	H
H10	561,224.15	1,626,230.04	805.8	7.7	H
H11	561,145.75	1,626,246.96	805.8	7.7	H
H12	561,314.18	1,626,299.75	806.5	7.0	H
H13	561,248.83	1,626,312.39	806.7	6.8	H
H14	561,170.10	1,626,330.19	806.6	6.9	H



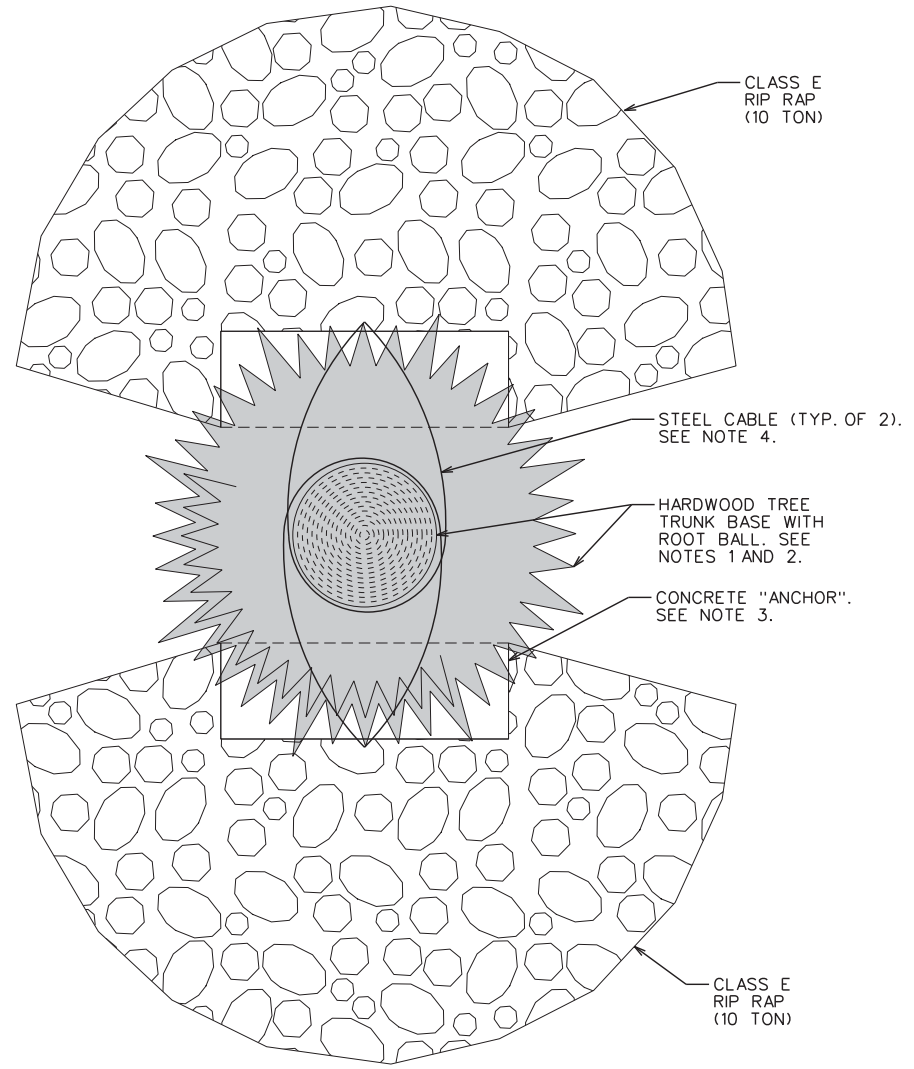
EASTER LAKE RESTORATION - CONTRACT 3
FISH HABITAT SITE PLAN
SNYDER & ASSOCIATES, INC.



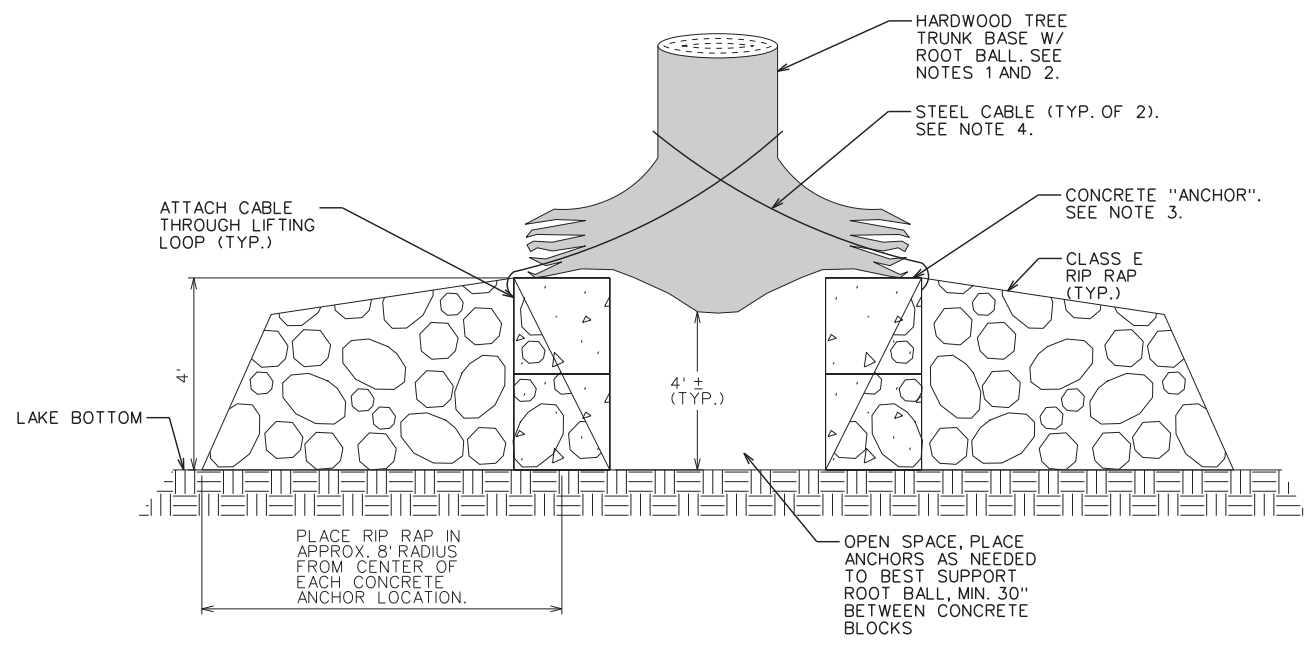
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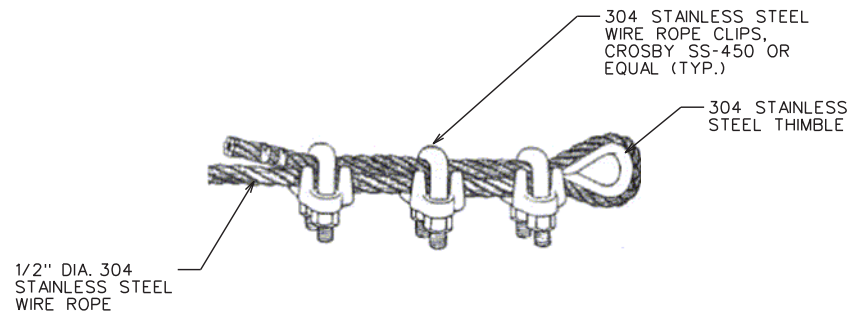
PLAN



ELEVATION

- NOTES:
1. HARDWOOD TREES AND ROOT BALLS TO BE OAK (BY OTHERS).
 2. ROOT BALLS TO BE A MINIMUM OF 9' DIAMETER.
 3. CONCRETE "ANCHORS" PROVIDED BY OWNER. CONTRACTOR TO HAUL FROM NEARBY LOCATION & DELIVER TO FINAL PLAN LOCATION. PLACE ACCORDING TO DETAILED DIMENSIONS OR AS DIRECTED BY OWNER.
 4. CABLE TO BE 1/2" STAINLESS STEEL WIRE ROPE. SEE DETAIL 2 ON THIS SHEET FOR CONNECTIONS. (BY OTHERS.)

1 ROCK & ROOT BALL FISH HABITAT - (TYPE A)
F.06 NO SCALE



2 CABLE DETAIL
F.06 NO SCALE

EASTER LAKE RESTORATION - CONTRACT 3

FISH HABITAT DETAILS

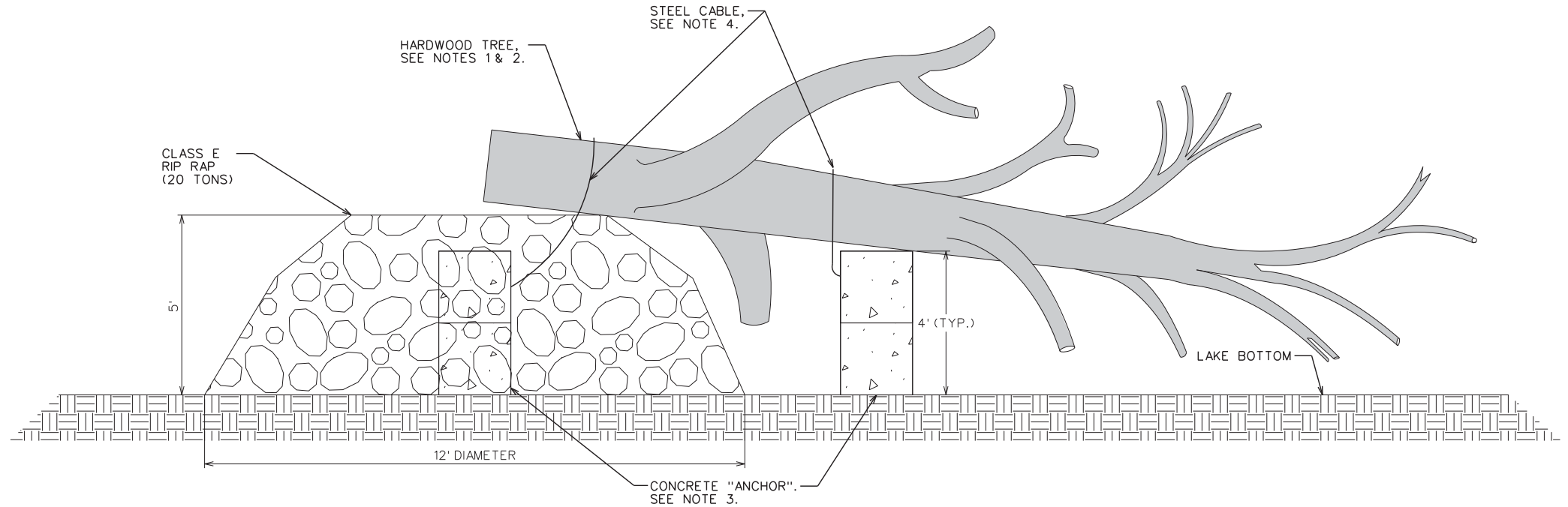
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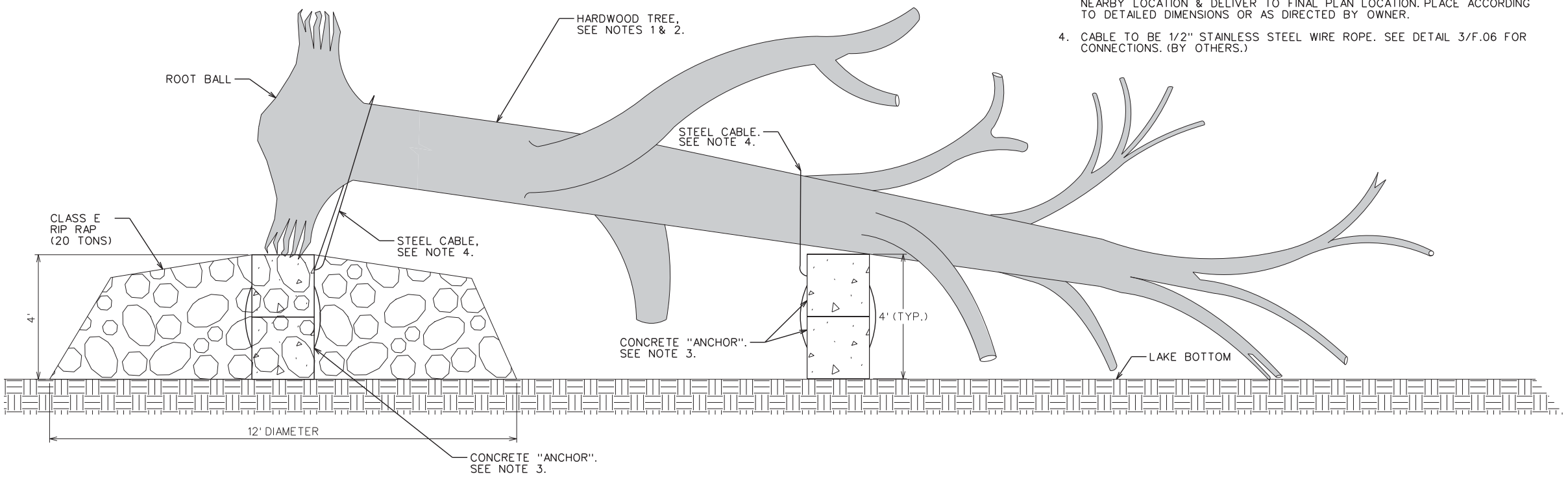
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1
 F.07
ROCK PILE & HARDWOOD TREE FISH HABITAT (WITHOUT ROOTBALL) (TYPE B)
 NO SCALE

- NOTES:
- HARDWOOD TREES SHALL BE OAK (PROVIDED BY OTHERS).
 - TREES (OR LARGE BRANCHES) SHALL HAVE MINIMUM BASE DIAMETER OF 30", AND BE WELL-BRANCHED.
 - CONCRETE "ANCHORS" PROVIDED BY OWNER. CONTRACTOR TO HAUL FROM NEARBY LOCATION & DELIVER TO FINAL PLAN LOCATION. PLACE ACCORDING TO DETAILED DIMENSIONS OR AS DIRECTED BY OWNER.
 - CABLE TO BE 1/2" STAINLESS STEEL WIRE ROPE. SEE DETAIL 3/F.06 FOR CONNECTIONS. (BY OTHERS.)



2
 F.07
ROCK PILE & HARDWOOD TREE FISH HABITAT (WITH ROOTBALL ATTACHED) (TYPE B)
 NO SCALE

EASTER LAKE RESTORATION - CONTRACT 3

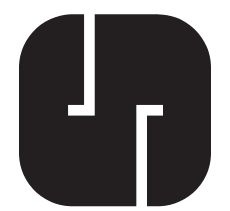
FISH HABITAT DETAILS

POLK COUNTY, IOWA

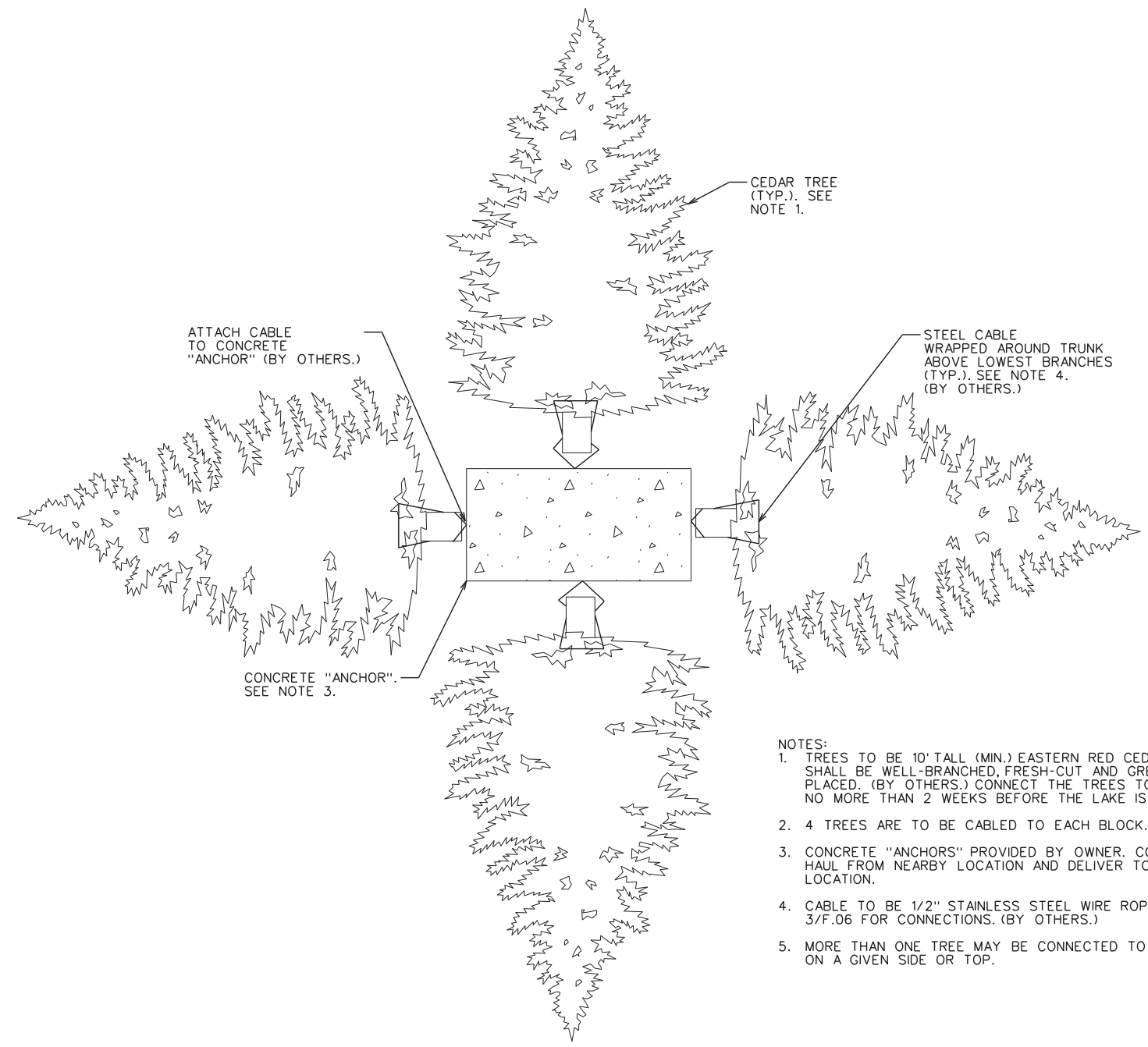
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Technician: DFM	Date: 10/25/2017	Project No: 1140546	Sheet F.07

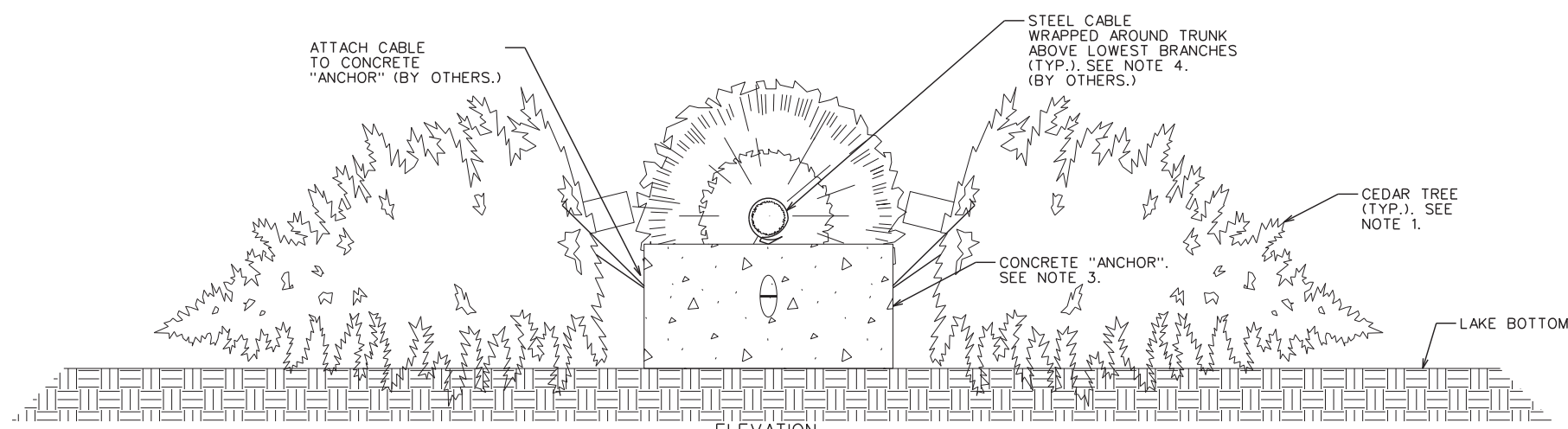


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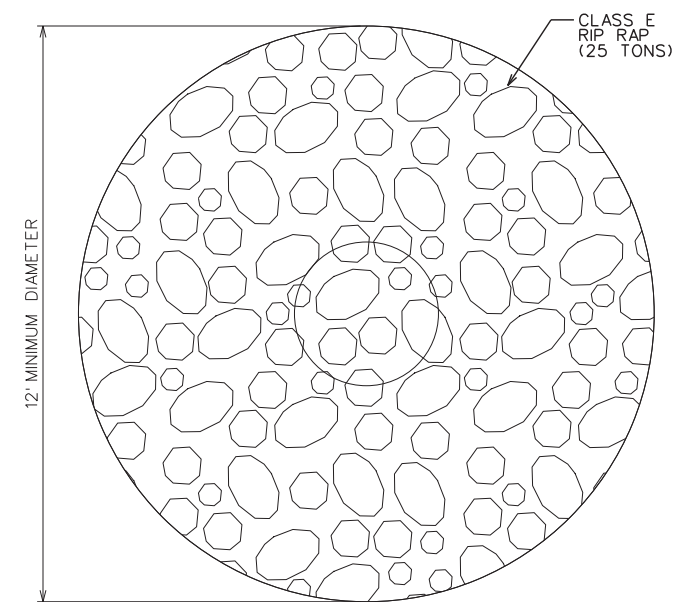
PLAN

- NOTES:
1. TREES TO BE 10' TALL (MIN.) EASTERN RED CEDAR. TREES SHALL BE WELL-BRANCHED, FRESH-CUT AND GREEN WHEN PLACED. (BY OTHERS.) CONNECT THE TREES TO THE ANCHORS NO MORE THAN 2 WEEKS BEFORE THE LAKE IS RE-FLOODED.
 2. 4 TREES ARE TO BE CABLED TO EACH BLOCK. (BY OTHERS.)
 3. CONCRETE "ANCHORS" PROVIDED BY OWNER. CONTRACTOR TO HAUL FROM NEARBY LOCATION AND DELIVER TO FINAL PLAN LOCATION.
 4. CABLE TO BE 1/2" STAINLESS STEEL WIRE ROPE. SEE DETAIL 3/F.06 FOR CONNECTIONS. (BY OTHERS.)
 5. MORE THAN ONE TREE MAY BE CONNECTED TO EACH LOOP ON A GIVEN SIDE OR TOP.

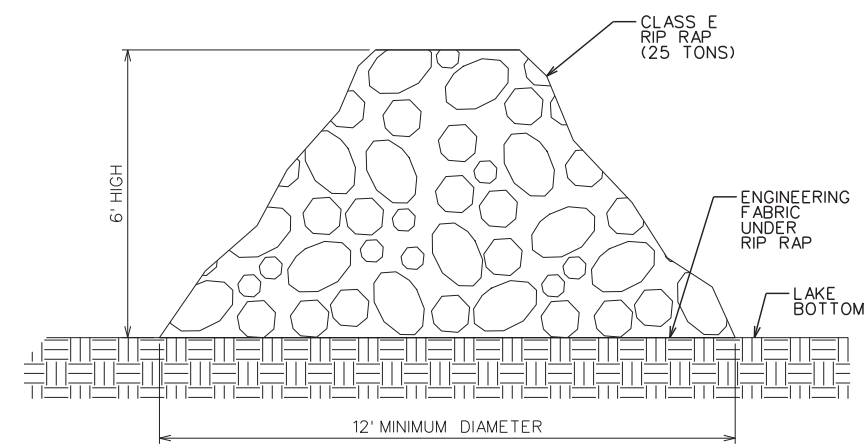


ELEVATION

1 CEDAR TREE FISH HABITAT - (TYPE C)
NO SCALE



PLAN



ELEVATION

2 ROCK PILE FISH HABITAT - (TYPE F)
NO SCALE

EASTER LAKE RESTORATION - CONTRACT 3

FISH HABITAT DETAILS

POLK COUNTY, IOWA

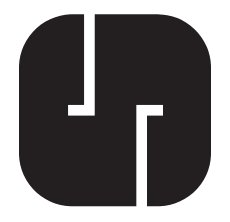
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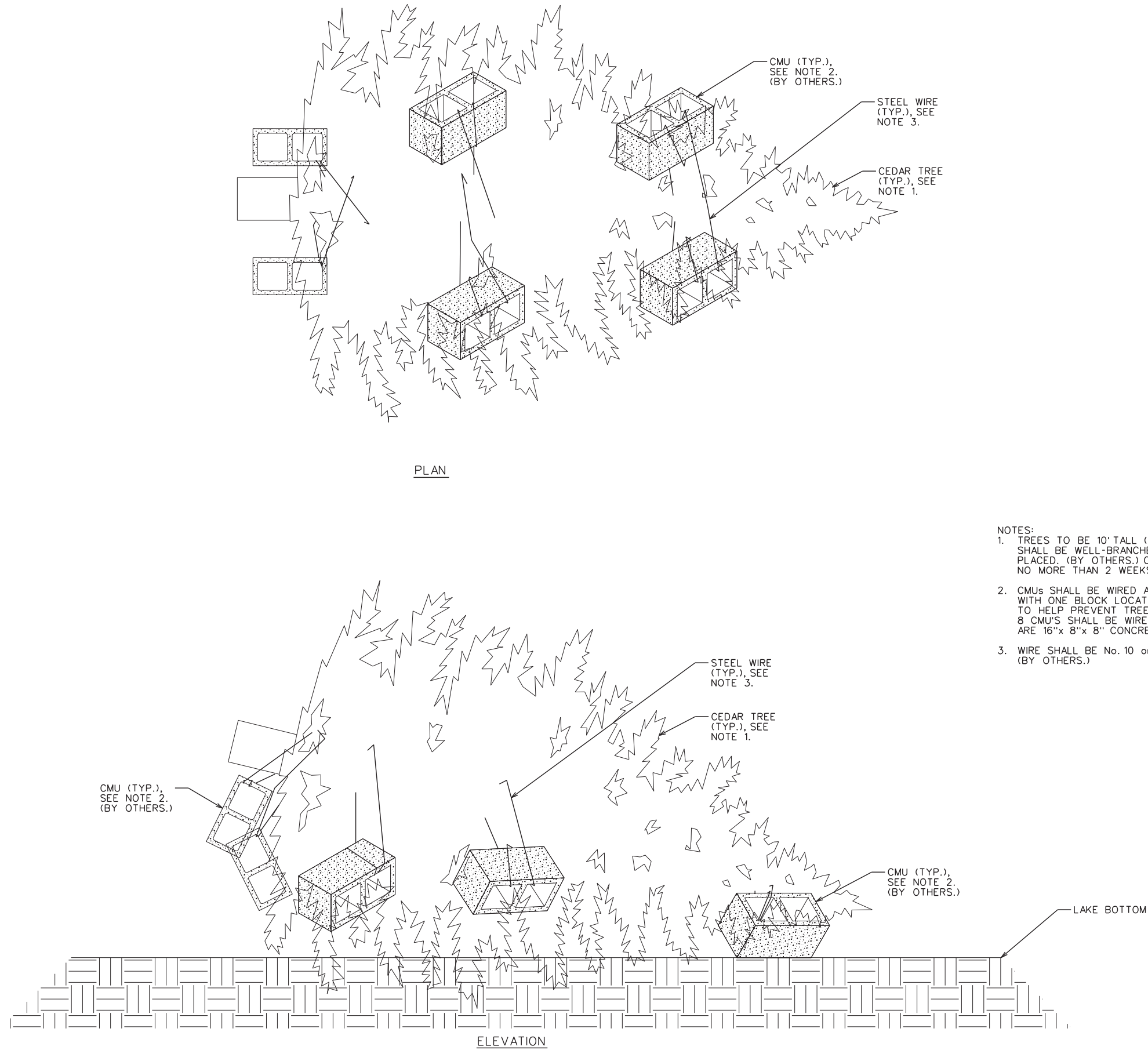
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Project No: 1140546

Sheet F.08



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NOTES:

1. TREES TO BE 10' TALL (MIN.) EASTERN RED CEDAR. TREES SHALL BE WELL-BRANCHED, FRESH-CUT AND GREEN WHEN PLACED. (BY OTHERS.) CONNECT THE TREES TO THE ANCHORS NO MORE THAN 2 WEEKS BEFORE THE LAKE IS RE-FLOODED.
2. CMUS SHALL BE WIRED AND ATTACHED TO CEDAR TREE IN PAIRS, WITH ONE BLOCK LOCATED ON EACH SIDE OF THE MAIN TRUNK TO HELP PREVENT TREE ROLLING ON UNEVEN SUBSTRATE. 8 CMU'S SHALL BE WIRED TO EACH TREE. (BY OTHERS) CMUS ARE 16"x 8"x 8" CONCRETE MASONRY UNITS (CMUs).
3. WIRE SHALL BE No. 10 or No. 12 GAUGE STEEL WIRE. (BY OTHERS.)

1 CEDAR TREE & CMU FISH HABITAT - (TYPE D)
 F.09 NO SCALE

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Engineer: DJJ	Checked By: ARB	Scale: 1"= 1'	Field Bk:
Technician: DFM	Date: 10/25/2017	Project No: 1140546	Sheet F.09

EASTER LAKE RESTORATION - CONTRACT 3

FISH HABITAT DETAILS

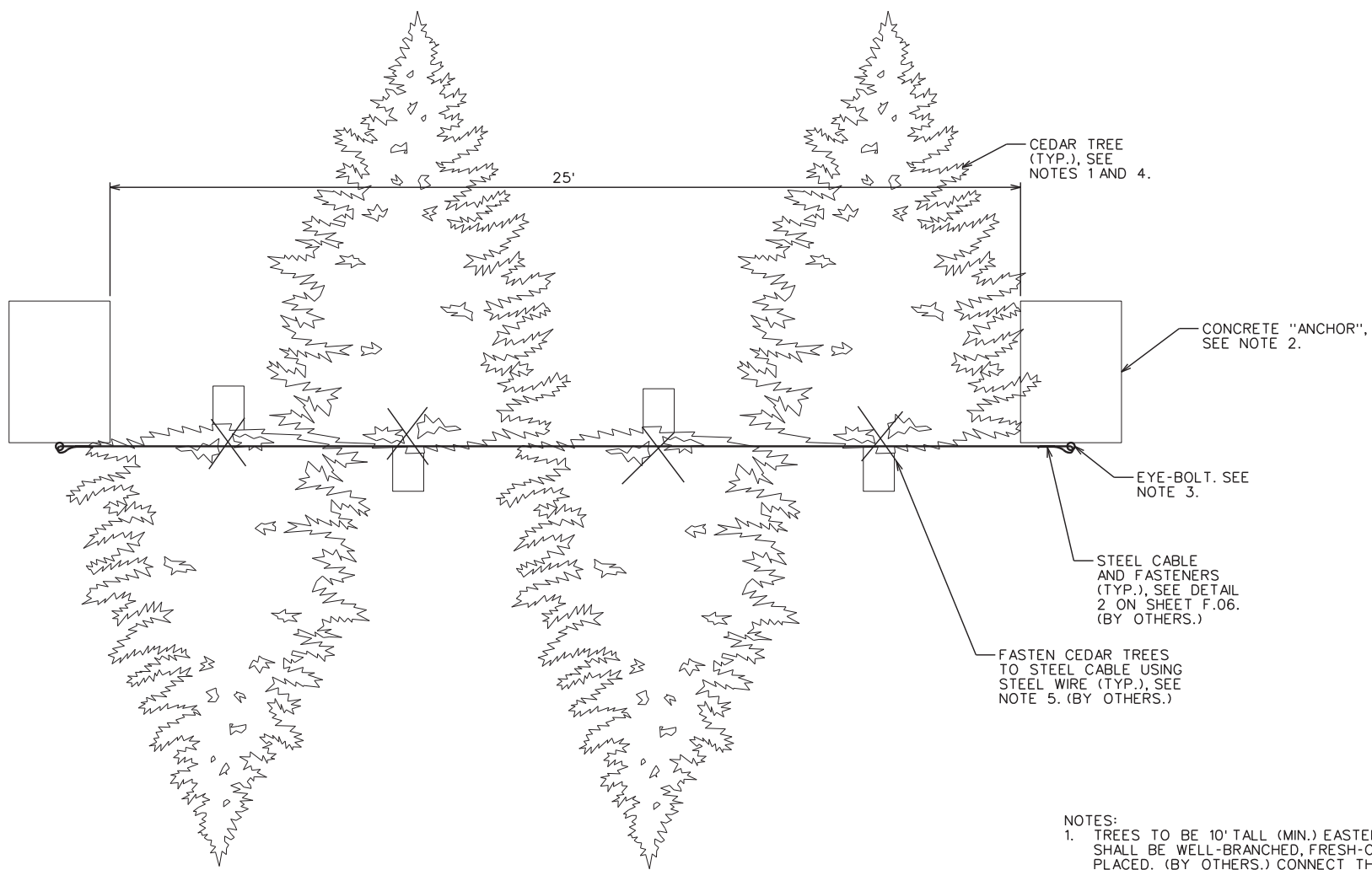
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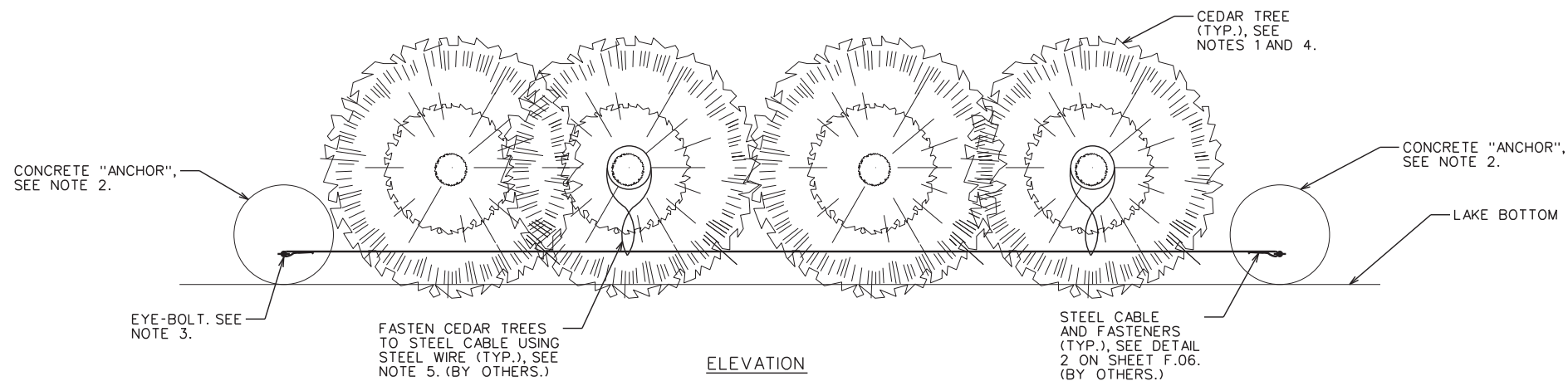
Project No: 1140546
 Sheet F.09



PLAN

NOTES:

1. TREES TO BE 10' TALL (MIN.) EASTERN RED CEDAR. TREES SHALL BE WELL-BRANCHED, FRESH-CUT AND GREEN WHEN PLACED. (BY OTHERS.) CONNECT THE TREES TO THE ANCHORS NO MORE THAN 2 WEEKS BEFORE THE LAKE IS RE-FLOODED.
2. CONCRETE "ANCHORS" PROVIDED BY OWNER. CONTRACTOR TO HAUL FROM NEARBY LOCATION AND DELIVER TO FINAL PLAN LOCATION, PLACE ACCORDING TO DETAILED DIMENSIONS OR AS DIRECTED BY OWNER.
3. EYE-BOLT WITH EXPANSION NUT TO BE SET IN DRILLED HOLE IN END OF CONCRETE "ANCHORS". ATTACH ENDS OF STAINLESS STEEL CABLE TO EYE BOLTS. (BY OTHERS.)
4. A MINIMUM OF 4 CEDAR TREES WILL BE USED PER HABITAT LOCATION. ALTERNATE TREE PLACEMENT ON EITHER SIDE OF STEEL CABLE AS SHOWN. WIRE BASE OF TREE TO STEEL CABLE. (BY OTHERS.)
5. CABLE SHALL BE 1/2" STAINLESS STEEL WIRE ROPE (BY OTHERS.). WIRE SHALL BE No. 10 OR No. 12 GAUGE STEEL WIRE. (BY OTHERS.)



ELEVATION

1 ANCHORED CABLE CEDAR TREE FISH HABITAT - (TYPE G)
F.10 NO SCALE

MARK	REVISION	DATE	BY
Engineer: DJJ	Checked By: ARB	Scale: 1" = 1'	Field Bk:
Technician: DFM	Date: 10/25/2017	Project No: 1140546	Sheet F.10

EASTER LAKE RESTORATION - CONTRACT 3

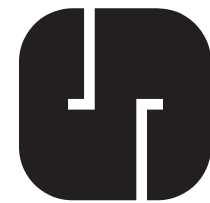
FISH HABITAT DETAILS

POLK COUNTY, IOWA

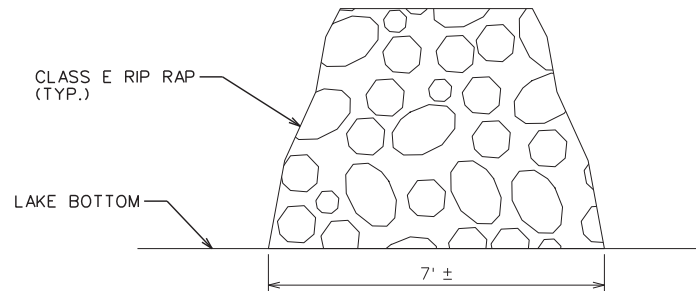
SNYDER & ASSOCIATES, INC. |

2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023

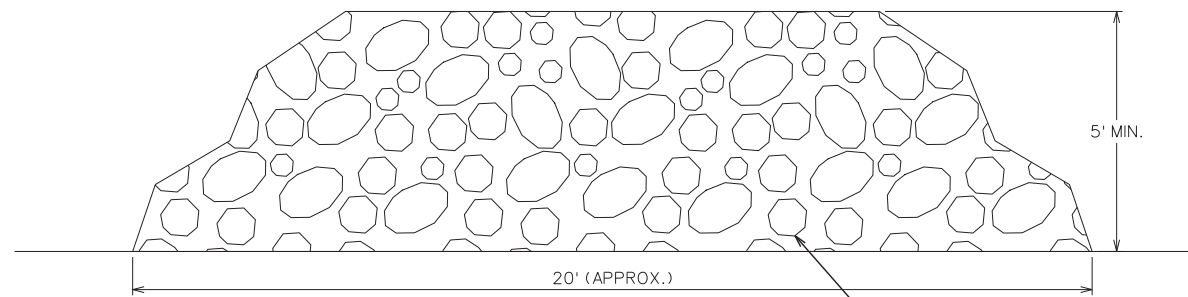
515-964-2020 | www.snyder-associates.com



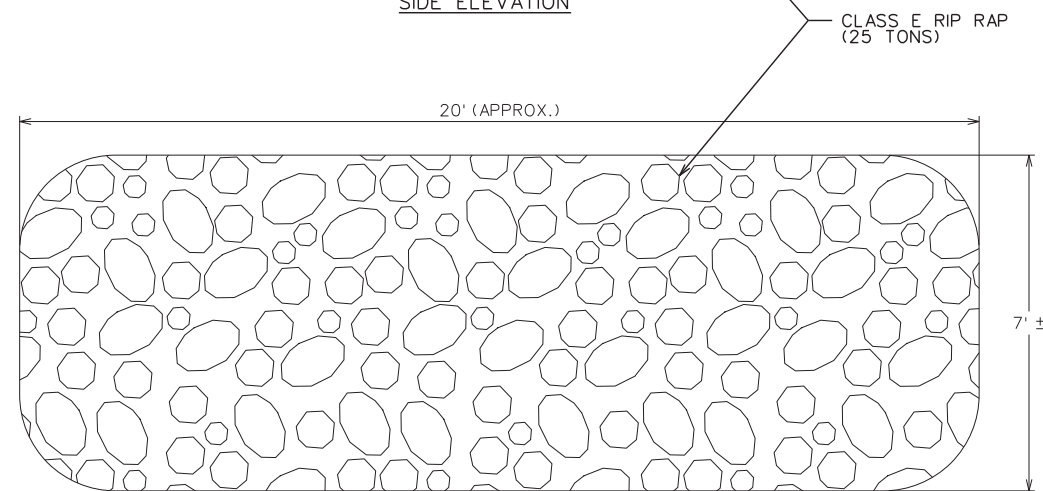
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 David Merical
 10/25/2017 11:47:07 AM
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END ELEVATION

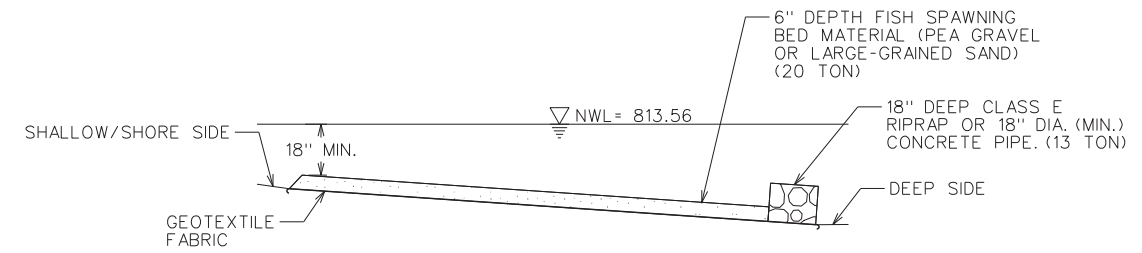


SIDE ELEVATION

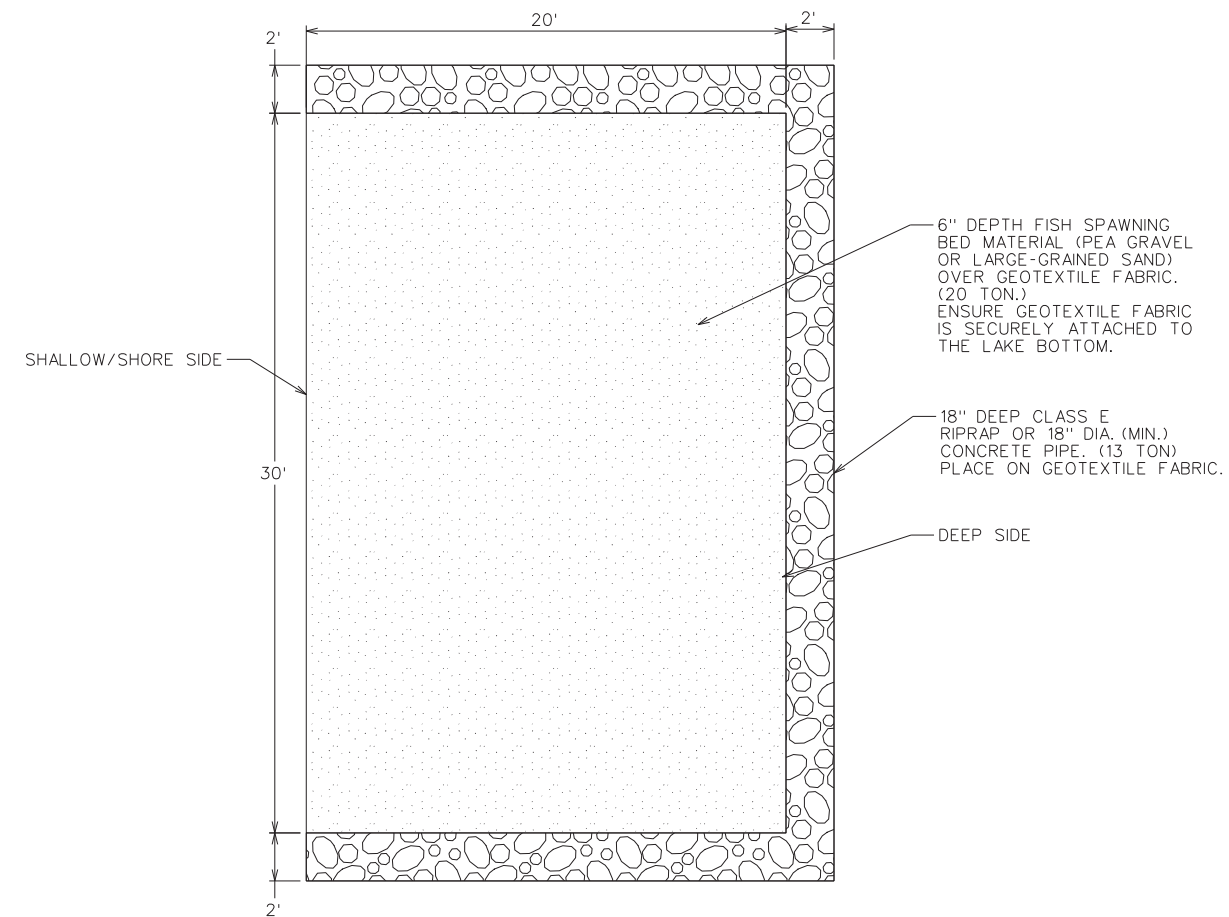


PLAN

1
F.11
ROCK REEF FISH HABITAT - (TYPE H)
NO SCALE



SECTION



PLAN VIEW

2
F.11
GRAVEL SPAWNING BED - (TYPE J)
NO SCALE

EASTER LAKE RESTORATION - CONTRACT 3

FISH HABITAT DETAILS

POLK COUNTY, IOWA

SNYDER & ASSOCIATES, INC.

2727 S.W. SNYDER BLVD.
ANKENY, IOWA 50023
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MARK	REVISION	DATE	BY
Engineer: DJJ	Checked By: ARB	Scale: 1" = 1'	Pg:
Technician: DFM	Date: 10/25/2017	Field Bk:	Pg:
Project No: 1140546			Sheet F.11

