Oak Glen Pipeline
Release Incident

APPENDIX

A

Primary Restoration As-Built Drawings

OAK GLEN PIPELINE RELEASE INCIDENT

PRIMARY RESTORATION CONSTRUCTION AS-BUILTS

MARCH 2019

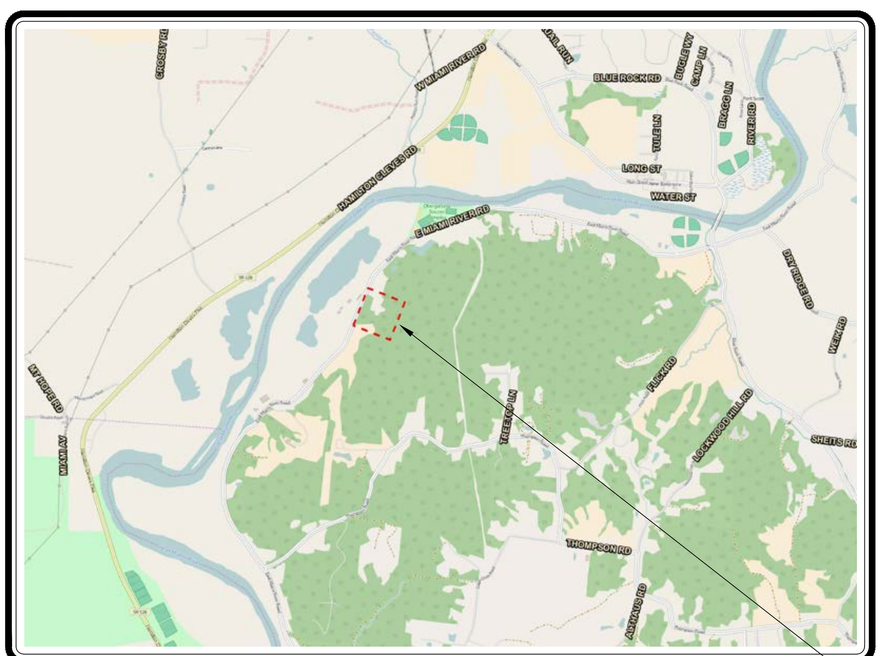
Sunoco Logistics

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	EXISTING CONDITIONS
3	TREATMENT AREA 2A-01 and 2A-02
4	TREATMENT AREA 2B-01
5	TREATMENT AREA 2B-02
6	TREATMENT AREA 2C-01
7	TREATMENT AREA 2C-02
8	TREATMENT AREA 2C-03 TO 24+00
9	PHASE II TREATMENT AREA
10	AS-BUILT CHANNEL CROSS-SECTIONS
11	AS-BUILT CHANNEL CROSS-SECTIONS
12	AS-BUILT CHANNEL CROSS-SECTIONS
13	AS-BUILT CHANNEL CROSS-SECTIONS
14	AS-BUILT CHANNEL CROSS-SECTIONS
15	AS-BUILT CHANNEL CROSS-SECTIONS
16	AS-BUILT CHANNEL CROSS-SECTIONS
17	TYPICAL POST CONSTRUCTION BANK GRADING
18	TYPICAL POST CONSTRUCTION BANK GRADING
19	DETAILS

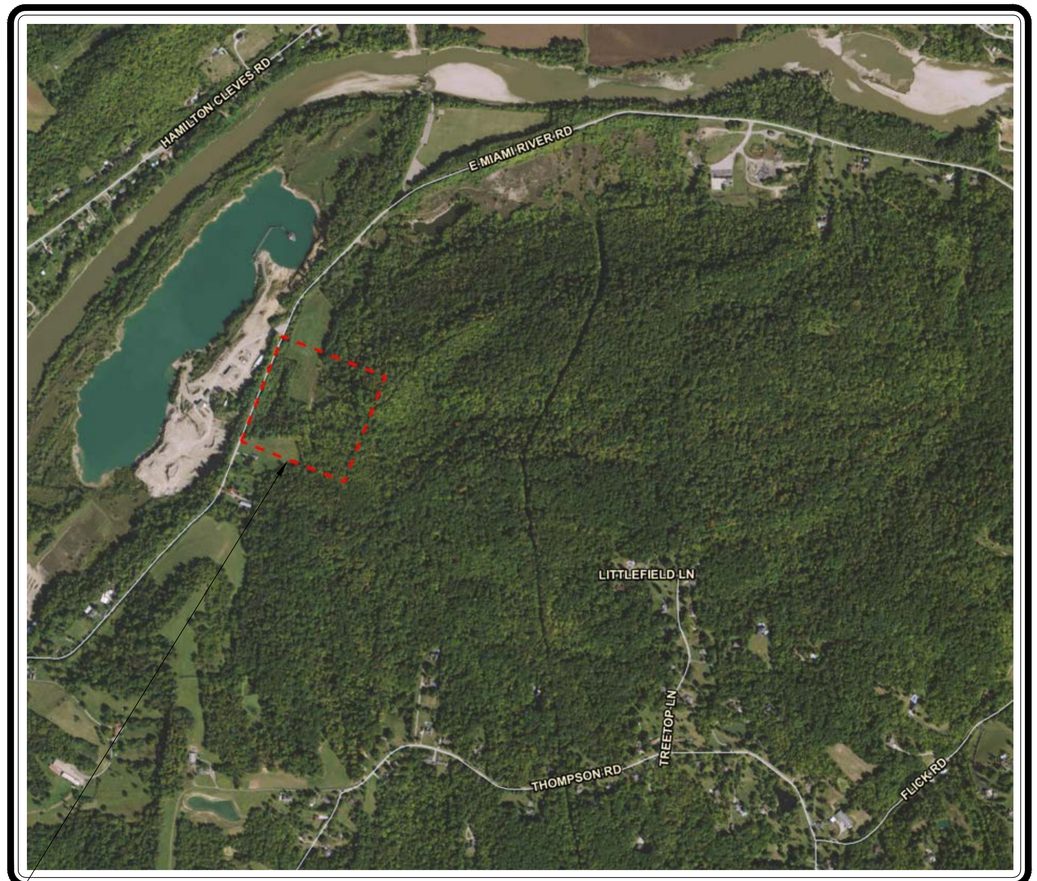
SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
20	DETAILS
21	DETAILS
22	DETAILS
23	DETAILS
24	DETAILS
25	PLANTING PLAN
26	PLANTING PLAN
27	PLANTING PLAN
28	SOIL EROSION AND SEDIMENT CONTROL PLAN
29	PLANTING PLAN - SEEDING
30	PLANTING PLAN - TREES AND SHRUBS
31	PHASE 2 SEED MIXES / PLANTING LISTS
32	PHASE 3 TREATMENT AND SEEDING PLAN
33	PHASE 3 SEED MIXES



VICINITY MAP
SCALE: NTS

PROJECT LOCATION



SITE MAP
SCALE: NTS

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COVER SHEET
OAK GLEN PIPELINE RELEASE INCIDENT -
PRIMARY RESTORATION CONSTRUCTION
AS-BUILTS

REVISION

A	3.31.16	Revisions made in accordance with Phase 1 Primary Restoration Plan Approval with Modifications (Natural Resource Trustees (OEPA/USFWS) and Great Parks of Hamilton County) dated March 4, 2016.

AS-BUILT

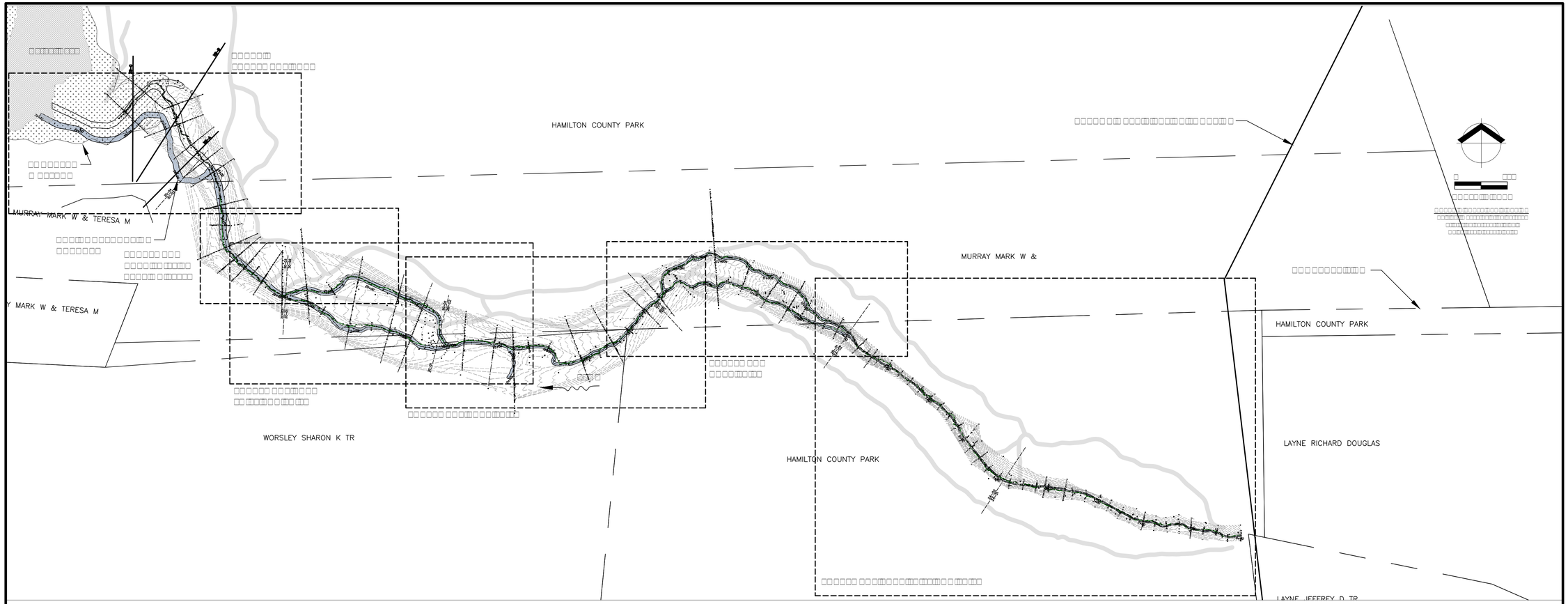
DRAWN BY:	SKL
DESIGNED BY:	AS
DATE:	MAR 2019
JOB NO:	J143037800

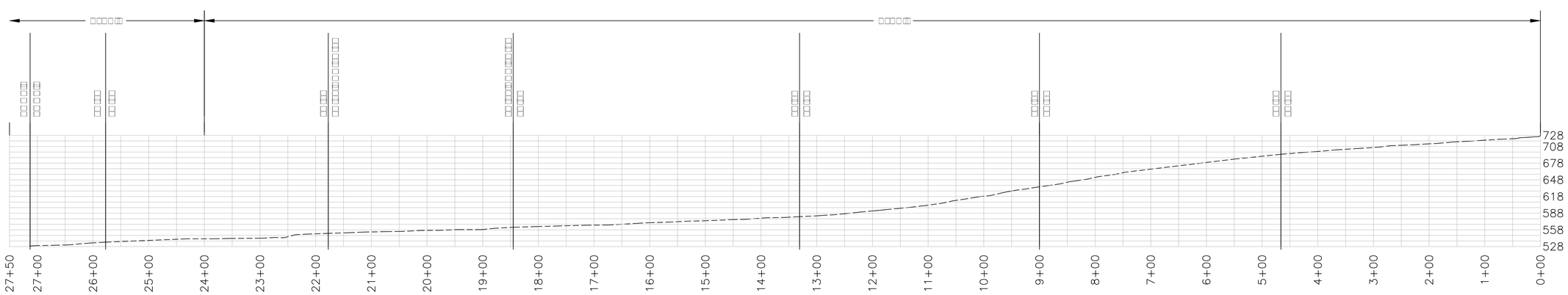
SHEET NO.

1

OF 33

Location: R:\Projects\141\143037800_CastleNENTRX_OakGlen\PFCAD\AsBuilt_Year1_2019\022801-OakGlen-CoverSheet.dwg
Layout: AS-Sheet-COVER-Sunoco-Logo-Cardno-Logo-Sunoco-Logo.dwg
Last Saved By: Stephen.LaFon, 3/1/2019 3:18:58 PM
Plotted By: Stephen.LaFon Plotted:March 1, 2019, 3:24:03 PM





EXISTING CHANNEL PROFILE (MAY 2015 SURVEY)

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EXISTING CONDITIONS

AS-BUILT

SHEET NO.

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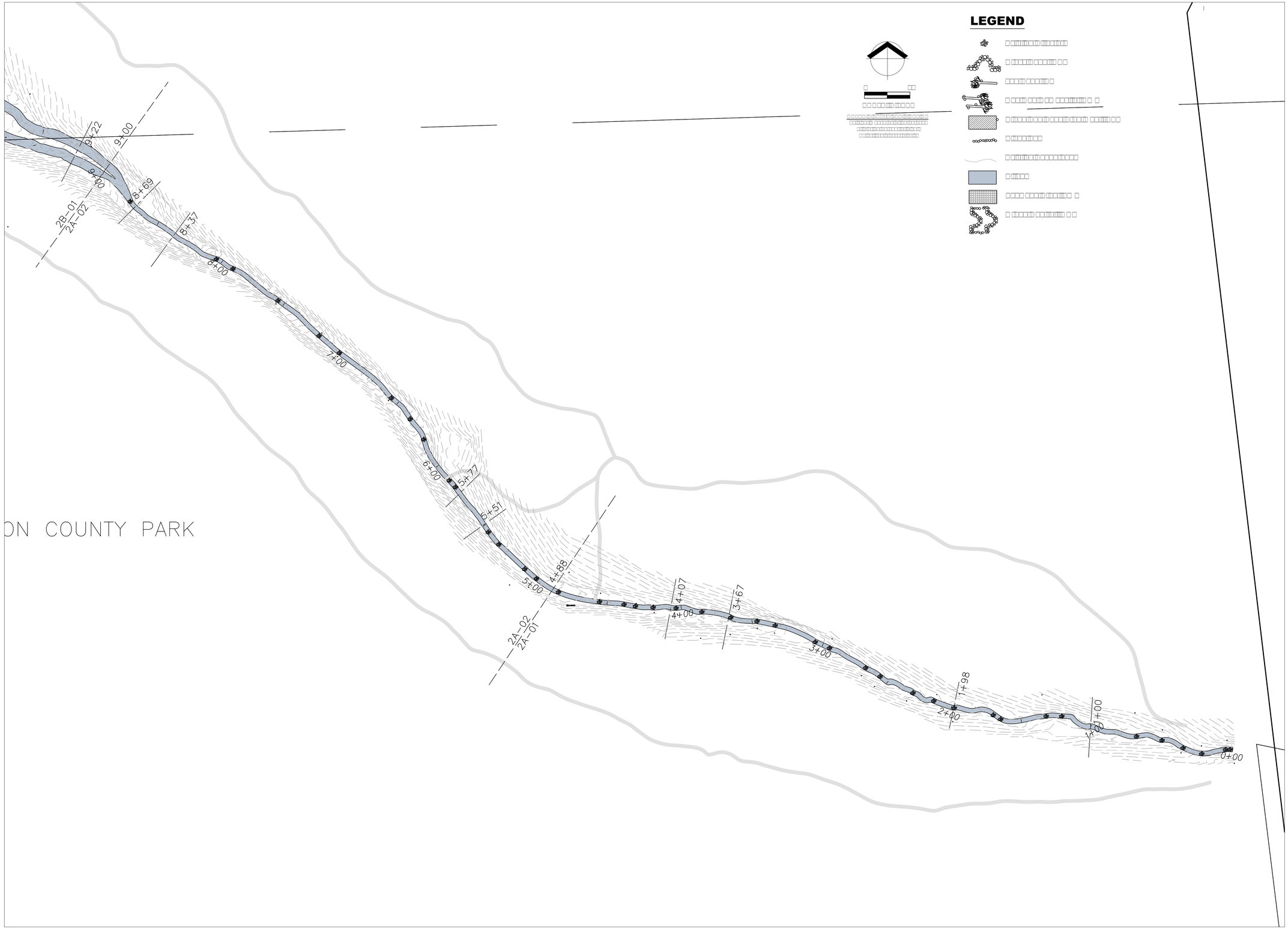

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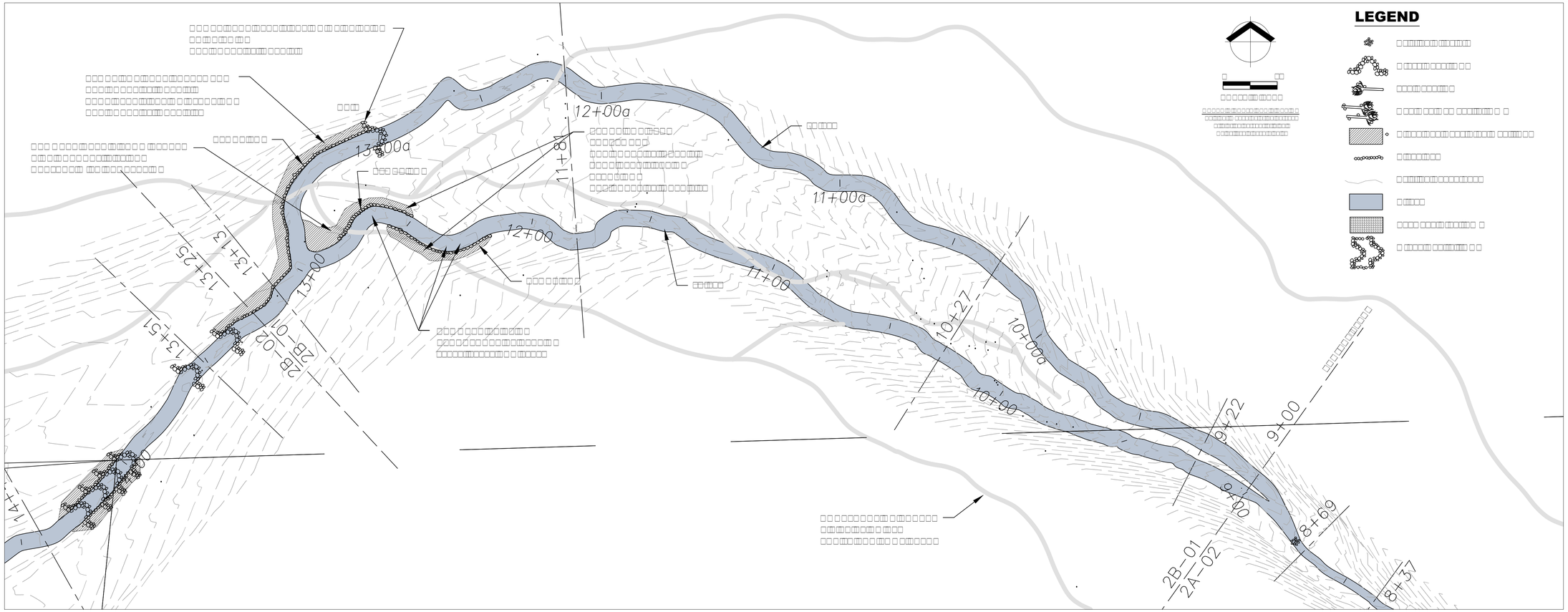
TREATMENT AREAS 2A-01 AND 2A-02

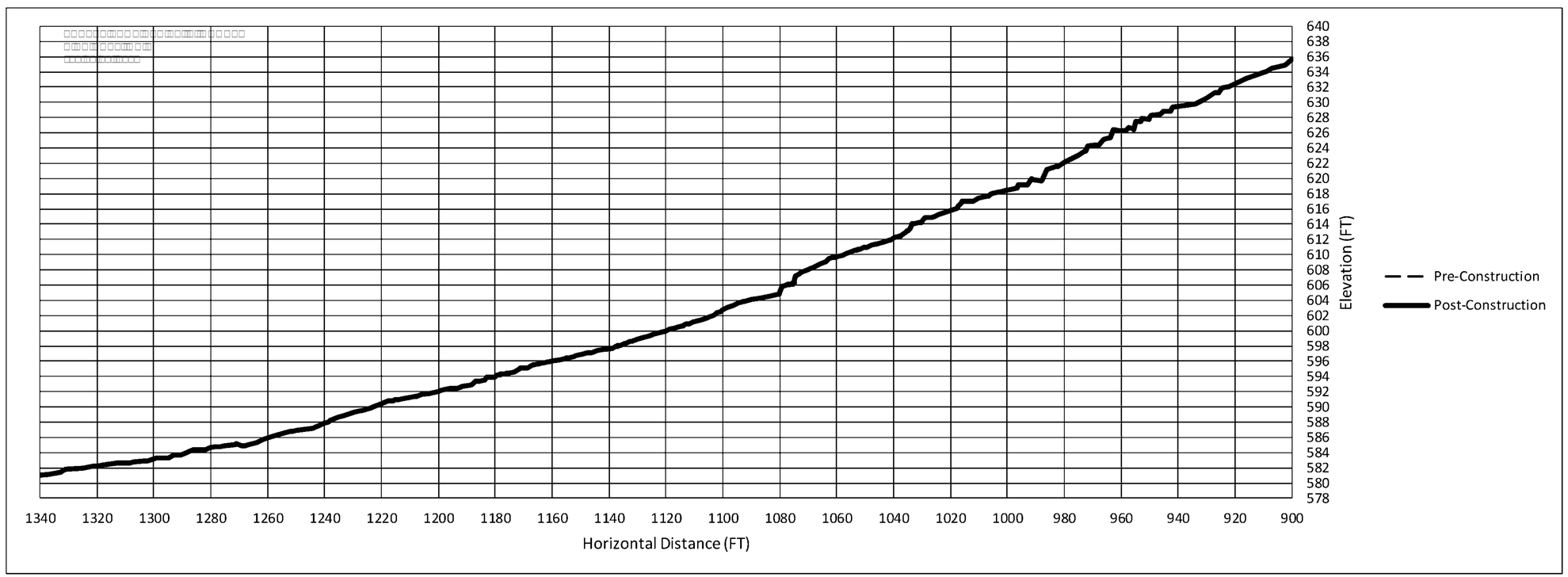
AS-BUILT

SHEET NO.

3

OF 33





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TREATMENT AREA 2B-01

AS-BUILT

SHEET NO.

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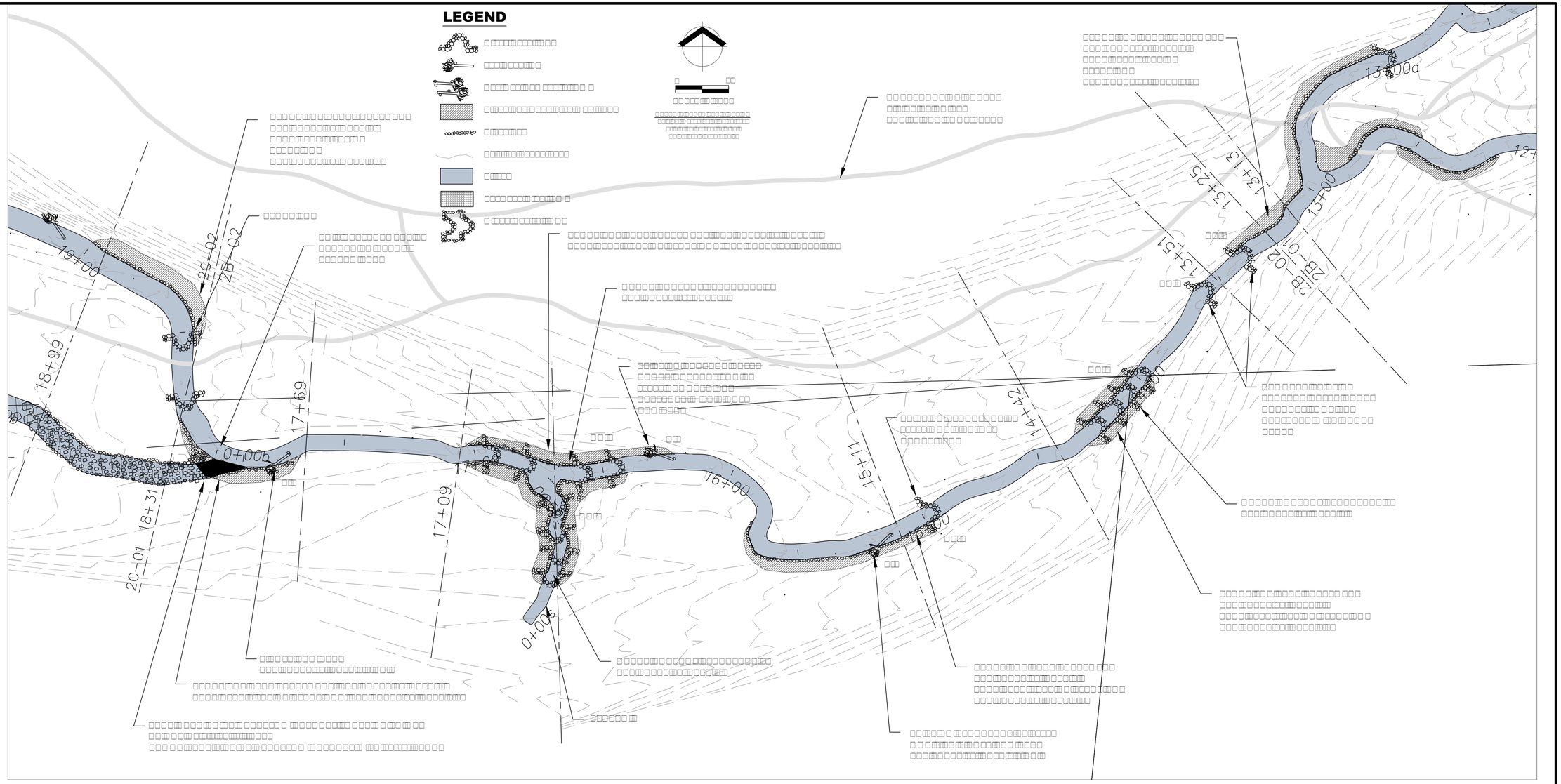

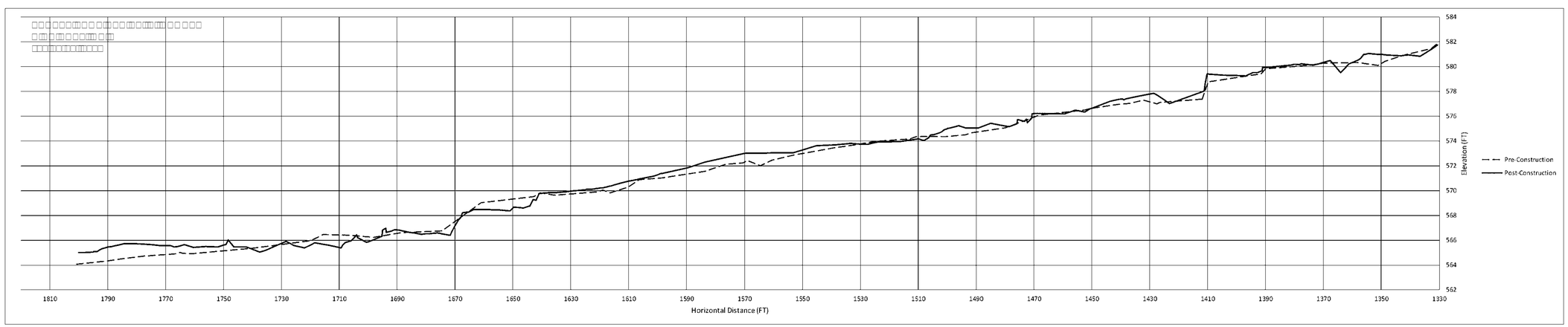

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TREATMENT AREA 2B-02

AS-BUILT

SHEET NO.

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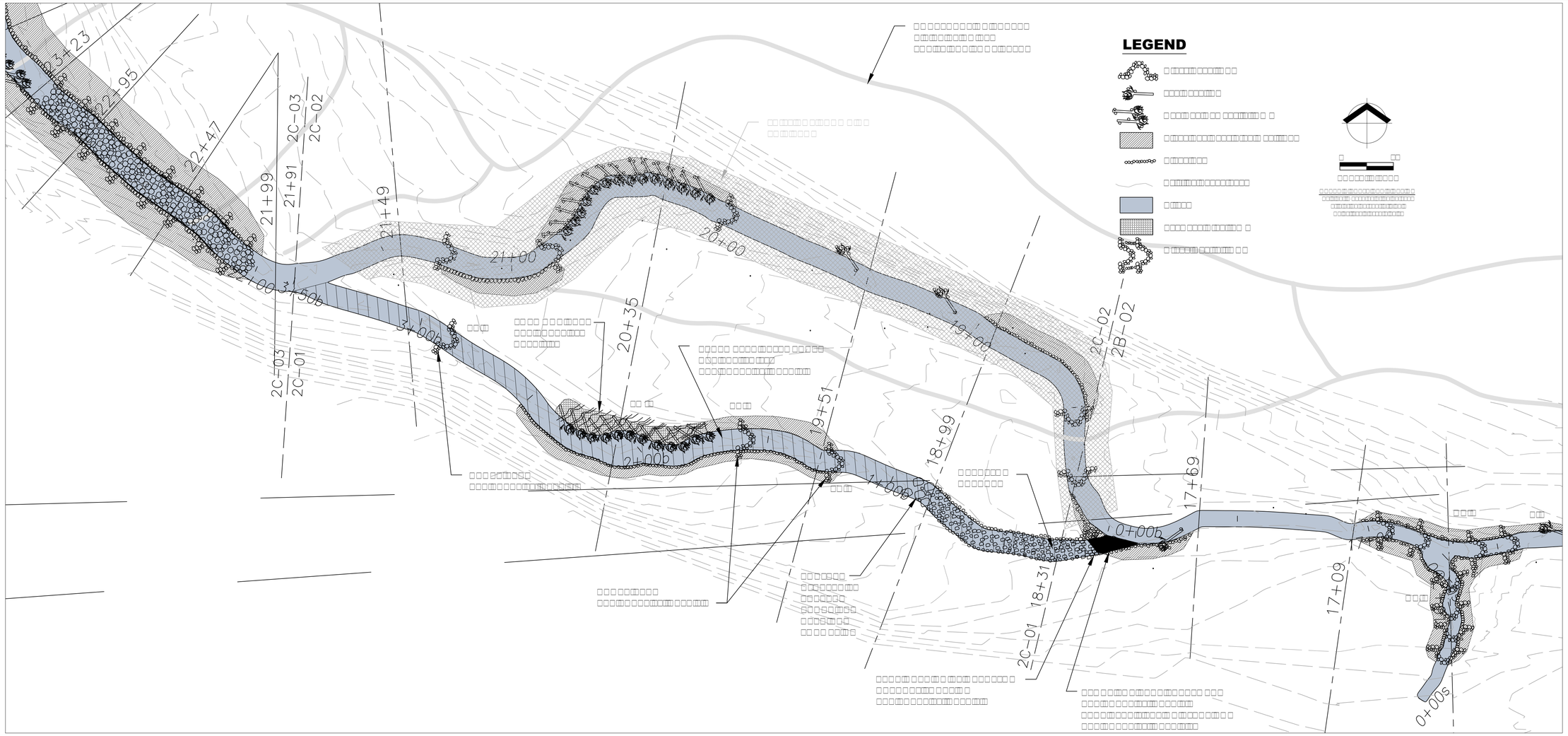

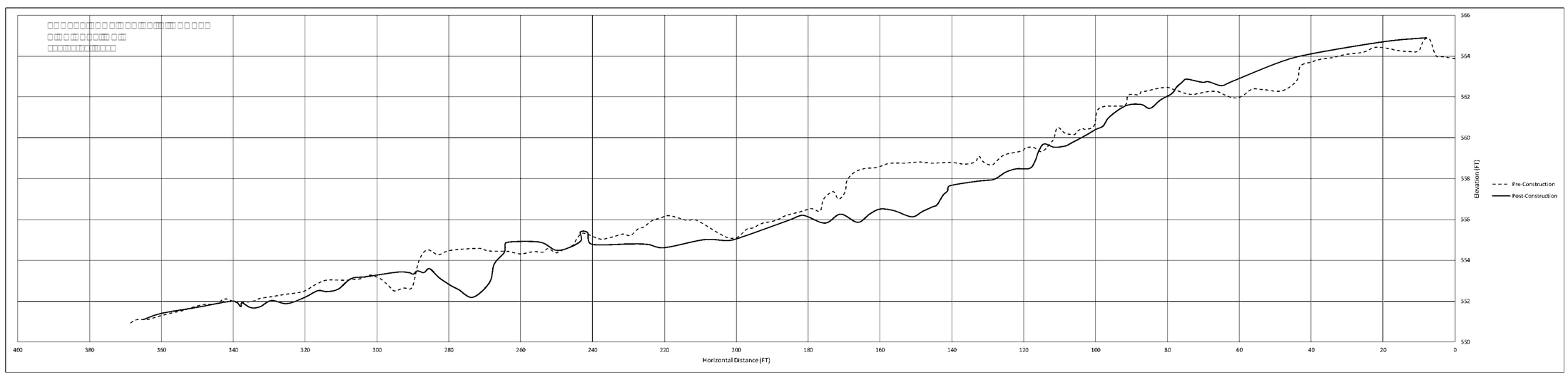

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TREATMENT AREA 2C-01

AS-BUILT

SHEET NO.

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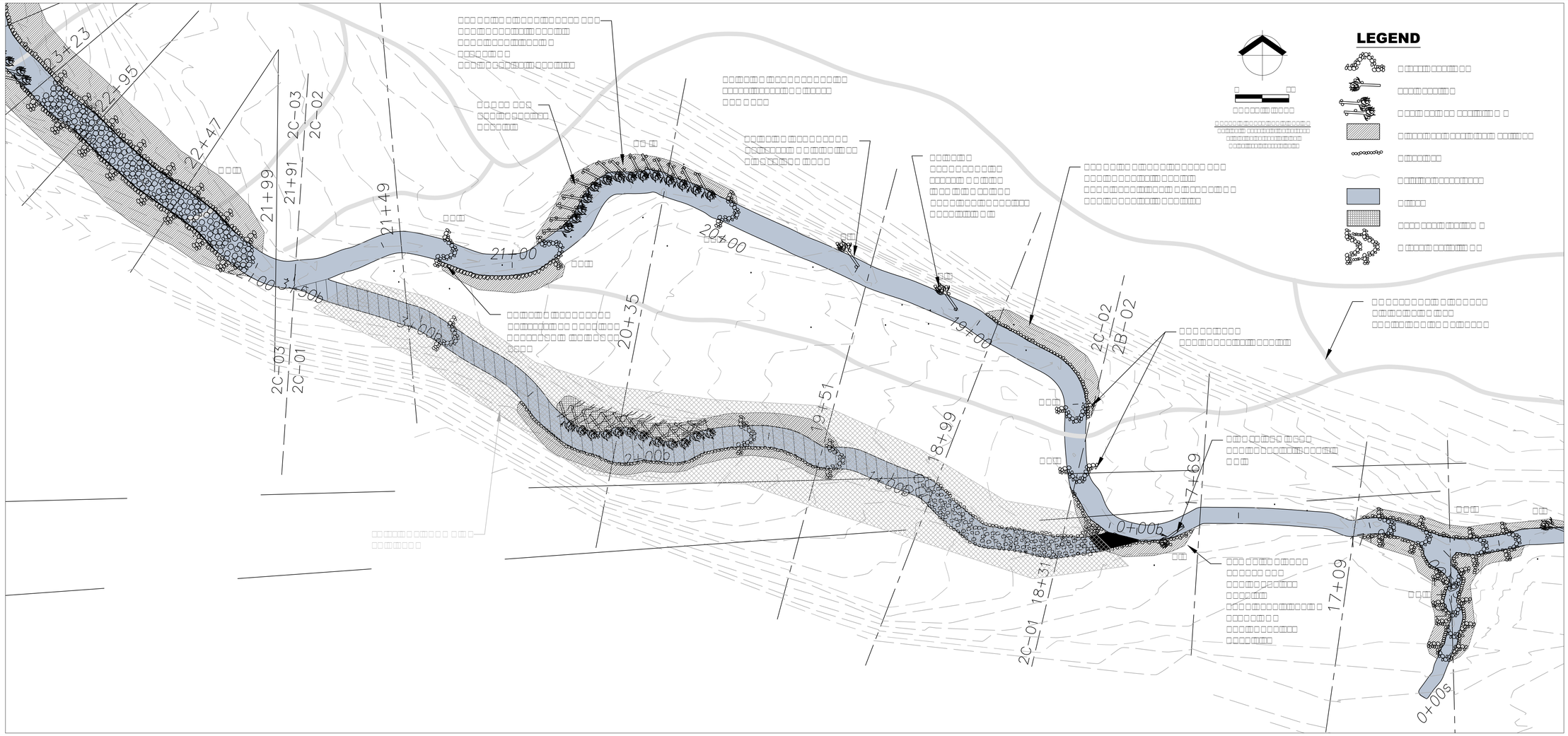

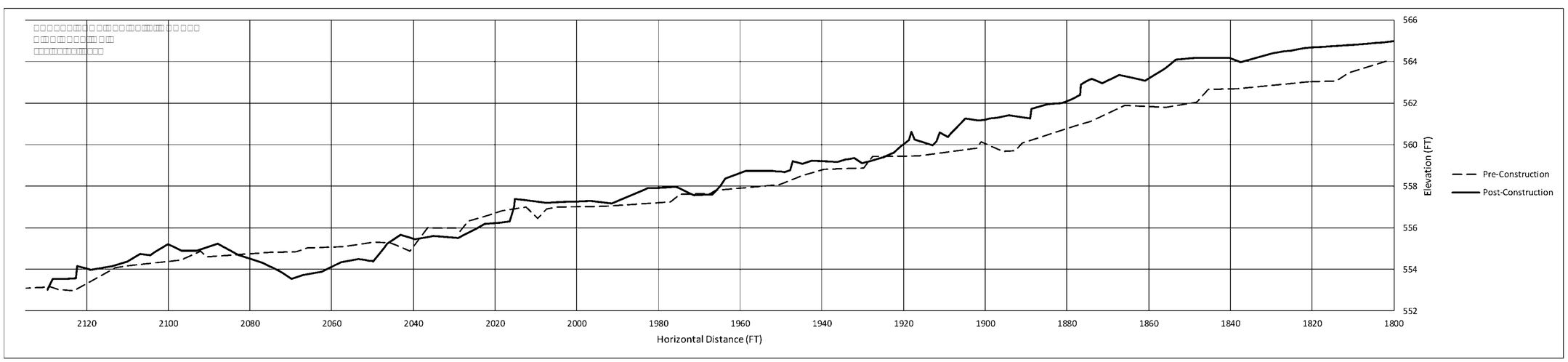

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TREATMENT AREA 2C-02

AS-BUILT

SHEET NO.

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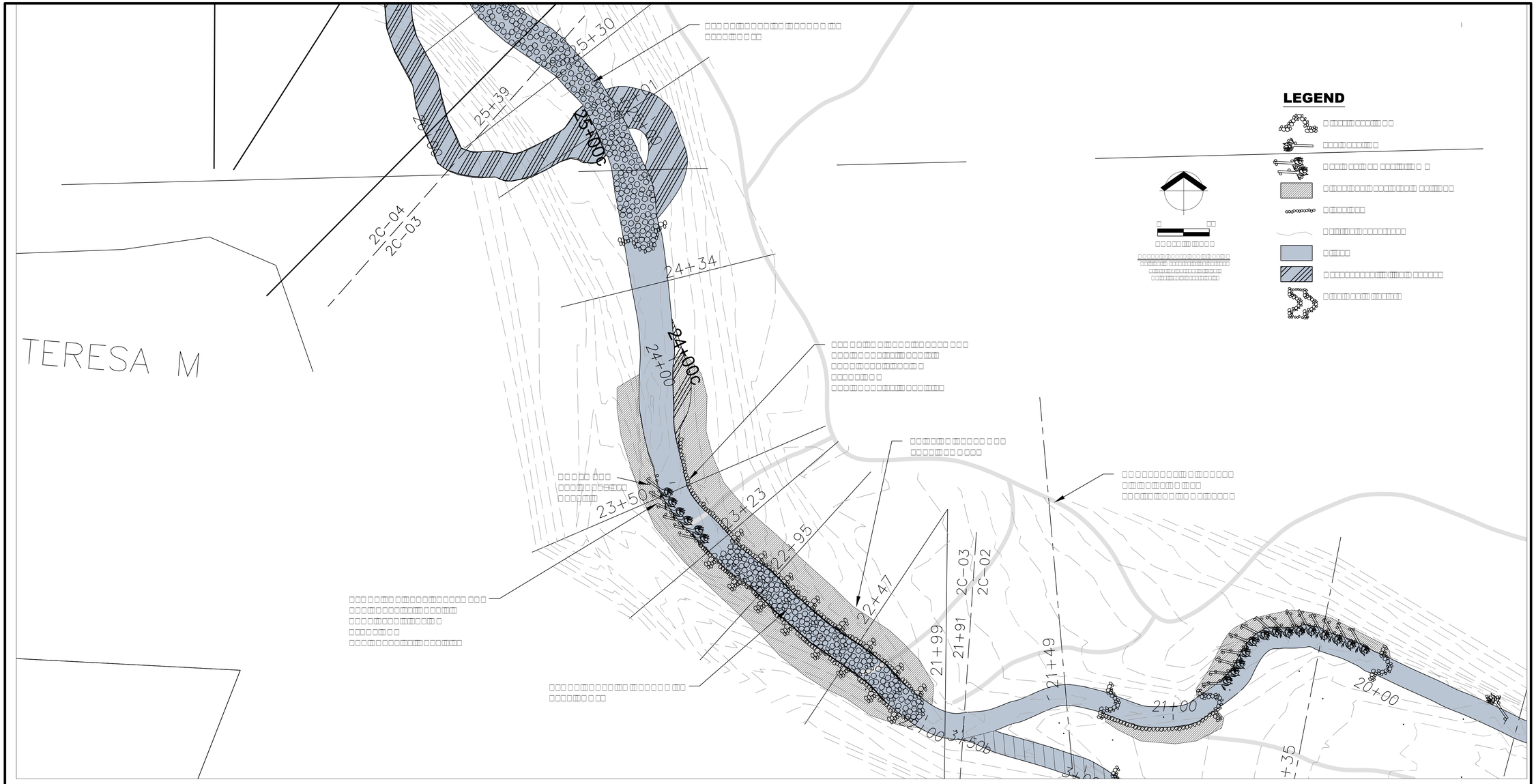

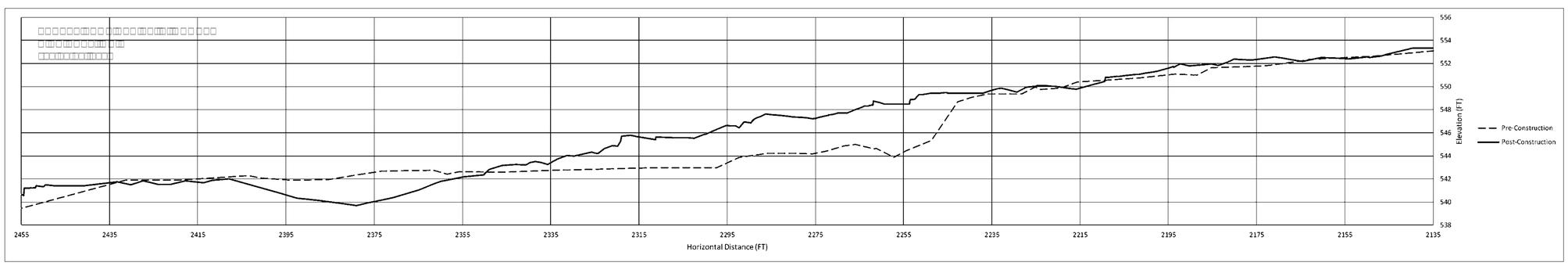

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TREATMENT AREA 2C-03 TO 2C-04

AS-BUILT

SHEET NO.

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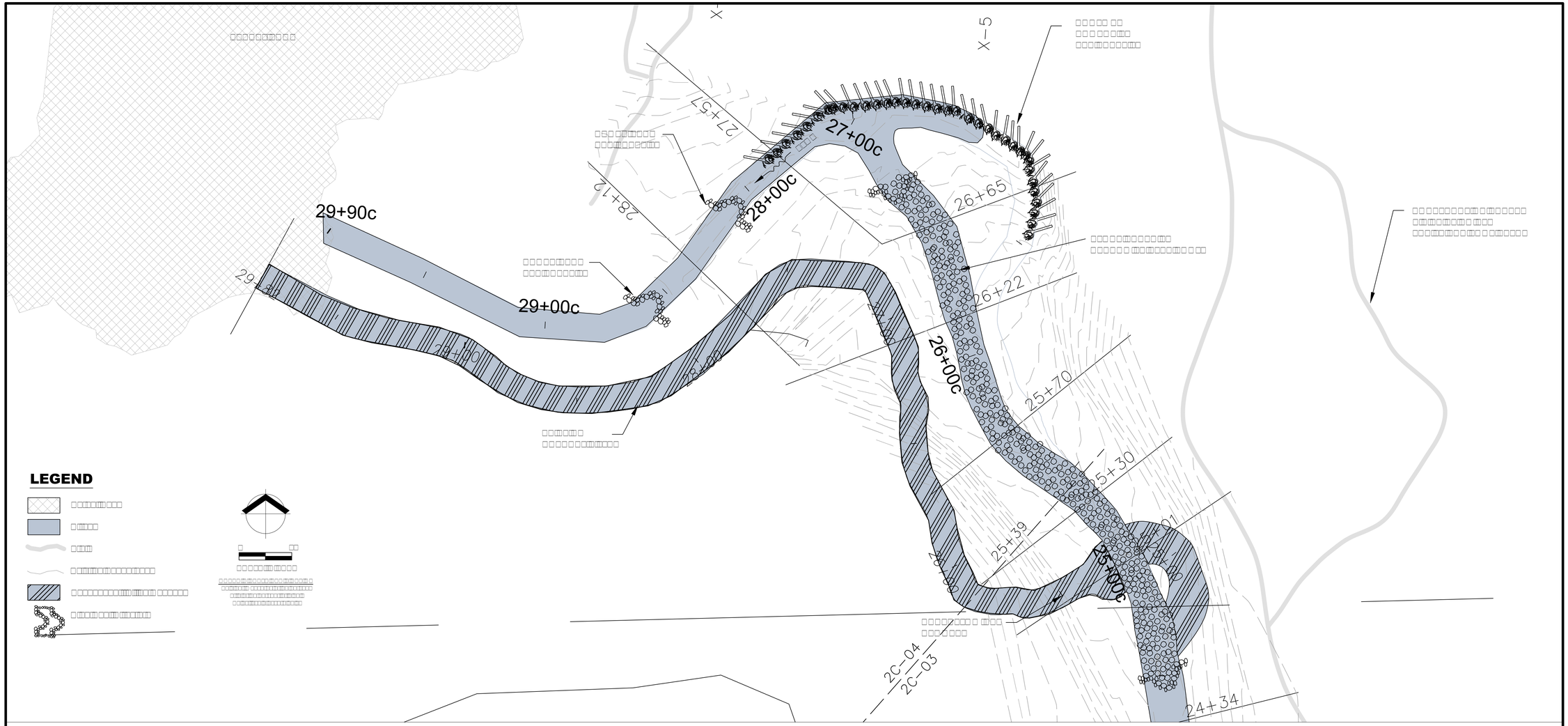

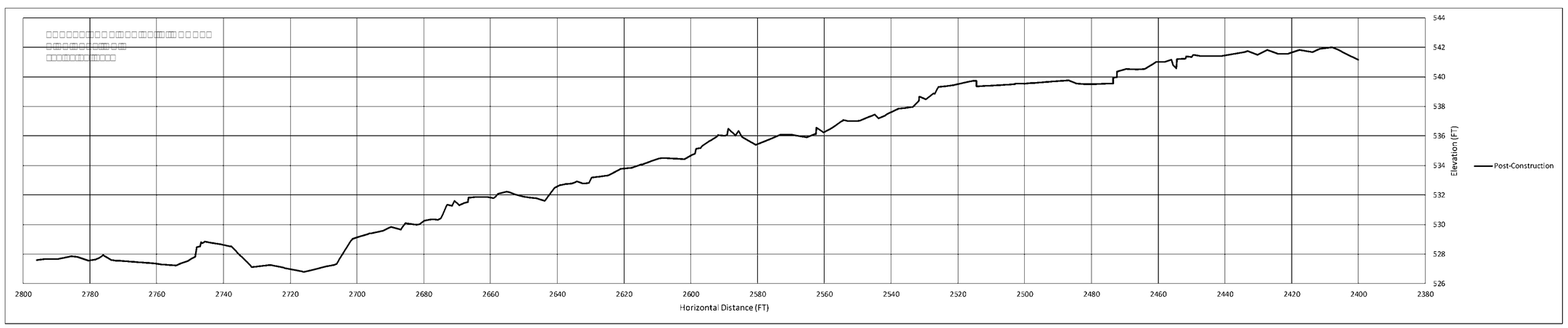

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TREATMENT AREA 2C-04

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SHEET NO.

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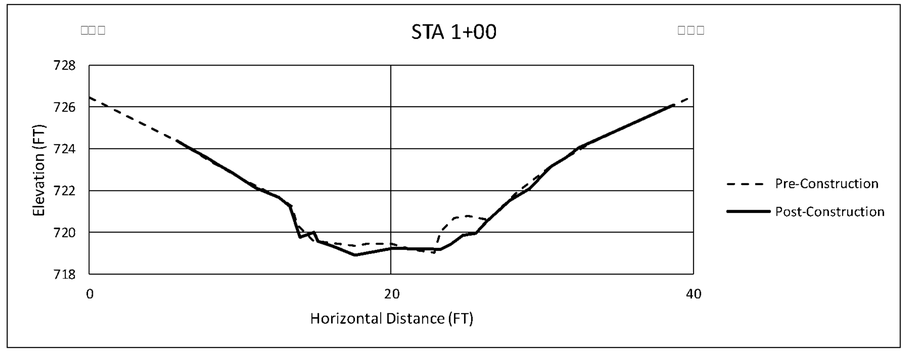

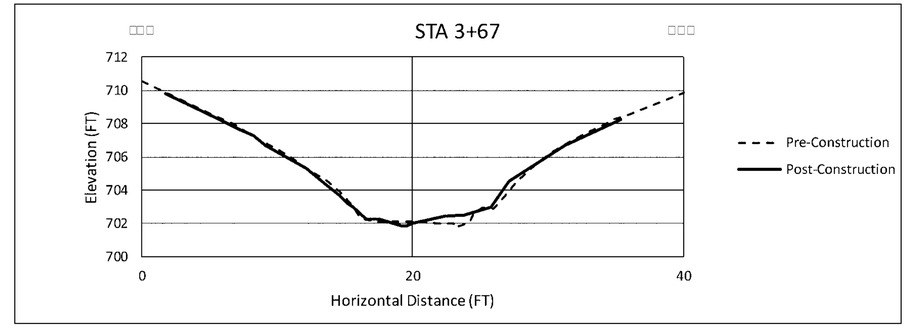

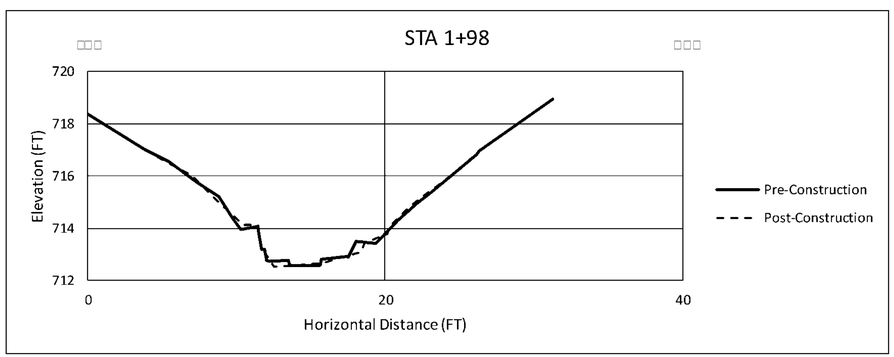

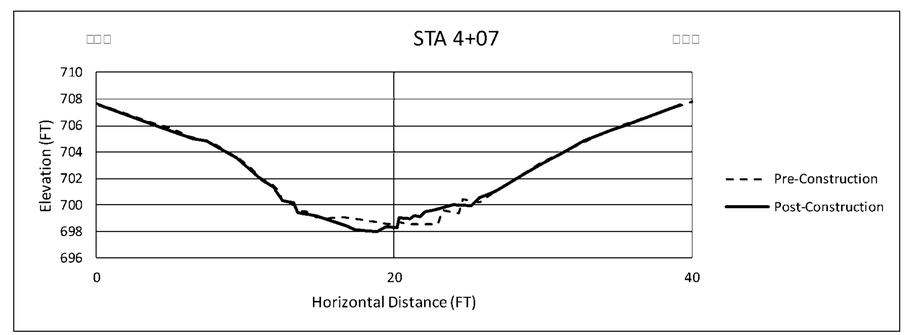

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ASBUILT CHANNEL CROSS SECTIONS

AS-BUILT

SHEET NO.

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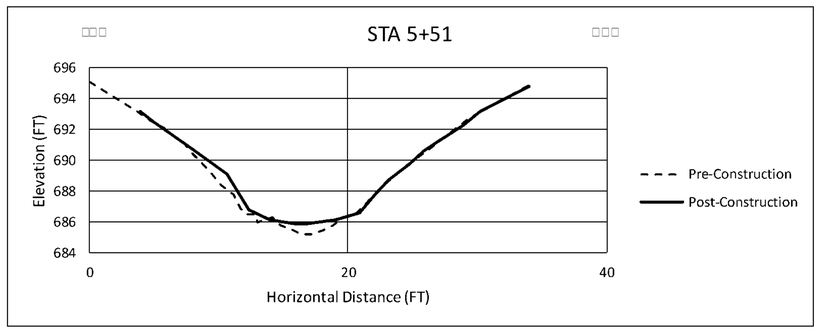

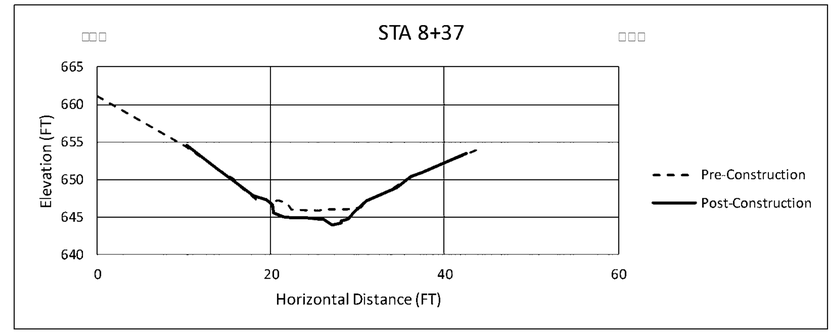

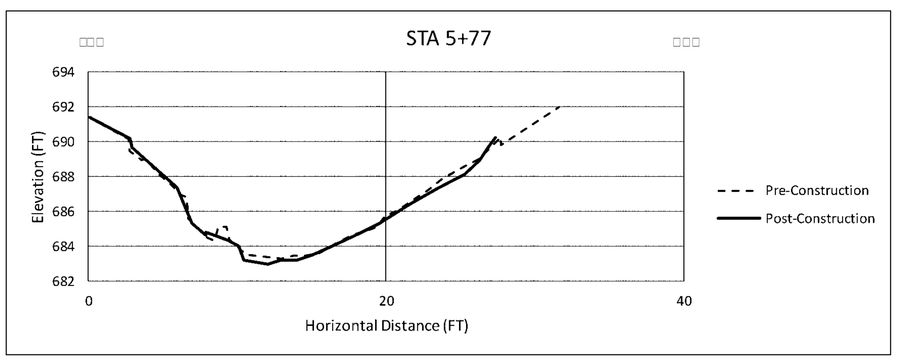

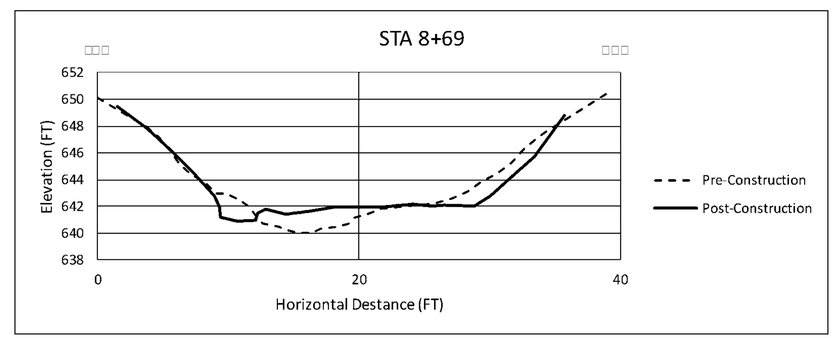

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ASBUILT CHANNEL CROSS SECTIONS

AS-BUILT

SHEET NO.

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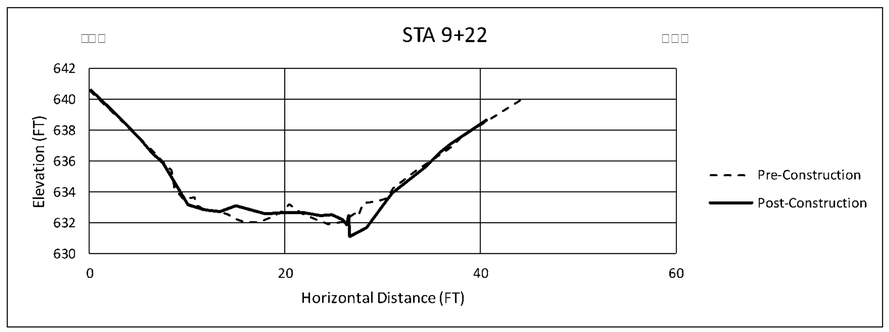

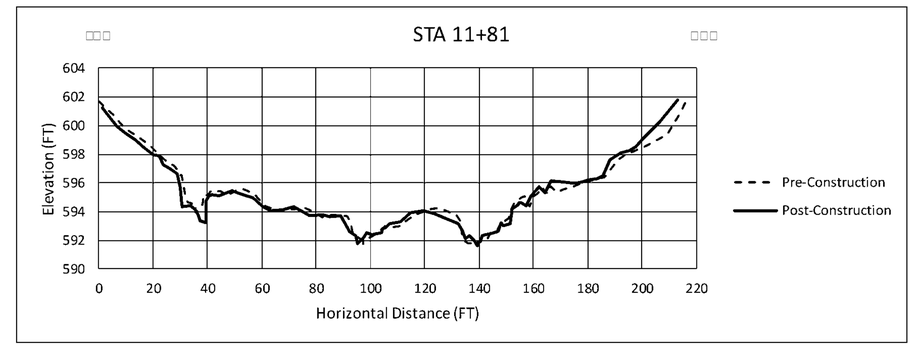

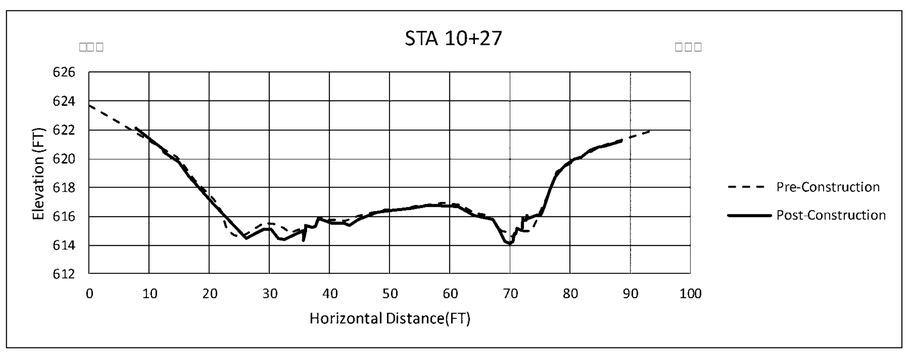

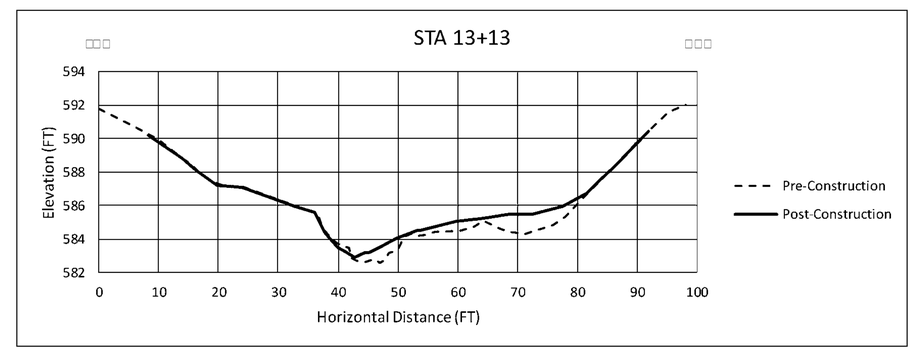

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ASBUILT CHANNEL CROSS SECTIONS

AS-BUILT

SHEET NO.

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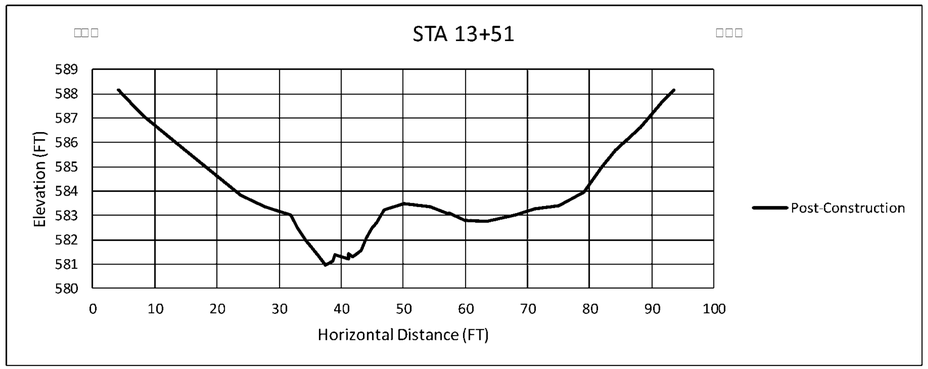

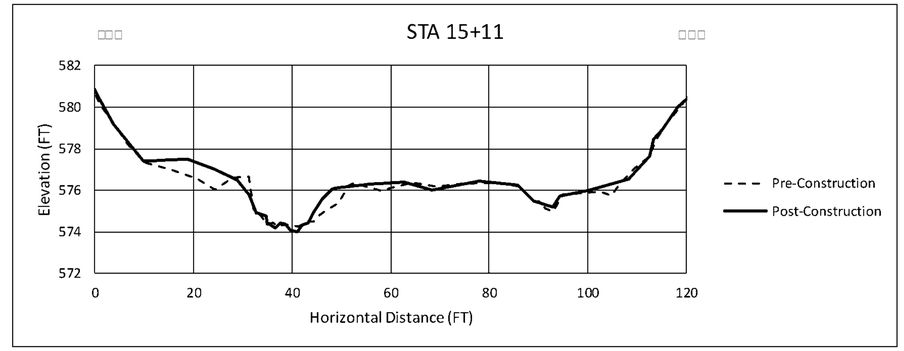

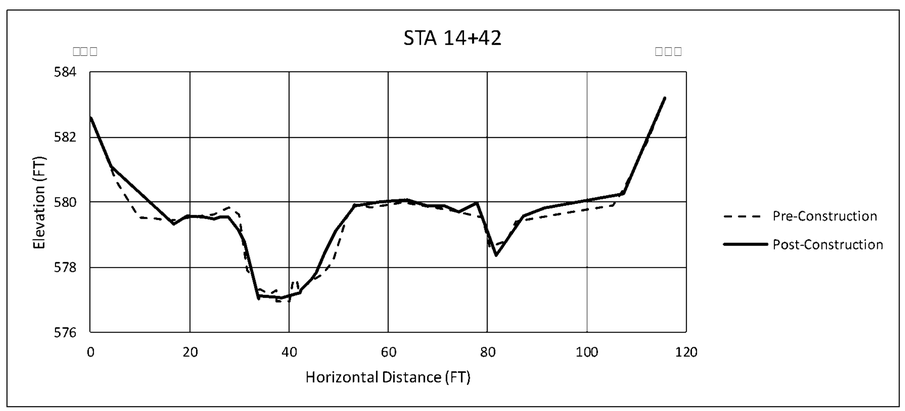

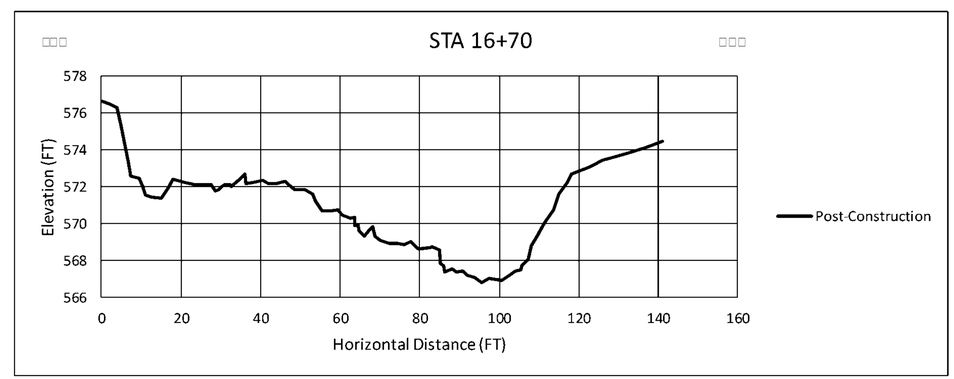

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ASBUILT CHANNEL CROSS SECTIONS

AS-BUILT

SHEET NO.

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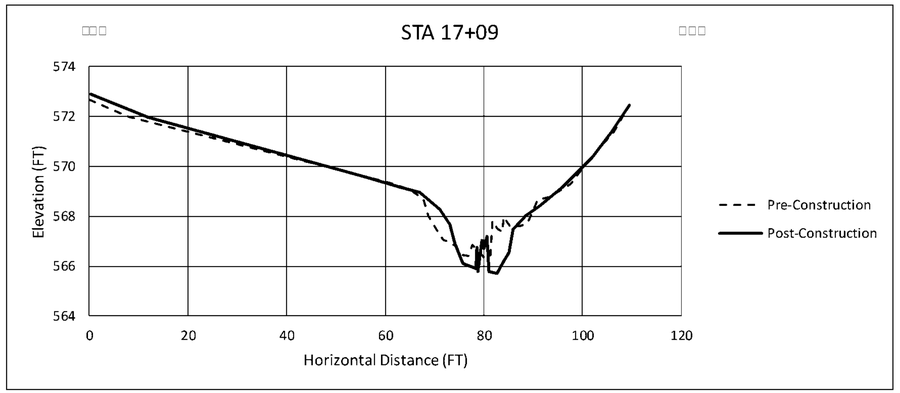

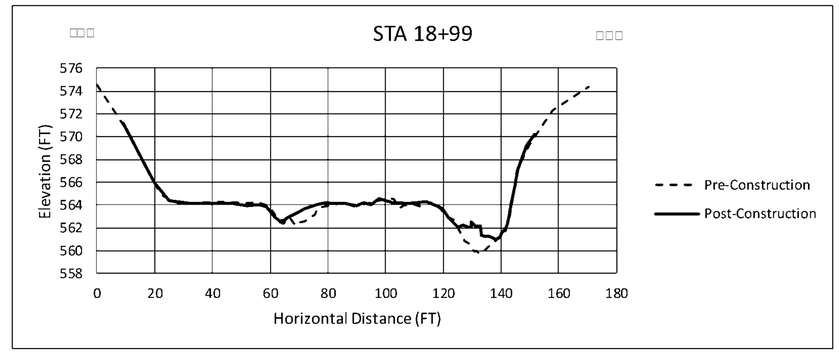

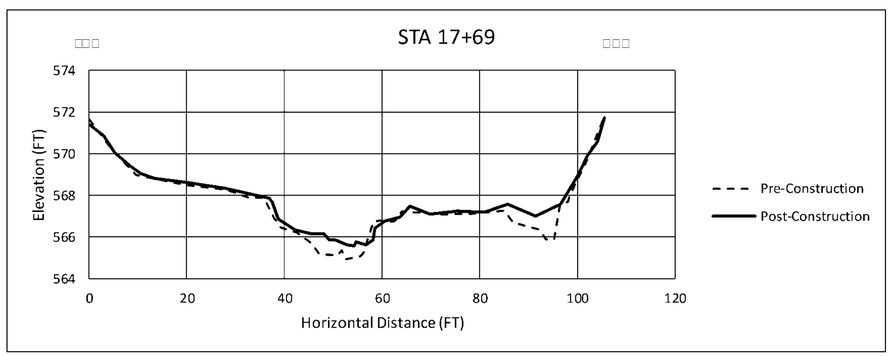

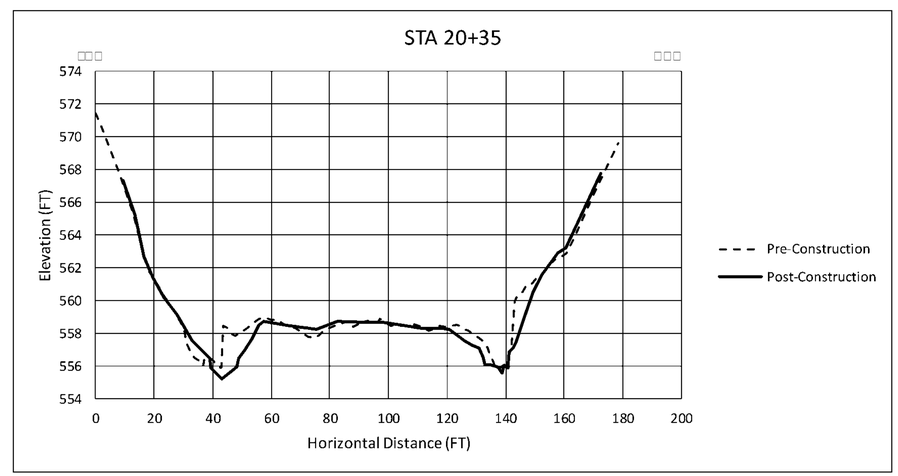

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ASBUILT CHANNEL CROSS SECTIONS

AS-BUILT

SHEET NO.

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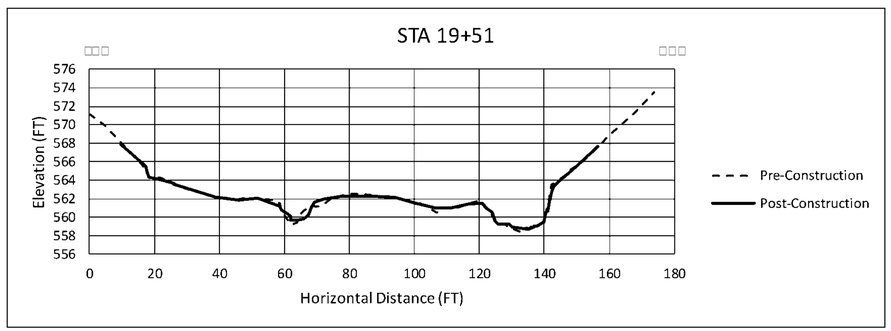

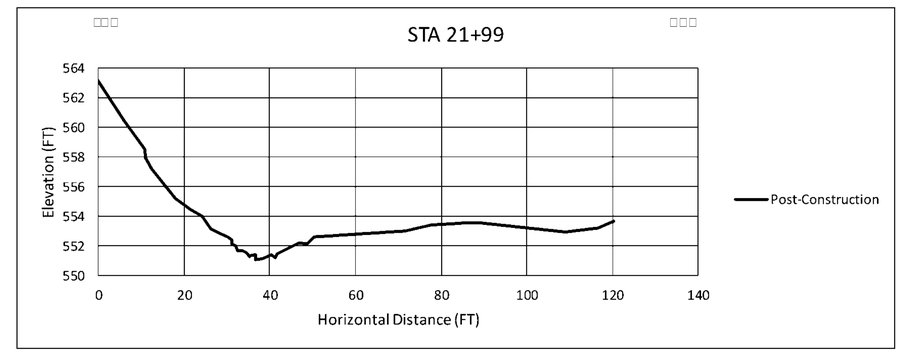

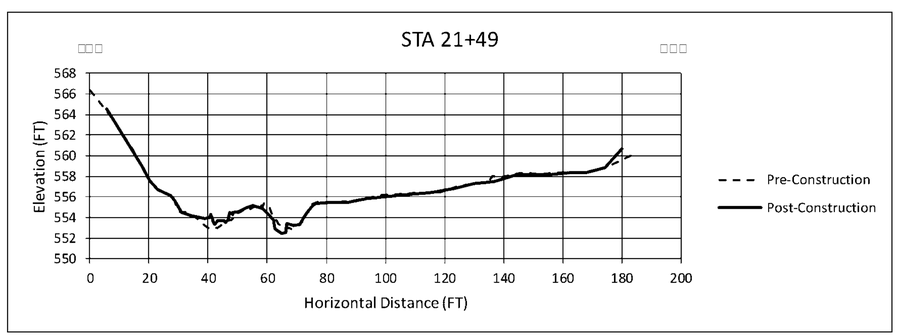

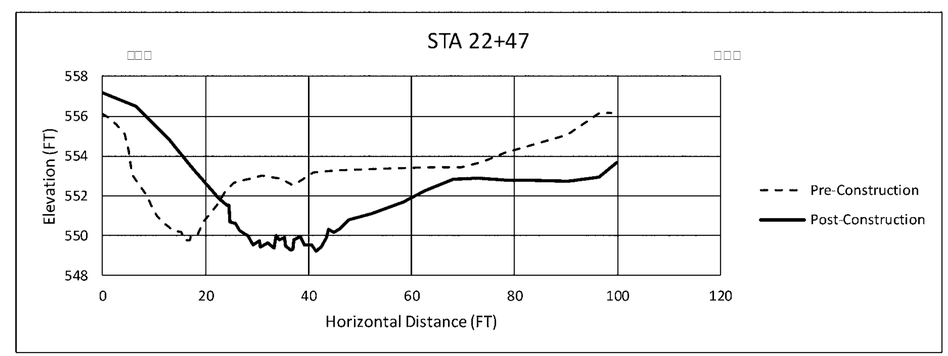

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ASBUILT CHANNEL CROSS SECTIONS

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SHEET NO.

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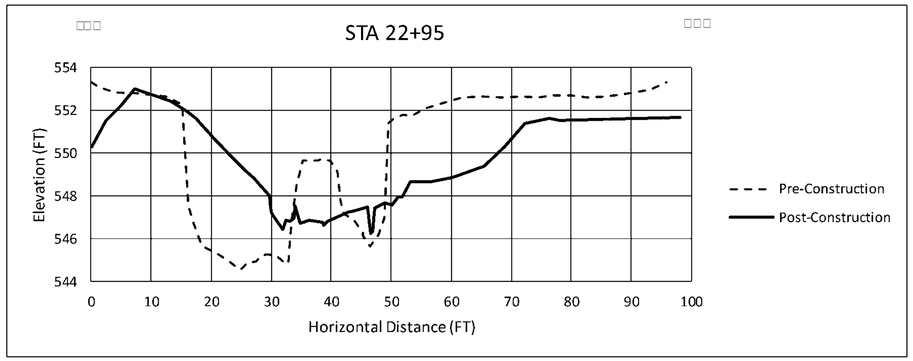

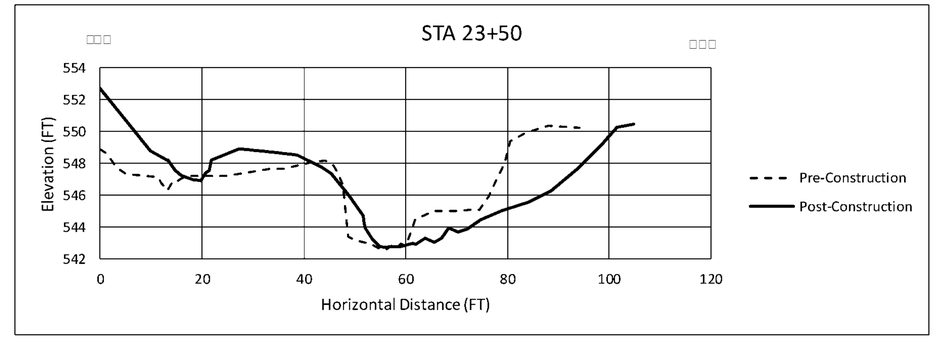

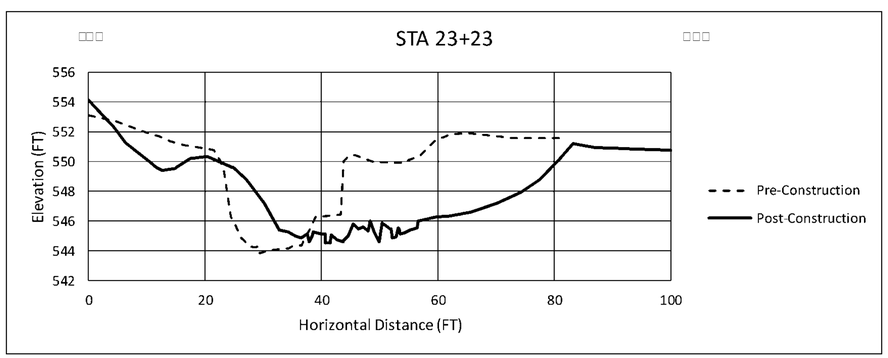

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ASBUILT CHANNEL CROSS SECTIONS

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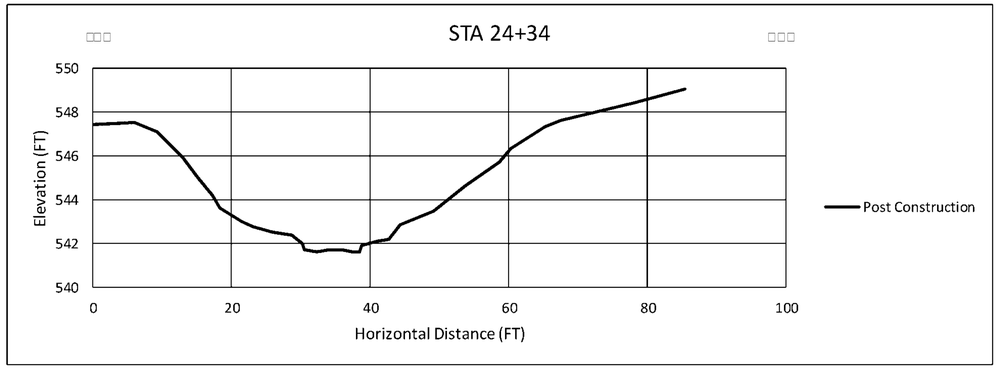

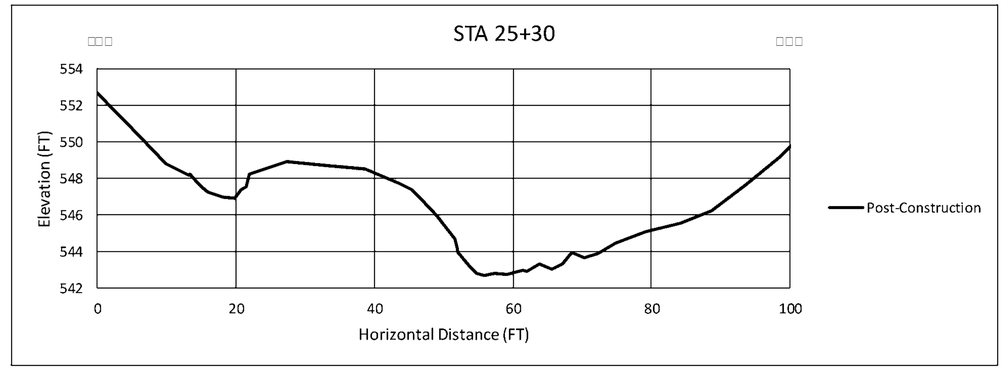

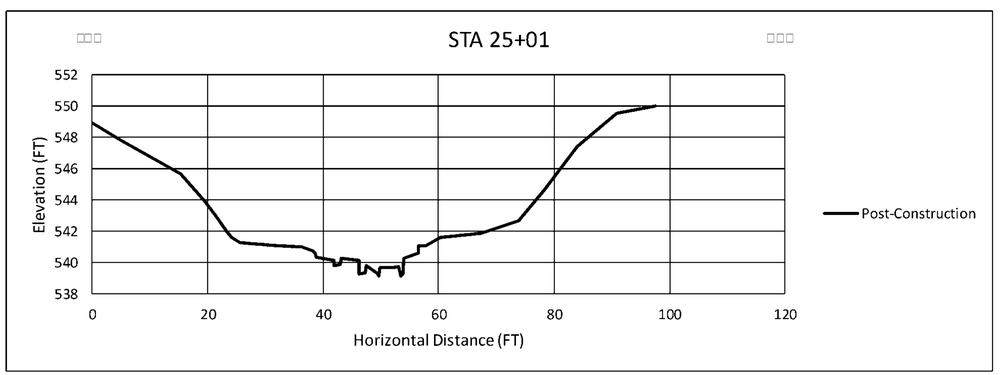

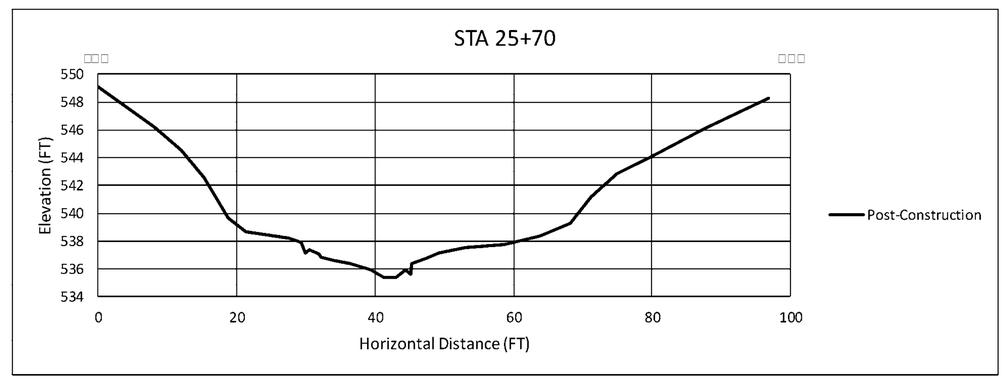

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TYPICAL POST CONSTRUCTION BANK GRADING

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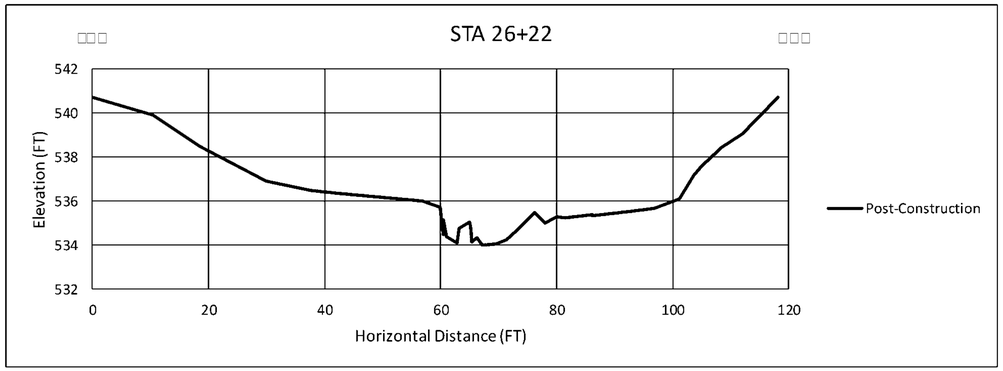

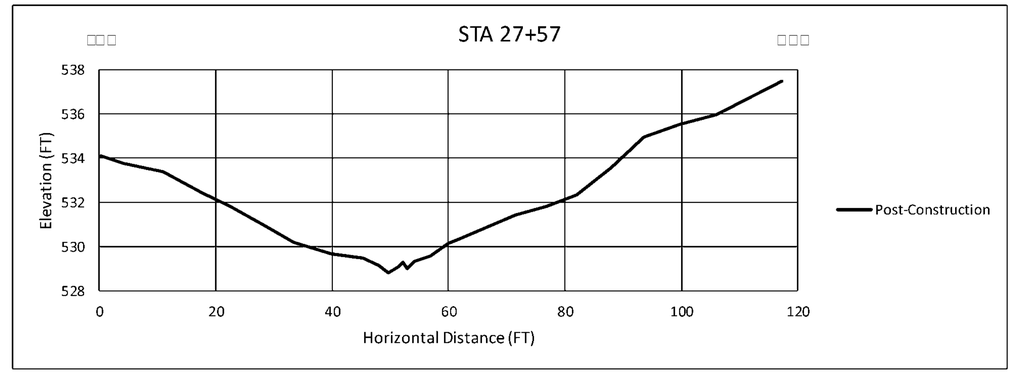

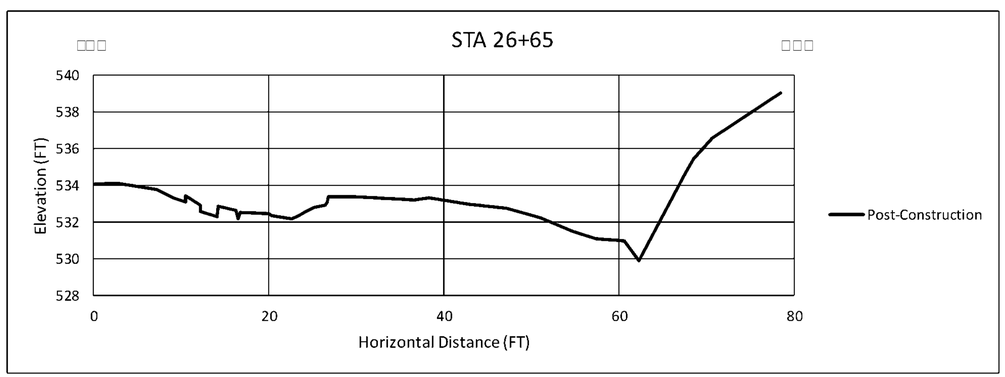

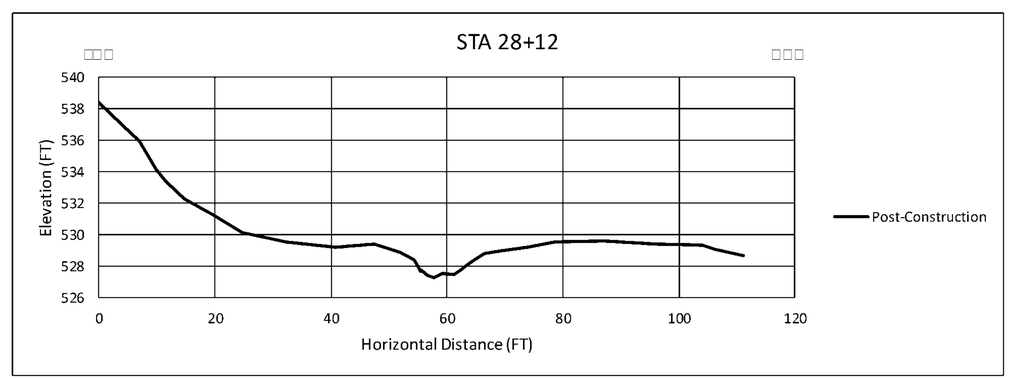

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TYPICAL POST CONSTRUCTION BANK GRADING

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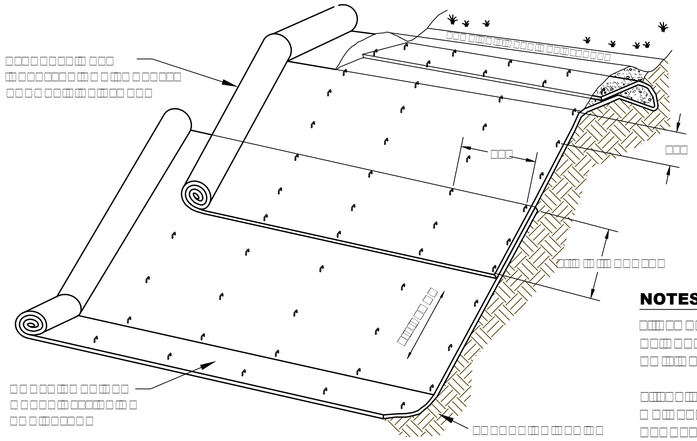
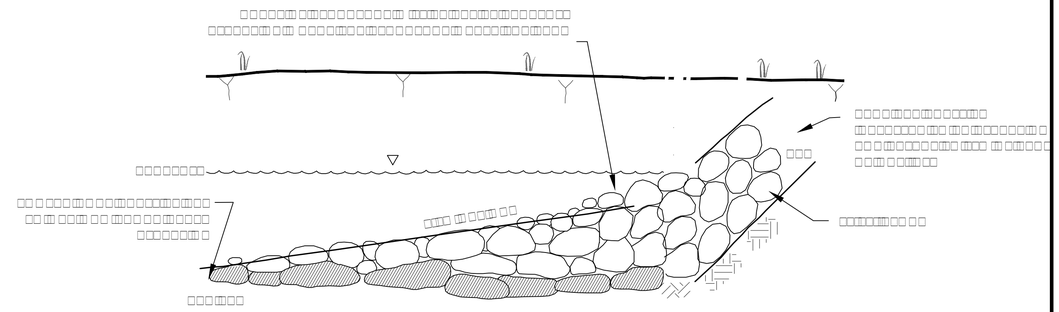
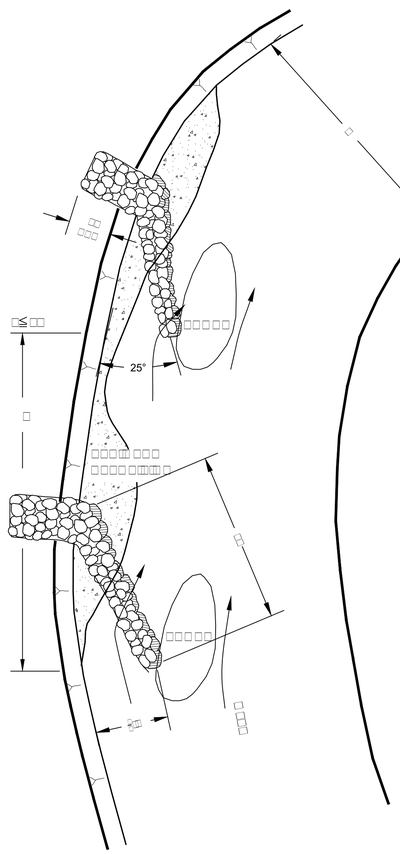
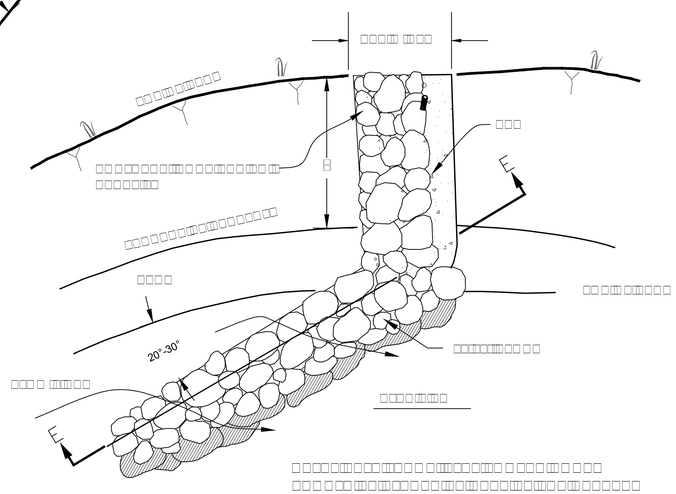


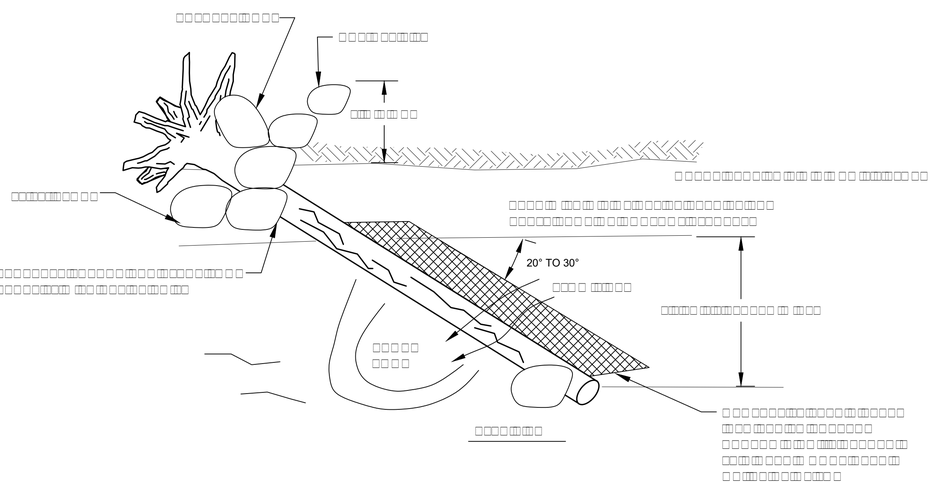
NOTES:

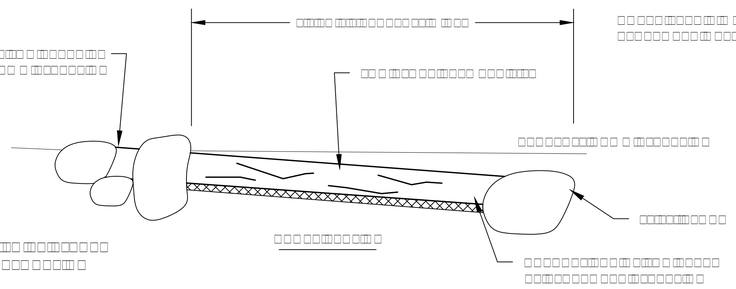
TYPICAL EROSION CONTROL BLANKET INSTALLATION











NOTES:

TYPICAL SINGLE ARM LOG VANE

TYPICAL SINGLE ARM STONE VANE

NOTES:

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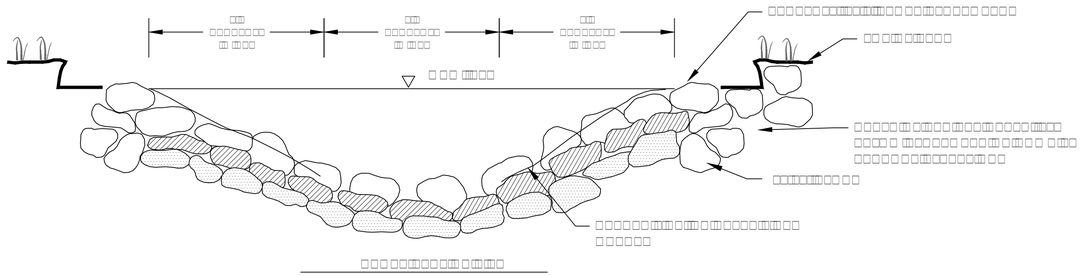

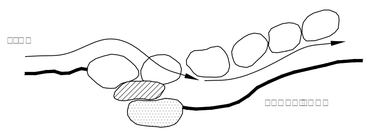

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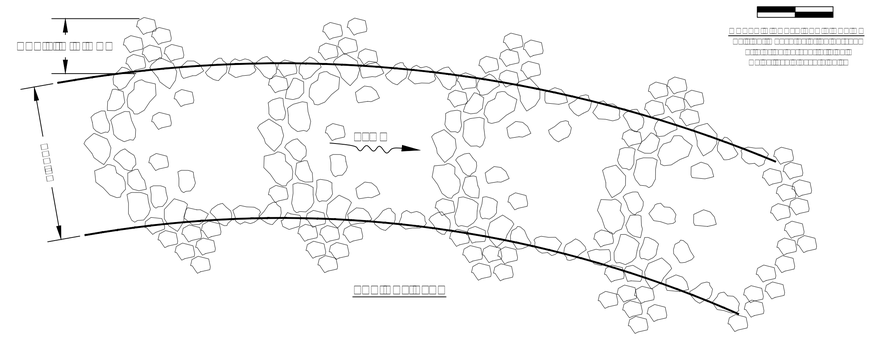

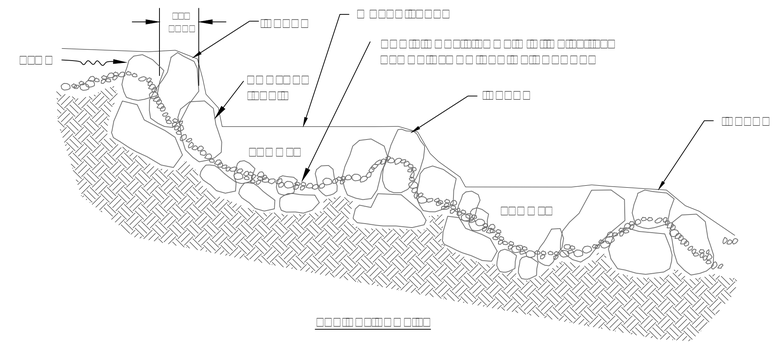

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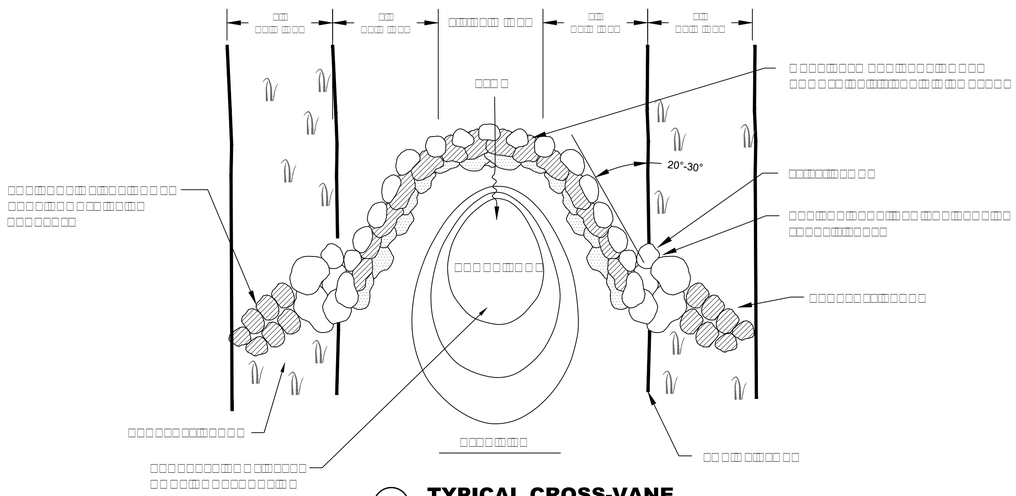
GRADE CONTROL STRUCTURE



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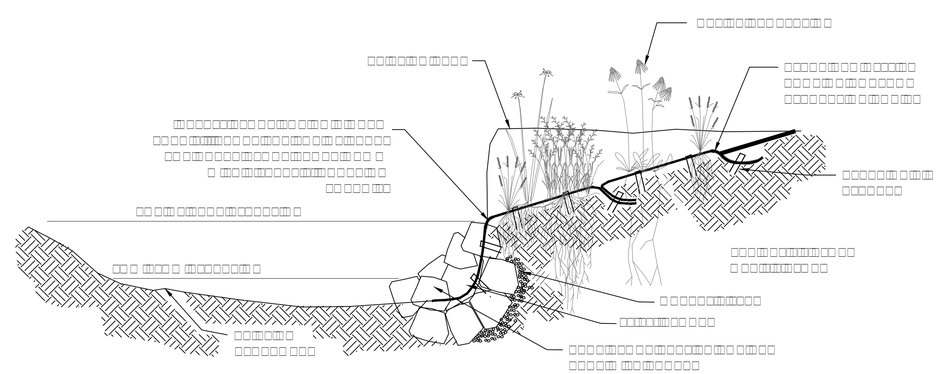
TYPICAL CROSS-VANE



STONE TOE BANK TREATMENT

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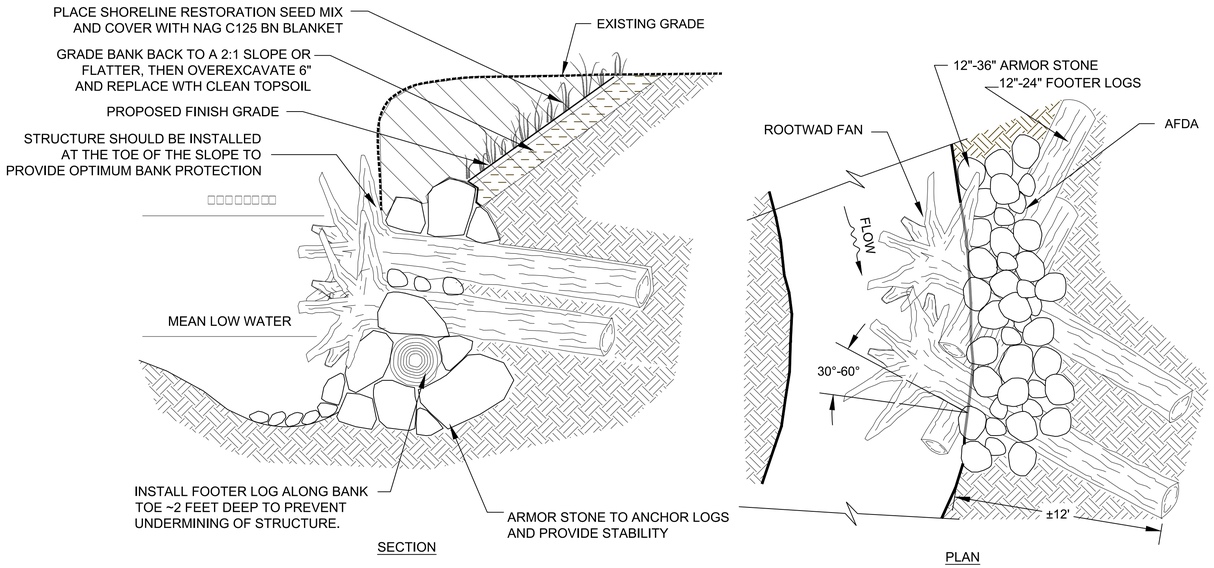
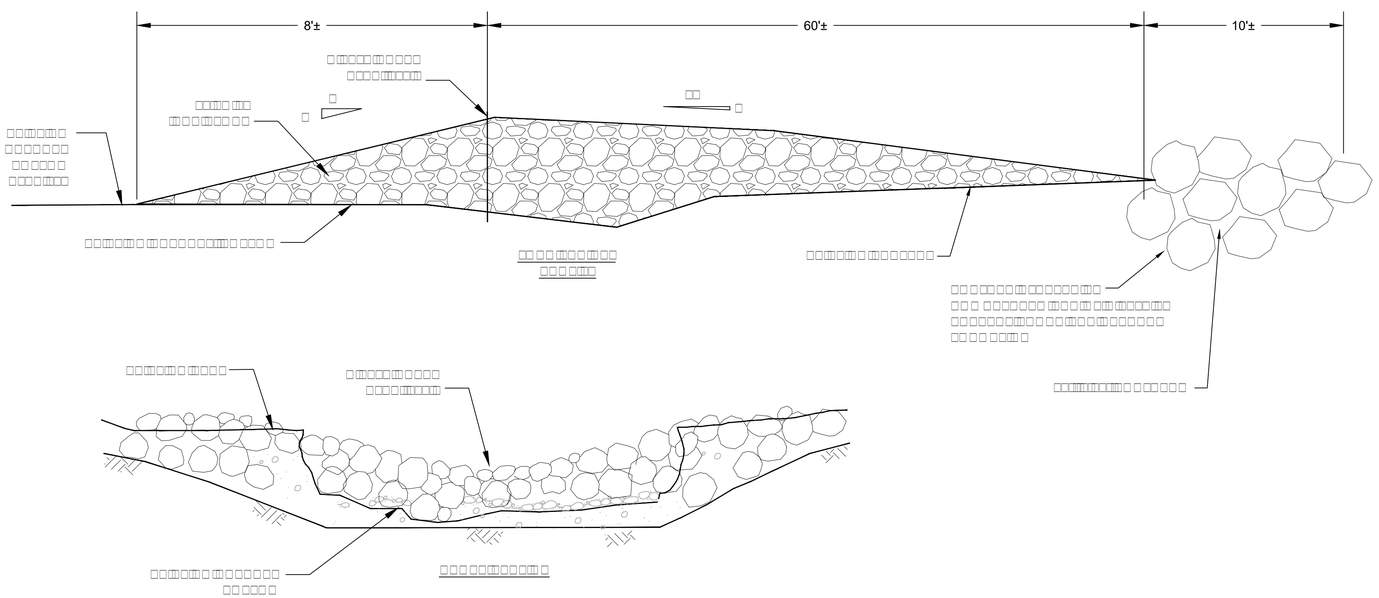
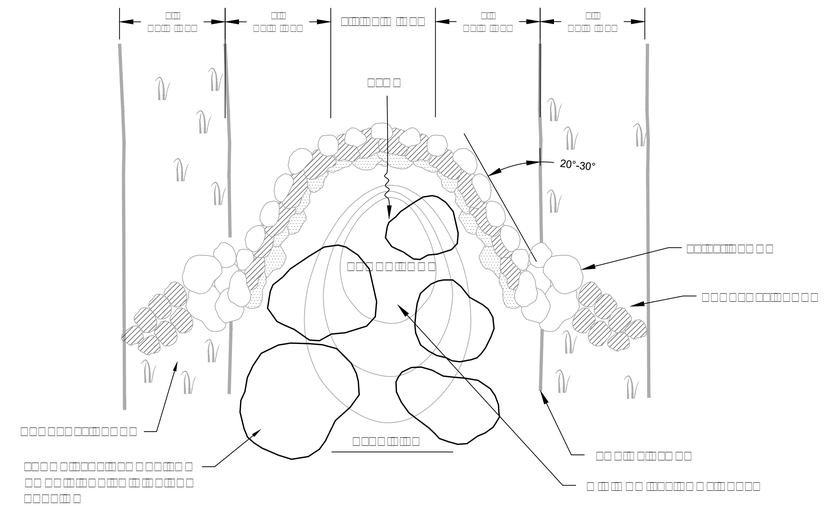


ROOTWAD COMPOSITE INSTALLATION



OVERFLOW ROCK RIFFLE STRUCTURE DETAIL

NOTES:



AMPHIBIAN HABITAT STRUCTURE

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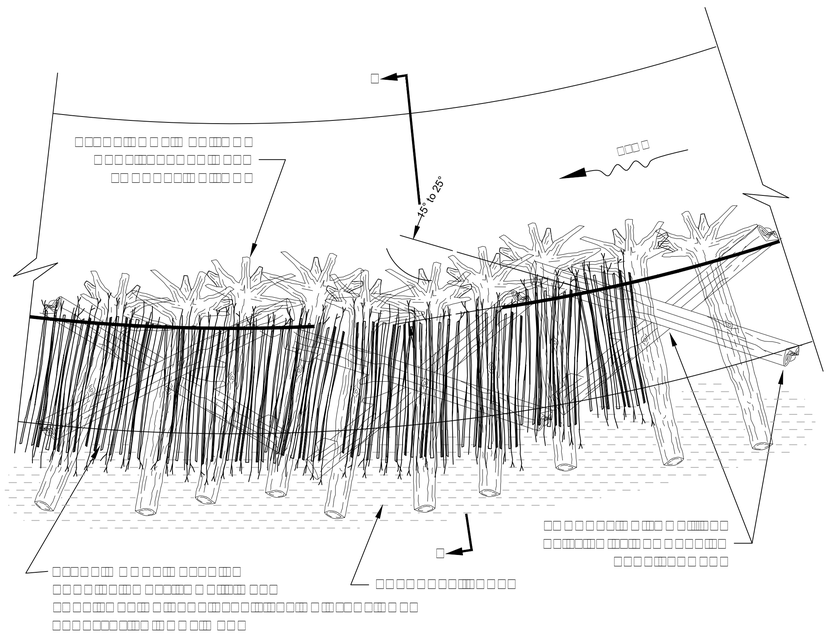
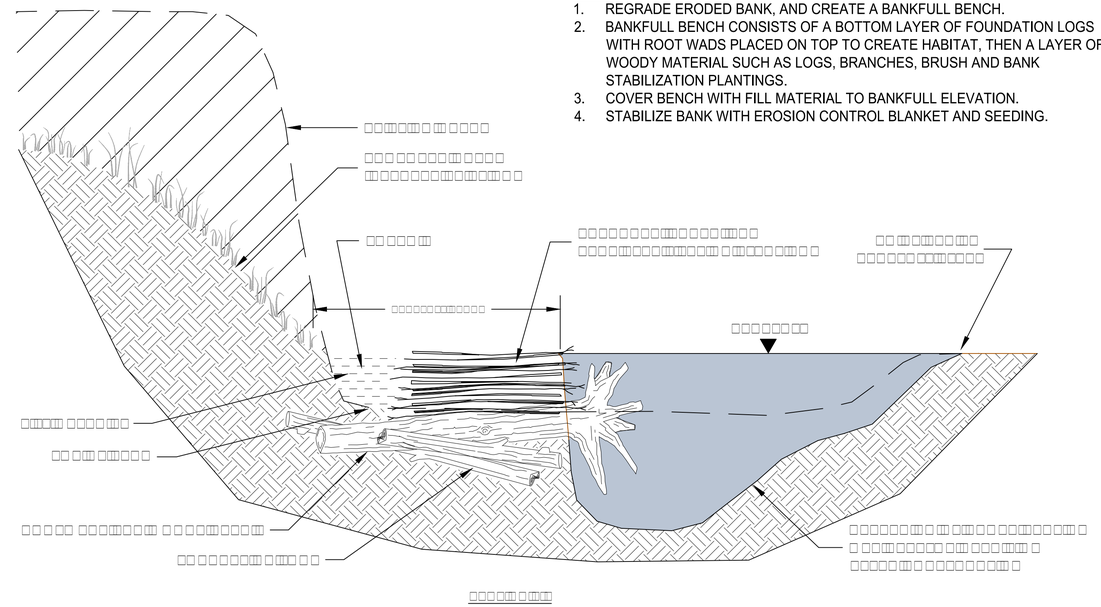
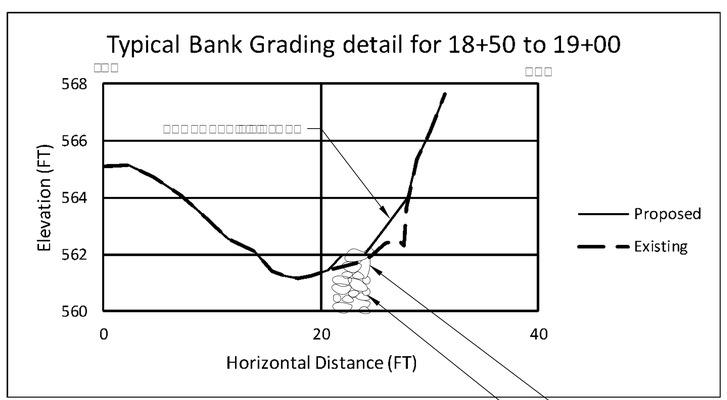
NOTES:
1. REGRADE ERODED BANK, AND CREATE A BANKFULL BENCH.
2. BANKFULL BENCH CONSISTS OF A BOTTOM LAYER OF FOUNDATION LOGS WITH ROOT WADS PLACED ON TOP TO CREATE HABITAT, THEN A LAYER OF WOODY MATERIAL SUCH AS LOGS, BRANCHES, BRUSH AND BANK STABILIZATION PLANTINGS.
3. COVER BENCH WITH FILL MATERIAL TO BANKFULL ELEVATION.
4. STABILIZE BANK WITH EROSION CONTROL BLANKET AND SEEDING.

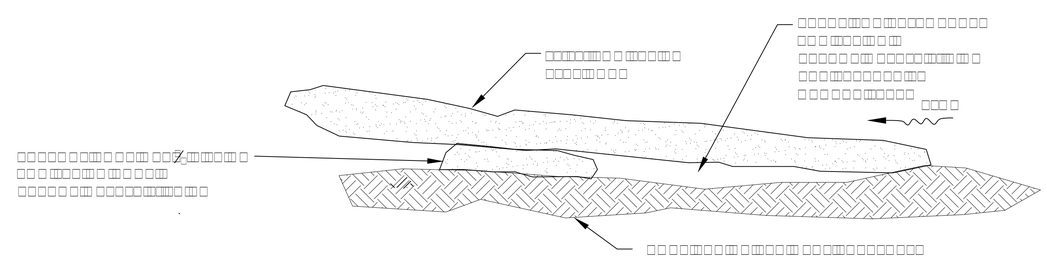




TYPICAL TOE WOOD - SOD MAT BANK RESTORATION



BANK GRADING - TYPICAL



AMPHIBIAN HABITAT EGG LAYING ROCK STRUCTURES

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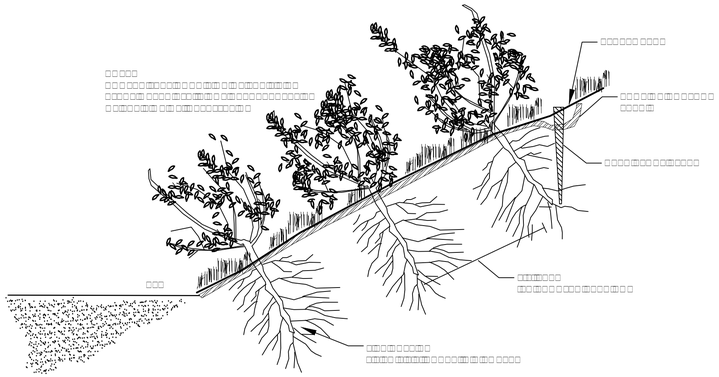
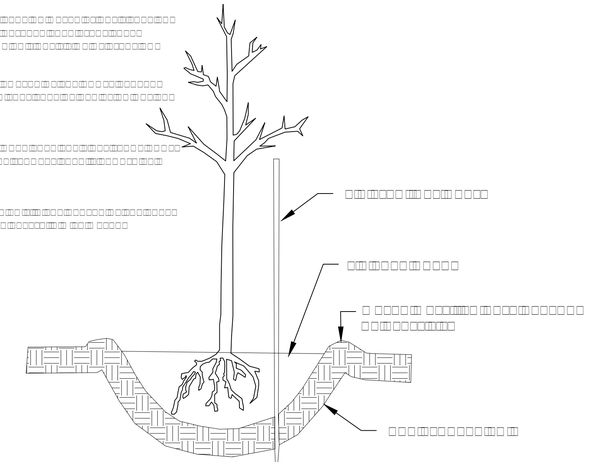
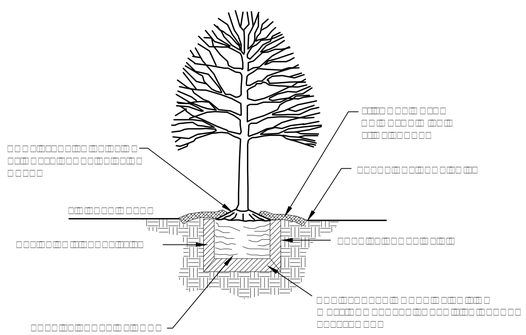


BANK STABILIZATION PLANTINGS



BARE ROOT DETAIL



CONTAINER TREE PLANTING DETAIL

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Sediment Removed During Response and Primary Restoration Activities*

Activity	Dates	Qty (tons)
Removed During Initial Response	Mar 2014 - June 2016	1,165
Primary Restoration Construction Disposal	Sept - Dec 2016	545
Storm Damage Repair Disposal	Oct 2017	530
Total		2,240

*The quantity of imported fill removed from the Phase 3 areas was not specifically tracked because excavated material was recycled by the contractor. Therefore, no waste volumes/weights were tracked for disposal purposes. As a first approximation, the amount of material removed is assumed to be generally equivalent to the amount of soil imported to backfill excavations.

Material Added During Primary Restoration Activities

Activity	Dates	Material	Qty (tons)
Phase 1 and 2 Restoration	July 2016 - Oct 2017	Top Soil	550
		Stone	2,303
Phase 3 Restoration	Dec 2017 - July 2018	Top Soil	1,499
Total			4,352

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Woodland Riparian Mix

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Carex frankii	Bristly Cattail Sedge	7.50	7.50	0.00
Bromus pubescens	Woodland Brome	16.00	16.00	0.00
Elymus canadensis	Canada Wild Rye	28.00	28.00	0.00
Elymus hystrix	Bottlebrush Grass	5.00	5.00	0.00
Elymus riparius	Riverbank Wild Rye	22.00	22.00	0.00
Elymus villosus	Silky Wild Rye	32.00	32.00	0.00
Elymus virginicus	Virginia Wild Rye	72.00	72.00	0.00
	Total	**182.50**	**182.50**	**0.00**
Aquilegia canadensis	Wild Columbine	0.50	1.20	+0.70
Actaea racemosa	Black Cohosh	2.00	0.00	-2.00
Aster cordifolius	Heart-Leaved Aster	1.00	1.00	0.00
Aster lateriflorus	Side-Flowering Aster	0.75	0.75	0.00
Aster novae-angliae	New England Aster	2.00	2.00	0.00
Aster shortii	Short's Aster	0.75	0.75	0.00
Impatiens capensis	Jewelweed*	4.00	0.00	-4.00
Lobelia siphilitica	Great Blue Lobelia*	0.25	0.43	+0.18
Monarda fistulosa	Wild Bergamot	1.50	1.50	0.00
Penstemon digitalis	Foxglove Beardtongue	1.25	1.25	0.00
Solidago caesia	Blue-Stemmed Goldenrod	0.25	0.25	0.00
Verbena urticifolia	Hairy White Vervain	1.25	1.25	0.00
Verbesina alternifolia	Wingstem	2.50	2.50	0.00
	Total	**18.00**	**12.88**	**-5.12**
Avena sativa	Common Oat	360.00	360.00	0.00
Lolium multiflorum	Annual Rye	100.00	100.00	0.00
	Total	**460.00**	**460.00**	**0.00**

*A transposition error was found in the planned applications rates for Jewelweed and Great Blue Lobelia between the Phase 1 Narrative Plan and the Plan Set; Planned application rates noted above reflect the rates that were listed in the Plan Set.

Supplemental Enhancement Species*		Planned Ounces/10 ac.	As-Built Ounces/10 ac.	Variance from Planned
Asarum canadense	Wild Ginger	4.00	0.00	-4.00
Claytonia virginica	Spring Beauty	2.00	0.00	-2.00
Dicentra cucullaria	Dutchman's Breeches	2.00	0.00	-2.00
Erythronium americanum	Yellow Trout Lily	4.00	0.00	-4.00
Geranium maculatum	Wild Geranium	2.00	0.00	-2.00
Mertensia virginica	Virginia Bluebells	2.00	2.00	0.00
Phlox divaricata	Woodland Phlox	2.00	0.00	-2.00
Polygonatum biflorum	Smooth Solomon's Seal	56.00	56.00	0.00
Sanguinaria canadensis	Bloodroot	8.00	8.00	0.00
Smilacina racemosa	Feathery False Solomon's Seal	16.00	9.02	-6.98
Osmundastrum cinnamomeum	Cinnamon Fern	As available	0.00	0.00
	Total	**98.00**	**75.02**	**-22.98**

*Supplemental Enhancement Species were bagged separately and hand-broadcast in appropriate habitats.

Slope Stabilization Seed Mix

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Permanent Grasses:				
Andropogon gerardii	Big Bluestem	48.00	48.00	0.00
Bouteloua curtipendula	Side-Oats Grama	16.00	16.00	0.00
Carex spp.	Prairie Sedge Mix	4.00	4.00	0.00
Elymus canadensis	Canada Wild Rye	32.00	32.00	0.00
Elymus virginicus	Virginia Wild Rye	24.00	24.00	0.00
Panicum virgatum	Switch Grass	0.00	12.00	+12.00
Schizachyrium scoparium	Little Bluestem	32.00	32.00	0.00
Sorghastrum nutans	Indian Grass	32.00	32.00	0.00
	Total	**188.00**	**200.00**	**+12.00**
Temporary Cover:				
Avena sativa	Common Oat	512.00	512.00	0.00
Lolium multiflorum	Annual Rye	240.00	240.00	0.00
	Total	**752.00**	**752.00**	**0.00**

Subcanopy Tree and Shrub Planting List (16' O.C.)

Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned
Asimina triloba	Pawpaw	400	**400**	*0*
Lindera benzoin	Spicebush	350	**350**	*0*
Cercis candensis	Redbud	330	**330**	*0*
Viburnum acerifolium	Maple Leaf Viburnum	200	**200**	*0*
Number of Installed Subcanopy Trees and Shrubs:		*1280*	***1280***	*0*

Canopy Tree Planting List (16' O.C.)

Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned
Carya cordiformis	Bitternut Hickory	84	**84**	*0*
Carya glabra	Pignut Hickory	84	**84**	*0*
Carya ovata	Shagbark Hickory	84	**84**	*0*
Lirodendron tulipifera	Tulip Poplar	84	**84**	*0*
Quercus rubrum	Red Oak	84	**84**	*0*
Number of Installed Canopy Trees and Shrubs:		*420*	***420***	*0*

Total Number of Installed Canopy and Subcanopy Trees and Shrub ***1700***

Bioenginnering & Bank Stabilization As-Built Planting List (2-3' O.C.)

		Live Stake			Bareroot		
Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned	Planned Qty.	As-Built Qty.	Variance from Planned
Cornus amomum	Silky Dogwood	165	**205**	*+40*	0	**0**	*0*
Cornus drummondii	Roughleaf Dogwood	50	**0**	*-50*	0	**0**	*0*
Sambucus canadensis	Elderberry	115	**200**	*+85*	0	**0**	*0*
Asimina triloba	Pawpaw	0	**0**	*0*	380	**400**	*+20*
Cercis candensis	Redbud	0	**0**	*0*	105	**125**	*+20*
Juglans nigra	Black Walnut	0	**0**	*0*	0	**100**	*+100*
Lindera benzoin	Spicebush	0	**0**	*0*	215	**225**	*+10*
Platanus occidentalis	Sycamore	0	**0**	*0*	0	**150**	*+150*
Viburnum acerifolium	Maple-Leaved Viburnum	75	**0**	*-75*	105	**125**	*+20*
Totals:		*405*	***405***	*0*	*805*	***1125***	*+320*

Total Number of Installed Bioengineering & Bank Stabilization Plants: ***1530***
Variance from Planned: ***+320***

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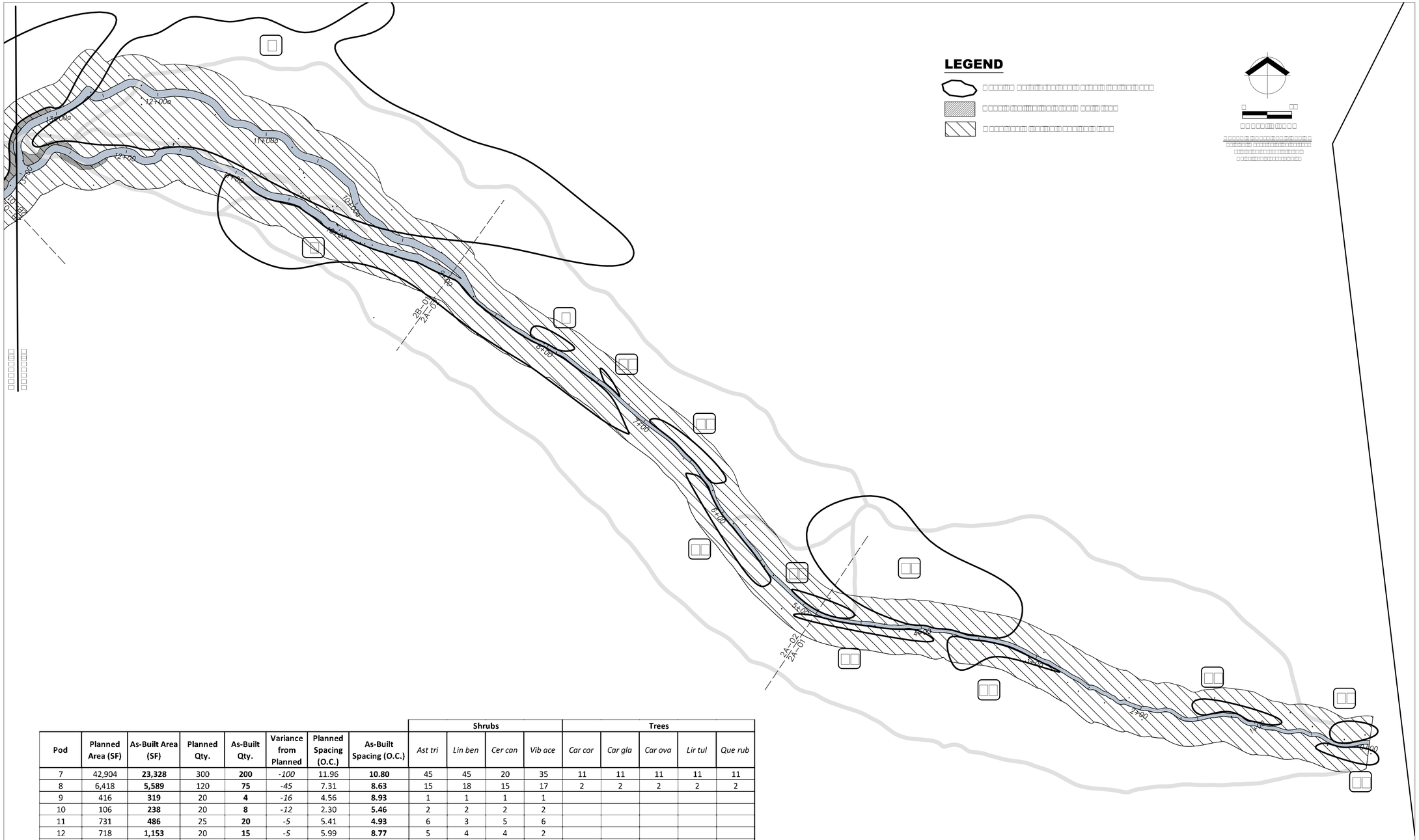
PHASE 1 PLANTING PLAN

AS-BUILT

SHEET NO.

25

OF 33



								Shrubs				Trees				
Pod	**Planned Area (SF)**	**As-Built Area (SF)**	**Planned Qty.**	**As-Built Qty.**	**Variance from Planned**	**Planned Spacing (O.C.)**	**As-Built Spacing (O.C.)**	*Ast tri*	*Lin ben*	*Cer can*	*Vib ace*	*Car cor*	*Car gla*	*Car ova*	*Lir tul*	*Que rub*
7	42,904	**23,328**	300	**200**	*-100*	11.96	**10.80**	45	45	20	35	11	11	11	11	11
8	6,418	**5,589**	120	**75**	*-45*	7.31	**8.63**	15	18	15	17	2	2	2	2	2
9	416	**319**	20	**4**	*-16*	4.56	**8.93**	1	1	1	1					
10	106	**238**	20	**8**	*-12*	2.30	**5.46**	2	2	2	2					
11	731	**486**	25	**20**	*-5*	5.41	**4.93**	6	3	5	6					
12	718	**1,153**	20	**15**	*-5*	5.99	**8.77**	5	4	4	2					
13	516	**477**	25	**6**	*-19*	4.54	**8.92**	2	1	1	2					
14	12,375	**4,485**	150	**50**	*-100*	9.08	**9.47**	10	8	7	15	2	2	2	2	2
15	596	**736**	20	**8**	*-12*	5.46	**9.59**	2	2	2	2					
16	1,023	**1,006**	25	**15**	*-10*	6.40	**8.19**	3	4	3	5					
17	806	**642**	20	**10**	*-10*	6.35	**8.01**	4	2	2	2					
18	1,078	**647**	25	**12**	*-13*	6.57	**7.34**	3	2	3	4					
19	538	**361**	20	**5**	*-15*	5.19	**8.50**	1	1	1	2					
Totals	68,225	**39,468**	790	**428**	*-362*	9.29	**9.60**	**99**	**93**	**66**	**95**	**15**	**15**	**15**	**15**	**15**
Area (ac)	1.566	**0.906**														

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PLANTING PLAN

AS-BUILT

SHEET NO.

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Pod	Planned Area (SF)	As-Built Area (SF)	Planned Qty.	As-Built Qty.	Variance from Planned	Planned Spacing (O.C.)	As-Built Spacing (O.C.)	Shrubs				Trees				
								Ast tri	*Lin ben*	*Cer can*	*Vib ace*	*Car cor*	*Car gla*	*Car ova*	*Lir tul*	*Que rub*
1	18,535	**7,995**	125	**300**	*+175*	12.18	**5.16**	56	49	90	25	16	16	16	16	16
2	15,710	**10,104**	120	**347**	*+227*	11.44	**5.40**	85	73	84	20	16	16	21	16	16
3	15,115	**16,030**	115	**200**	*+85*	11.46	**8.95**	50	40	25	15	15	15	10	15	15
4	4,734	**3,546**	40	**80**	*+40*	10.88	**6.66**	20	15	10	10	5	5	5	5	5
5	70,893	**21,518**	450	**300**	*-150*	12.55	**8.47**	80	70	45	30	15	15	15	15	15
6	8,570	**1,666**	60	**45**	*-15*	11.95	**6.09**	10	10	10	5	2	2	2	2	2
Totals	133,557	**60,860**	910	**1,272**	*+362*	12.11	**6.92**	**301**	**257**	**264**	**105**	**69**	**69**	**69**	**69**	**69**
AREA (ac)	3.07	**1.40**														

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PLANTING PLAN

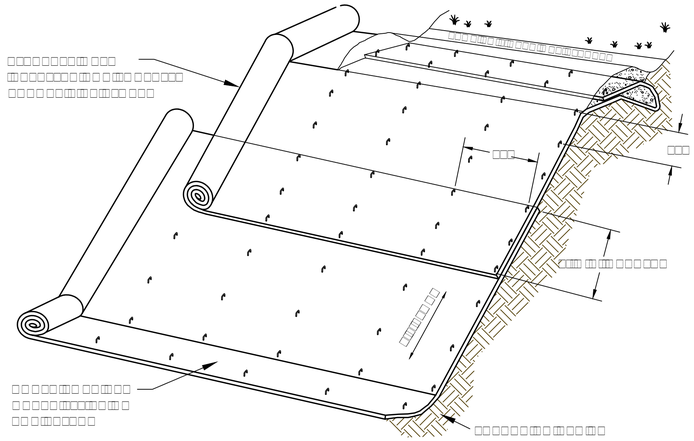
AS-BUILT

SHEET NO.

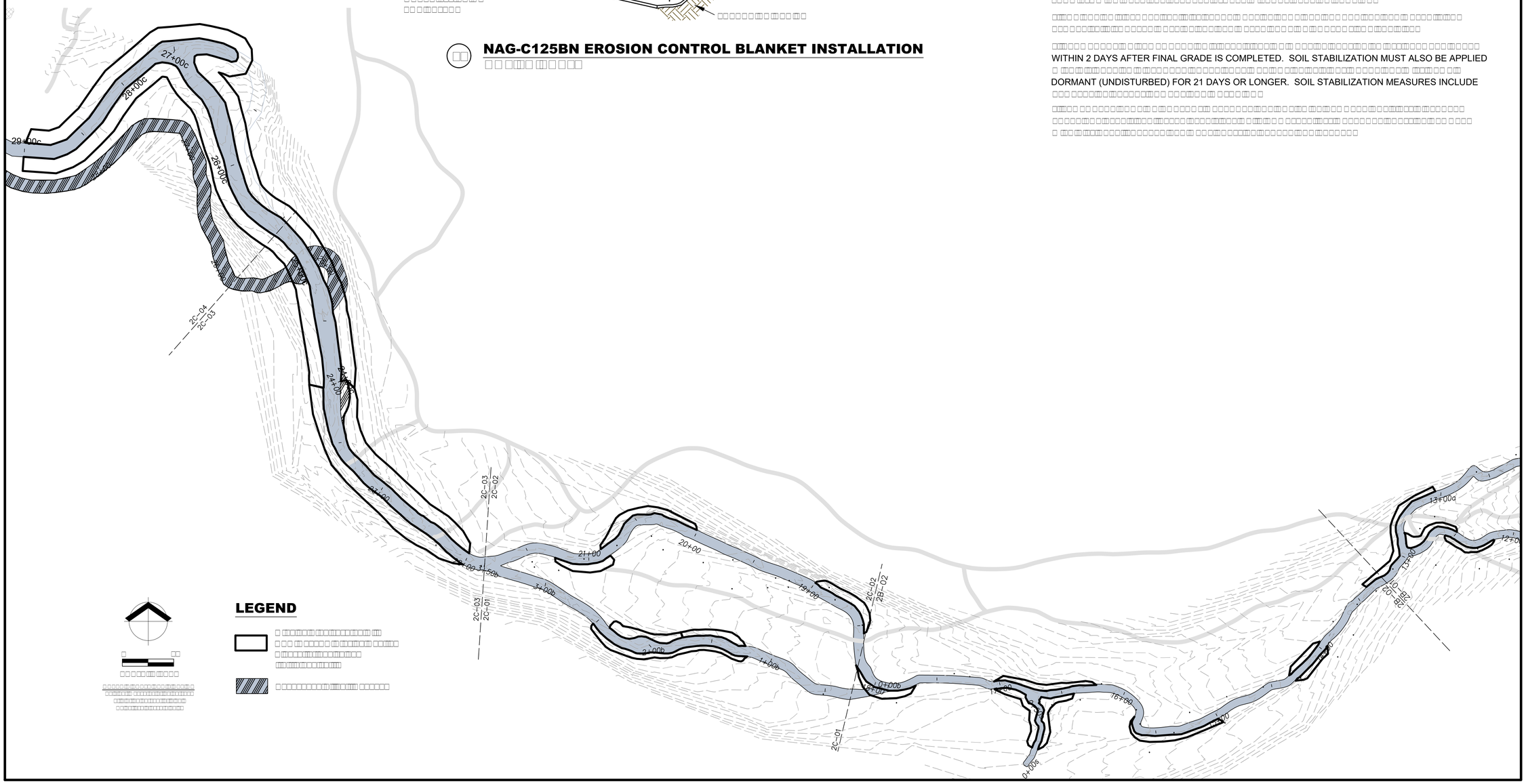
27

OF 33

NOTES:



NAG-C125BN EROSION CONTROL BLANKET INSTALLATION



WITHIN 2 DAYS AFTER FINAL GRADE IS COMPLETED. SOIL STABILIZATION MUST ALSO BE APPLIED

DORMANT (UNDISTURBED) FOR 21 DAYS OR LONGER. SOIL STABILIZATION MEASURES INCLUDE

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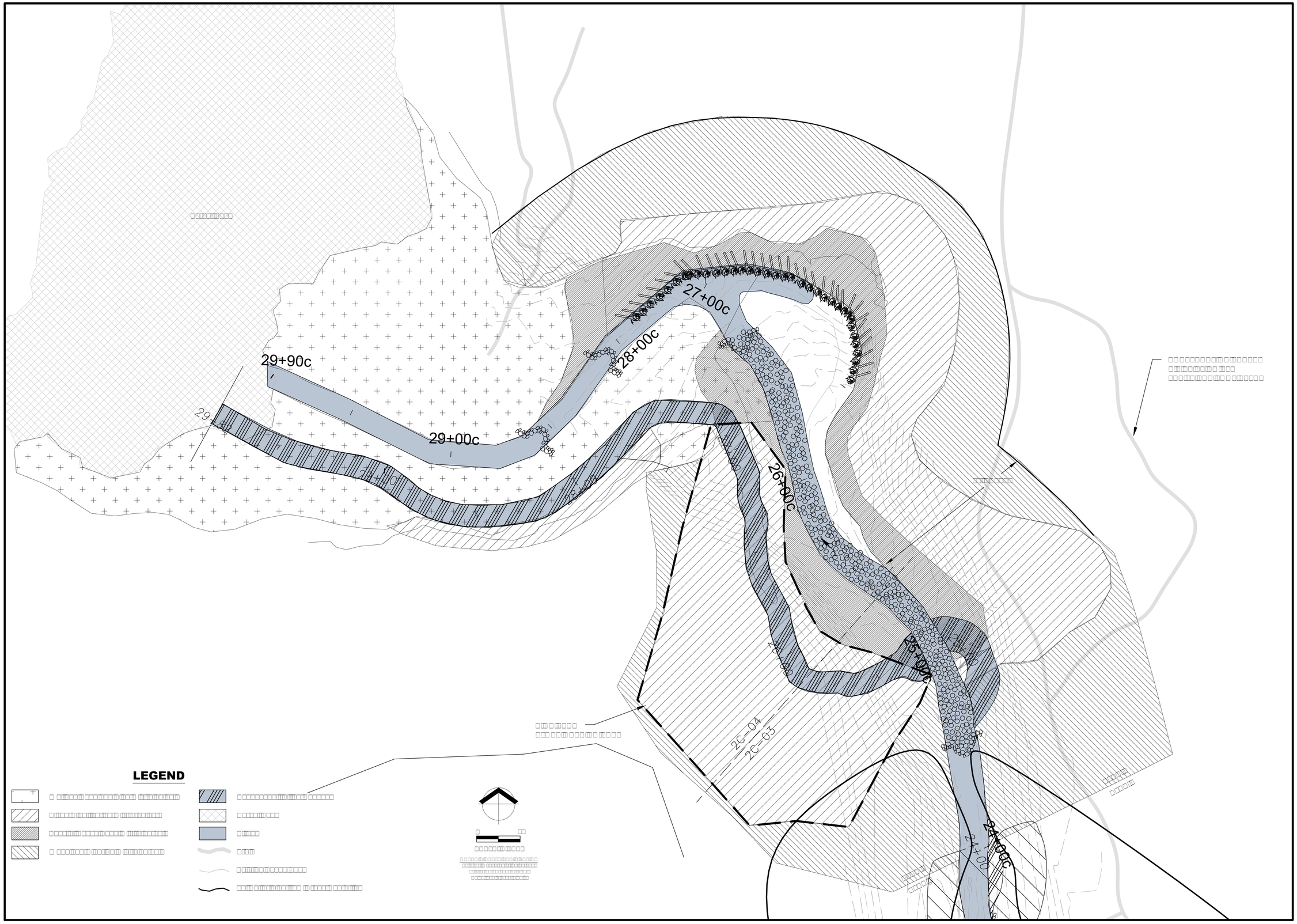
SOIL EROSION AND SEDIMENT CONTROL PLAN

AS-BUILT

SHEET NO.

28

OF 33



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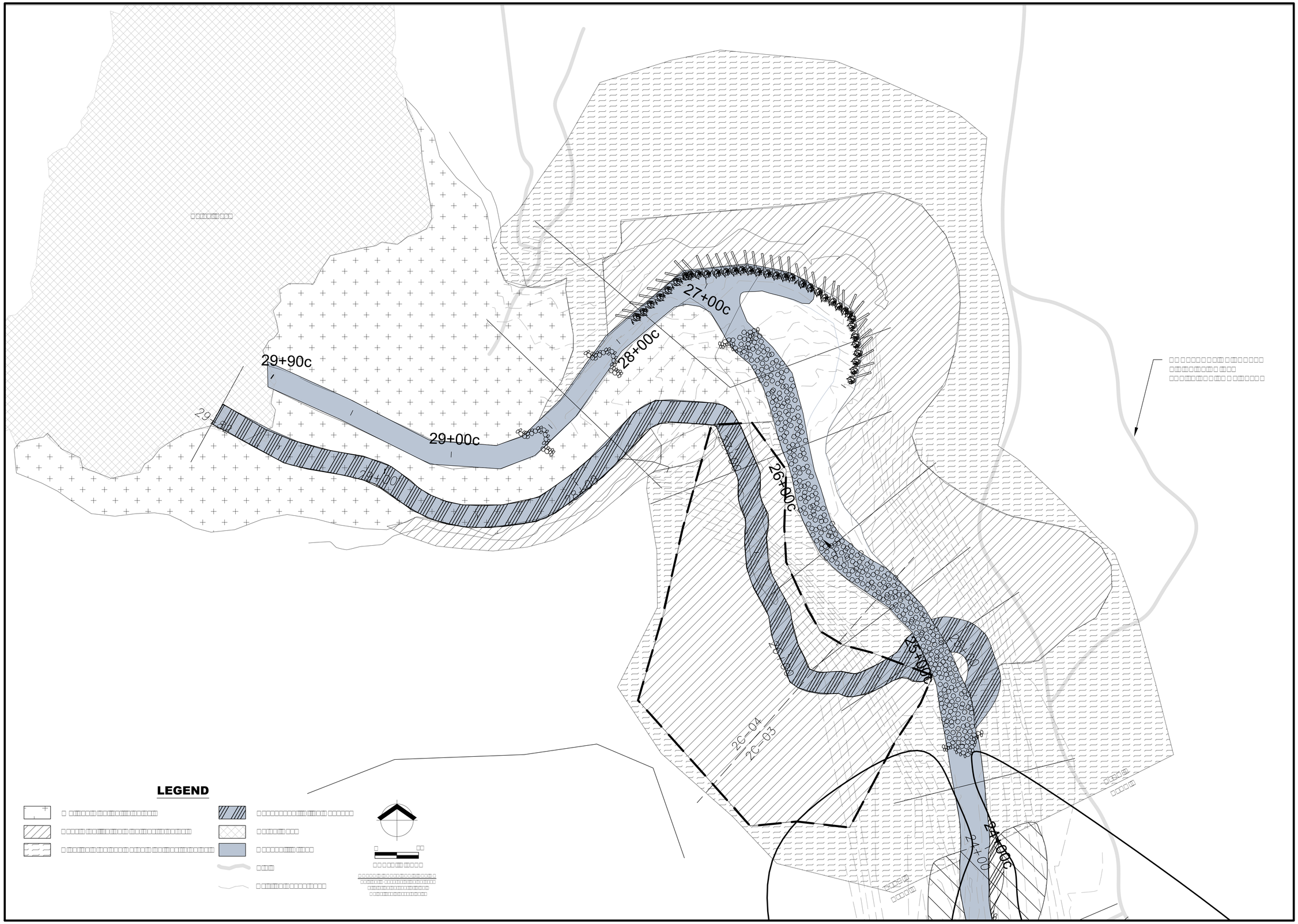
PHASE 2 PLANTING PLAN - SEEDING

AS-BUILT

SHEET NO.

29

OF 33



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PHASE 2 PLANTING PLAN - TREES AND SHRUBS

AS-BUILT

SHEET NO.

30

OF 33

Woodland Riparian Mix (0.54 ac.)

Botanical Name	Common Name	Planned Ounces/Acre	1st Application As-Built Ounces/Acre	2nd Application As-Built Ounces/Acre	Variance from Planned
Carex frankii	Bristly Cattail Sedge	7.50	7.59	7.50	+7.59
Bromus pubescens	Woodland Brome	16.00	15.93	16.00	+15.93
Elymus canadensis	Canada Wild Rye	28.00	27.96	28.00	+27.96
Elymus hystrix	Bottlebrush Grass	5.00	5.00	5.00	+5.00
Elymus riparius	Riverbank Wild Rye	22.00	22.04	22.00	+22.04
Elymus villosus	Silky Wild Rye	32.00	32.04	32.00	+32.04
Elymus virginicus	Virginia Wild Rye	72.00	72.04	72.00	+72.04
	Total	**182.50**	**182.59**	**182.50**	**+182.59**
Aquilegia canadensis	Wild Columbine	0.50	0.56	4.00	+4.06
Actaea racemosa	Black Cohosh	2.00	0.00		-2.00
Aster cordifolius	Heart-Leaved Aster	1.00	0.93	2.50	+2.43
Aster lateriflorus	Side-Flowering Aster	0.75	0.74		-0.01
Aster novae-angliae	New England Aster	2.00	2.04		+0.04
Aster shortii	Short's Aster	0.75	0.74		-0.01
Impatiens capensis	Jewelweed*	4.00	0.00		-4.00
Lobelia siphilitica	Great Blue Lobelia*	0.25	0.19		-0.06
Monarda fistulosa	Wild Bergamot	1.50	1.48	4.00	+3.98
Penstemon digitalis	Foxglove Beardtongue	1.25	1.30	4.00	+4.05
Solidago caesia	Blue-Stemmed Goldenrod	0.25	0.19		-0.06
Verbena urticifolia	Hairy White Vervain	1.25	1.30		+0.05
Verbesina alternifolia	Wingstem	2.50	2.59	5.00	+5.09
	Total	**18.00**	**12.04**	**19.50**	**+13.54**
Avena sativa	Common Oat	360.00	360.00	360.00	+360.00
Lolium multiflorum	Annual Rye	100.00	100.00	100.00	+100.00
	Total	**460.00**	**460.00**	**460.00**	**+460.00**

*A transposition error was found in the planned applications rates for Jewelweed and Great Blue Lobelia between the Phase 2 Narrative Plan and the Plan Set; Planned application rates noted above reflect the rates that were listed in the Plan Set.

Bankful Bench Seed Mix (0.27 ac.)

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Permanent Grasses/Sedges:				
Calamagrostis canadensis	Bluejoint Grass	1.00	1.11	+0.11
Carex crinita	Fringed Sedge	2.00	1.85	-0.15
Carex lupulina	Common Hop Sedge	4.00	4.07	+0.07
Carex lurida	Bottlebrush Sedge	1.50	1.48	-0.02
Carex frankii	Bristly Cattail Sedge	3.00	2.96	-0.04
Carex squarrosa	Narrow-Leaved Cattail Sedge	1.00	1.11	+0.11
Carex vulpinoidea	Brown Fox Sedge	4.00	4.07	+0.07
Elymus virginicus	Virginia Wild Rye	20.00	20.00	0.00
Glyceria striata	Fowl Manna Grass	2.00	1.85	-0.15
Juncus effusus	Common Rush	0.50	0.37	-0.13
Leersia oryzoides	Rice Cut Grass	2.00	1.85	-0.15
Scirpus atrovirens	Dark Green Rush	2.00	1.85	-0.15
Spartina pectinata	Prairie Cord Grass	1.00	1.11	0.11
	Total	**44.00**	**43.68**	**-0.32**
Temporary Cover:				
Avena sativa	Common Oat	360.00	360.00	0.00
Lolium multiflorum	Annual Rye	100.00	100.00	0.00
	Total	**460.00**	**460.00**	**0.00**
Forbs:				
Alisma spp.	Water Plantain (Various Mix)	3.00	2.96	-0.04
Angelica atropurpurea	Great Angelica	1.00	1.11	+0.11
Bidens cernua	Nodding Bur Marigold	2.50	2.59	+0.09
Boehmeria cylindrica	False Nettle	2.00	1.85	-0.15
Campanulastrum americanum	Tall Bellflower	0.25	0.37	+0.12
Cephalanthus occidentalis	Buttonbush	0.50	0.37	-0.13
Doellingeria umbellata	Flat-Topped Aster	0.25	0.37	+0.12
Helenium autumnale	Sneezeweed	2.00	1.85	-0.15
Heracleum lanatum	Cow Parsnip	0.75	0.74	-0.01
Hibiscus moscheutos	Swamp Rose Mallow	2.00	1.85	-0.15
Lobelia siphilitica	Great Blue Lobelia	0.50	0.37	-0.13
Lycopus americanus	Common Water Horehound	0.25	0.37	0.12
Mimulus ringens	Monkey Flower	1.25	1.11	-0.14
Penthorum sedoides	Ditch Stonecrop	0.50	0.37	-0.13
Polygonum spp.	Pinkweed (Various Mix)	0.50	0.37	-0.13
Rudbeckia laciniata	Wild Golden Glow	2.00	1.85	-0.15
Senna hebecarpa	Wild Senna	2.00	1.85	-0.15
Solidago patula	Swamp Goldenrod	1.00	1.11	0.11
Symphyotrichum puniceum	Swamp Aster	0.75	0.74	-0.01
Verbesina alternifolia	Wingstem	4.00	4.07	0.07
	Total	**27.50**	**26.27**	**-1.23**

Subcanopy Tree and Shrub Planting List (Planned 0.81 ac; As-Built 0.78 ac.)

Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned
Asimina triloba	Pawpaw	80	**80**	*0*
Lindera benzoin	Spicebush	70	**70**	*0*
Cercis canadensis	Redbud	40	**40**	*0*
Viburnum acerifolium	Maple Leaf Viburnum	35	**35**	*0*
	Total	225	**225**	*0*

Canopy Tree Planting List (Planned 0.81 ac; As-Built 0.78 ac.)

Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned
Carya cordiformis	Bitternut Hickory	25	**25**	*0*
Carya glabra	Pignut Hickory	25	**25**	*0*
Carya ovata	Shagbark Hickory	25	**25**	*0*
Juglans nigra	Black Walnut	0	**25**	*+25*
Platanus occidentalis	American Sycamore	0	**25**	*+25*
Liriodendron tulipifera	Tulip Poplar	25	**25**	*0*
Quercus rubra	Red Oak	25	**25**	*0*
	Total	125	**175**	*+50*

Total Number of Installed Canopy and Subcanopy Trees and Shrubs: 400
Variance from Planned: +50

Trees and shrubs planted on average 10' centers (435 stems/acre)

Slope Stabilization Seed Mix (0.54 ac.)

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance om Planne
Permanent Grasses:				
Andropogon gerardii	Big Bluestem	48.00	47.96	-0.04
Bouteloua curtipendula	Side-Oats Grama	16.00	15.93	-0.07
Carex molesta	Field Oval Sedge	4.00	4.07	+0.07
Chamaecrista fasciculata	Partridge pea	0.00	12.04	+12.04
Elymus canadensis	Canada Wild Rye	32.00	32.04	+0.04
Elymus virginicus	Virginia Wild Rye	24.00	24.07	+0.07
Rudbeckia hirta	Black-eyed Susan	0.00	5.00	+5.00
Schizachyrium scoparium	Little Bluestem	32.00	32.04	+0.04
Sorghastrum nutans	Indian Grass	32.00	32.04	+0.04
	Total	**188.00**	**205.19**	**+17.19**
Temporary Cover:				
Avena sativa	Common Oat	512.00	512.04	+0.04
Lolium multiflorum	Annual Rye	240.00	240.00	0.00
	Total	**752.00**	**752.04**	**+0.04**

Bioengineering and Bank Stabilization Planting List (Planned 0.54 ac; As-Built 0.68 ac.)

		Live Stake			Bareroot		
Botanical Name	**Common Name**	**Planned Qty.**	**As-Built Qty.**	**Variance from Planned**	**Planned Qty.**	**As-Built Qty.**	**Variance from Planned**
Cornus amomum	Silky Dogwood	290	**0**	*-290*	0	**0**	0
Cornus drummondii	Roughleaf Dogwood	290	**0**	*-290*	0	**500**	*+500*
Vibrurnum acerifolium	Maple Leaf Viburnum	290	**0**	*-290*	475	**0**	*-475*
Sambucus canadensis	Elderberry	290	**300**	*+10*	0	**0**	*0*
Cercis canadensis	Redbud	0	**0**	*0*	475	**550**	*+75*
Asimina triloba	Pawpaw	0	**0**	*0*	475	**0**	*-475*
Lindera benzoin	Spicebush	0	**0**	*0*	475	**0**	*-475*
Juglans nigra	Black Walnut	0	**0**	*0*	0	**500**	*+500*
Platanus occidentalis	American Sycamore	0	**0**	*0*	0	**500**	*+500*
Quercus rubra	Red Oak	0	**0**	*0*	0	**500**	*+500*
Carya cordiformis	Bitternut Hickory	0	**0**	*0*	0	**500**	*+500*
	Total	1,160.00	**300**	*-860*	1,900.00	**3,050.00**	*+1150*

Total Number of Installed Bioengineering & Bank Stabilization Plants: 3,350.00
Variance from Planned: +290

Trees and shrubs planted on average 3' centers

Wetland Seed and Plug Mix (0.53 ac.)

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Carex frankii	Bristly Cattail Sedge	7.50	7.55	+0.05
Bromus pubescens	Woodland Brome	16.00	16.04	+0.04
Elymus canadensis	Canada Wild Rye	28.00	27.92	-0.08
Elymus hystrix	Bottlebrush Grass	5.00	5.09	+0.09
Elymus riparius	Riverbank Wild Rye	22.00	22.08	+0.08
Elymus villosus	Silky Wild Rye	32.00	32.08	+0.08
Elymus virginicus	Virginia Wild Rye	72.00	72.08	+0.08
	Total	**182.50**	**182.84**	**+0.34**
Avena sativa	Common Oat	360.00	360.00	0.00
Lolium multiflorum	Annual Rye	100.00	100.00	0.00
	Total	**460.00**	**460.00**	**0.00**

Wetland Plug List (3' O.C.)

Botanical Name	Common Name	Planned QTY Plugs	As-Built QTY Plugs	Variance from Planned
Carex frankii	Bristly Cattail Sedge	700	700	0
Elymus canadensis	Canada Wild Rye	350	450	+100
Elymus hystrix	Bottlebrush Grass	350	0	-350
Elymus riparius	Riverbank Wild Rye	650	900	+250
Elymus virginicus	Virginia Wild Rye	650	650	0
	Total	**2700**	**2700**	**0**

Assumes Wetland Mudlfat Planting Area = ~0.53 acres

Wetland Planting List (Planned 0.53 ac; As-Built 0.59 ac.)

Botanical Name	Common Name	Planned Qty.	As-Built Qty.	Variance from Planned
Acer saccharinum	Silver Maple	20	**30**	*+10*
Carya laciniosa	Shellbark Hickory	25	**25**	*0*
Cephalanthus occidentalis	Buttonbush	140	**140**	*0*
Quercus bicolor	Swamp White Oak	25	**30**	*+5*
Plantanus occidentalis	American Sycamore	25	**30**	*+5*
Salix nigra	Black Willow	15	**20**	*+5*
	Total	250	**275**	*+25*

Trees and shrubs planted on average 10' centers (435 stems/acre)

SCALE IN FEET

GRAPHIC SCALE VERIFICATION
This bar measures 1" on 22"x34" or 1/2" on 11"x17" original.
Adjust scale accordingly.

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PHASE 2 SEED MIXES / PLANTING LISTS
OAK GLEN PIPELINE RELEASE INCIDENT - PRIMARY RESTORATION CONSTRUCTION
AS-BUILTS

REVISION
A | 07/15/16 | Revised per Trustee / Stakeholder comments dated 6/10/16

STAMP:
AS-BUILT

DRAWN BY: SKL
DESIGNED BY: AS
DATE: MAR 2019
JOB NO: J143037800

SHEET NO.
31
OF 33

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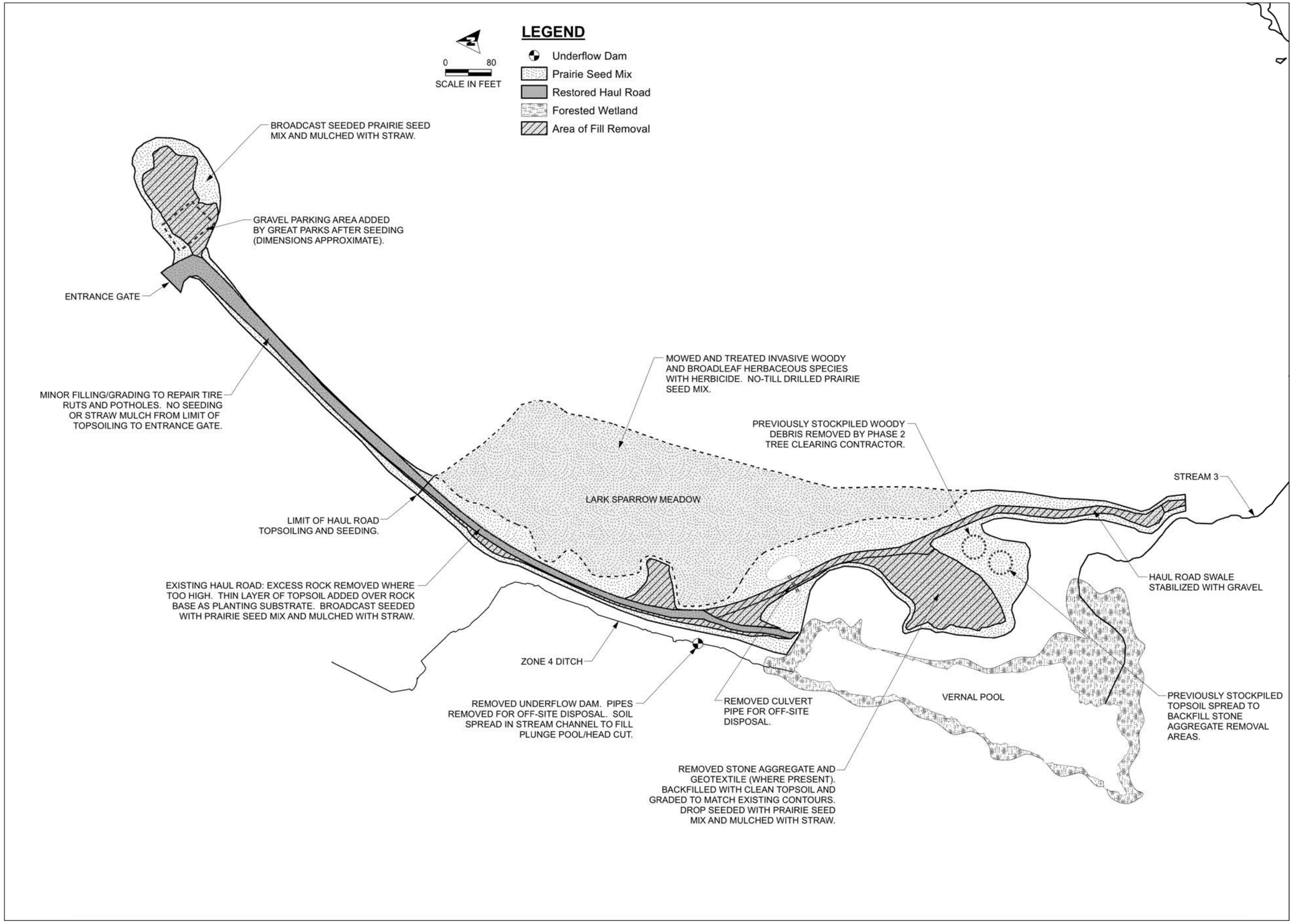

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PHASE 3 TREATMENT AND SEEDING PLAN
OAK GLEN PIPELINE RELEASE INCIDENT - PRIMARY RESTORATION CONSTRUCTION
AS-BUILTS

REVISION		
A	07/15/16	Revised per Trustee / Stakeholder comments dated 6/10/16

STAMP:

AS-BUILT

DRAWN BY:	SKL
DESIGNED BY:	AS
DATE:	MAR 2019
JOB NO:	J143037800

SHEET NO.

32

OF 33

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Last Saved By: Stephen LaFon 3/1/2019 3:19:16 PM
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Woodland Riparian Mix

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Carex frankii	Bristly Cattail Sedge	7.50	7.50	0.00
Bromus pubescens	Woodland Brome	16.00	16.00	0.00
Elymus canadensis	Canada Wild Rye	28.00	28.00	0.00
Elymus hystrix	Bottlebrush Grass	5.00	5.00	0.00
Elymus riparius	Riverbank Wild Rye	22.00	22.00	0.00
Elymus villosus	Silky Wild Rye	32.00	32.00	0.00
Elymus virginicus	Virginia Wild Rye	72.00	72.00	0.00
	Total	**182.50**	**182.50**	**0.00**
Aquilegia canadensis	Wild Columbine	0.50	1.20	+0.70
Actaea racemosa	Black Cohosh	2.00	0.00	-2.00
Aster cordifolius	Heart-Leaved Aster	1.00	1.00	0.00
Aster lateriflorus	Side-Flowering Aster	0.75	0.75	0.00
Aster novae-angliae	New England Aster	2.00	2.00	0.00
Aster shortii	Short's Aster	0.75	0.75	0.00
Impatiens capensis	Jewelweed*	4.00	0.00	-4.00
Lobelia siphilitica	Great Blue Lobelia*	0.25	0.43	+0.18
Monarda fistulosa	Wild Bergamot	1.50	1.50	0.00
Penstemon digitalis	Foxglove Beardtongue	1.25	1.25	0.00
Solidago caesia	Blue-Stemmed Goldenrod	0.25	0.25	0.00
Verbena urticifolia	Hairy White Vervain	1.25	1.25	0.00
Verbesina alternifolia	Wingstem	2.50	2.50	0.00
	Total	**18.00**	**12.88**	**-5.12**
Avena sativa	Common Oat	360.00	360.00	0.00
Lolium multiflorum	Annual Rye	100.00	100.00	0.00
	Total	**460.00**	**460.00**	**0.00**

*A transposition error was found in the planned applications rates for Jewelweed and Great Blue Lobelia between the Phase 1 Narrative Plan and the Plan Set, as referenced in the Phase 3 Primary Restoration Plan; Planned application rates noted above reflect the rates that were listed in the Phase 1 Plan Set.

Prairie Seed Mix

Botanical Name	Common Name	Planned Ounces/Acre	As-Built Ounces/Acre	Variance from Planned
Permanent Grasses:				
Andropogon gerardii	Big Bluestem	12.00	12.00	0.00
Bouteloua curtipendula	Side-Oats Grama	16.00	16.00	0.00
Carex spp.	Prairie Sedge Mix	3.00	3.00	0.00
Elymus canadensis	Canada Wild Rye	24.00	24.00	0.00
Panicum virgatum	Switchgrass	2.50	2.50	0.00
Schizachyrium scoparium	Little Bluestem	28.00	28.00	0.00
Sorghastrum nutans	Indian Grass	12.00	12.00	0.00
	Total	**97.50**	**97.50**	**0.00**
Temporary Cover:				
Avena sativa	Common Oat	360.00	360.00	0.00
Lolium multiflorum	Annual Rye	100.00	100.00	0.00
	Total	**460.00**	**460.00**	**0.00**
Forbs:				
Asclepias syriaca	Common Milkweed	1.00	1.00	0.00
Asclepias tuberosa	Butterfly Weed	1.00	1.00	0.00
Chamaecrista fasciculata	Partridge Pea	9.00	9.00	0.00
Coreopsis lanceolata	Sand Coreopsis	5.00	5.00	0.00
Echinacea purpurea	Broad-leaved Purple Coneflower	7.50	7.50	0.00
Heliopsis helianthoides	False Sunflower	0.25	0.25	0.00
Lupinus perennis	Wild Lupine	1.00	1.00	0.00
Monarda fistulosa	Wild Bergamot	0.50	0.50	0.00
Penstemon digitalis	Foxglove Beard Tongue	1.00	1.00	0.00
Pycnanthemum virginianum	Common Mountain Mint	0.50	0.50	0.00
Ratibida pinnata	Yellow Coneflower	3.50	3.50	0.00
Rudbeckia hirta	Black-Eyed Susan	8.00	8.00	0.00
Solidago speciosa	Showy Goldenrod	1.00	1.00	0.00
Symphyotrichum laeve	Smooth Blue Aster	0.50	0.50	0.00
Symphyotrichum novae-angliae	New England Aster	0.75	0.75	0.00
	Total	**40.50**	**40.50**	**0.00**

SCALE IN FEET

GRAPHIC SCALE VERIFICATION
This bar measures 1" on 22"x34"
or 1/2" on 11"x17" original.
Adjust scale accordingly.

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PHASE 3 SEED MIXES
OAK GLEN PIPELINE RELEASE INCIDENT -
PRIMARY RESTORATION CONSTRUCTION
AS-BUILTS

REVISION

A	07/15/16	Revised per Trustee / Stakeholder comments dated 6/10/16

STAMP:

AS-BUILT

DRAWN BY:	SKL
DESIGNED BY:	AS
DATE:	MAR 2019
JOB NO:	J143037800

SHEET NO.

33

OF 33

Location: R:\Projects\14\143\143037800_CentrixENTRIX_OakGlen\NPICAD\AsBuilt_Year1_20190228\31-OakGlen-Seed Mix.dwg
Layout Tab Name: 33-Seed Mix, Images - Xrefs
Last Saved By: Stephen LaFon Saved: March 1, 2019 3:19:51 PM
Plotted By: Stephen LaFon Plotted: March 1, 2019, 3:21:18 PM