GAYLORD ROAD CULVERT REPLACEMENT

GAYLORD ROAD · TOWN OF OWEGO · TIOGA COUNTY NEW YORK

TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT

30% DESIGN SUBMISSION

DECEMBER 23, 2019

PREPARED FOR

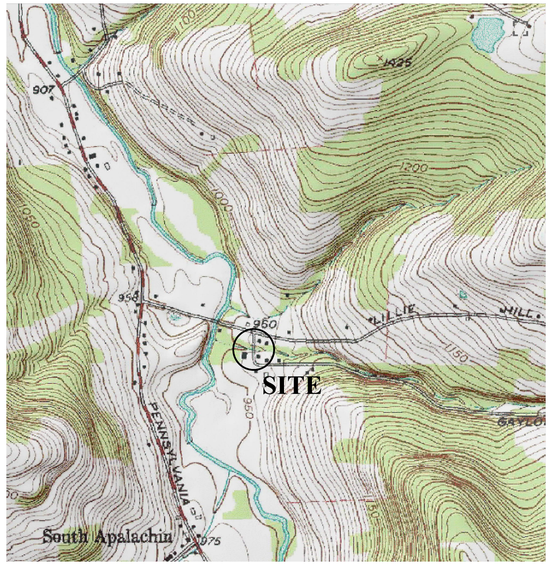
TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
183 CORPORATE DRIVE
OWEGO, NY 13827

PREPARED BY

FUSS & O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

SHEET INDEX

SHEET No.	SHEET TITLE
GI-001	COVER SHEET
EX-101	EXISTING CONDITIONS PLAN
CP-101	SELECTIVE DEMOLITION PLAN
CG-101	CULVERT REPLACEMENT GRADING PLAN
CS-101	CULVERT REPLACEMENT AND SITE RESTORATION PLAN
PR-101	CULVERT REPLACEMENT AND STREAM PROFILE
CD-501	CULVERT REPLACEMENT DETAILS

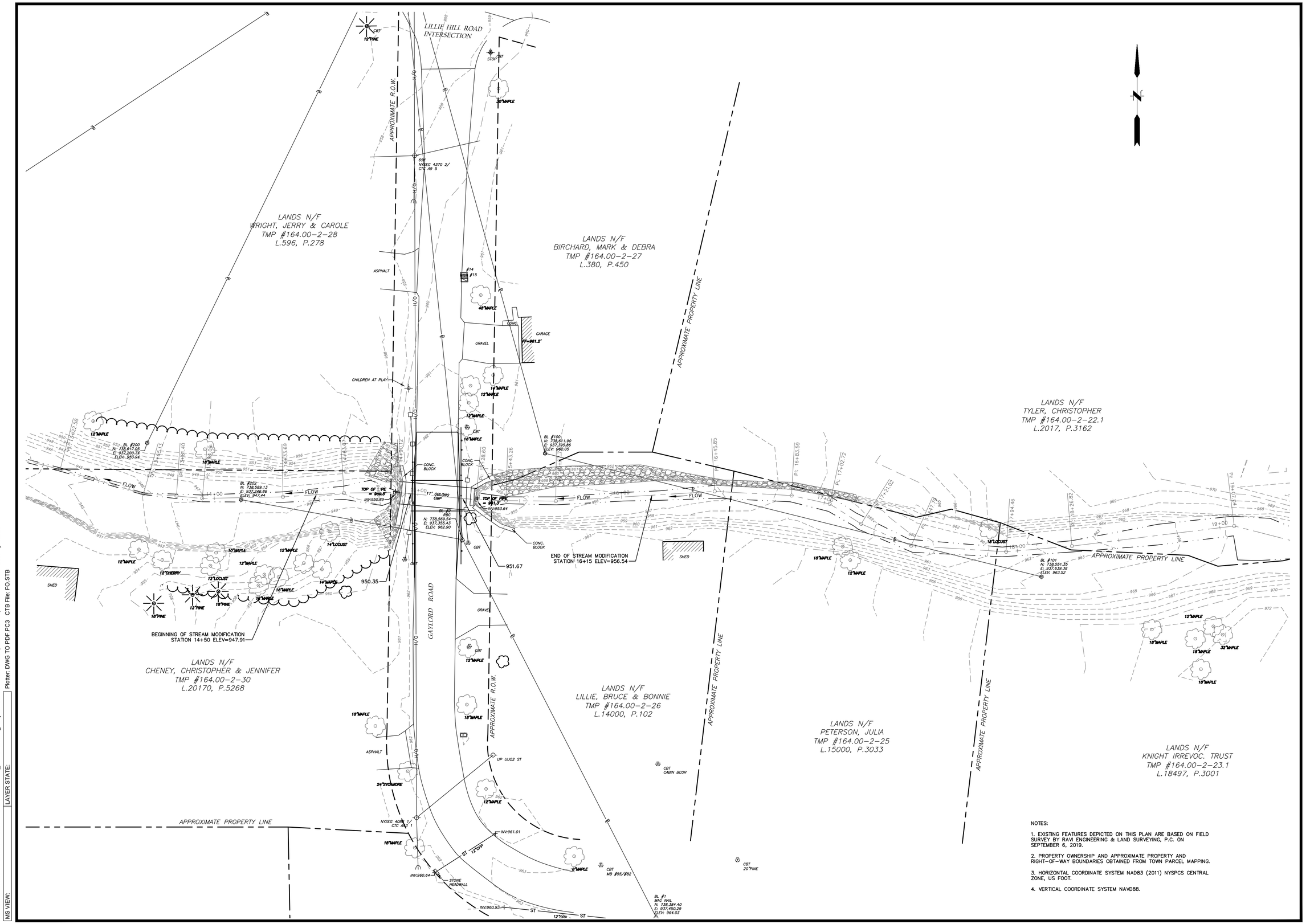


LOCATION MAP
SCALE: 1" =NOT TO SCALE

PROJ. No.: 20180471.A10
DATE: DECEMBER, 2019

GI-001

File Path: J:\DWG\P20180471A10\Civil\Plan\20180471A10_COV01.dwg, Layout: COV-001 GAYLORD, Plotted: Monday, December 23, 2019, User: sjamalus Plotter: DWG TO PDF.PC3 CTB File: FO.STB



NOTES:

1. EXISTING FEATURES DEPICTED ON THIS PLAN ARE BASED ON FIELD SURVEY BY RAVI ENGINEERING & LAND SURVEYING, P.C. ON SEPTEMBER 6, 2019.

2. PROPERTY OWNERSHIP AND APPROXIMATE PROPERTY AND RIGHT-OF-WAY BOUNDARIES OBTAINED FROM TOWN PARCEL MAPPING.

3. HORIZONTAL COORDINATE SYSTEM NAD83 (2011) NYSPCS CENTRAL ZONE, US FOOT.

4. VERTICAL COORDINATE SYSTEM NAVD88.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.: NAD 83 (2011)
VERT.: NAVD 88
20 10 0 20
GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
EXISTING CONDITIONS PLAN
GAYLORD ROAD CULVERT REPLACEMENT
30% DESIGN SUBMISSION
TOWN OF OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: 12/23/2019

EX-101

File Path: J:\DWG\P2018\0471A10\Civil\Plan\20180471A10_STP01-GL.dwg Layout: EX-101 Plotted: Mon, December 23, 2019 - 1:01 PM User: sjamatus
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
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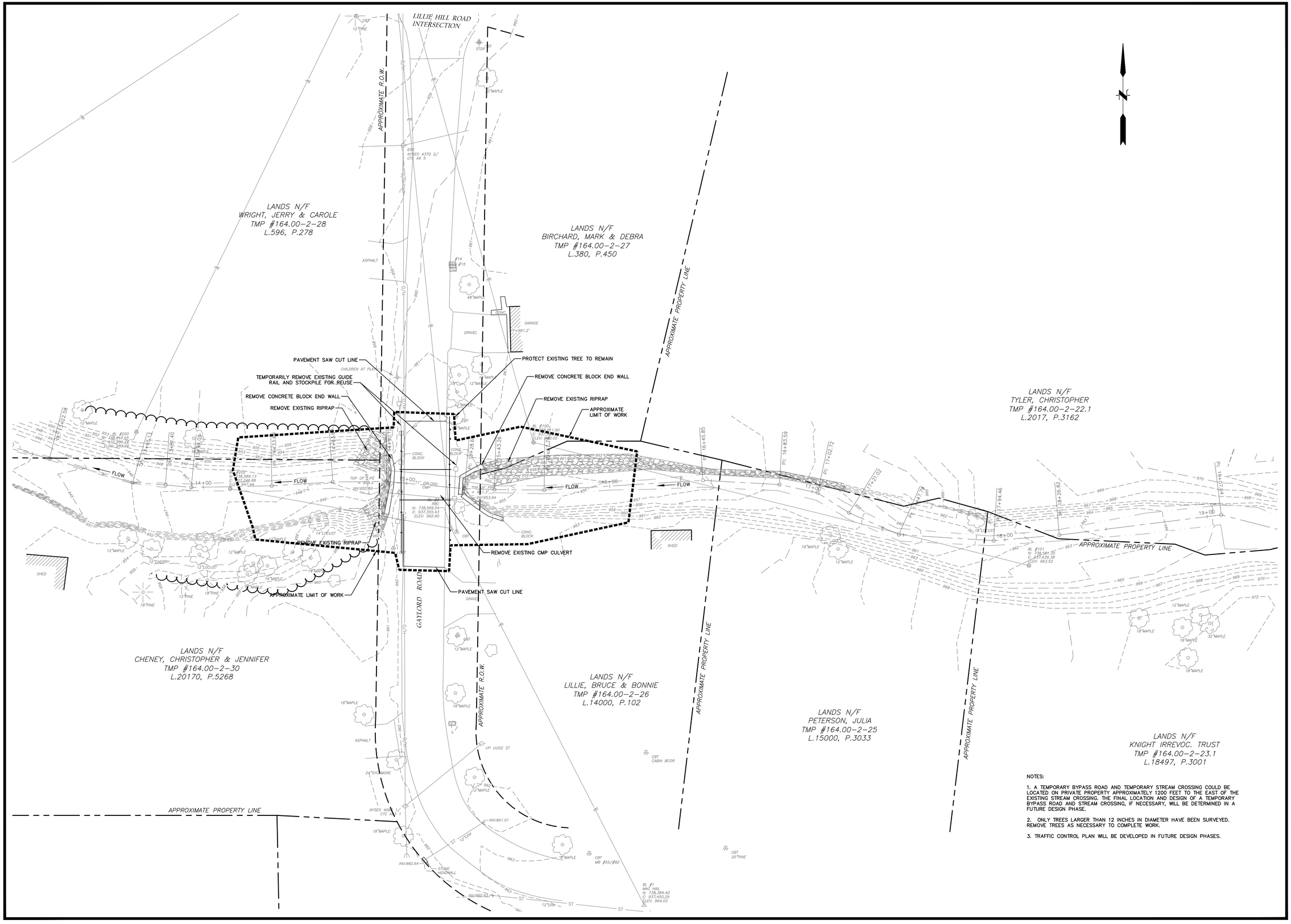
LAYER STATE:



NOTES:

1. A TEMPORARY BYPASS ROAD AND TEMPORARY STREAM CROSSING COULD BE LOCATED ON PRIVATE PROPERTY APPROXIMATELY 1200 FEET TO THE EAST OF THE EXISTING STREAM CROSSING. THE FINAL LOCATION AND DESIGN OF A TEMPORARY BYPASS ROAD AND STREAM CROSSING, IF NECESSARY, WILL BE DETERMINED IN A FUTURE DESIGN PHASE.

2. ONLY TREES LARGER THAN 12 INCHES IN DIAMETER HAVE BEEN SURVEYED. REMOVE TREES AS NECESSARY TO COMPLETE WORK.

3. TRAFFIC CONTROL PLAN WILL BE DEVELOPED IN FUTURE DESIGN PHASES.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.: NAD 83 (2011)
VERT.: NAVD 88
20 10 0 20
GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
SELECTIVE DEMOLITION
GAYLORD ROAD CULVERT REPLACEMENT
30% DESIGN SUBMISSION
TOWN OF OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: 12/23/2019

CP-101

File Path: J:\DWG\P2018\0471\A10\Civil\Plan\20180471A10_STP01-GL.dwg Layout: CP-101 Plotted: Mon, December 23, 2019 - 10:13 AM User: sjamaitus
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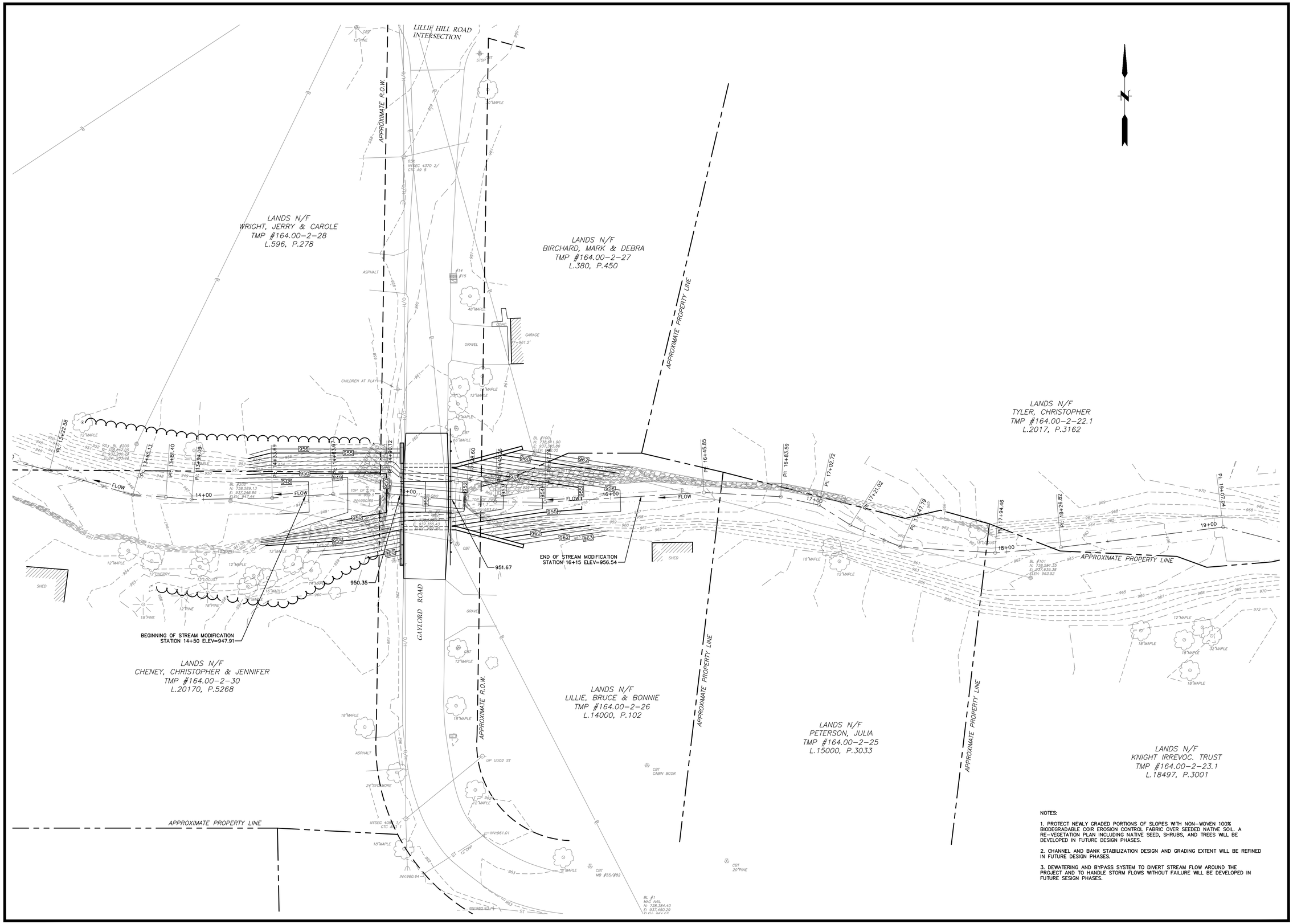

NOTES:

1. PROTECT NEWLY GRADED PORTIONS OF SLOPES WITH NON-WOVEN 100% BIODEGRADABLE COIR EROSION CONTROL FABRIC OVER SEEDED NATIVE SOIL. A RE-VEGETATION PLAN INCLUDING NATIVE SEED, SHRUBS, AND TREES WILL BE DEVELOPED IN FUTURE DESIGN PHASES.

2. CHANNEL AND BANK STABILIZATION DESIGN AND GRADING EXTENT WILL BE REFINED IN FUTURE DESIGN PHASES.

3. DEWATERING AND BYPASS SYSTEM TO DIVERT STREAM FLOW AROUND THE PROJECT AND TO HANDLE STORM FLOWS WITHOUT FAILURE WILL BE DEVELOPED IN FUTURE SESIGN PHASES.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.: NAD 83 (2011)
VERT.: NAVD 88
20 10 0 20
GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
CULVERT REPLACEMENT AND GRADING PLAN
GAYLORD ROAD CULVERT REPLACEMENT
30% DESIGN SUBMISSION
TOWN OF OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: 12/23/2019

CG-101

File Path: J:\DWG\P2018\0471A10\Civil\Plan\20180471A10_STP01-GL.dwg Layout: CG-101 Plotted: Mon, December 23, 2019 - 10:13 AM User: sjamaitus
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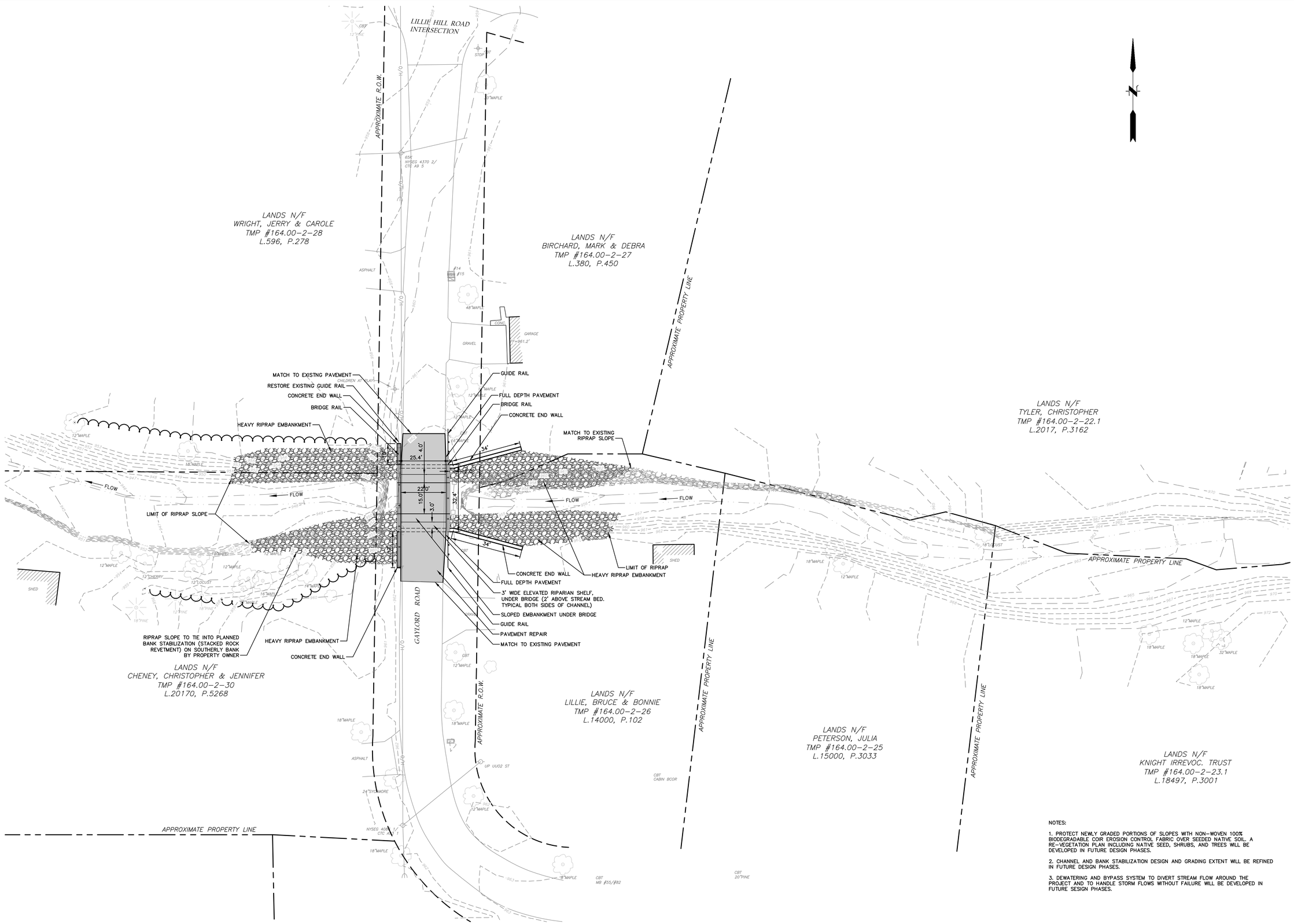

NOTES:

1. PROTECT NEWLY GRADED PORTIONS OF SLOPES WITH NON-WOVEN 100% BIODEGRADABLE COIR EROSION CONTROL FABRIC OVER SEEDED NATIVE SOIL. A RE-VEGETATION PLAN INCLUDING NATIVE SEED, SHRUBS, AND TREES WILL BE DEVELOPED IN FUTURE DESIGN PHASES.

2. CHANNEL AND BANK STABILIZATION DESIGN AND GRADING EXTENT WILL BE REFINED IN FUTURE DESIGN PHASES.

3. DEWATERING AND BYPASS SYSTEM TO DIVERT STREAM FLOW AROUND THE PROJECT AND TO HANDLE STORM FLOWS WITHOUT FAILURE WILL BE DEVELOPED IN FUTURE SESIGN PHASES.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.: NAD 83 (2011)
VERT.: NAVD 88
20 10 0 20
GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
CULVERT REPLACEMENT AND SITE RESTORATION PLAN
GAYLORD ROAD CULVERT REPLACEMENT
30% DESIGN SUBMISSION
TOWN OF OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: 12/23/2019

CS-101

File Path: J:\DWG\P2018\0471\A10\Civil\Plan\20180471A10_STP01-GL.dwg Layout: CS-101 Plotted: Mon, December 23, 2019 - 10:13 AM User: sjamaitus
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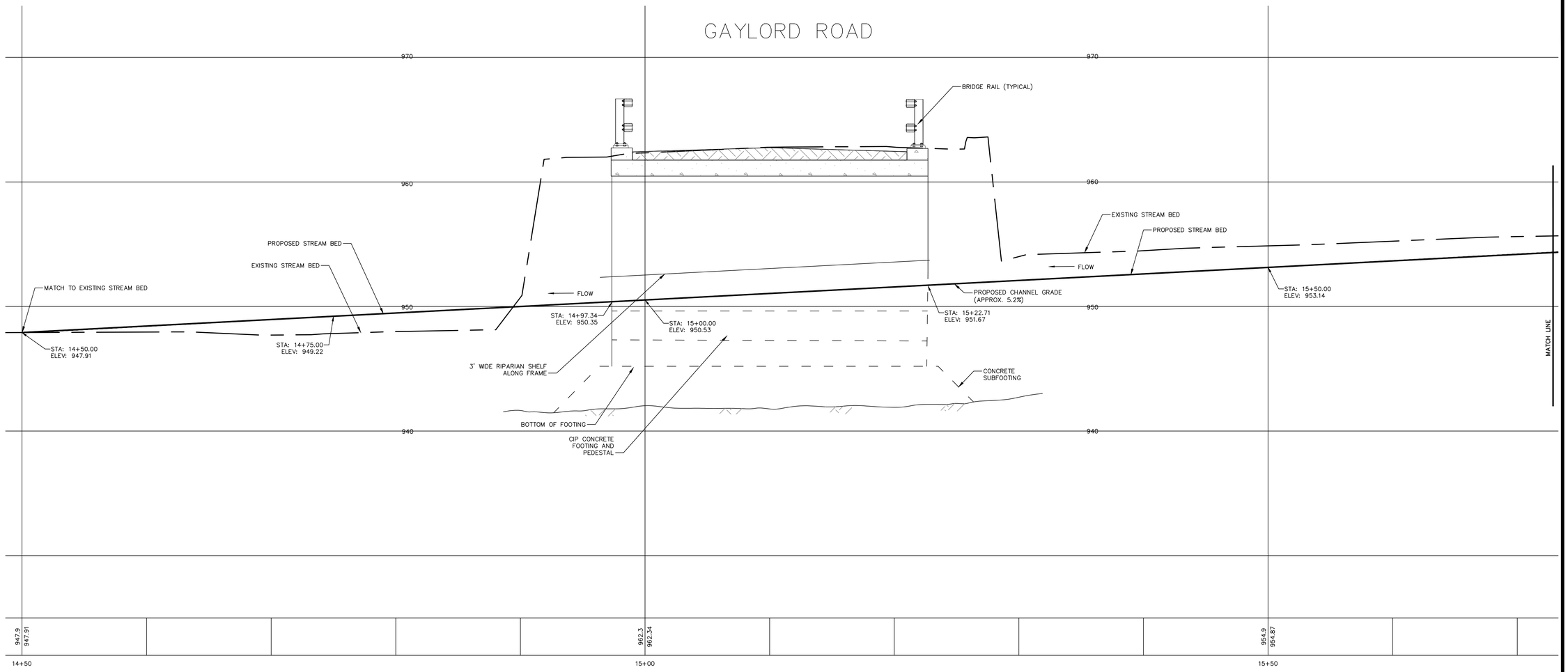
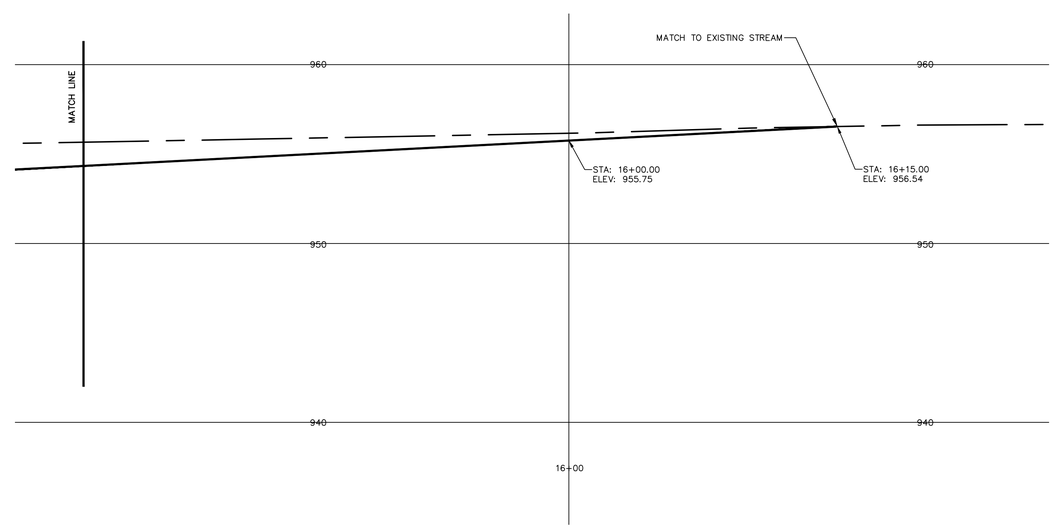


PROFILE STA 10+00 – 20+38
SCALE: H: 1"=4'
V: 1"=4'



No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE:
HORZ.: 1" = 4'
VERT.: 1"=4'

DATUM:
HORZ.: NAD 83 (2011)
VERT.: NAVD 88

4 2 0 4
GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER
CONSERVATION DISTRICT
CULVERT REPLACEMENT AND
STREAM PROFILE
GAYLORD CREEK CULVERT REPLACEMENT
TOWN OF OWEGO NEW YORK

PROJ. No.: 20190471.A10
DATE: 12/23/2019

PR-101

File Path: J:\DWG\P\20190471\A10\Civil\Plan\20190471A10_STP01-GL.dwg Layout: PR-101 Plotted: Mon, December 23, 2019 - 11:56 AM User: sjamaitus
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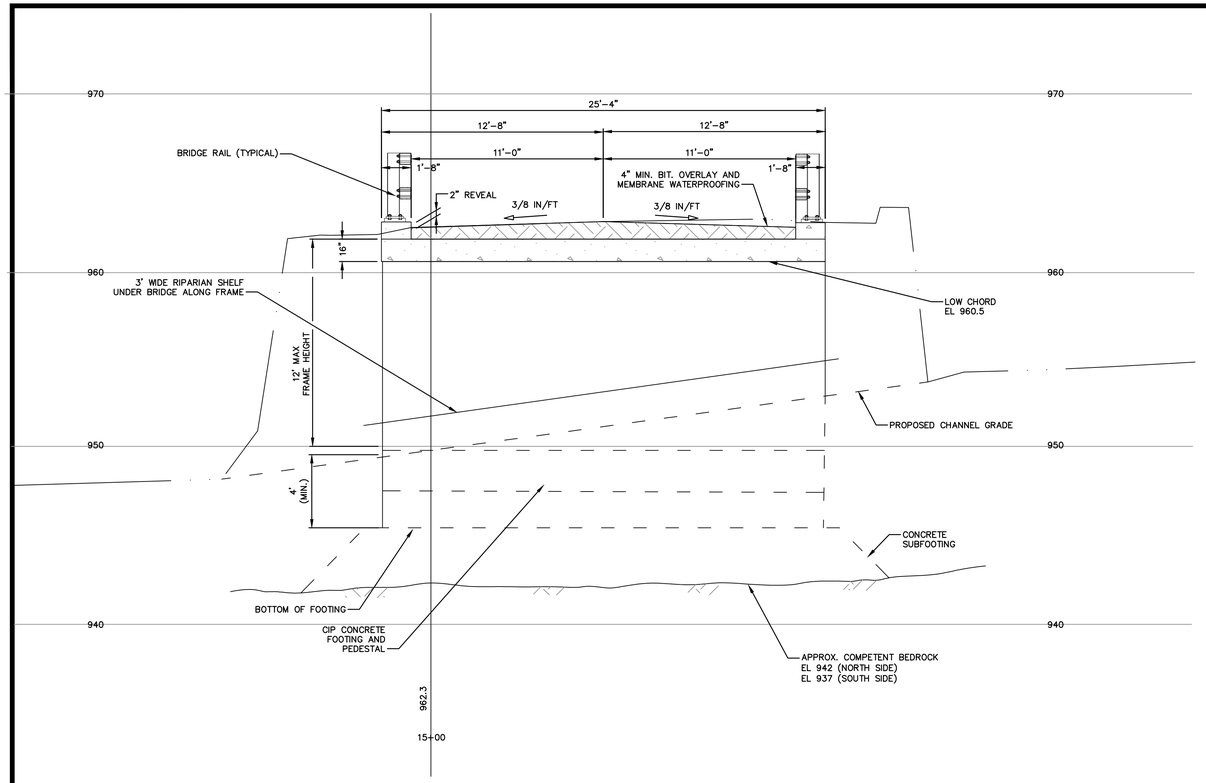
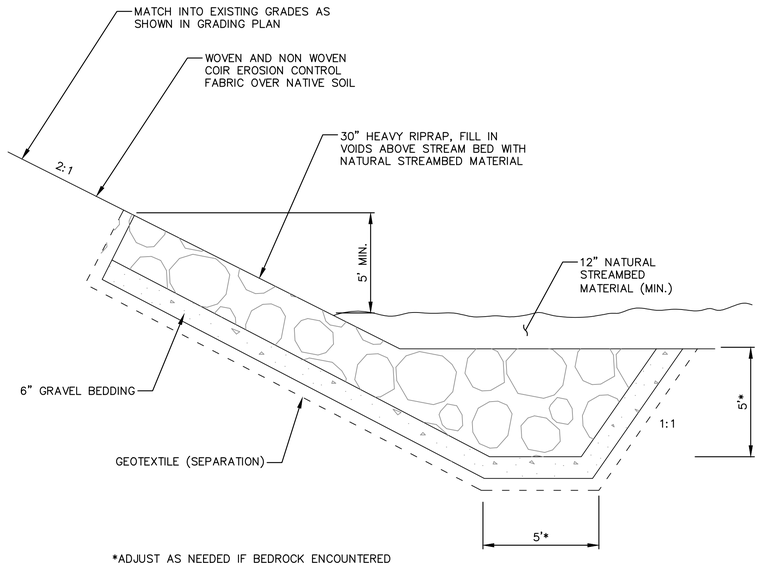


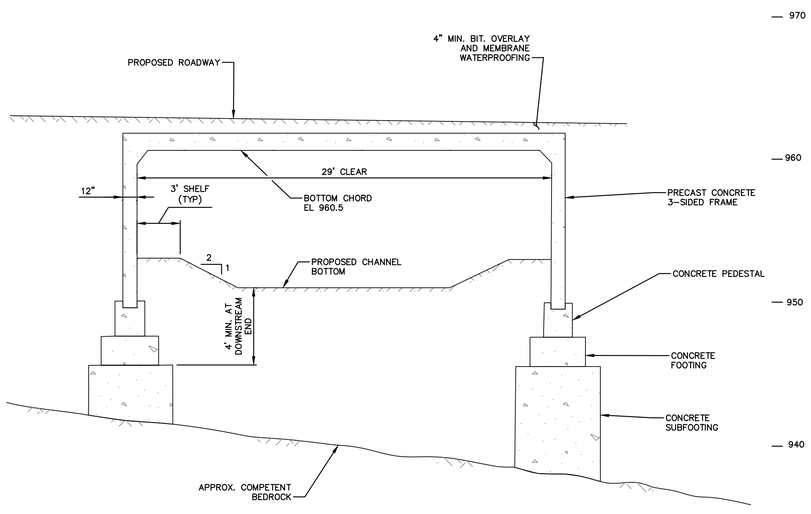
PROFILE VIEW

NOT TO SCALE



TYPICAL SECTION RIPRAP SLOPE PROTECTION

NOT TO SCALE



TYPICAL SECTION STREAM CROSSING STRUCTURE AND FOUNDATION

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SCALE: HORZ.: NOT TO SCALE VERT.:

DATUM: HORZ.: NAD 83 (2011) VERT.: NAVD 88

20 10 0 20 GRAPHIC SCALE

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TIOGA COUNTY SOIL AND WATER CONSERVATION DISTRICT
CULVERT REPLACEMENT AND DETAILS
GAYLORD ROAD CULVERT RENOVATION
30% DESIGN SUBMISSION
TOWN OF OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: 12/23/2019

CD-501

File Path: J:\DWG\P2018\0471\A10\Civil\Plan\20180471A10_COV01.dwg Layout: CD-501 GL Plotted: Mon, December 23, 2019 - 10:13 AM User: sjamaitus
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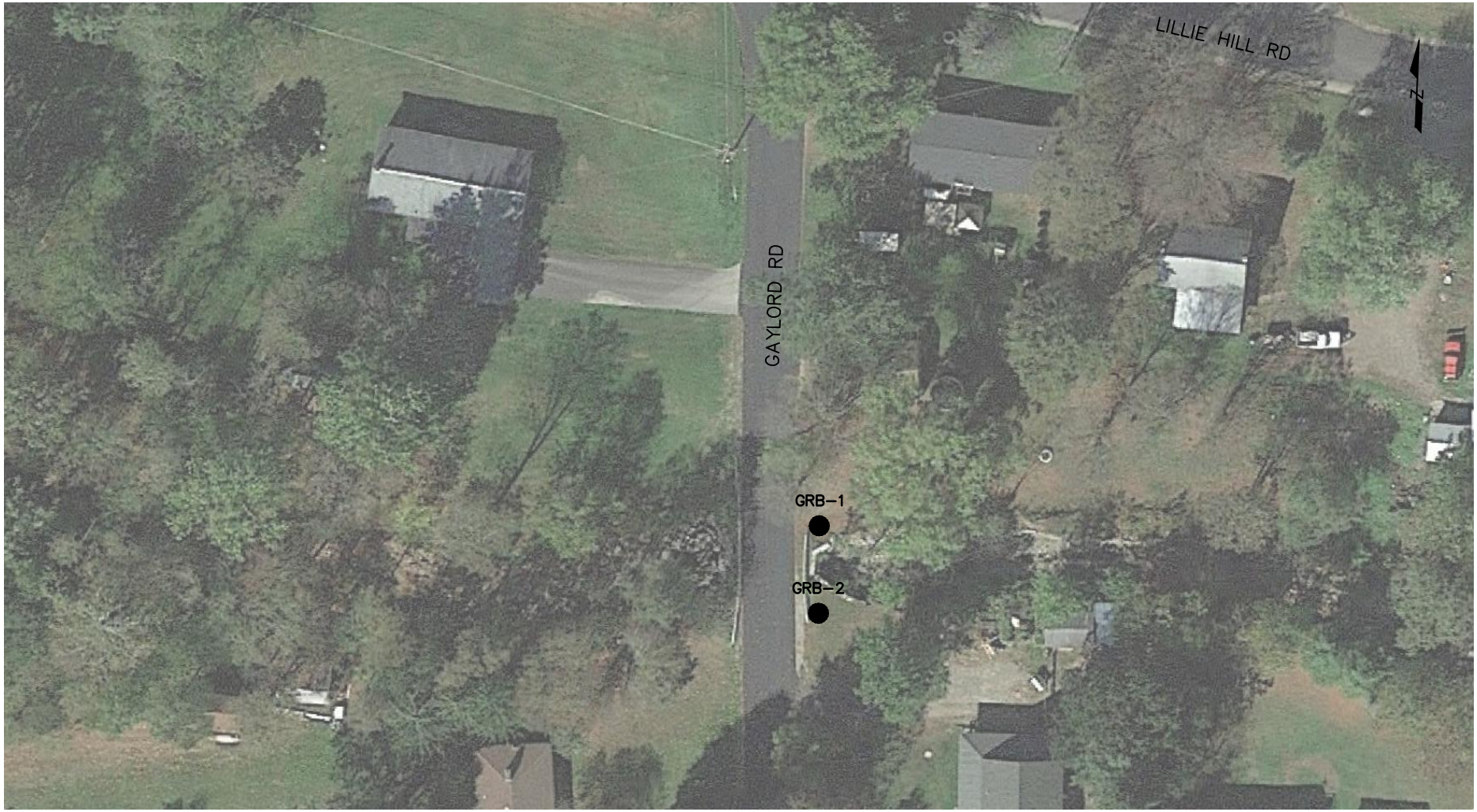
LAYER STATE:



REFERENCES

MAP SHOWING LOCATION OF GAYLORD ROAD, APPALACHIN, NEW YORK. GOOGLE EARTH.

SOIL BORING LOCATIONS ARE APPROXIMATE BASED ON FIELD OBSERVATIONS.

LEGEND

GRB-X ● SOIL BORING LOCATION

SCALE:	
HORZ.: 1" - 60'	
VERT.:	
DATUM:	
HORZ.:	
VERT.:	

0 30 60

GRAPHIC SCALE

FUSS & O'NEILL

146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

INTER-FLUVE ENGINEERING PLLC

TEST BORING LOCATION PLAN

GAYLORD ROAD

OWEGO NEW YORK

PROJ. No.: 20180471.A10
DATE: DECEMBER 2019

FIGURE 1

File Path: C:\Users\sdevincentis\Desktop\Susquehannalsmd_Boring Location Plans_20180471.A10.dwg Layout: GAYLORD Plotted: Tue, December 17, 2019 - 9:19 AM User: sdevincentis
Plotter: DWG TO PDF.PC3 CTB File: FO.STB
MS VIEW: LAYER STATE:

Test Boring Logs

FUSS & O'NEILL

SOIL BORING LOG

BORING NO.: **GRB-1**

Project:	Regional Susquehanna River Initiative Floodplain Management and Stream Restoration	**Project No.:**	20180471.A10
Location:	Gaylord Road, Owego, New York	**Project Mgr:**	Erik Mas, P.E.
Client:	Inter-Fluve Engineering, PLLC	**Field Eng. Staff:**	S. DeVincentis
Drilling Co.:	SJB Services, Inc.	**Date Started:**	November 13, 2019
Driller:	G. Spizzirri	**Date Finished:**	November 14, 2019

Elevation: 962 ft. **Vertical Datum:** NAVD 1988 **Boring Location:** (See Exploration Plan) **Coord.:** Not Surveyed

Horizontal Datum:

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	NX
Length (ft)	5	2	5
Inside Dia. (in.)	4	1.375	1.875
Hammer Wt. (lb.)	140	140	-
Hammer Fall (in.)	30	30	-

Rig Make & Model: Diedrich D-120

☐ Truck ☐ Tripod ☐ Cat-Head
☑ Rubber Tire ☐ Geoprobe ☑ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☐ Cutting Head

Hammer Type: ☐ Safety ☐ Doughnut ☑ Automatic ☐ _____

Drilling Fluid: ☐ Bentonite ☐ Polymer ☑ Water ☐ None

Drill Rod Size: **Casing Advance**: Hollow Stem Auger

Depth/ Elev. (ft)	Sample No. / Interval (ft)	Rec / Pen. (in)	Sample Blows per 6"	Stratum Graphic	USCS Symbol Group	Visual - Manual Identification & Description* (density/consistency, color, Group Name & Symbol, maximum particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	Dilatancy	Toughness	Plasticity	Dry Strength	Remarks
						TOPSOIL 0.5					
960											
5	SS-1 5.0'- 7.0'	7/24	5 3 4 3		FILL	Loose, brown, fine to coarse Sand, some fine to coarse Gravel, little Silt, little clay -FILL- 7.0	-	-	-	-	dry
10	SS-2 10.0'- 11.8'	14/21	15 21 31 50/3"		GM	Very dense, gray to brown, fine to coarse Gravel, some fine to coarse Sand, little Silt, little Clay -RESIDUAL SOIL- Piece of fractured bedrock @ 10.75'	-	-	-	-	dry
950											
15	SS-3 15.0'- 17.0'	22/24	7 23 26 42		GM	Dense, gray, fine to coarse Gravel, some fine to coarse Sand, little Silt, little Clay -RESIDUAL SOIL- 16.5	-	-	-	-	wet at 16.25'
						Very dense, gray, Weathered Shale 20.0	-	-	-	-	Auger Refusal at 20'

Water Level Data

Date	Time	Elapsed Time (hr)	Depth in feet: Bottom of Hole	Depth in feet: Water

Minor Constituent Proportions

And	35 - 50%
Some	20 - 35%
Little	10 - 20%
Trace	<10%

Soil Density

Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Soil Consistency

Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

Sample Type

SS	Split Spoon
ST	Shelby Tube
GS	Grab Sample
ET	Extruded Tube

Notes: Boring Terminated at 35 feet

Boring No.: **GRB-1**

Field Test Legend: Dilatancy: N - None S - Slow R - Rapid Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

FUSS & O'NEILL

SOIL BORING LOG
(continued)

BORING NO.: **GRB-1**

Depth/ Elev. (ft)	Sample No. / Interval (ft)	Rec / Pen. (in)	Sample Blows per 6"	Stratum Graphic	USCS Symbol Group	Visual - Manual Identification & Description* (density/consistency, color, Group Name & Symbol, maximum particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	Field Tests: Dilatancy	Toughness	Plasticity	Dry Strength	Remarks*
	RC-1 20.0'-25.0'	18/60				SHALE, gray, moderately to highly weathered, extremely close to close joint spacing	-	-	-	-	Core Rate (min/foot) 4 2.5 2 1.5 2 RQD = 0%
940											
25	RC-2 25.0'-30.0'	12/60				SHALE, gray, moderately to highly weathered, extremely close to close joint spacing	-	-	-	-	Core Rate (min/foot) 2 1.5 3 2.5 3 RQD = 0%
30	RC-3 30.0'-35.0'	14/60				SHALE, gray, moderately to highly weathered, extremely close to close joint spacing	-	-	-	-	Core Rate (min/foot) 1.5 2.5 2 2.5 2 RQD = 0%
930											
35						35.0					
40											
920											
45											

NOTES:

PROJECT NO.: **20180471.A10**

BORING NO.: **GRB-1**

NOTES: Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

FUSS & O'NEILL

SOIL BORING LOG

BORING NO.: **GRB-2**

Project:	Regional Susquehanna River Initiative Floodplain Management and Stream Restoration	**Project No.:**	20180471.A10
Location:	Gaylord Road, Owego, New York	**Project Mgr:**	Erik Mas, P.E.
Client:	Inter-Fluve Engineering, PLLC	**Field Eng. Staff:**	S. DeVincentis
Drilling Co.:	SJB Services, Inc.	**Date Started:**	November 14, 2019
Driller:	G. Spizzirri	**Date Finished:**	November 14, 2019

Elevation: 962 ft. **Vertical Datum:** NAVD 1988 **Boring Location:** (See Exploration Plan) **Coord.:** Not Surveyed

Horizontal Datum:

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	-
Length (ft)	5	2	-
Inside Dia. (in.)	4	1.375	-
Hammer Wt. (lb.)	140	140	-
Hammer Fall (in.)	30	30	-

Rig Make & Model: Diedrich D-120

☐ Truck ☐ Tripod ☐ Cat-Head
☑ Rubber Tire ☐ Geoprobe ☑ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☐ Cutting Head

Hammer Type: ☐ Safety ☐ Doughnut ☑ Automatic ☐ _____

Drilling Fluid: ☐ Bentonite ☐ Polymer ☐ Water ☐ None

Drill Rod Size:

Casing Advance: Hollow Stem Auger

Depth/ Elev. (ft)	Sample No. / Interval (ft)	Rec / Pen. (in)	Sample Blows per 6"	Stratum Graphic	USCS Symbol Group	Visual - Manual Identification & Description* (density/consistency, color, Group Name & Symbol, maximum particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	Dilatancy	Toughness	Plasticity	Dry Strength	Remarks
						TOPSOIL 0.5					
960											
5	SS-1 5.0'- 6.3'	7/15	5 6 50/3"		FILL	Very dense, brown, fine to coarse Sand, some fine to coarse Gravel, little Silt, little clay, occasional cobbles and boulders -FILL-	-	-	-	-	dry
10	SS-2 10.0'- 12.0'	13/24	33 21 25 21		FILL	Dense, brown, fine to coarse Sand, some Gravel, little Silt, little Clay -FILL-	-	-	-	-	dry
						12.0					
950											
15	SS-3 15.0'- 15.3'	4/4	50/4"		GM	15' to 15.3': Very dense, gray to brown, fine to coarse Gravel, some fine to coarse Sand, little Silt, little Clay -RESIDUAL SOIL- Piece of fractured bedrock @ 15.3'	-	-	-	-	dry

Water Level Data

Date	Time	Elapsed Time (hr)	Depth in feet: Bottom of Hole	Depth in feet: Water

Minor Constituent Proportions

And	35 - 50%
Some	20 - 35%
Little	10 - 20%
Trace	<10%

Soil Density

Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Soil Consistency

Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	>30

Sample Type

SS	Split Spoon
ST	Shelby Tube
GS	Grab Sample
ET	Extruded Tube

Notes: Boring Terminated at 42 feet

Boring No.: **GRB-2**

Field Test Legend: Dilatancy: N - None S - Slow R - Rapid Plasticity: NP - Non-Plastic L - Low M - Medium H - High
Toughness: L - Low M - Medium H - High Dry Strength: N - None L - Low M - Medium H - High VH - Very High

NOTES: Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

FUSS & O'NEILL

SOIL BORING LOG
(continued)

BORING NO.: **GRB-2**

Depth/ Elev. (ft)	Sample No. / Interval (ft)	Rec / Pen. (in)	Sample Blows per 6"	Stratum Graphic	USCS Symbol Group	Visual - Manual Identification & Description* (density/consistency, color, Group Name & Symbol, maximum particle size, structure, odor, moisture, optional descriptions, geologic interpretation)	Field Tests: Dilatancy	Toughness	Plasticity	Dry Strength	Remarks*
	SS-4 20.0'-22.0'	18/24	34 32 34 31		GM	Very dense, gray to brown, fine to coarse Gravel, some fine to coarse Sand, little Silt, little Clay -RESIDUAL SOIL-	-	-	-	-	wet at 21.25'
940											
25						25.0					
	SS-5 25.0'-25.5'	4/6	50/6"			Very dense, gray, Weathered Shale	-	-	-	-	
30	SS-6 30.0'-32.0'	10/24	24 30 35 37			Very dense, gray, Weathered Shale	-	-	-	-	
930											
35	SS-7 35.0'-37.0'	18/24	13 23 22 17			Dense, gray, Weathered Shale	-	-	-	-	
40	SS-8 40.0'-42.0'	10/24	10 21 25 46			Dense, gray, Weathered Shale	-	-	-	-	
						42.0					
920											
45											

NOTES:

PROJECT NO.: **20180471.A10**

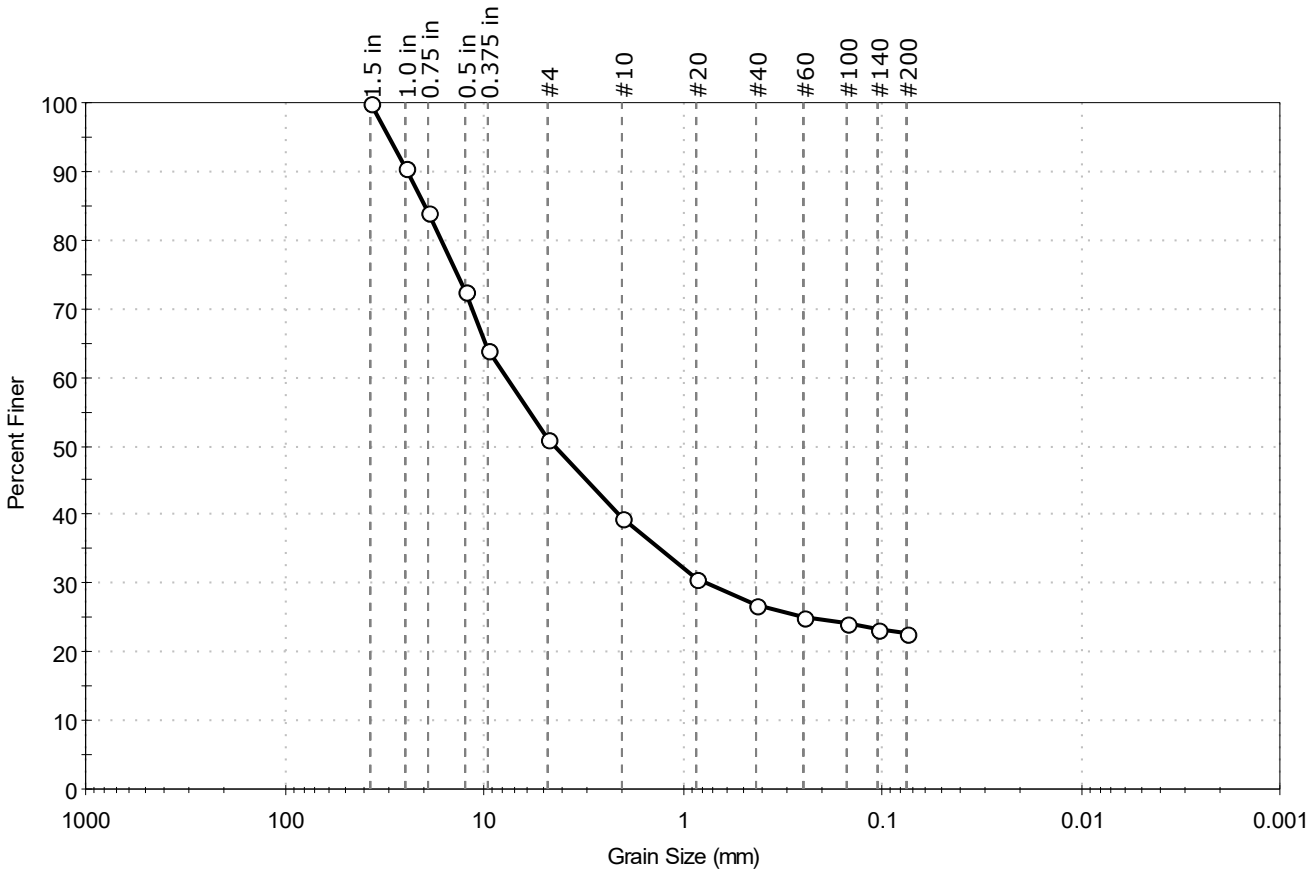
BORING NO.: **GRB-2**

NOTES: Soil identifications and field tests based on visual-manual methods per ASTM D2488 and using the modified Burmister System

Gradation Test Report

Client:	Fuss & O'Neill, Inc.				
Project:	Susquehanna River				
Location:	Appalacin & Nichols, NY			Project No:	GTX-310984
Boring ID:	GRB-2	Sample Type:	tube	Tested By:	GA
Sample ID:	S4	Test Date:	12/05/19	Checked By:	bfs
Depth :	20-22	Test Id:	532196		
Test Comment:	---				
Visual Description:	Moist, gray silty gravel with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	48.9	28.3	22.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1.0 in	25.00	91		
0.75 in	19.00	84		
0.5 in	12.50	73		
0.375 in	9.50	64		
#4	4.75	51		
#10	2.00	40		
#20	0.85	31		
#40	0.42	27		
#60	0.25	25		
#100	0.15	24		
#140	0.11	23		
#200	0.075	23		

Coefficients

D_{85} = 19.7848 mm D_{30} = 0.7413 mm

D_{60} = 7.6856 mm D_{15} = N/A

D_{50} = 4.3506 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD