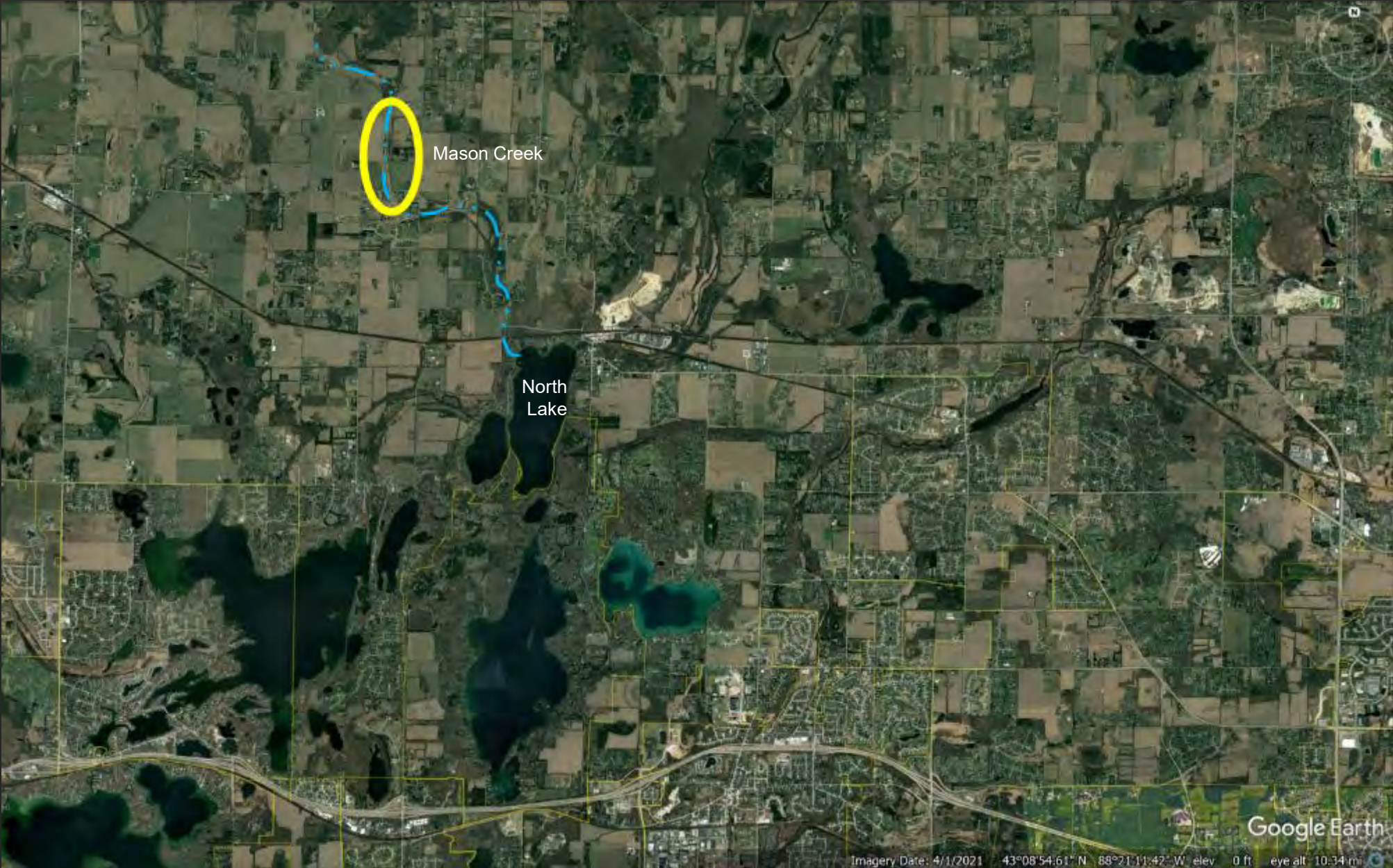




# MASON CREEK

STREAMBANK RESTORATION FOR IMPROVED  
WATER QUALITY





Mason Creek

North  
Lake

Google Earth

Imagery Date: 4/1/2021 43°08'54.61" N 88°21'11.42" W elev 0 ft eye alt 10.34 mi

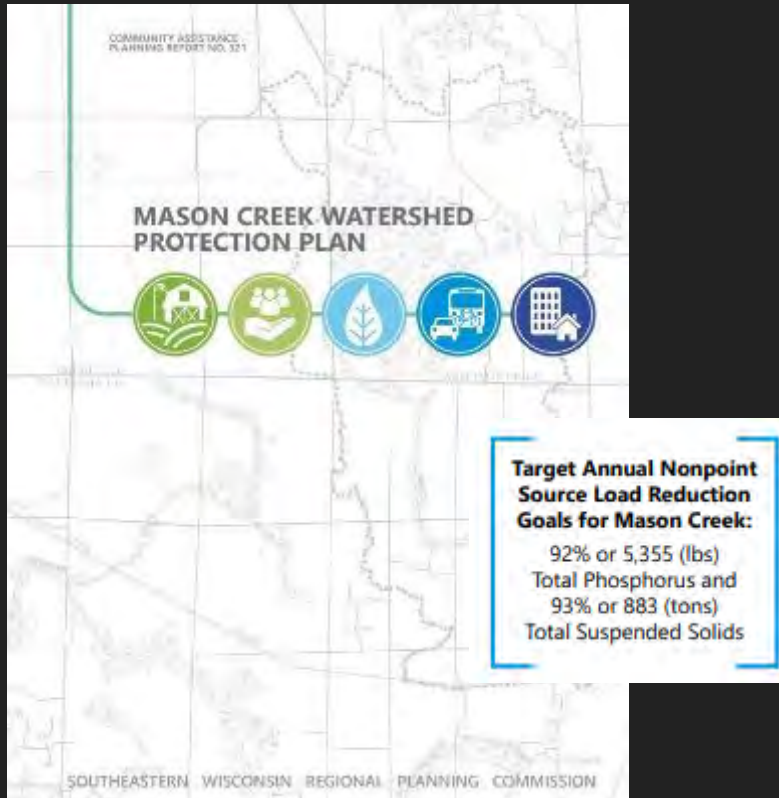


## Mason Creek Pre-Construction Conditions

- Agricultural land use → channelization, sediment & phosphorus loading
- Watershed position → brook trout & remnant sedge meadow

# Mason Creek Funding

- 2018 Watershed Plan
- Tall Pines Conservancy & Stantec Grant Assistance Program
  - WDNR Surface Water Program
  - WDNR Wetland Surcharge
  - WDNR Targeted Runoff Management
  - Local & Municipal Contributions



## ***Instream Fish and Wildlife Habitat Recommendations***

- Improve instream flows (i.e., floodwater detention, enhanced groundwater recharge)
- Protect existing high quality components (i.e., brook trout spawning areas)
- Restore degraded stream channels, wetlands, and riparian buffer areas
- Reconnect all portions of Mason Creek to North Lake by removing barriers to aquatic organism passage barriers and restoring latent ecological value to North Lake

# STREAMBANK EVOLUTION: PAST, PRESENT & FUTURE

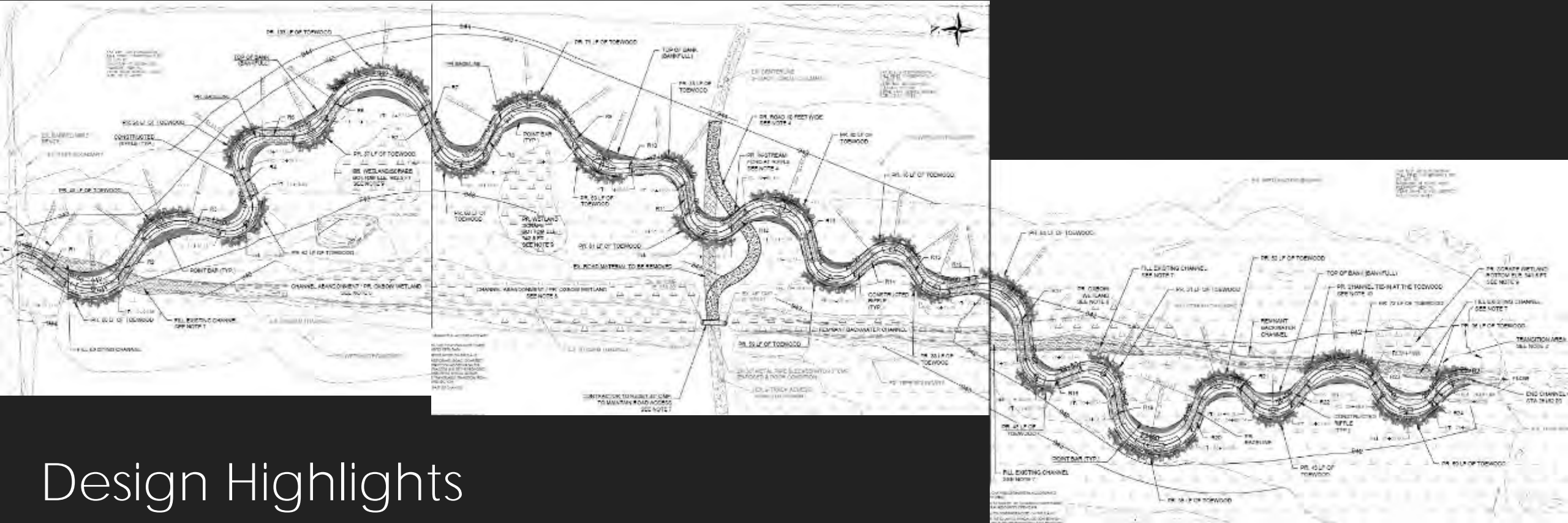
Incision/Downcutting of a Stream Channel Causes Floodplain Disconnection



restoring, protecting and sustaining the Root-Pike basin

[www.rootpikewin.org](http://www.rootpikewin.org)

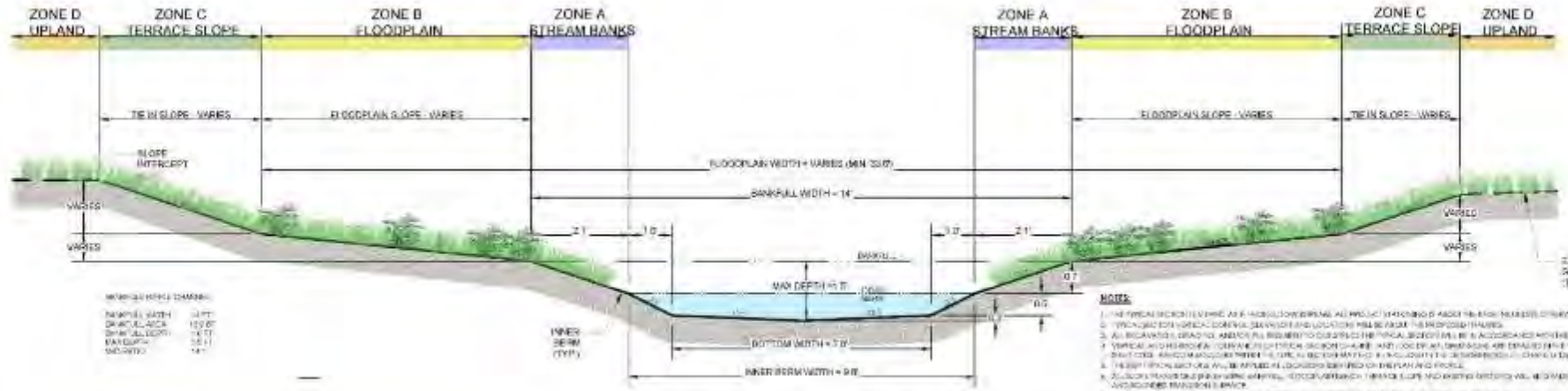




# Design Highlights

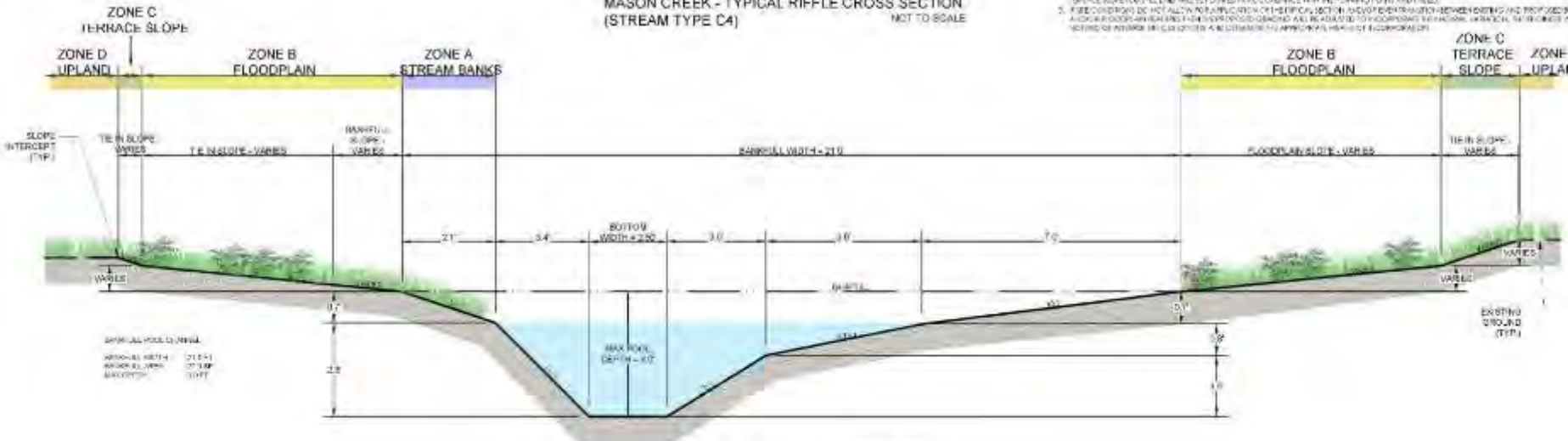
- Meandering, low-gradient, riffle-pool-run-glide stream
- Enhanced floodplain connectivity
- Vegetated banks (toe wood and sod mats)
- Enhanced riffle and runs sections

# Typical Sections



MASON CREEK - TYPICAL RIFFLE CROSS SECTION (STREAM TYPE C4) NOT TO SCALE

- NOTES**
1. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  2. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  3. ALL DIMENSIONS, EXCEPT WHERE SHOWN OTHERWISE, SHALL BE IN FEET AND INCHES.
  4. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  5. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  6. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  7. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  8. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  9. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.
  10. THE RIFFLE SECTION IS TO BE CONSTRUCTED AS A RIFFLE WITH A BENTONITE LINER TO BE INSTALLED TO PREVENT SEEPAGE FROM THE RIFFLE.



MASON CREEK - TYPICAL POOL CROSS SECTION (STREAM TYPE C4) NOT TO SCALE

File Path: \\s:\projects\2014\20140601\_mason\_creek\_restoration\plan\typical\typical\_riffle.dwg (10/11/14) 10:48:00



DATE	DESCRIPTION	BY	CHKD



MASON CREEK STREAM RESTORATION				TALL PINES CONSERVATORY			
REVISED	DATE	BY	APPROVED	DATE	BY	APPROVED	SCALE

DESIGN	
TYPICAL SECTION & PLANTING PLANS	
DATE	

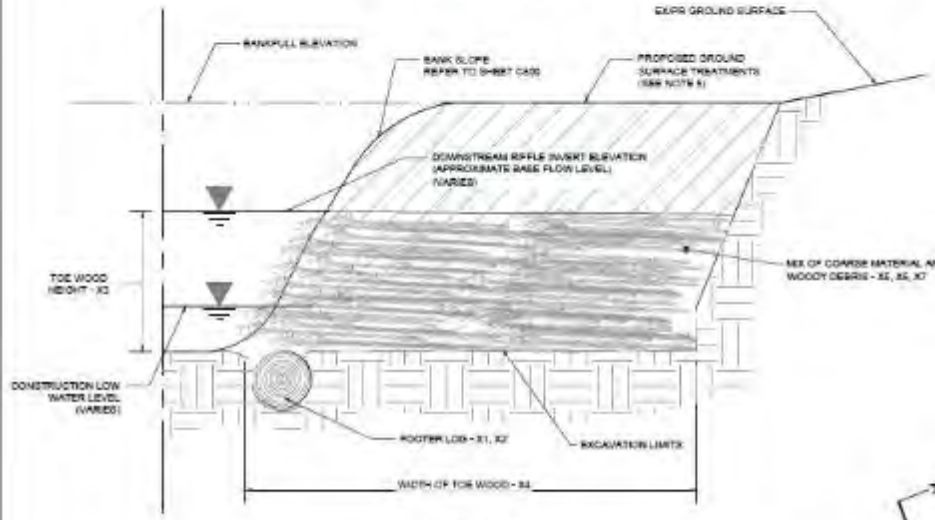
# Toe Wood Detail



PLAN - SYMBOL

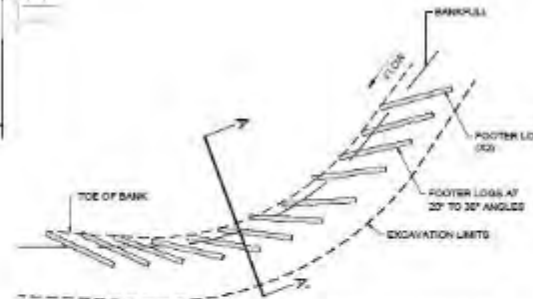
### NOTES

1. DETAIL TYPICAL SECTIONS ARE VIEWED FACING DOWNSTREAM AND APPLICATION OF THE POOL TYPICAL SECTION SHALL BE REVERSED AS WROOD DEPENDING ON THE STREAM AND THE DIRECTION OF THE REND IN THE STREAM APPLICABLE ESTERMSICAL.
2. APPLICABLE ESTERMSICAL:
  - CDS AND CDS - OVERVIEW AND HORIZONTAL DATA
  - ESTERMSICAL - PLAN SHEETS
  - CDS - TYPICAL POOL SECTIONS
3. WOODY MATERIAL OF APPROPRIATE SIZE CONSISTING OF LOGS, TRUNKS, LIMBS, BRANCHES, AND SMALLER WOODY DEBRIS INCLUDING TOPS OR SLABS OR SITE WOODY MATERIAL IS PREFERRED. WOODY DEBRIS SHOULD BE GREEN OR RELATIVELY GREEN AND MAY CONSIST OF HARDWOOD, CONIFER, OR A COMBINATION OF BOTH.
4. ON TOP OF THE INSTALLED TOE WOOD THE CONTRACTOR MAY CONSIDER / INSTALL A VARIETY OF GROUND SURFACE TREATMENTS TO COMPLETE THE BANK SURFACE FROM BANK WARD TO BANKHILL (TOP OF BANK). THE PROPOSED TREATMENTS SHALL CLOSELY MATCH THE PROPOSED SLOPE OF THE TYPICAL POOL SECTION.
5. THE PREFERRED SURFACE TREATMENT IS VEGETATED SOG MATS TAKEN FROM THE ADJACENT FLOODPLAIN. SOG MAT SHALL CONSIST OF SURFACE VEGETATION (GRASSES, FORNS, SHRUBS, SMALL TREES) AND THE UNDERLYING SOG LAYER. MINIMUM IS TYPICALLY 1" OF SOG, HOWEVER IF ROOT STRUCTURE EXTENDS DEEPER THAN 1" THEN THE MAT THICKNESS SHALL BE INCREASED. MATS SHALL BE 4' X 4' IN LENGTH AND 1/2" - 2" IN WIDTH, AVOID SQUARE MATS.
6. COIR WRAPPED SOG MATS AND/OR COMPACTED SOG WITH SURFACE APPLIED MULCH (EROSION CONTROL FABRIC) MAY BE USED IN LOTS OF 500 MATS PENDING APPROVAL BY THE ENGINEER. THE CONTRACTOR SHALL ADJUST CHANGES IN WRITING WITH 2 WEEKS FOR APPROVAL BY ENGINEER AND OWNER.
7. CONSTRUCTION LOW WATER LEVEL VARIES.

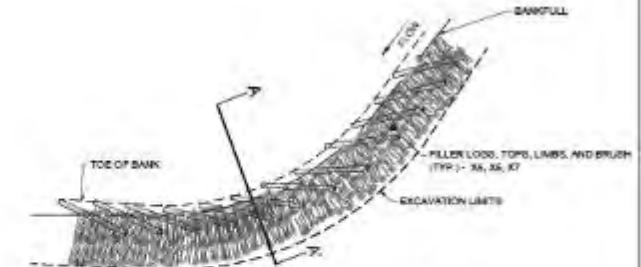


SECTION A-A'

TOE WOOD DIMENSIONS			
VARIABLE	PI RANGE DIMS	TYPICAL DIM	DESCRIPTION
X1	0.0 - 10.0	8"	FOOTER LOG LENGTH
X2	0.0 - 10.0	7"	FOOTER LOG WIDTH
X3	1.0 - 2.0	1"	TOE WOOD HEIGHT
X4	0.0 - 3.0	1"	TOE WOOD WIDTH
X5	0.0 - 5.0	3"	WOODY DEBRIS LENGTH
X6	0.0 - 10.0	7"	WOODY DEBRIS WIDTH
X7	15 - 30	1"	NEEDLE LEAF MATERIAL (SHOULDER VOLUMES)
X8	100	1"	COARSE MATERIAL (TYPICAL)



PLAN VIEW AT CONSTRUCTION LOW WATER ELEVATION



PLAN VIEW AT BASE FLOW ELEVATION

### DETAIL - TOEWOOD

Professional Certification	NO.	REVISION	BY	DATE



MASON CREEK STREAM RESTORATION				TALL PINES CONSERVATORY	
DESIGNED BY	DATE	APPROVED BY	DATE	SCALE	
CHECKED BY	DATE	PROJECT MANAGER	DATE	DRAWN BY	SD
APPROVED BY	DATE	PROJECT MANAGER	DATE	CHECKED BY	SKC
DESIGNED BY	DATE	PROJECT MANAGER	DATE	SHEET NO.	14 OF 18
DESIGNED BY	DATE	PROJECT MANAGER	DATE	PROJECT NO.	10000000
DESIGNED BY	DATE	PROJECT MANAGER	DATE	DATE	2/2021

DESIGN  
DETAILS  
C700



Construction

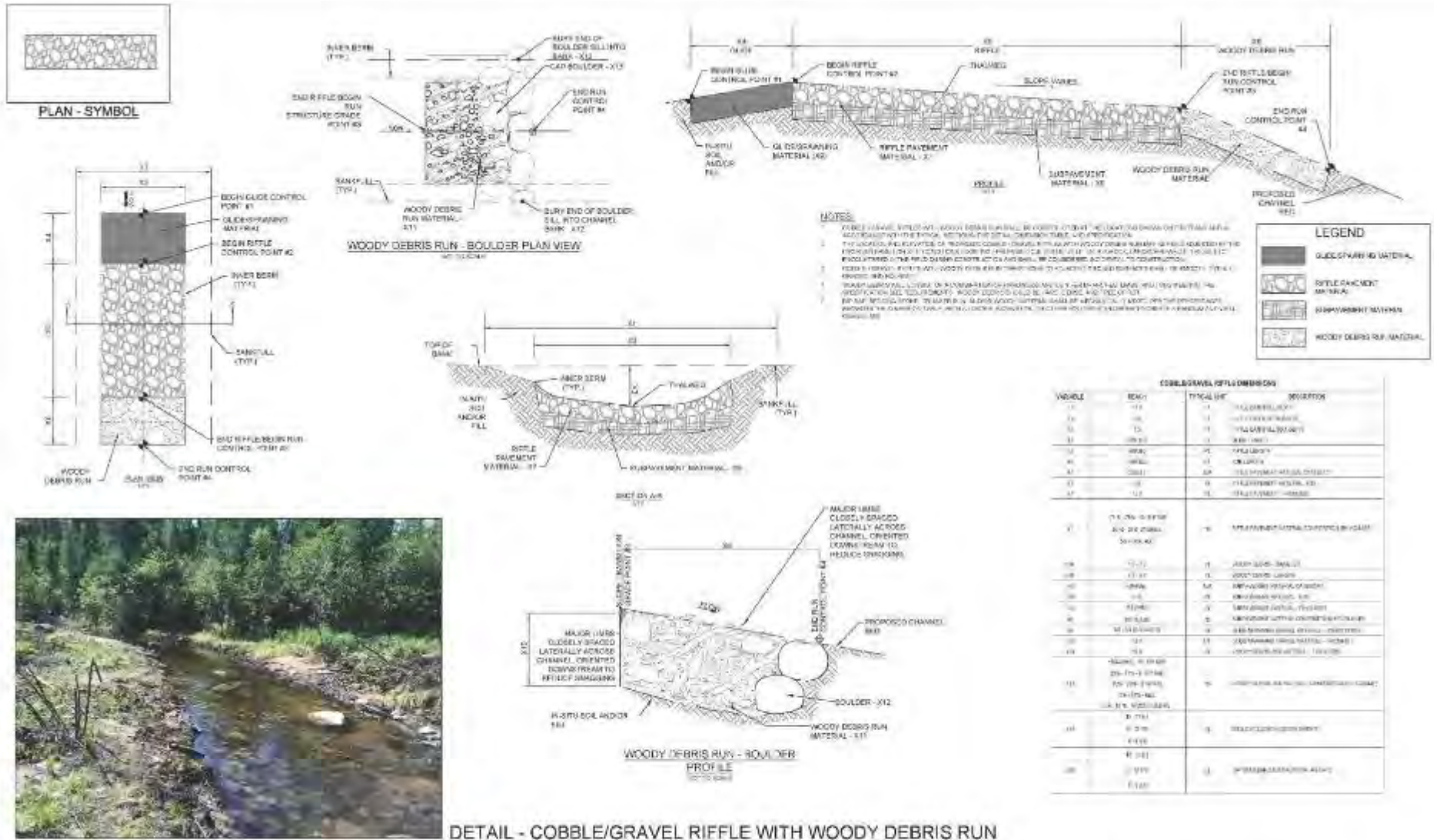
Toe Wood

Mason Creek

During construction  
prior to channel  
activation



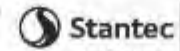
# Rifle/Run Detail



DETAIL - COBBLE/GRAVEL RIFFLER WITH WOODY DEBRIS RUN



DATE	REVISION



MASON CREEK STREAM RESTORATION TALL PINES CONSERVATORY			
DATE	APPROVED	DATE	APPROVED

DESIGN  
DET A115  
CT01

## Riffle

Mason Creek

During construction  
prior to channel  
activation



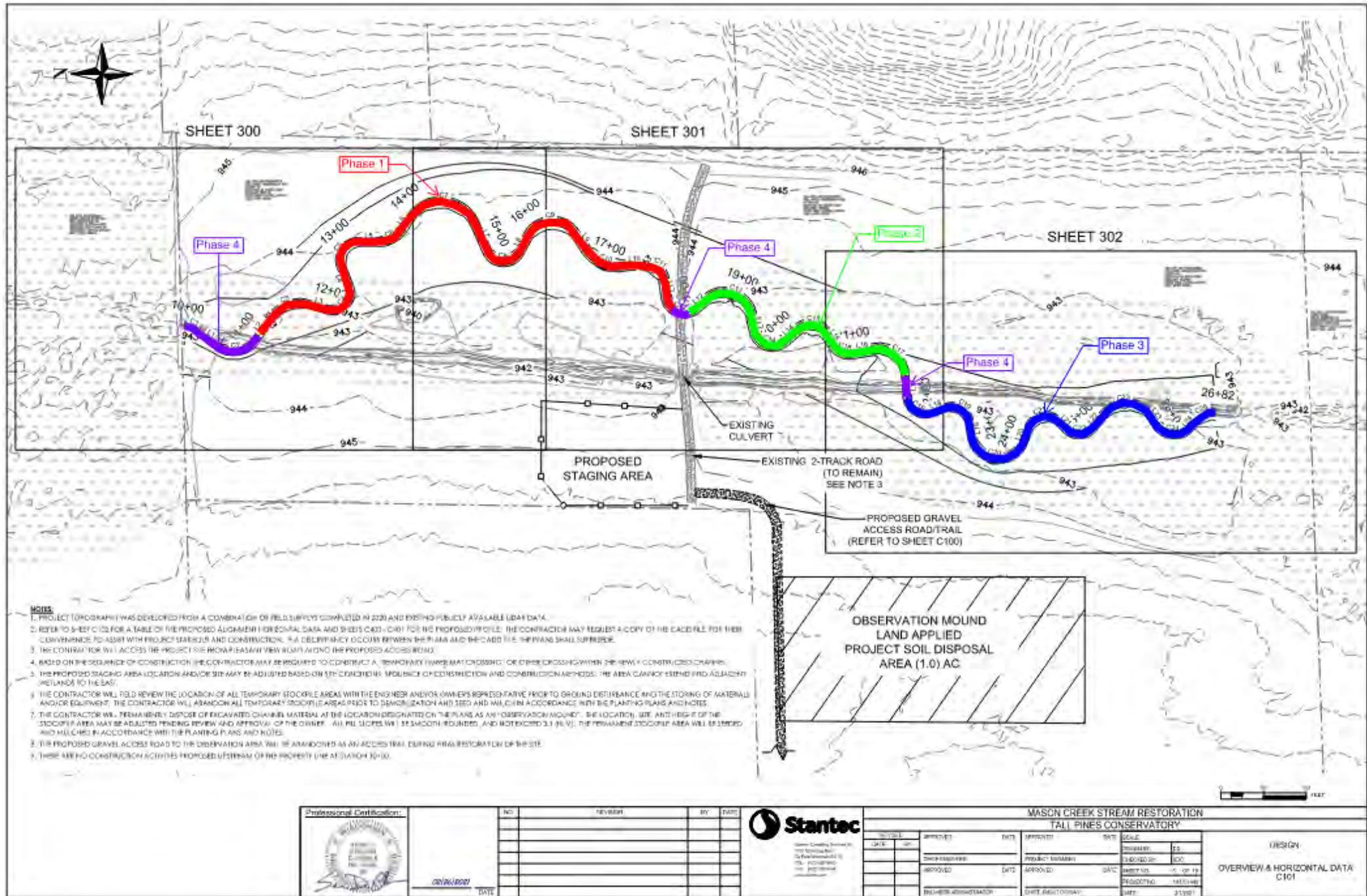
Run

Mason Creek

During construction  
prior to channel  
activation



# Construction Sequence



Professional Certification:	NO.	REVISION	BY	DATE

DATE	DATE	DATE	DATE



MASON CREEK STREAM RESTORATION			
TALL PINES CONSERVATORY			
DESIGNED BY	DATE	SCALE	DATE
PROJECT MANAGER	DATE	PROJECT NO.	DATE
APPROVED	DATE	PROJECT NO.	DATE
DESIGNED BY	DATE	PROJECT NO.	DATE
APPROVED	DATE	PROJECT NO.	DATE
DESIGNED BY	DATE	PROJECT NO.	DATE
APPROVED	DATE	PROJECT NO.	DATE

DESIGN
OVERVIEW & HORIZONTAL DATA
C101





# PARTNERSHIPS MAKE IT HAPPEN



Tall Pines Conservancy



Oconomowoc Watershed Protection Program



North Lake Management District



Town of Merton



Southeast Wisconsin Trout Unlimited



Stantec



Wondra Construction



Field & Stream





**MASON CREEK TODAY**

# OBSERVED RESULTS

## IMPROVED BIOTICS

Return of Native Macroinvertebrates  
Establishment of Native Macrophytes  
Higher Oxygen Levels

## IMPROVED WATER QUALITY

Water Clarity  
Reduced Sedimentation  
Reduced Phosphorous

## IMPROVED HABITAT

Improved Trout Habitat  
Native Prairie and Wetland Restoration  
Observed Fauna/Flora



# MASON CREEK TOMORROW



# SUMMARY

- SUPPORTING PARTNERSHIPS
- IDENTIFYING NEEDS
- COMMUNITY SUPPORT
- LOOKING TO THE FUTURE



# THANK YOU

**Erik Joost** – Watershed Protect Manager - OWPP

**Paul Meuer** – Land Protection Manager - TPC