

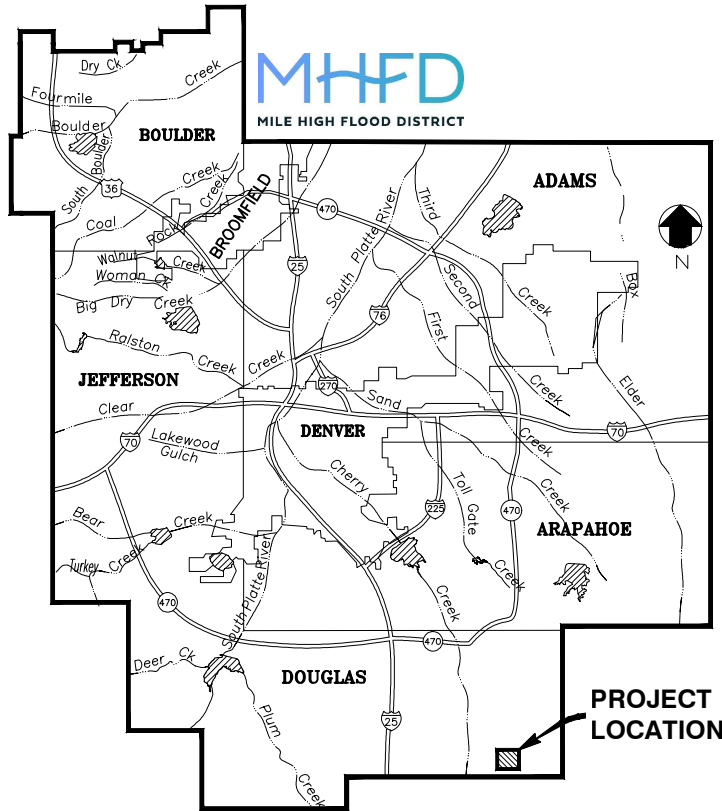


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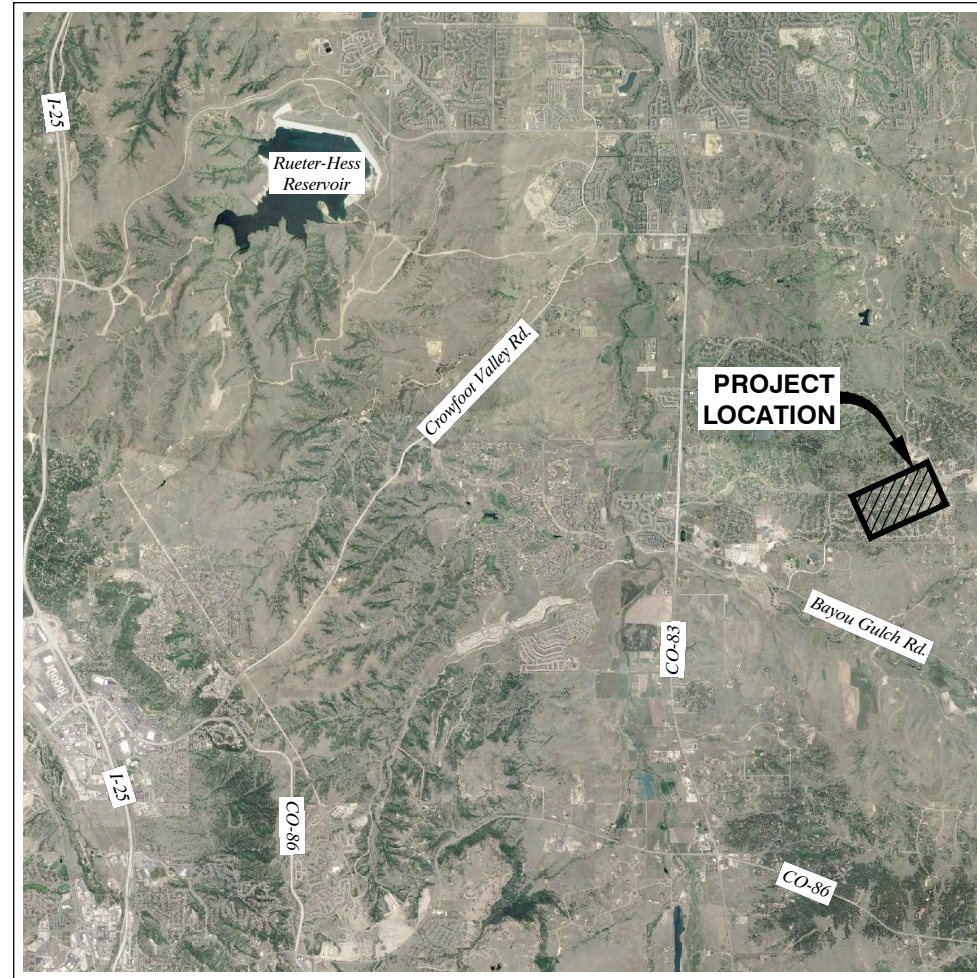
CONTRACT DRAWINGS FOR CONSTRUCTION OF TIMBERS CREEK IMPROVEMENTS (PHASE 2)

DOUGLAS COUNTY CASE NO. FC 2017-013
MHFD PROJECT #106677
JANUARY, 2023

- APPROVALS -



VICINITY MAP
N.T.S.



LOCATION MAP: DOUGLAS COUNTY, CO
SCALE: 1"=10,000'

MILE HIGH FLOOD DISTRICT
SUITE #156 B
2480 W. 26TH AVE.
DENVER, COLORADO 80211
(303) 455-6277

DocuSigned by:
Laura Kröeger
LAURA KRÖEGER, P.E. EXECUTIVE DIRECTOR
1/19/2023 | 2:40 PM PST
DATE

DocuSigned by:
David J. Skudodas
DAVID SKUDODAS, P.E. DIRECTOR - DESIGN, CONSTRUCTION, AND MAINTENANCE
1/18/2023 | 7:37 PM PST
DATE

DocuSigned by:
Jim Watt
JIM WATT, P.E. WATERSHED MANAGER
1/18/2023 | 12:55 PM PST
DATE

DOUGLAS COUNTY
COLORADO

Douglas County
Department of Public Works Engineering
100 Third St.
Castle Rock, CO 80104

DocuSigned by:
Matt Williams
MATT WILLIAMS, P.E., CFM
1/19/2023 | 7:18 AM PST
DATE

MULLER
ENGINEERING COMPANY
7245 W. ALASKA DR. SUITE 300 LAKEWOOD, COLORADO 80226

THESE DRAWINGS FOR TIMBERS CREEK IMPROVEMENTS (PHASE 2) WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION).

Gene T. Ryken
GENE T. RYKEN, P.E. (#57459) PROJECT ENGINEER
1/9/2023
DATE

Athena A. Gomez
ATHENA A. GOMEZ, E.I. DESIGN ENGINEER
1/9/2023
DATE

DocuSigned by:
Matt Williams
ASSISTANT DIRECTOR
OF DEVELOPMENT REVIEW
1/19/2023 | 7:18 AM PST
DATE
THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.
ENGINEERING DIVISION ACCEPTANCE BLOCK

PROJECT CONTACTS:

MHFD	JIM WATT	303-455-6277
DOUGLAS COUNTY	BRAD ROENSTEIN	303-660-7490
MULLER ENGINEERING COMPANY	GENE RYKEN ATHENA GOMEZ	303-988-4939 303-988-4939

PROJECT DESIGN TEAM:



BENCHMARK:

PROJECT BENCHMARK IS A 2" ALUMINUM CAP (EP96250) SET ON THE SOUTH SIDE OF S. PINERY PARKWAY APPROXIMATELY 400' WESTERLY FROM THE INTERSECTION OF S. PINERY PARKWAY WITH DEMOCRAT ROAD WITH A NAVD 88 ELEVATION OF 6384.05' (OPUS SOLUTION).

PREPARED UNDER THE SUPERVISION OF



DESIGNED: AAG
DRAWN: JGG
CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)

GENERAL

TITLE SHEET

DATE
1/9/2023
DRAWING NO.
G-1
SHEET NO.
1 OF 44

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Know what's below
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GENERAL NOTES FOR SURVEY:

ALL DIRECTIONS, DISTANCES AND DIMENSIONS ARE BASED ON COORDINATES FROM THE COLORADO COORDINATE SYSTEM OF 1983 CENTRAL ZONE (C.R.S. 38-52-102) WITH A COMBINED SCALE FACTOR OF 0.999657602 (1.000342515).

STATE PLANE CONTROL POINTS:

POINT NO.	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
AW45849	1586936.075	3221723.522	6384.882	2" ALUMINUM CAP
AW45850	1586957.805	3221954.684	6382.031	2" ALUMINUM CAP
EP23292	1585929.323	3219199.448	6256.653	2" ALUMINUM CAP
EP23293	1585945.355	3219415.106	6261.712	60D NAIL
EP96250	1586830.857	3222038.392	6384.046	SITE BENCHMARK 2" ALUMINUM CAP (OPUS)

ABBREVIATIONS:

- APPROX - APPROXIMATELY
- CL - CENTER LINE
- CCD - CITY AND COUNTY OF DENVER
- CFS - CUBIC FEET PER SECOND
- C & G - CURB AND GUTTER
- C G & SW - CURB, GUTTER, & SIDEWALK
- CH - CURB HEAD
- CIP - CORRUGATED IRON PIPE (WATER)
- CPM - CAPITAL PROJECTS MANAGEMENT
- DIP - DUCTILE IRON PIPE (WATER)
- DT- DECIDUOUS TREE
- DWD - DENVER WATER DEPARTMENT
- E - EAST
- EF - EACH FACE
- E.G.L. - ENERGY GRADE LINE
- EOA - EDGE OF ASPHALT
- ES - EACH SIDE
- EX- EXISTING
- EW - EACH WAY
- FG - FINAL GRADE
- FL - FLOW LINE
- FO - FIBER OPTIC LINE
- G - GAS
- H.G.L. - HYDRAULIC GRADE LINE
- HP - HIGH POINT
- I - INLET
- INV. - INVERT
- LF- LINEAR FEET
- LP - LOW POINT
- MH - MANHOLE
- MJ- MECHANICAL JOINT
- N - NORTH
- NTS - NOT TO SCALE
- OHE - OVERHEAD ELECTRIC LINE
- PL - PROPERTY LINE
- PVC - POLY VINYL CHLORIDE
- q - DESIGN FLOW
- Q_{full} - FULL FLOW CAPACITY
- RCBC - REINFORCED CONCRETE BOX CULVERT
- RCP - REINFORCED CONCRETE PIPE
- R.L. - RANGE LINE
- S - SOUTH
- STM - STORM SEWER
- SS - SANITARY SEWER
- SW - SIDEWALK
- TELE- TELEPHONE LINE
- TOC - TOP OF CONCRETE
- T.O.P. - TOP OF PIPE
- T.O.W. - TOP OF WALL
- TYP. - TYPICAL
- UE - UNDERGROUND ELECTRIC LINE
- U.N.O. - UNLESS NOTED OTHERWISE
- VCP - VITRIFIED CLAY PIPE
- W - WEST
- WAT - WATER
- WMD - WASTEWATER MANAGEMENT DIVISION

SURVEY FEATURES LEGEND:

- EASEMENT LINE
 - PROPERTY LINE (NOT R.O.W.)
 - R.O.W. LINE
- #### EXISTING FEATURES LEGEND:
- EXISTING STREET LIGHT
 - EXISTING UTILITY/POWER POLE
 - EXISTING GUY WIRE
 - EXISTING TRAFFIC POLE
 - EXISTING ELECTRIC METER
 - EXISTING ELECTRIC BOX
 - EXISTING FIRE HYDRANT
 - EXISTING WATER VALVE
 - EXISTING WATER MH
 - EXISTING WATER METER
 - EXISTING WATER LINE
 - EXISTING GAS LINE
 - EXISTING STORM LINE W/MANHOLE
 - EXISTING SANITARY LINE W/MANHOLE
 - EXISTING UNDERGROUND ELECTRIC
 - EXISTING OVERHEAD ELECTRIC
 - EXISTING FIBER OPTIC
 - EXISTING FENCE
 - EXISTING MAJOR CONTOUR
 - EXISTING MINOR CONTOUR
 - EXISTING DIRECTION OF SURFACE FLOW

PROPOSED FEATURES LEGEND:

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED CURB & GUTTER
- PROPOSED LIMITS OF CONSTRUCTION
- PROPOSED FENCE
- PROPOSED WATERLINE
- PROPOSED SURFACE DRAINAGE SWALE
- PROPOSED WATER VALVE
- PROPOSED LANDSCAPING
- PROPOSED CONCRETE SURFACE
- PROPOSED DECORATIVE CONCRETE SURFACE
- PROPOSED PERMEABLE CONCRETE PAVERS
- PROPOSED FULL DEPTH ASPHALT SURFACE
- PROPOSED ASPHALT PAVEMENT MILLING AND OVERLAY
- PROPOSED TRUNCATED SIDEWALK DOME PANEL
- PROPOSED GREEN INFRASTRUCTURE LANDSCAPING
- PROPOSED COBBLE
- PROPOSED CURB RAMP
- PROPOSED DIRECTION OF SURFACE FLOW
- BORE/TEST HOLE LOCATION

CHANNEL FEATURES LEGEND:

- EFFECTIVE 100-YR FEMA FLOODPLAIN PER FIRM NO. 0800460203J (REVISED SEPTEMBER 4, 2020)
- PROPOSED 5-YR FLOODPLAIN
- PROPOSED 100-YR FLOODPLAIN
- WETLANDS (PHASE 1 MAPPED DECEMBER, 2018 AND PHASE 2 MAPPED SEPTEMBER, 2022)

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PREPARED UNDER THE SUPERVISION OF

DESIGNED: AAG
DRAWN: JGG
CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY

MULLER ENGINEERING COMPANY
7245 W. ALASKA DR., SUITE 300 LAKEWOOD, COLORADO 80226

MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY COLORADO

HPF METRO DISTRICT

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
GENERAL		DRAWING NO. G-2
INDEX OF SHEETS, LEGEND, AND GENERAL NOTES		SHEET NO. 2 OF 44

GENERAL NOTES:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE MILE HIGH FLOOD DISTRICT (MHFD). THE MHFD RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
2. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR WILL HAVE THE PLAN SET AND CONTRACT DOCUMENTS ON-SITE WHILE WORK IS IN PROGRESS.
3. EXCEPT WHERE OTHERWISE PROVIDED FOR IN THESE PLANS AND SPECIFICATIONS, IN ADDITION TO MHFD, THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SHALL APPLY.
4. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (1-800-922-1811 OR 811) AND OTHER AFFECTED UTILITIES TO LOCATE UNDERGROUND FACILITIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTRACTOR SHALL POTHOLE AND SURVEY THE LOCATION AND ELEVATION OF ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY CONSTRUCTION PRIOR TO START OF CONSTRUCTION. THE POTHOLING AND SURVEY WORK SHALL BE INCLUDED AND PAID FOR AS PART OF MOBILIZATION
5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 24 HOURS PRIOR TO STARTING WORK AND 24 HOURS PRIOR TO EACH DESIRED AND REQUIRED INSPECTION.
6. PROJECT FACILITIES ARE TO BE LOCATED BASED ON THE SURVEY COORDINATES, ELEVATIONS, DIMENSIONS, AND/OR GEOMETRIC DESIGN DATA PROVIDED ON THE DRAWINGS. ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST FROM MULLER ENGINEERING COMPANY, INC.
7. CONTRACTOR SHALL FIELD VERIFY THE LOCATION (HORIZONTAL AND VERTICAL) AT CONNECTIONS TO ALL EXISTING INFRASTRUCTURE. THIS INFORMATION SHALL BE COLLECTED AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION AND/OR PRIOR TO INSTALLATION OF ANY NEW FACILITIES SHOWN ON THESE CONTRACT DRAWINGS. THE ENGINEER WILL DETERMINE IF ANY MINOR MODIFICATIONS TO THE NEW FACILITIES SHOWN ON THE CONTRACT DRAWINGS ARE NECESSARY SUCH AS HORIZONTAL AND VERTICAL ADJUSTMENTS.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE ENGINEER OF ANY CONSTRUCTION PROBLEMS DUE TO CHANGED CONDITIONS OR DESIGN ERRORS ENCOUNTERED BY THE CONTRACTOR. THE CONTRACTOR AND ENGINEER WILL WORK TOGETHER TO REVISE THE PLANS PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK. ANY IMPROVEMENTS NOT CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS, OR THE APPROVED REVISED PLANS, SHALL BE REMOVED AND THE IMPROVEMENTS SHALL BE RECONSTRUCTED AT NO COST TO THE PROJECT.
9. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND INCLUDES TRAFFIC CONTROL IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CITY'S REVIEW OF PLANS AND CONSTRUCTION IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING STABLE EXCAVATIONS AND TEMPORARY SLOPES AND FOR SATISFYING ALL APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS. TEMPORARY EXCAVATIONS SHALL PROVIDE, AT MINIMUM, THE TRENCH DIMENSIONS AND CLEARANCES SHOWN OR SPECIFIED. TEMPORARY CONSTRUCTION SLOPES SHALL BE SLOPED, SHORED, SHEETED, AND/OR BRACED IN ACCORDANCE WITH STABILITY REQUIREMENTS AND APPLICABLE REGULATIONS, AND SHALL BE NO STEEPER THAN THE SLOPES SHOWN OR SPECIFIED WITHOUT THE APPROVAL OF THE ENGINEER. ANY SUCH APPROVALS BY THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR FROM SOLE RESPONSIBILITY FOR PROVIDING STABLE EXCAVATIONS AND TEMPORARY SLOPES.
11. EXISTING FACILITIES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED IN PLACE OR REMOVED AND REPLACED IN KIND, AS APPROVED BY ENGINEER.
12. TREE PROTECTION AND REMOVAL: ALL TREES/SHRUBS ARE TO BE PROTECTED DURING CONSTRUCTION UNLESS IDENTIFIED ON THE PLANS FOR REMOVAL. CONTRACTOR IS TO FLAG TREES TO BE REMOVED AND VERIFY WITH THE ENGINEER PRIOR TO REMOVING ANY TREES. CONTRACTOR SHALL INSTALL ORANGE FENCING AROUND TREES TO BE PROTECTED.
13. EARTHWORK SHALL BE COMPLETE IN PLACE WITH ALL EXCESS MATERIAL HAULED OFF-SITE. COMPACTION REQUIREMENTS SHALL BE 95% OF THE MAXIMUM DRY DENSITY. MOISTURE REQUIREMENTS WILL BE WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT. TESTS MAY BE PERFORMED BY THE OWNER, IF A FAILED TEST IS RECEIVED THEN THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF THE TEST AND ANY CORRECTIVE ACTIONS NECESSARY.
14. FOR CLARITY, ITEMS SHOWN FOR REMOVAL ON THE DEMOLITION AND REMOVAL PLANS MAY NOT BE SHOWN ON SUBSEQUENT SHEETS.
15. IF HEAVY EQUIPMENT TO BE USED ON THE PROJECT HAS PREVIOUSLY BEEN USED IN ANOTHER STREAM, RIVER, LAKE, POND, OR WETLAND, ONE OF THE FOLLOWING DISINFECTION PRACTICES IS NECESSARY PRIOR TO CONSTRUCTION TO PREVENT THE SPREAD OF NEW ZEALAND MUD SNAILS, ZEBRA MUSSELS, QUAGGA MUSSELS, WHIRLING DISEASE, AND ANY OTHER AQUATIC INVASIVE SPECIES INTO THIS DRAINAGE. THESE PRACTICES ARE ALSO NECESSARY AFTER PROJECT COMPLETION, PRIOR TO THE EQUIPMENT BEING USED IN ANOTHER STREAM, RIVER, LAKE, POND, OR WETLAND:
 - REMOVE ALL MUD AND DEBRIS FROM EQUIPMENT (TRACKS, TURRETS, BUCKETS, DRAGS, TEETH, ETC.) AND SPRAY / SOAK EQUIPMENT IN A 1:15 SOLUTION OF SPARQUAT INSTITUTIONAL CLEANER AND WATER. KEEP EQUIPMENT MOIST FOR AT LEAST 10 MINUTES OR
 - REMOVE ALL MUD AND DEBRIS FROM EQUIPMENT (TRACKS, TURRETS, BUCKETS, DRAGS, TEETH, ETC.) AND SPRAY / SOAK EQUIPMENT WITH WATER GREATER THAN 140 DEGREES FAHRENHEIT FOR AT LEAST 10 MINUTES.

CLEAN HAND TOOLS, BOOTS, AND ANY OTHER EQUIPMENT THAT WILL BE USED IN THE WATER WITH ONE OF THE ABOVE OPTIONS AS WELL. THE COST OF DISINFECTING EQUIPMENT AND TOOLS SHALL BE INCIDENTAL TO THE PROJECT AND BE INCLUDED IN THE COST OF THE WORK.

17. THE MIGRATORY BIRD TREATY ACT (MBTA) PROTECTS MIGRATORY BIRDS AND THEIR NESTS AND EGGS. FOR PROJECTS THAT COULD POTENTIALLY HAVE AN IMPACT, THE FOLLOWING CONDITIONS APPLY:

- 1) TREE TRIMMING/REMOVAL: TREE TRIMMING AND/OR REMOVAL ACTIVITIES SHALL BE COMPLETED BEFORE BIRDS BEGIN TO NEST OR AFTER THE YOUNG HAVE FLEDGED. IN COLORADO, MOST NESTING AND REARING ACTIVITIES OCCUR BETWEEN APRIL 1 AND AUGUST 31. HOWEVER, SINCE SOME BIRDS NEST AS EARLY AS FEBRUARY, A NESTING BIRD SURVEY SHALL BE CONDUCTED BY A BIOLOGIST BEFORE ANY TREE TRIMMING OR REMOVAL ACTIVITIES BEGIN.
- 2) BRIDGE/BOX CULVERT WORK: BRIDGE OR BOX CULVERT WORK THAT MAY DISTURB NESTING BIRDS SHALL BE COMPLETED BEFORE BIRDS BEGIN TO NEST OR AFTER THE YOUNG HAVE FLEDGED. NO BRIDGE OR BOX CULVERT WORK MAY TAKE PLACE BETWEEN APRIL 1 AND AUGUST 31. IF WORK ACTIVITIES ARE PLANNED BETWEEN THESE DATES, NESTS SHALL BE REMOVED (BEFORE NESTING BEGINS) AND APPROPRIATE MEASURES TAKEN TO ASSURE NO NEW NESTS ARE CONSTRUCTED. FAILURE TO REMOVE AND KEEP NESTS FROM BECOMING ESTABLISHED MAY POSTPONE PROJECT CONSTRUCTION.
- 3) CLEARING/GRUBBING ACTIVITIES: CLEARING AND GRUBBING OF VEGETATION THAT MAY DISTURB GROUND NESTING BIRDS SHALL BE COMPLETED BEFORE BIRDS BEGIN TO NEST OR AFTER THE YOUNG HAVE FLEDGED. IF WORK ACTIVITIES ARE PLANNED BETWEEN APRIL 1 AND AUGUST 31, VEGETATION SHALL BE REMOVED AND/OR TRIMMED TO A HEIGHT OF SIX (6) INCHES OR LESS PRIOR TO APRIL 1. ONCE VEGETATION HAS BEEN REMOVED AND/OR TRIMMED, APPROPRIATE MEASURES, I.E. REPEATED MOWING/TRIMMING, SHALL BE IMPLEMENTED TO ASSURE VEGETATION DOES NOT GROW MORE THAN SIX (6) INCHES. FAILURE TO MAINTAIN VEGETATION HEIGHT OF SIX (6) INCHES OR LESS MAY POSTPONE PROJECT CONSTRUCTION.
- 4) BIRDS OF PREY: FOR BIRDS OF PREY THAT COULD POTENTIALLY NEST NEAR THE PROJECT SITE, PLEASE CONTACT THE CDOT R-4 BIOLOGIST AND/OR REFER TO THE COLORADO PARKS AND WILDLIFE'S "RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTORS" GUIDELINES AVAILABLE AT COLORADO PARKS AND WILDLIFE DISTRICT OFFICE

18. PERMIT REQUIREMENTS

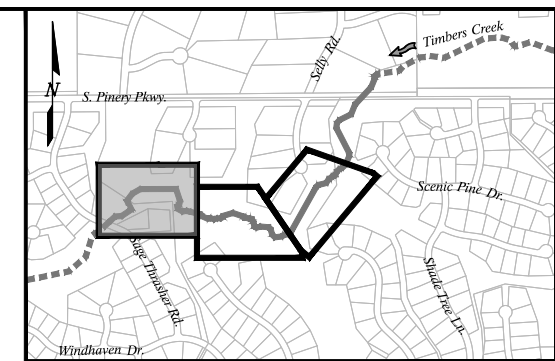
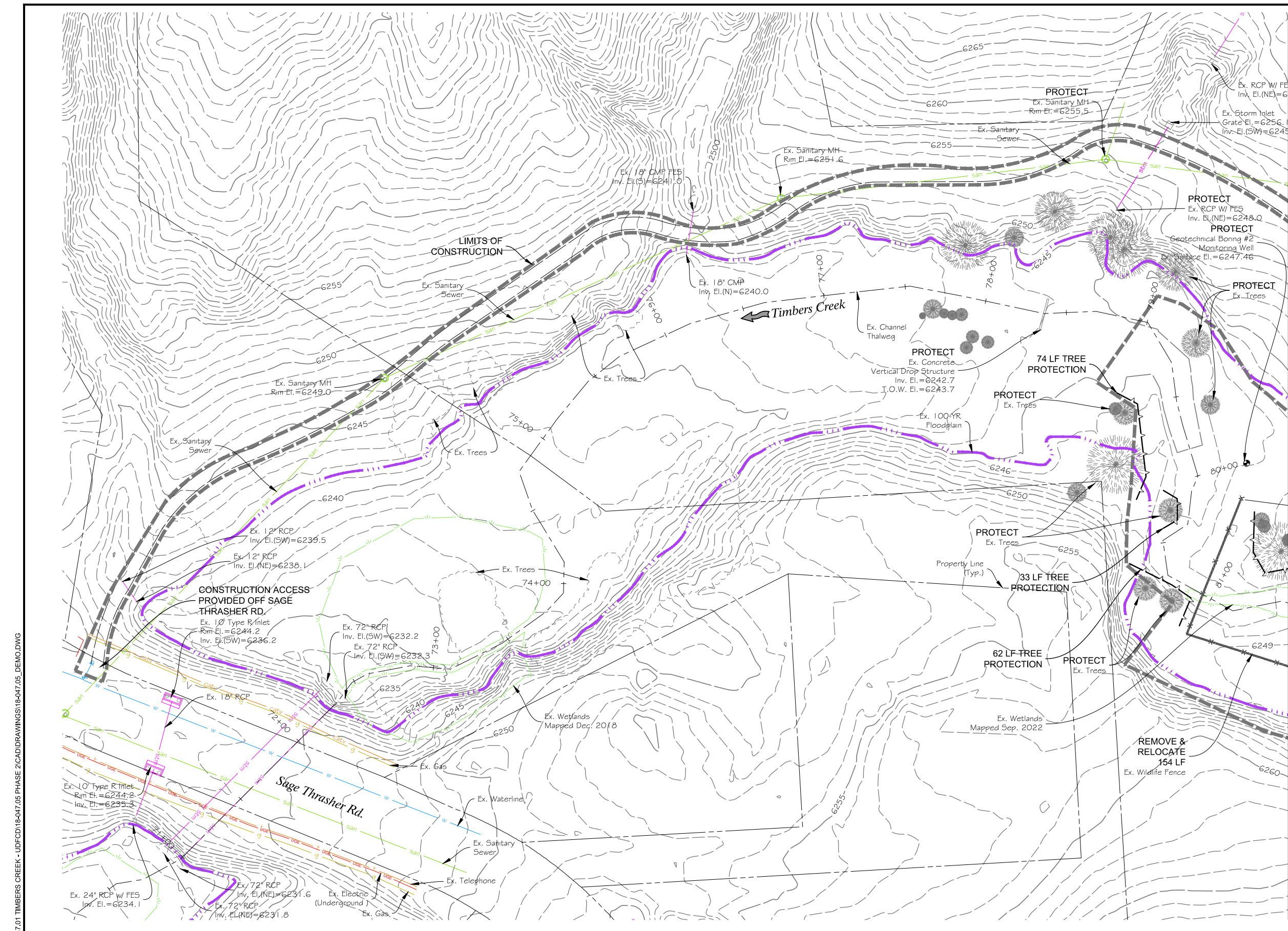
- A) THE CONTRACTOR WILL BE REQUIRED TO OBTAIN DOUGLAS COUNTY GRADING EROSION AND SEDIMENT CONTROL (GESC) PERMIT.
- B) CONTRACTOR WILL BE REQUIRED TO OBTAIN COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT COLORADO DISCHARGE PERMIT.

EARTHWORK NOTES AND QUANTITIES:

UNADJUSTED CUT	=	589	CY
UNADJUSTED FILL	=	629	CY
IMPORTED CLAY	=	180	CY (ASSUMES 10% SHRINKAGE DURING COMPACTION)
ADJUSTED NET	=	140	CY (HAUL TO STOCKPILE LOCATION ONSITE WITH ENGINEER'S DIRECTION)

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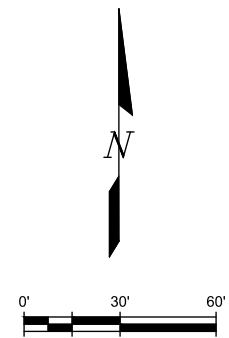
PREPARED UNDER THE SUPERVISION OF 	DESIGNED: AAG	FINAL DESIGN	SHEET REVISIONS				 7245 W. ALASKA DR., SUITE 300 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HPF METRO DISTRICT	TIMBERS CREEK IMPROVEMENTS (PHASE 2)	DATE 1/9/2023
	DRAWN: JGG										GENERAL	DRAWING NO. G-3
	CHECKED: CLK										GENERAL NOTES	SHEET NO. 3 OF 44



KEYMAP
SCALE: 1"=1500'

- NOTES:**
1. FOR CLARITY, ITEMS SHOWN FOR REMOVAL MAY NOT BE SHOWN ON OTHER PROPOSED IMPROVEMENT DRAWINGS IN THIS PLAN SET.
 2. CLEAN SAWCUTS SHALL BE PERFORMED AT THE EDGES OF ALL CONCRETE REMOVALS.
 3. FIELD SURVEY WAS LIMITED TO THE WORK LIMITS. ONLY TREES WITHIN THE LIMITS OF CONSTRUCTION HAVE BEEN SURVEYED.
 4. THE SCOPE OF WORK AND BID TAB INCLUDES REMOVAL OF FENCING AND TEMPORARY IRRIGATION WITHIN THE PHASE 1 IMPROVEMENTS PREVIOUSLY CONSTRUCTED. THESE REMOVALS ARE NOT SHOWN WITHIN THE LIMITS OF CONSTRUCTION AND SHALL BE COORDINATED WITH THE ENGINEER. THE CONTRACTOR SHALL LIMIT THE USE OF HEAVY MACHINERY WHILE PERFORMING THESE REMOVALS TO MINIMIZE/PREVENT IMPACTS TO EXISTING VEGETATION.

MATCHLINE - SHIT. 5



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PREPARED UNDER THE SUPERVISION OF

DESIGNED: AAG

DRAWN: JGG

CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY

MULLER ENGINEERING COMPANY
7245 W. ALASKA DR., SUITE 300 LAKEWOOD, COLORADO 80226

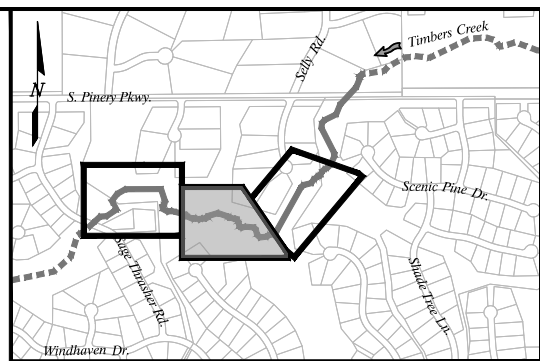
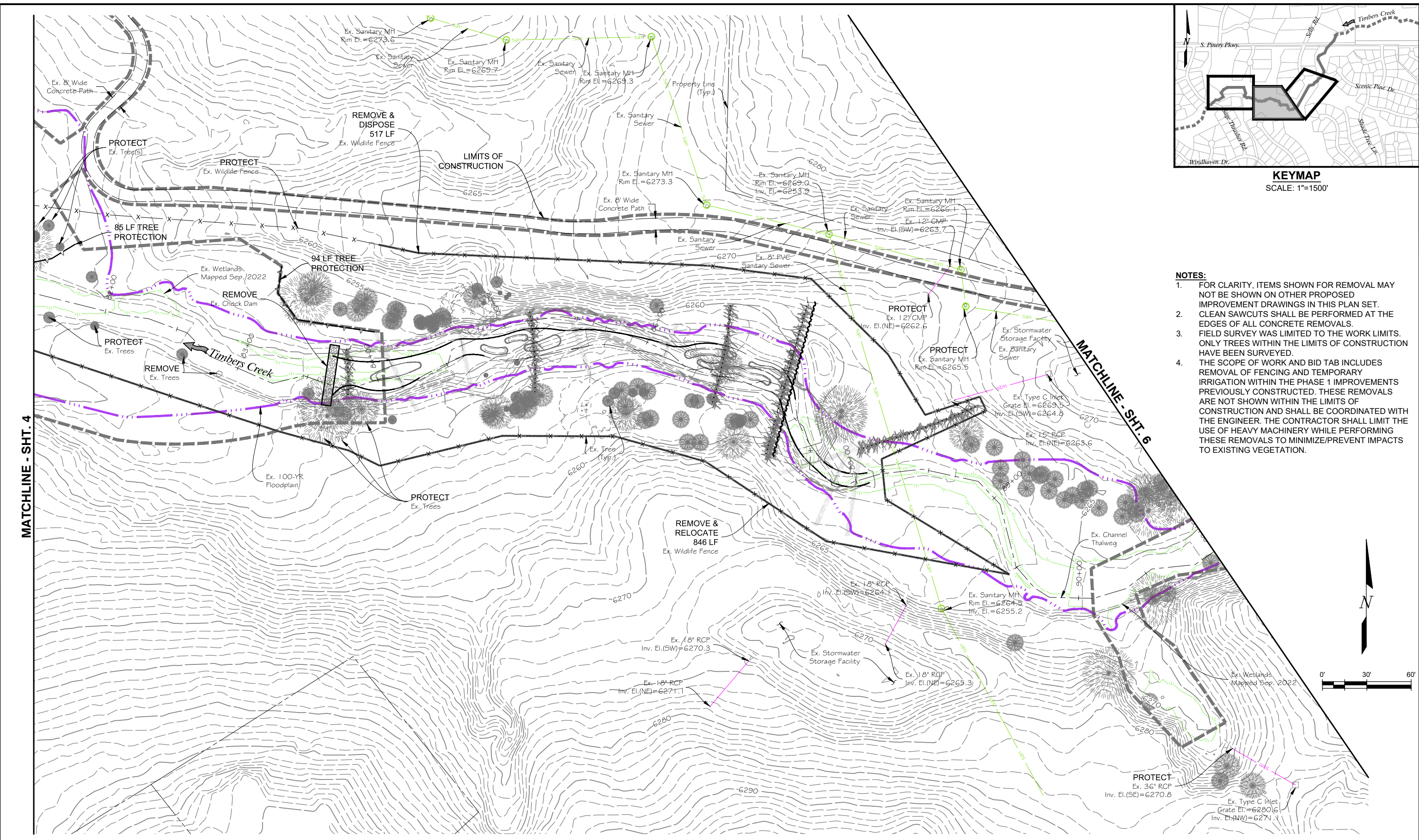
M+HFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRODISTRICT

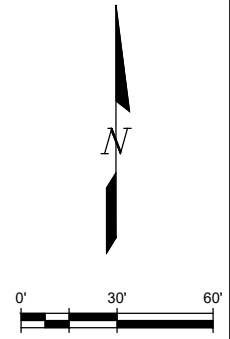
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CIVIL		1/9/2023
DEMOLITION PLAN		DRAWING NO.
		C-1
		SHEET NO.
		4 OF 44

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KEYMAP
SCALE: 1"=1500'

- NOTES:**
- FOR CLARITY, ITEMS SHOWN FOR REMOVAL MAY NOT BE SHOWN ON OTHER PROPOSED IMPROVEMENT DRAWINGS IN THIS PLAN SET.
 - CLEAN SAWCUTS SHALL BE PERFORMED AT THE EDGES OF ALL CONCRETE REMOVALS. FIELD SURVEY WAS LIMITED TO THE WORK LIMITS. ONLY TREES WITHIN THE LIMITS OF CONSTRUCTION HAVE BEEN SURVEYED.
 - THE SCOPE OF WORK AND BID TAB INCLUDES REMOVAL OF FENCING AND TEMPORARY IRRIGATION WITHIN THE PHASE 1 IMPROVEMENTS PREVIOUSLY CONSTRUCTED. THESE REMOVALS ARE NOT SHOWN WITHIN THE LIMITS OF CONSTRUCTION AND SHALL BE COORDINATED WITH THE ENGINEER. THE CONTRACTOR SHALL LIMIT THE USE OF HEAVY MACHINERY WHILE PERFORMING THESE REMOVALS TO MINIMIZE/PREVENT IMPACTS TO EXISTING VEGETATION.



PREPARED UNDER THE SUPERVISION OF

FINAL DESIGN

DESIGNED: AAG
 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

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NO.	DATE	DESCRIPTION	BY

MULLER ENGINEERING COMPANY
 7245 W. ALASKA DR. SUITE 300 LAKEWOOD, COLORADO 80226

MHFD
 MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
 COLORADO

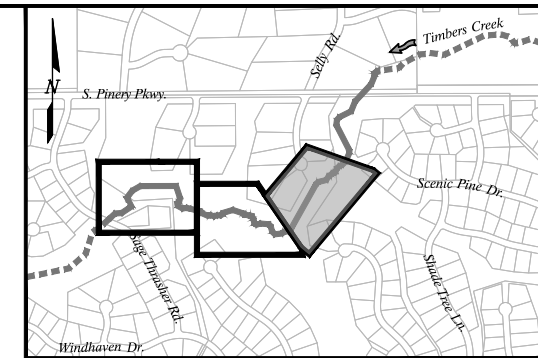
HPF
 METRO DISTRICT

TIMBERS CREEK IMPROVEMENTS (PHASE 2)

CIVIL

DEMOLITION PLAN

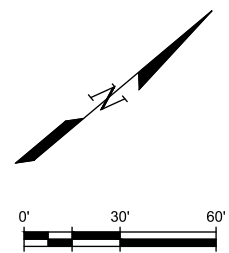
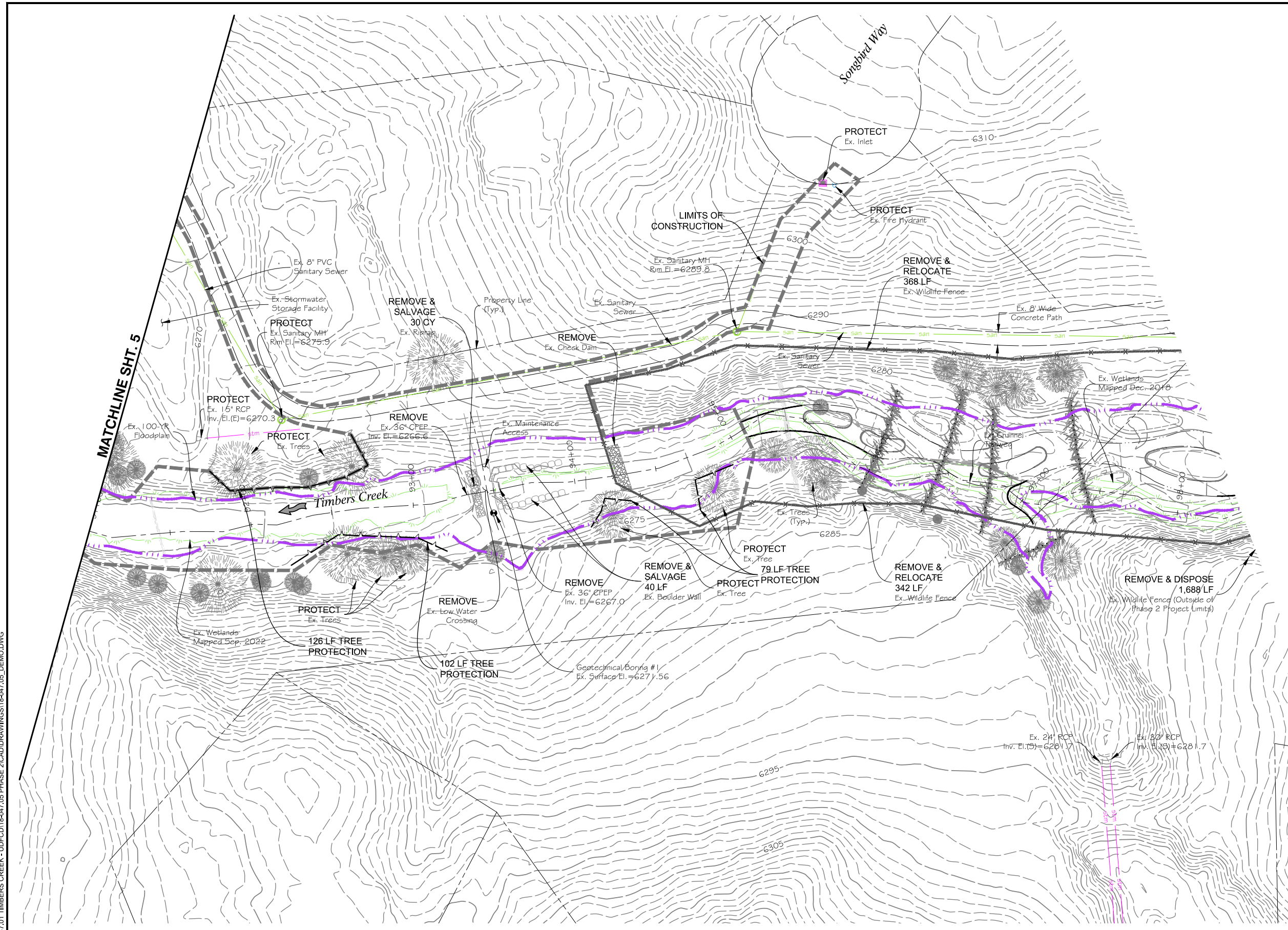
DATE: 1/9/2023
 DRAWING NO.: C-2
 SHEET NO.: 5 OF 44



KEYMAP
SCALE: 1"=1500'

NOTES:

1. FOR CLARITY, ITEMS SHOWN FOR REMOVAL MAY NOT BE SHOWN ON OTHER PROPOSED IMPROVEMENT DRAWINGS IN THIS PLAN SET.
2. CLEAN SAWCUTS SHALL BE PERFORMED AT THE EDGES OF ALL CONCRETE REMOVALS.
3. FIELD SURVEY WAS LIMITED TO THE WORK LIMITS. ONLY TREES WITHIN THE LIMITS OF CONSTRUCTION HAVE BEEN SURVEYED.
4. THE SCOPE OF WORK AND BID TAB INCLUDES REMOVAL OF FENCING AND TEMPORARY IRRIGATION WITHIN THE PHASE 1 IMPROVEMENTS PREVIOUSLY CONSTRUCTED. THESE REMOVALS ARE NOT SHOWN WITHIN THE LIMITS OF CONSTRUCTION AND SHALL BE COORDINATED WITH THE ENGINEER. THE CONTRACTOR SHALL LIMIT THE USE OF HEAVY MACHINERY WHILE PERFORMING THESE REMOVALS TO MINIMIZE/PREVENT IMPACTS TO EXISTING VEGETATION.



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 NAME: P:\2018 PROJECTS\18-047.01 TIMBERS CREEK - UDFCD\18-047.05 PHASE 2\CADD\DRAWINGS\18-047.05_DEMO.DWG

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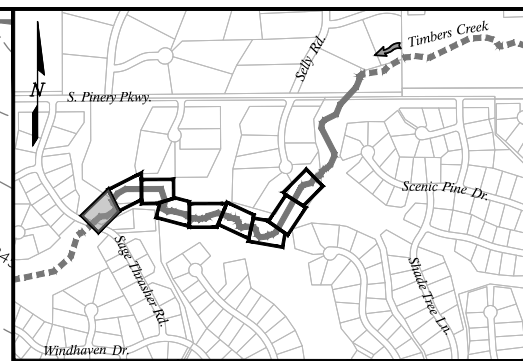
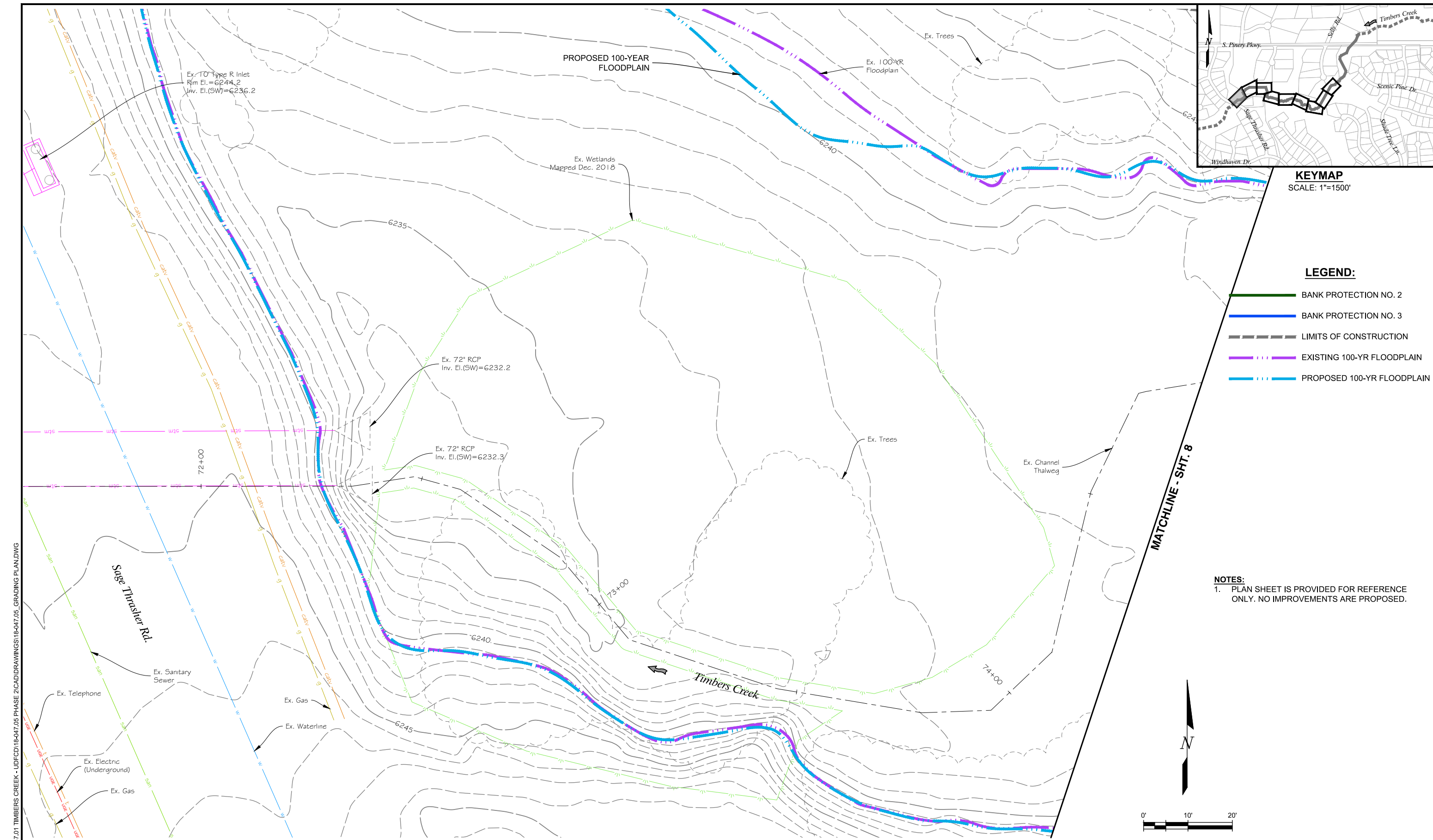
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 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY

7245 W. ALASKA DR., SUITE 300 LAKEWOOD, COLORADO 80226

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
CIVIL		1/9/2023
DEMOLITION PLAN		DRAWING NO.
		C-3
		SHEET NO.
		6 OF 44

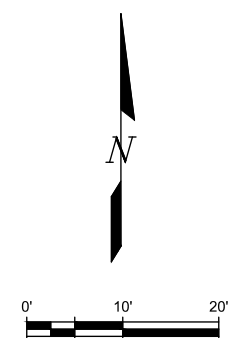


KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- - - - EXISTING 100-YR FLOODPLAIN
- - - - PROPOSED 100-YR FLOODPLAIN

NOTES:
1. PLAN SHEET IS PROVIDED FOR REFERENCE ONLY. NO IMPROVEMENTS ARE PROPOSED.



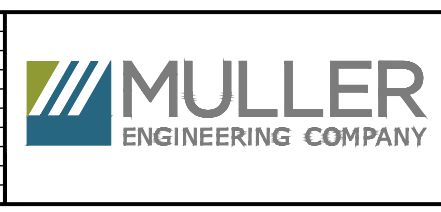
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PREPARED UNDER THE SUPERVISION OF

DESIGNED: AAG
 DRAWN: JGG
 CHECKED: CLK

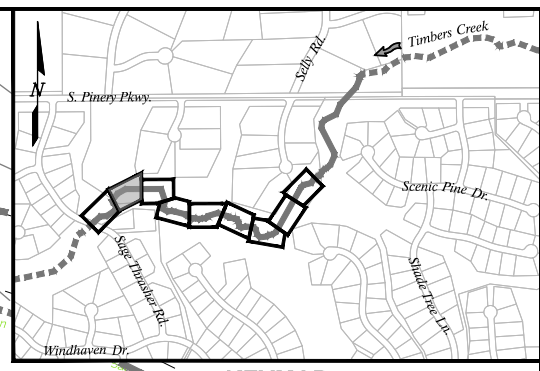
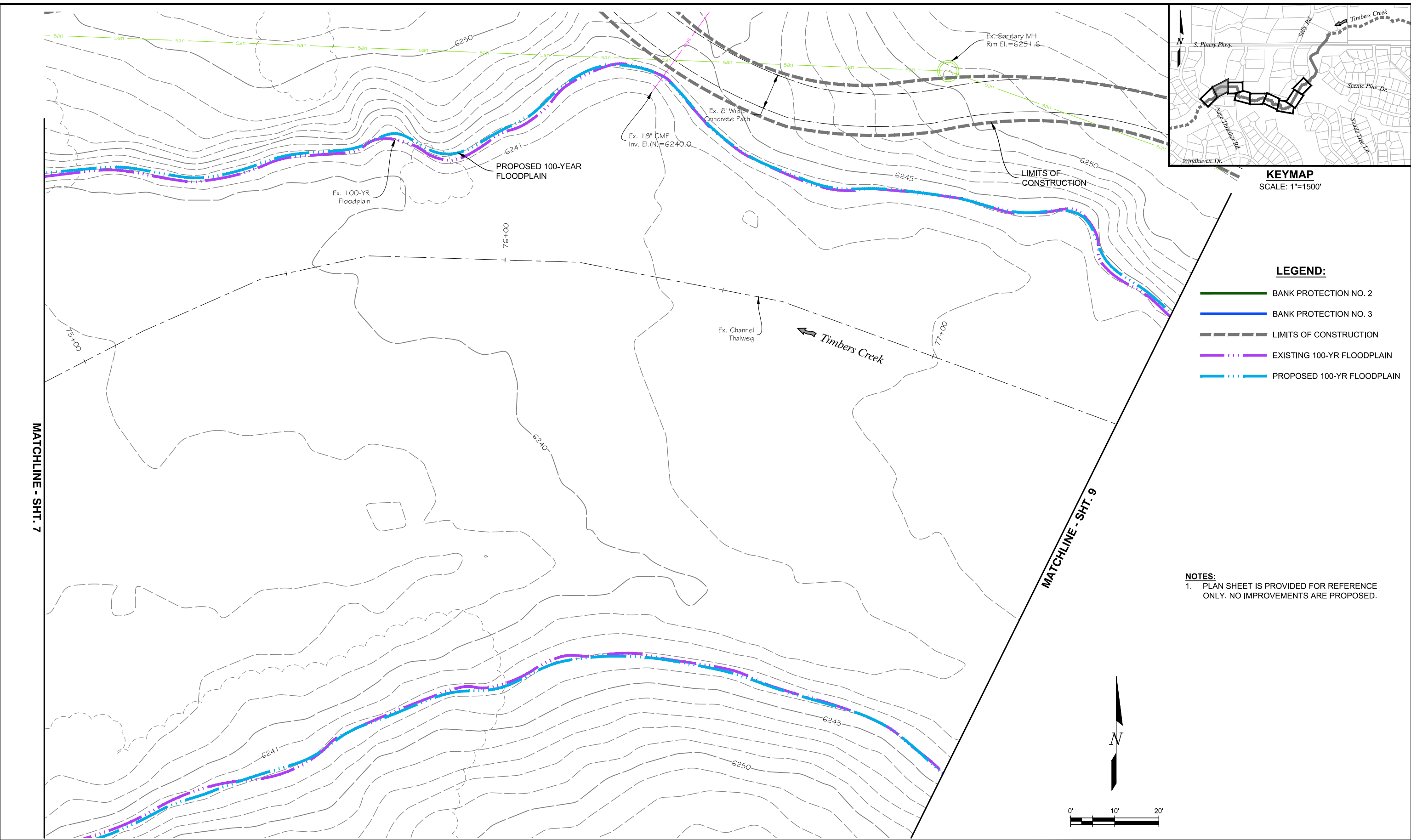
FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-4
GRADING PLAN		SHEET NO. 7 OF 44

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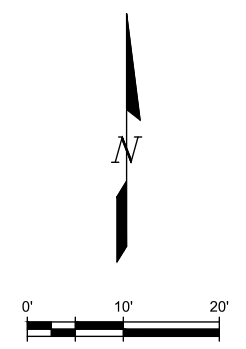
KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- - - - EXISTING 100-YR FLOODPLAIN
- - - - PROPOSED 100-YR FLOODPLAIN

NOTES:

1. PLAN SHEET IS PROVIDED FOR REFERENCE ONLY. NO IMPROVEMENTS ARE PROPOSED.



MATCHLINE - SHT. 7

MATCHLINE - SHT. 9

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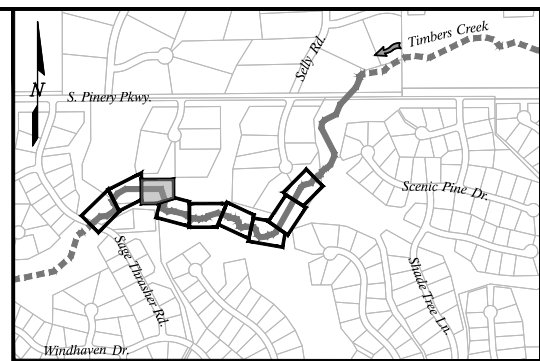
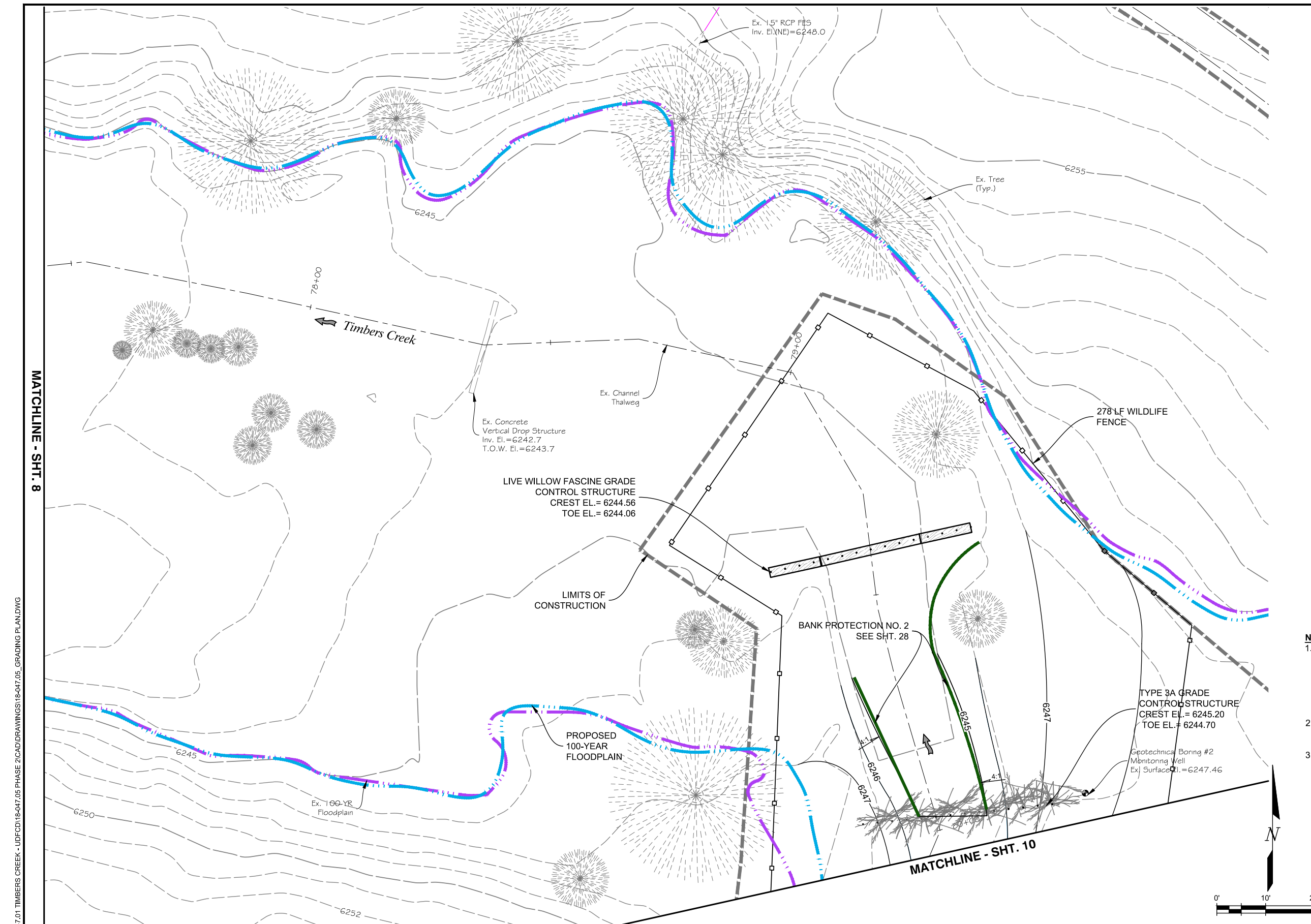
DESIGNED: AAG
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 CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-5
GRADING PLAN		SHEET NO. 8 of 44



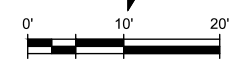
KEYMAP
SCALE: 1"=1500'

- LEGEND:**
- BANK PROTECTION NO. 2
 - BANK PROTECTION NO. 3
 - LIMITS OF CONSTRUCTION
 - - - - EXISTING 100-YR FLOODPLAIN
 - - - - PROPOSED 100-YR FLOODPLAIN

- NOTES:**
1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
 2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
 3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PLAN & PROFILE SHTS. FOR LEFT AND RIGHT DEVIATIONS.

MATCHLINE - SHT. 8

MATCHLINE - SHT. 10



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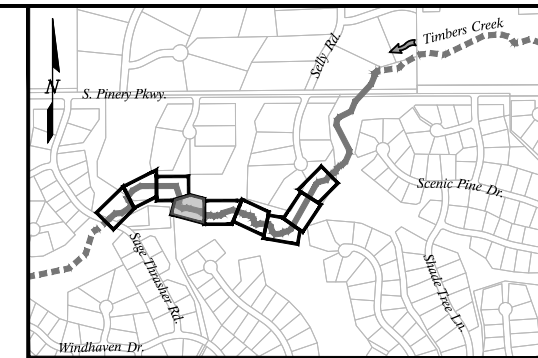
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DRAWN: JGG
CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-6
GRADING PLAN		SHEET NO. 9 OF 44



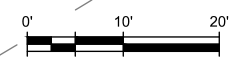
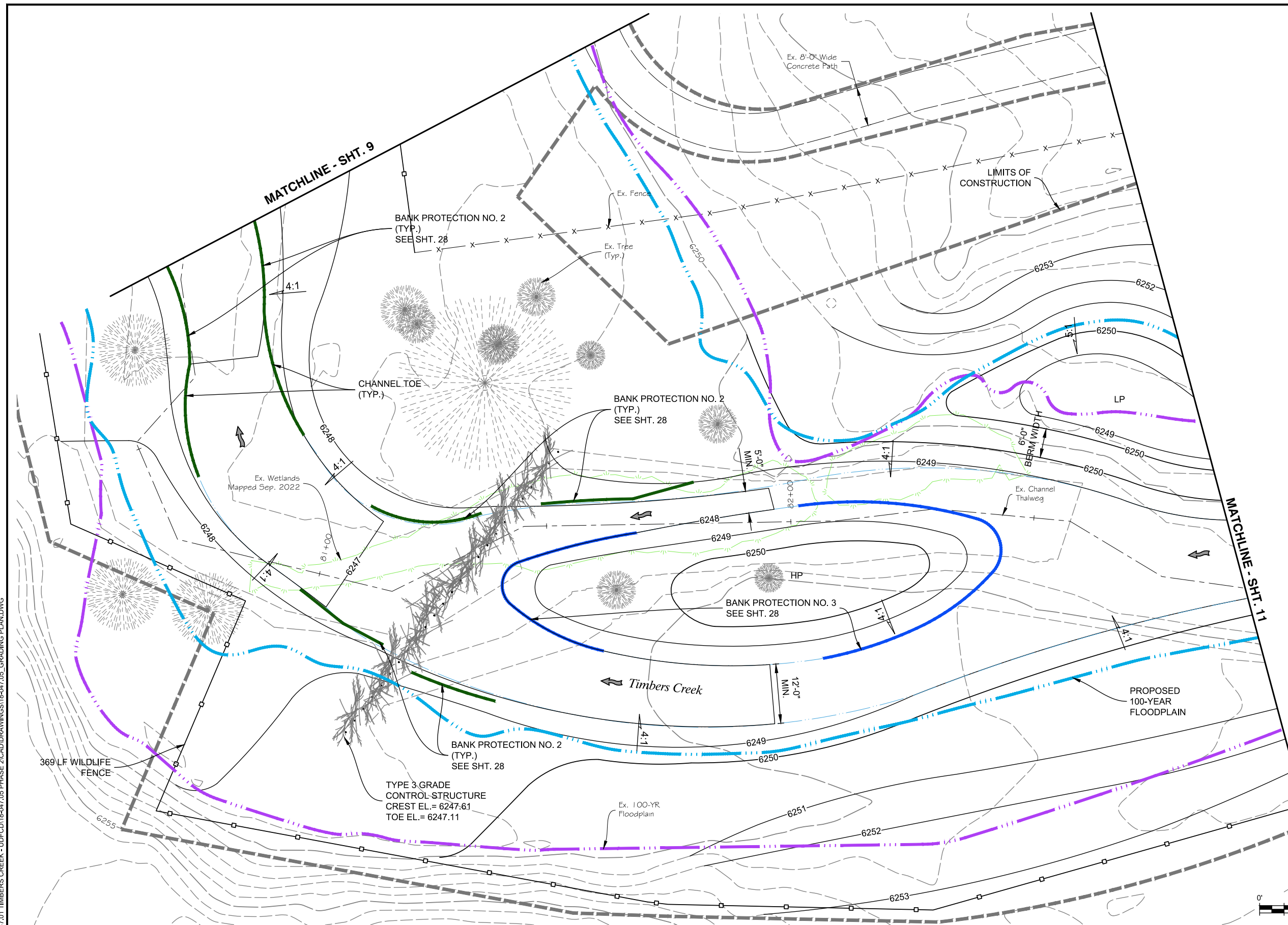
KEYMAP
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LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- - - - LIMITS OF CONSTRUCTION
- · - · - EXISTING 100-YR FLOODPLAIN
- · - · - PROPOSED 100-YR FLOODPLAIN

NOTES:

1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PLAN & PROFILE SHTS. FOR LEFT AND RIGHT DEVIATIONS.



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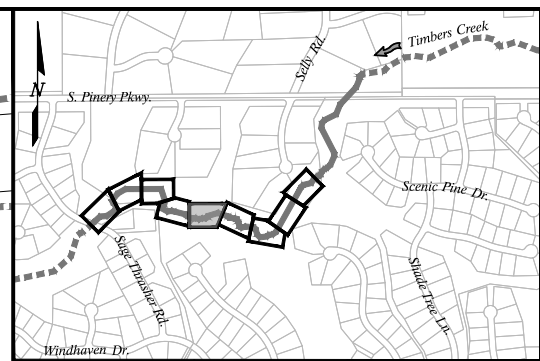
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FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
CIVIL		1/9/2023
GRADING PLAN		DRAWING NO.
		C-7
		SHEET NO.
		10 OF 44



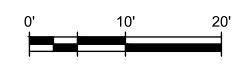
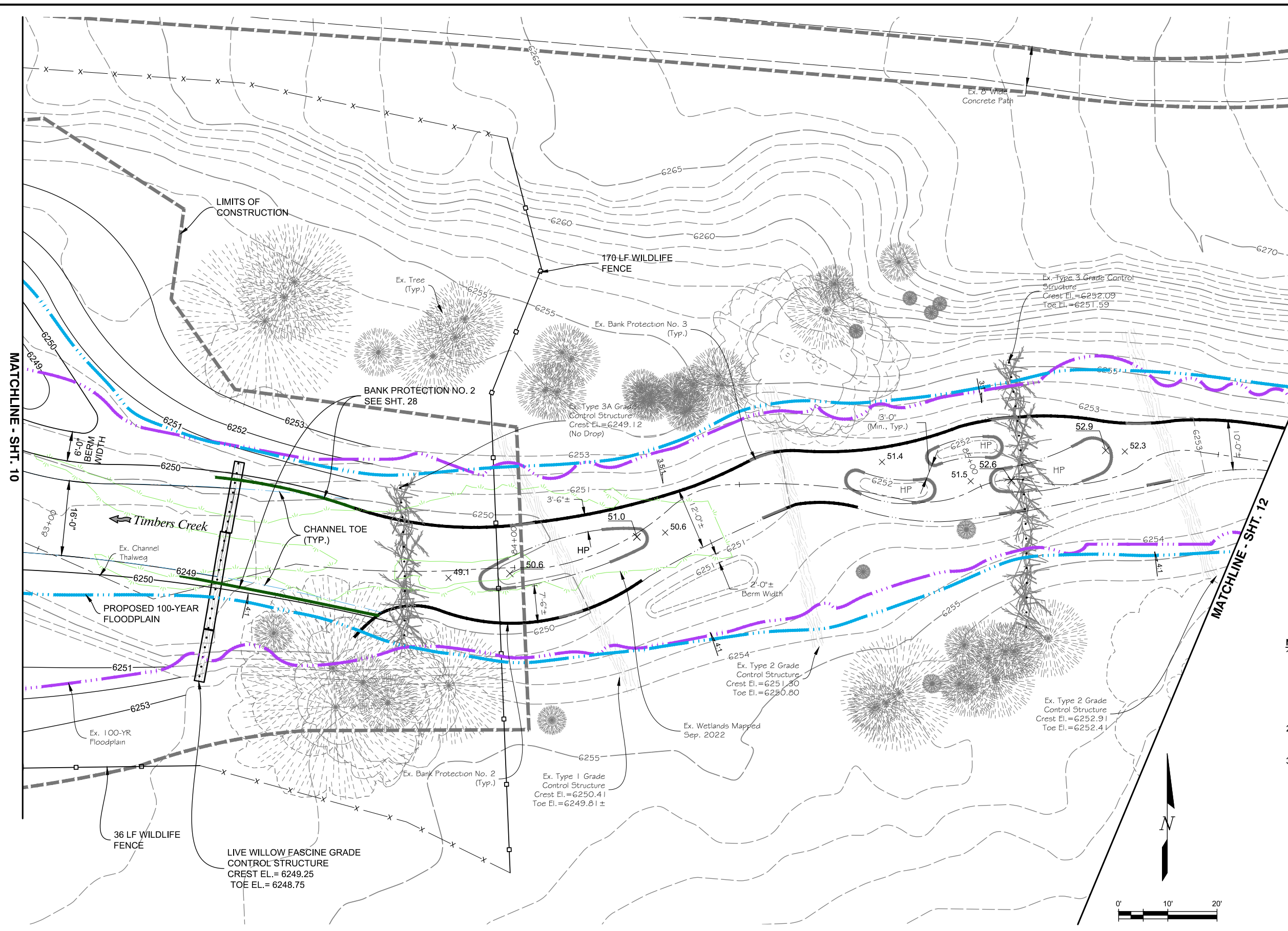
KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- - - - EXISTING 100-YR FLOODPLAIN
- - - - PROPOSED 100-YR FLOODPLAIN

NOTES:

1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PLAN & PROFILE SHTS. FOR LEFT AND RIGHT DEVIATIONS.



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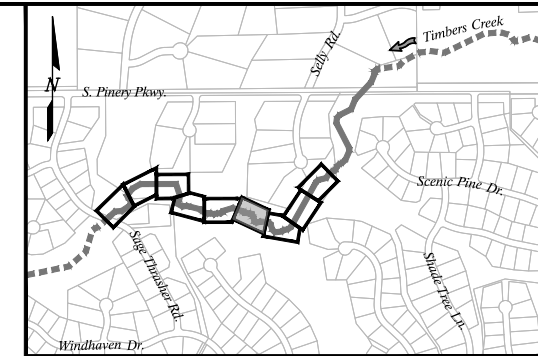
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 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
CIVIL		1/9/2023
GRADING PLAN		DRAWING NO.
		C-8
		SHEET NO.
		11 OF 44

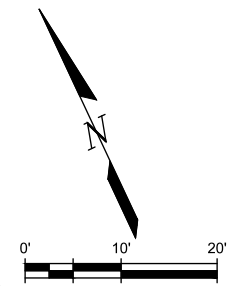
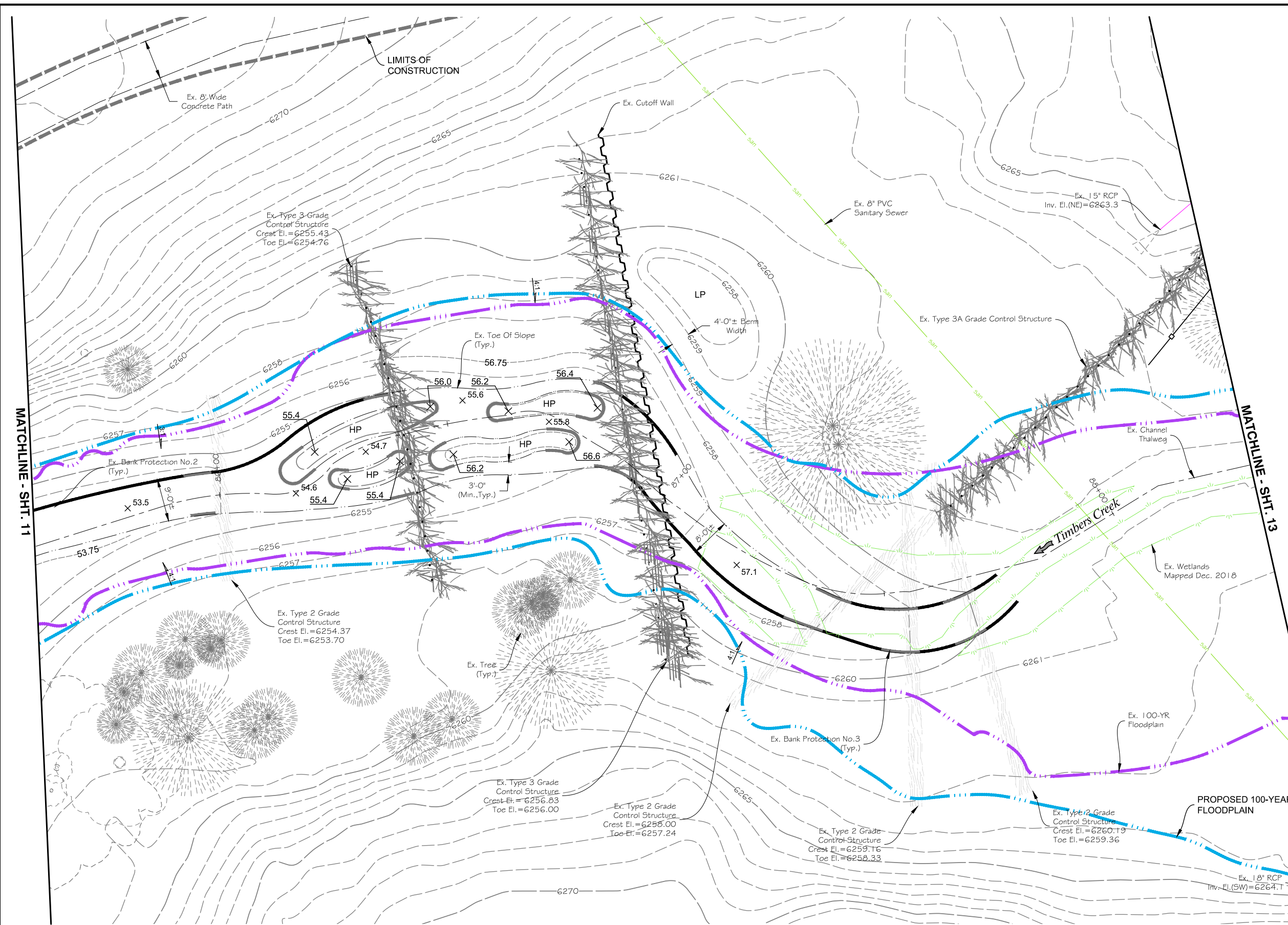


KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- - - - LIMITS OF CONSTRUCTION
- · - · - EXISTING 100-YR FLOODPLAIN
- · - · - PROPOSED 100-YR FLOODPLAIN

NOTES:
1. PLAN SHEET IS PROVIDED FOR REFERENCE ONLY. NO IMPROVEMENTS ARE PROPOSED.



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DESIGNED: AAG
DRAWN: JGG
CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION

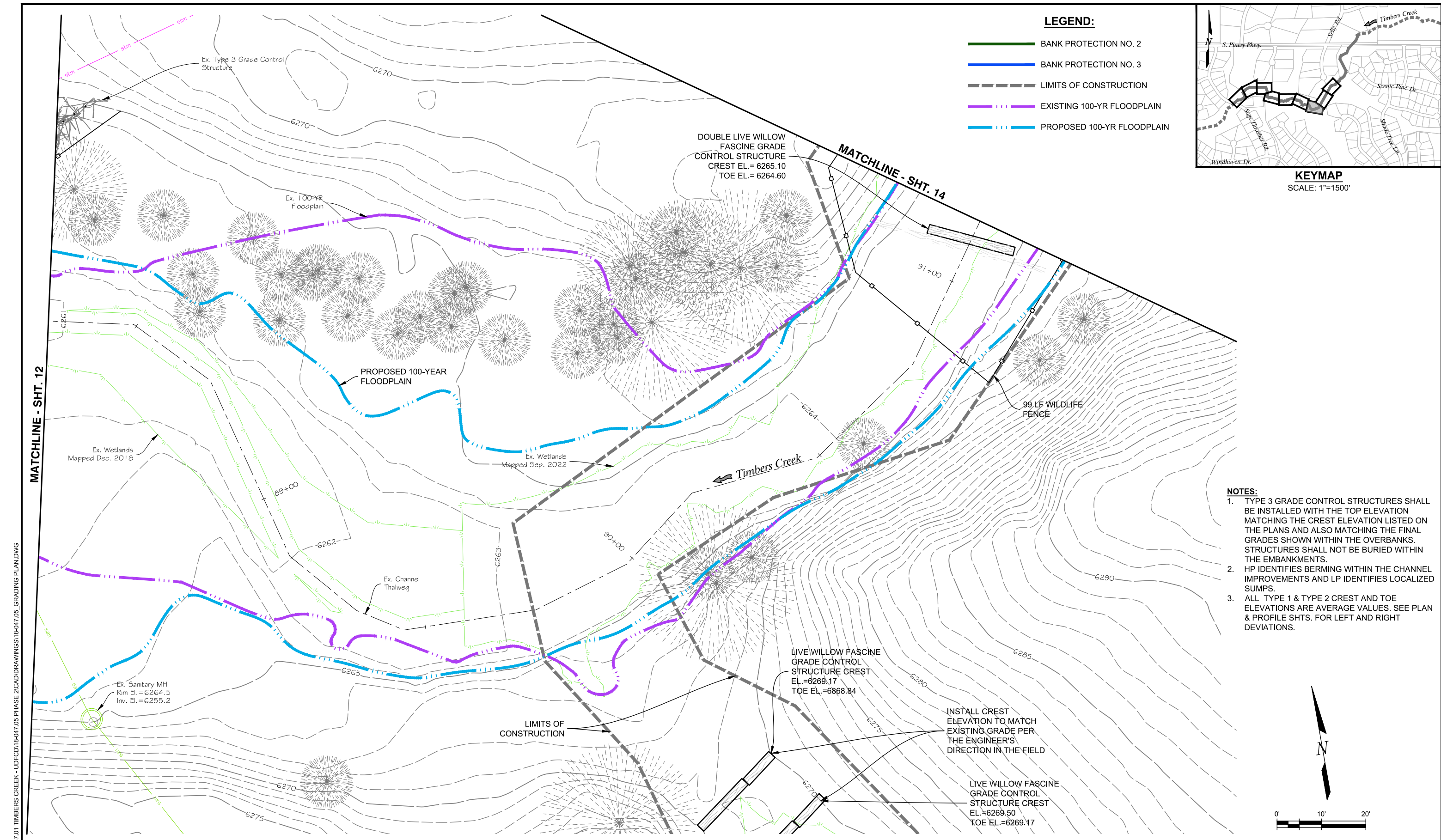


TIMBERS CREEK IMPROVEMENTS (PHASE 2)

CIVIL

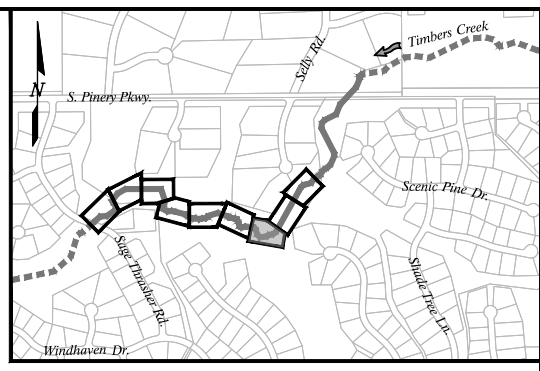
GRADING PLAN

DATE: 1/9/2023
DRAWING NO.: C-9
SHEET NO.: 12 OF 44

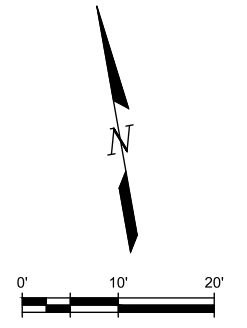


LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- - - LIMITS OF CONSTRUCTION
- · - · - EXISTING 100-YR FLOODPLAIN
- · - · - PROPOSED 100-YR FLOODPLAIN



- NOTES:**
1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
 2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
 3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PLAN & PROFILE SHTS. FOR LEFT AND RIGHT DEVIATIONS.



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DESIGNED: AAG

DRAWN: JGG

CHECKED: CLK

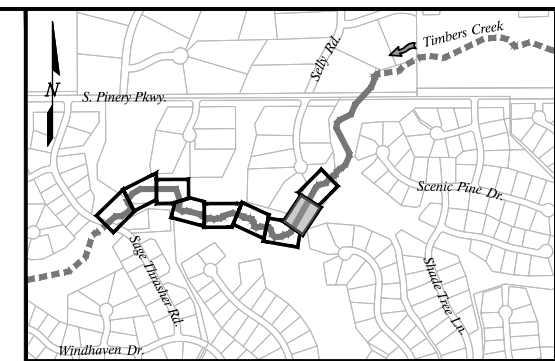
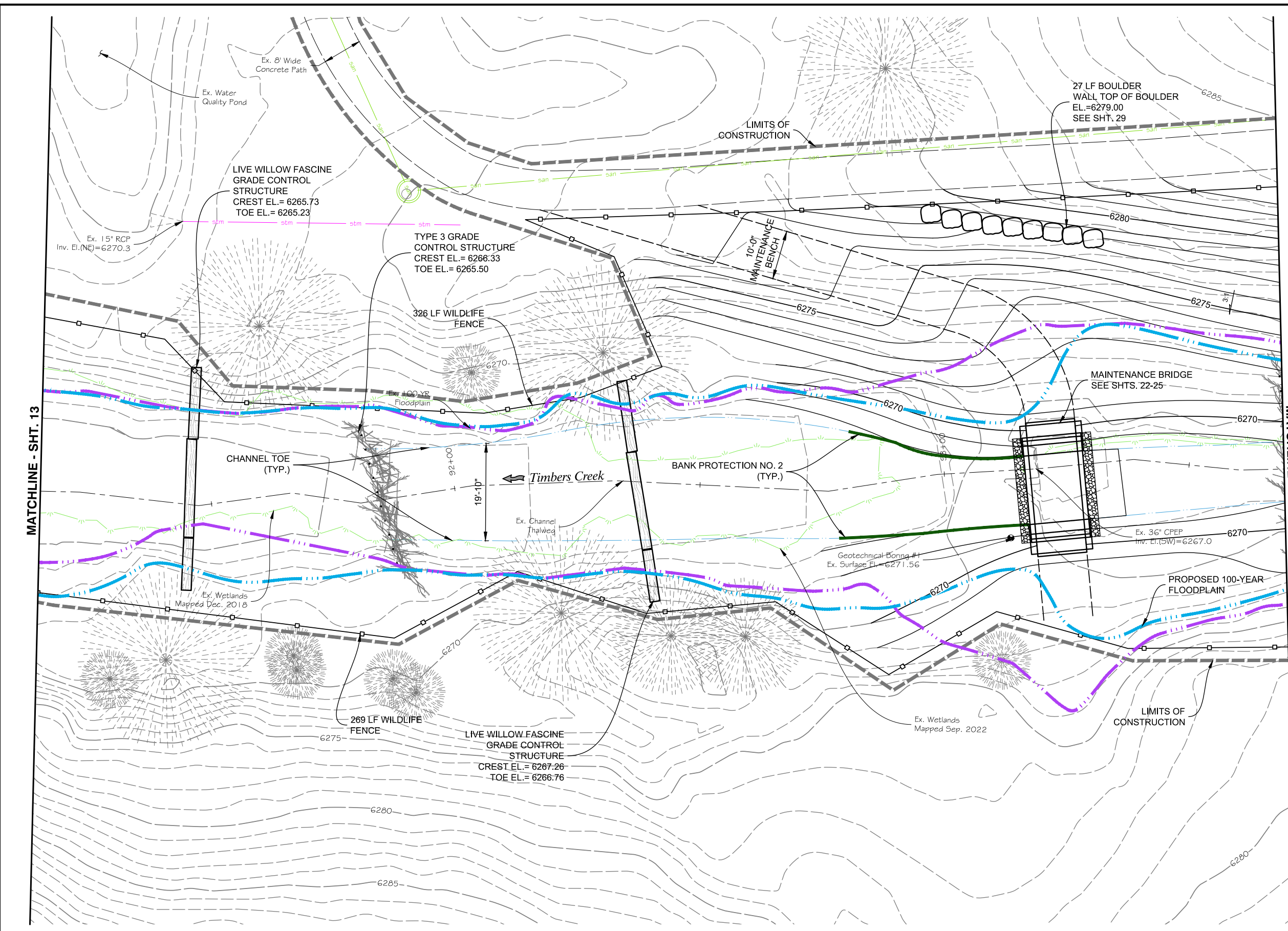
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NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
CIVIL		1/9/2023
GRADING PLAN		DRAWING NO.
		C-10
		SHEET NO.
		13 OF 44

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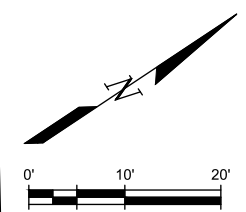
KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- - - - EXISTING 100-YR FLOODPLAIN
- - - - PROPOSED 100-YR FLOODPLAIN

NOTES:

1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
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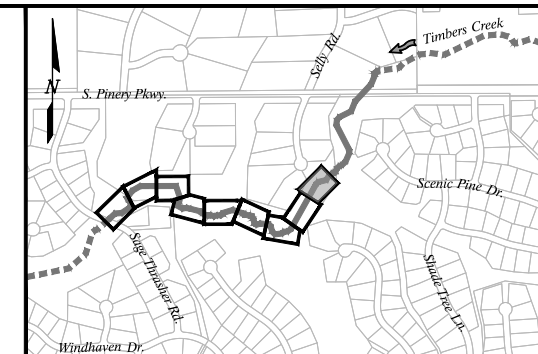
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FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-11
GRADING PLAN		SHEET NO. 14 OF 44



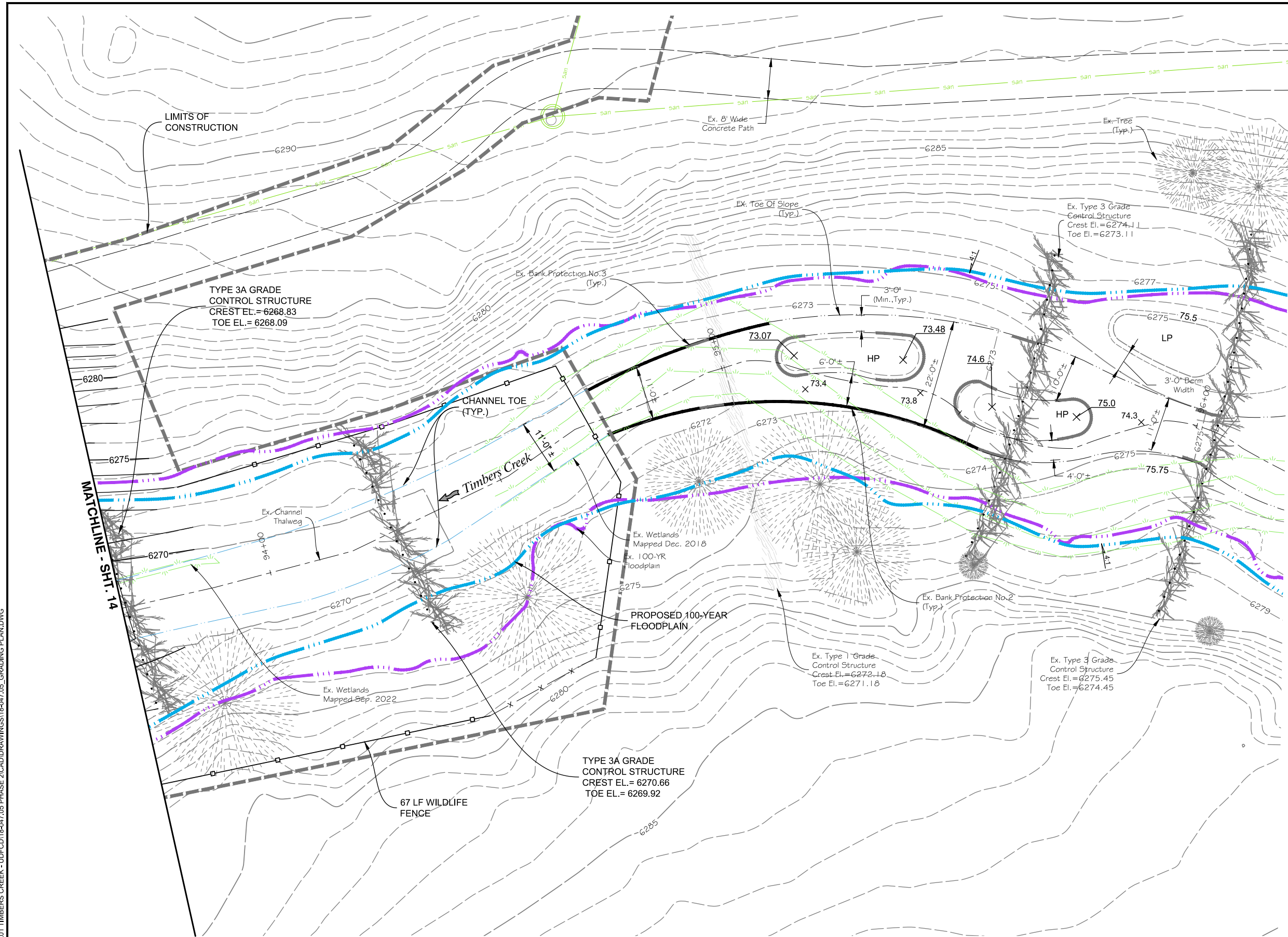
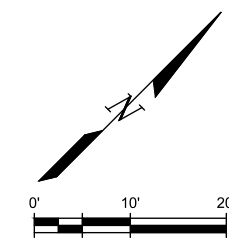
KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- - - - - EXISTING 100-YR FLOODPLAIN
- - - - - PROPOSED 100-YR FLOODPLAIN

NOTES:

1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
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3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PLAN & PROFILE SHTS. FOR LEFT AND RIGHT DEVIATIONS.



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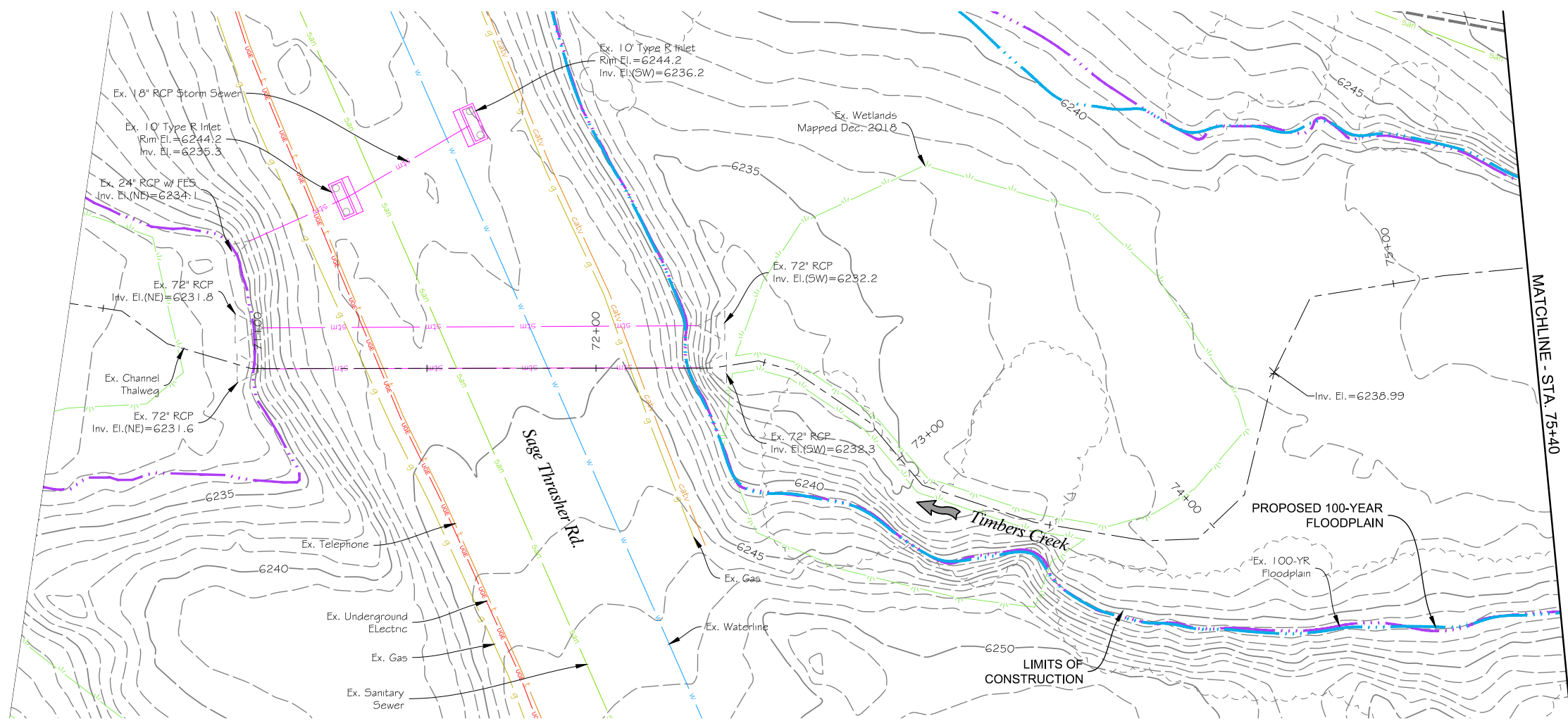
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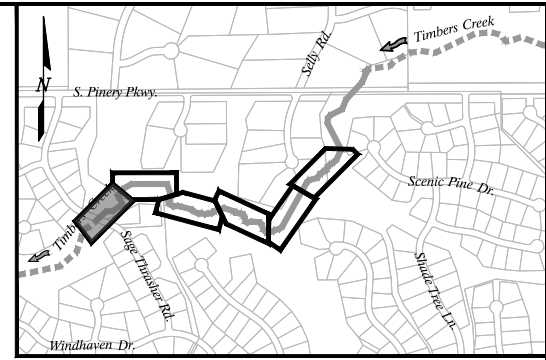
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NO.	DATE	DESCRIPTION



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CIVIL		1/9/2023
GRADING PLAN		DRAWING NO.
		C-12
		SHEET NO.
		15 OF 44

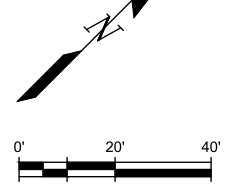


PLAN

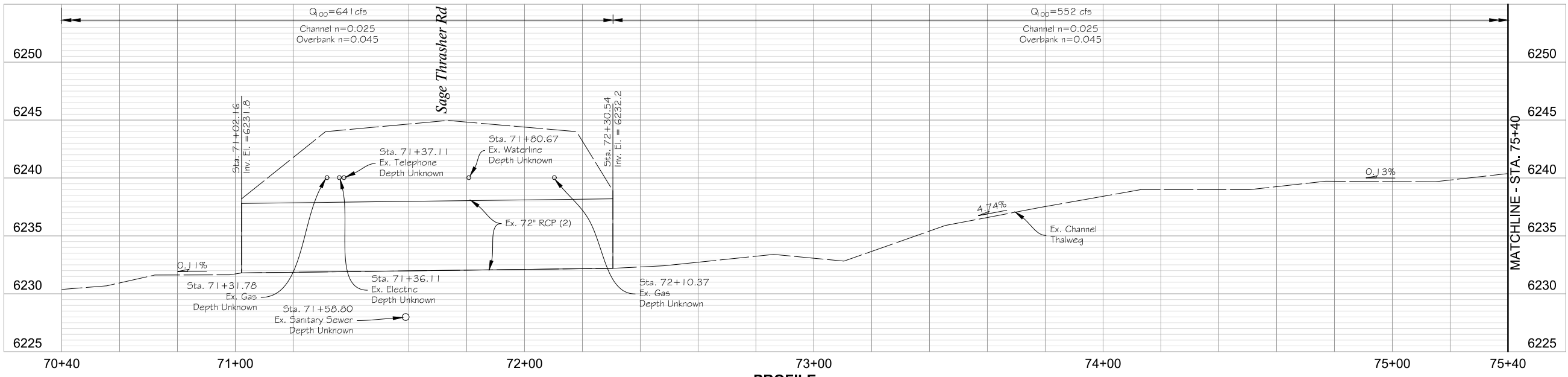


KEYMAP
SCALE: 1"=1500'

- LEGEND:**
- BANK PROTECTION NO. 2
 - BANK PROTECTION NO. 3
 - LIMITS OF CONSTRUCTION
 - - - - EXISTING 100-YR FLOODPLAIN
 - PROPOSED 100-YR FLOODPLAIN



- NOTES:**
1. PLAN & PROFILE SHEET IS PROVIDED FOR REFERENCE ONLY. NO IMPROVEMENTS ARE PROPOSED.



PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=10'

PLOTTED: 1/15/2023 10:25:34 PM
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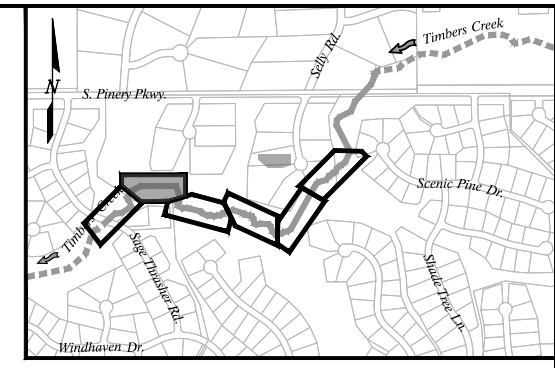
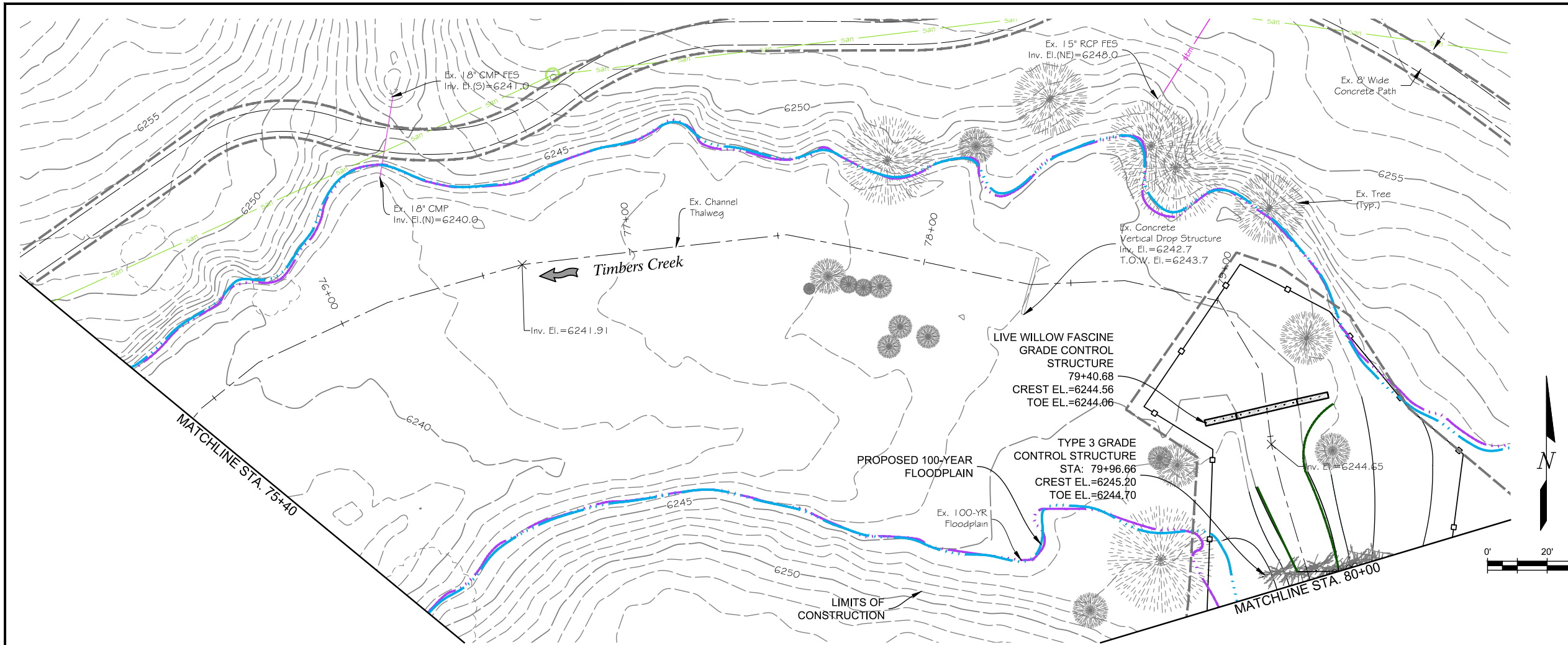
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 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



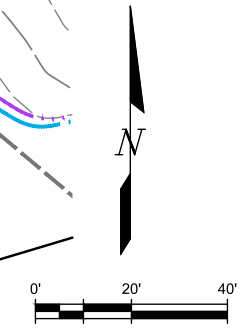
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CIVIL		1/9/2023
PLAN & PROFILE		DRAWING NO.
		C-13
		SHEET NO.
		16 OF 44



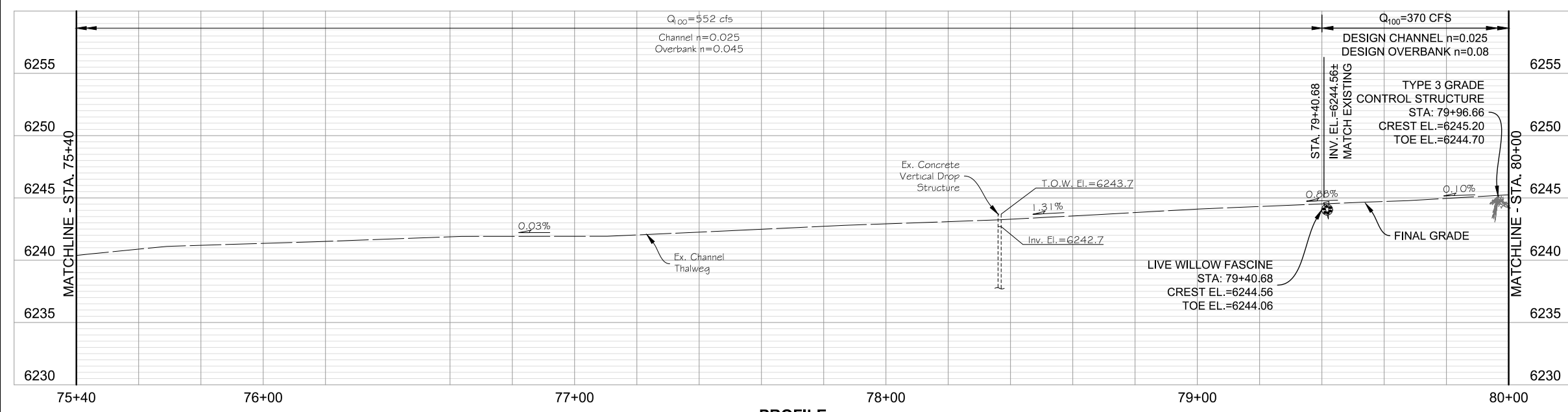
KEYMAP
SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION
- EXISTING 100-YR FLOODPLAIN
- PROPOSED 100-YR FLOODPLAIN



PLAN



PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=10'

- NOTES:**
- TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
 - HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
 - ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PROFILE FOR LEFT AND RIGHT DEVIATIONS. ALL "LEFT" AND "RIGHT" CALLOUTS ARE BASED LOOKING DOWNSTREAM.
 - ALL SLOPES CALCULATED USING THALWEG INFORMATION SHOWN ON GRADING PLANS.

PLOTTED: 1/15/2023 10:27:17 PM
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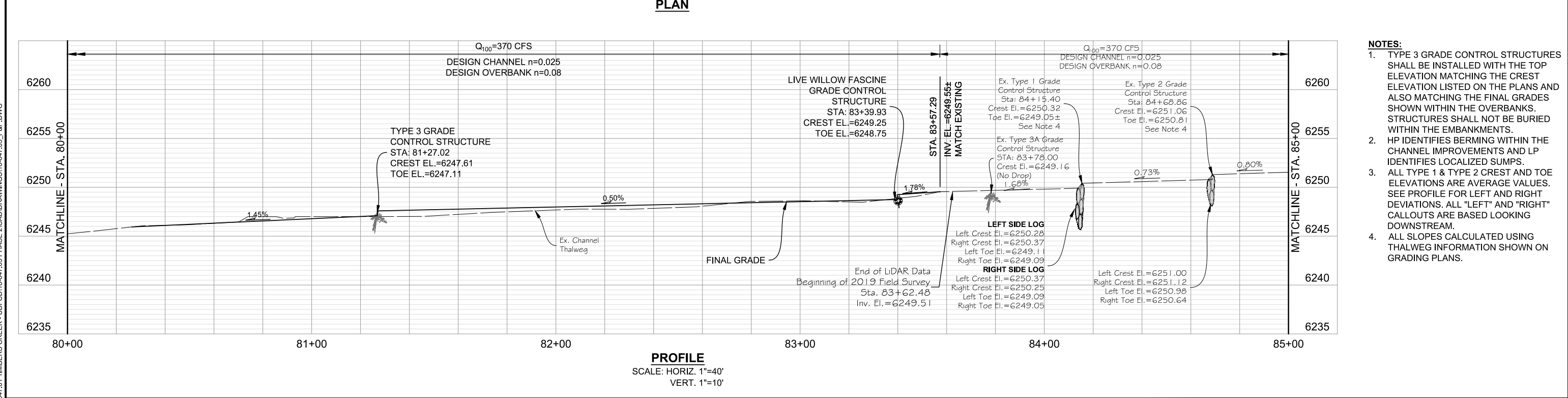
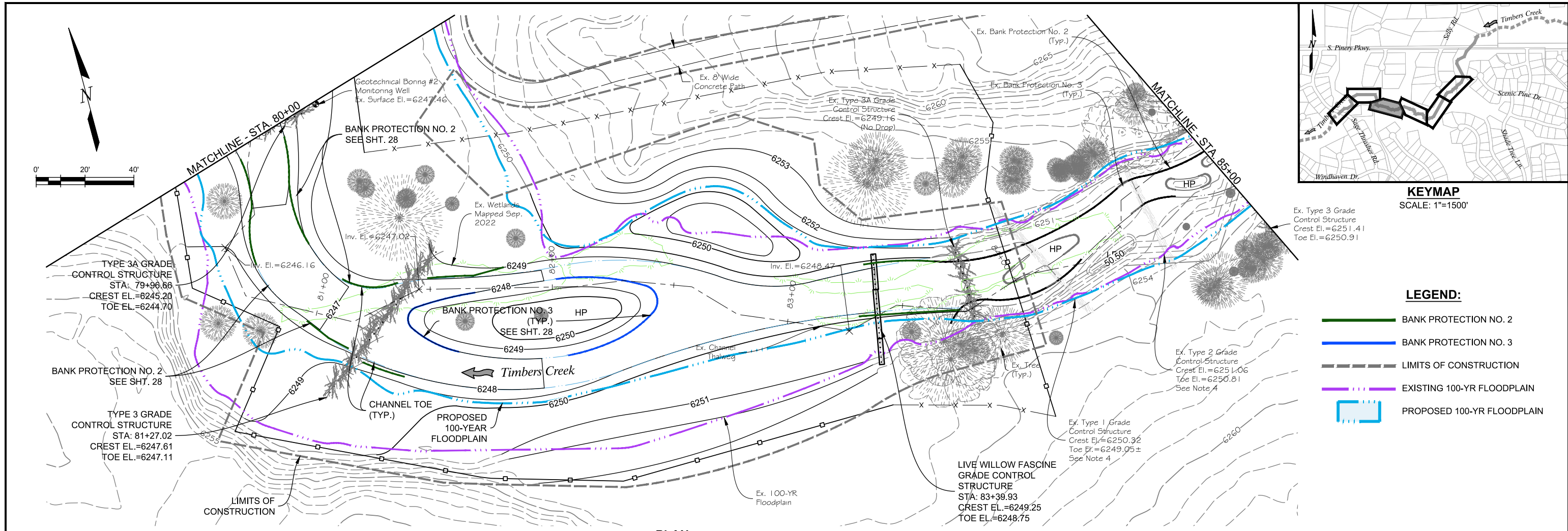
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DESIGNED: AAG
 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

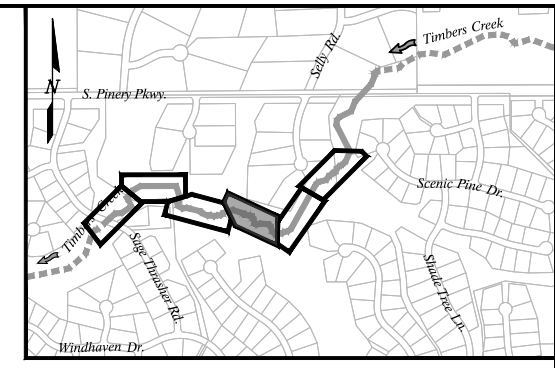
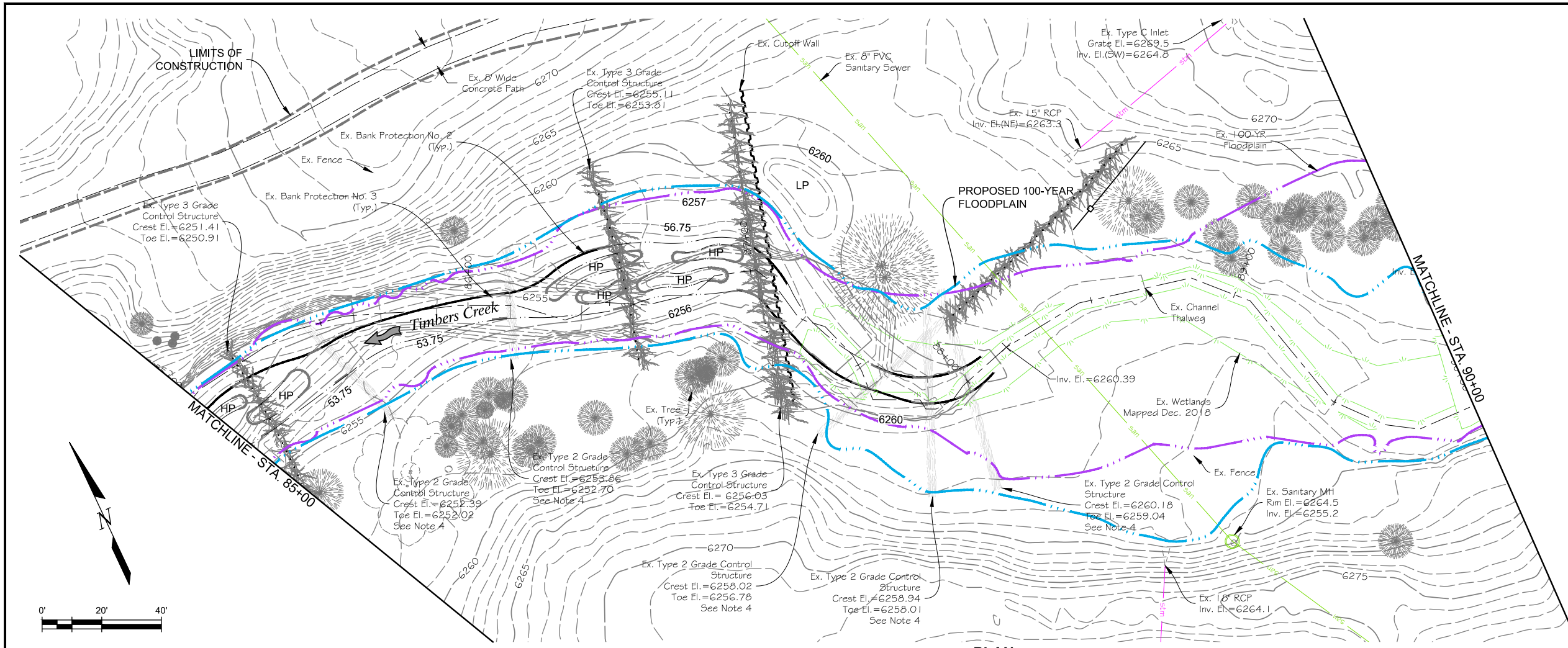
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NO.	DATE	DESCRIPTION	BY

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
CIVIL		1/9/2023
PLAN & PROFILE		DRAWING NO.
		C-14
		SHEET NO.
		17 OF 44



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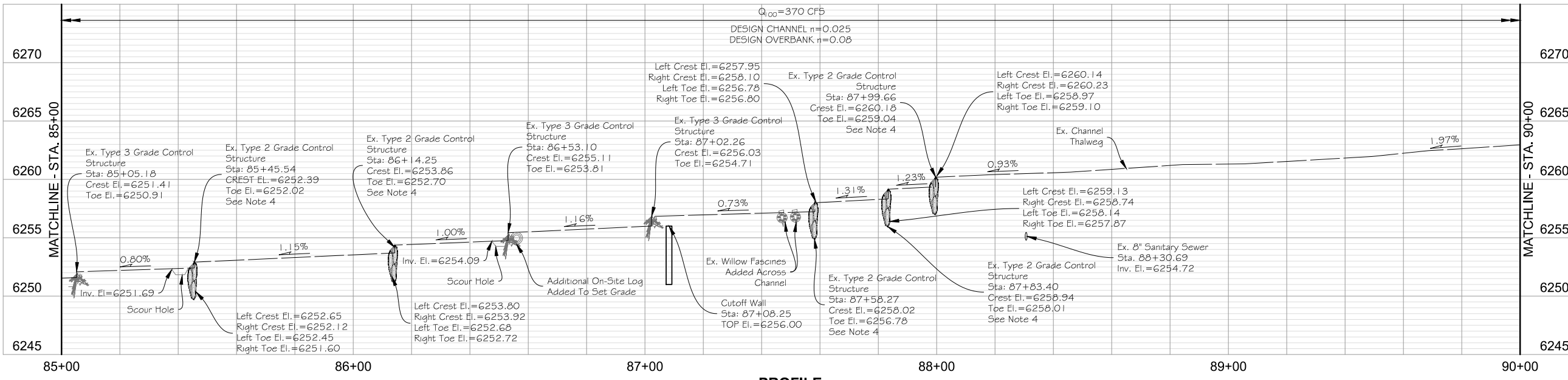
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CHECKED: CLK							PLAN & PROFILE			DRAWING NO.		
										C-15		
										SHEET NO. 18 OF 44		



KEYMAP
SCALE: 1"=1500'

- LEGEND:**
- BANK PROTECTION NO. 2
 - BANK PROTECTION NO. 3
 - LIMITS OF CONSTRUCTION
 - EXISTING 100-YR FLOODPLAIN
 - PROPOSED 100-YR FLOODPLAIN

PLAN



PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=10'

- NOTES:**
- PLAN & PROFILE SHEET IS PROVIDED FOR REFERENCE ONLY. NO IMPROVEMENTS ARE PROPOSED.

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 COLORADO LICENSED PROFESSIONAL ENGINEER 57459 1/1/2025

PREPARED UNDER THE SUPERVISION OF

DESIGNED: AAG

DRAWN: JGG

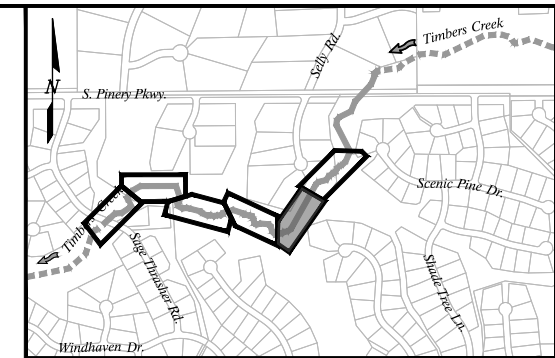
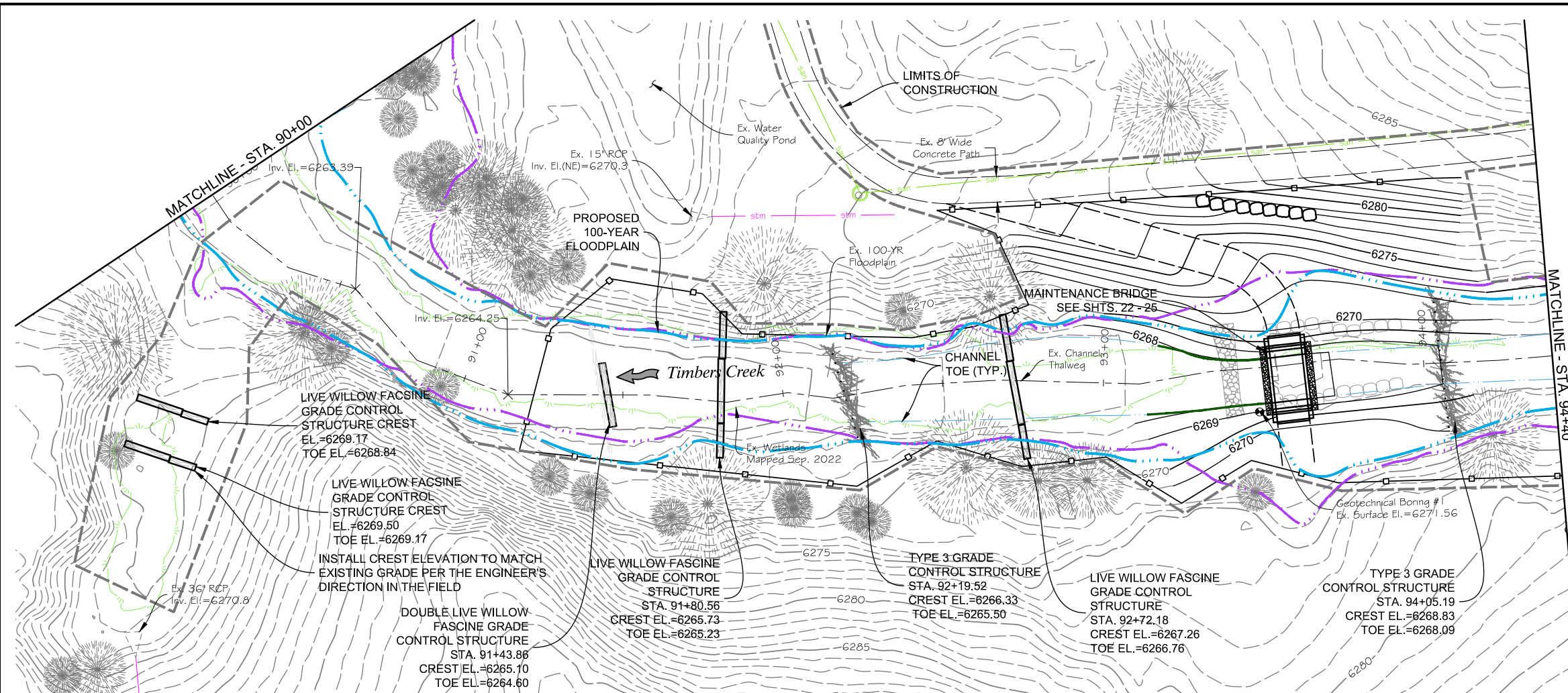
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NO.	DATE	DESCRIPTION	BY



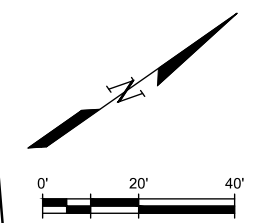
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PLAN & PROFILE		DRAWING NO.
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		SHEET NO.
		19 OF 44



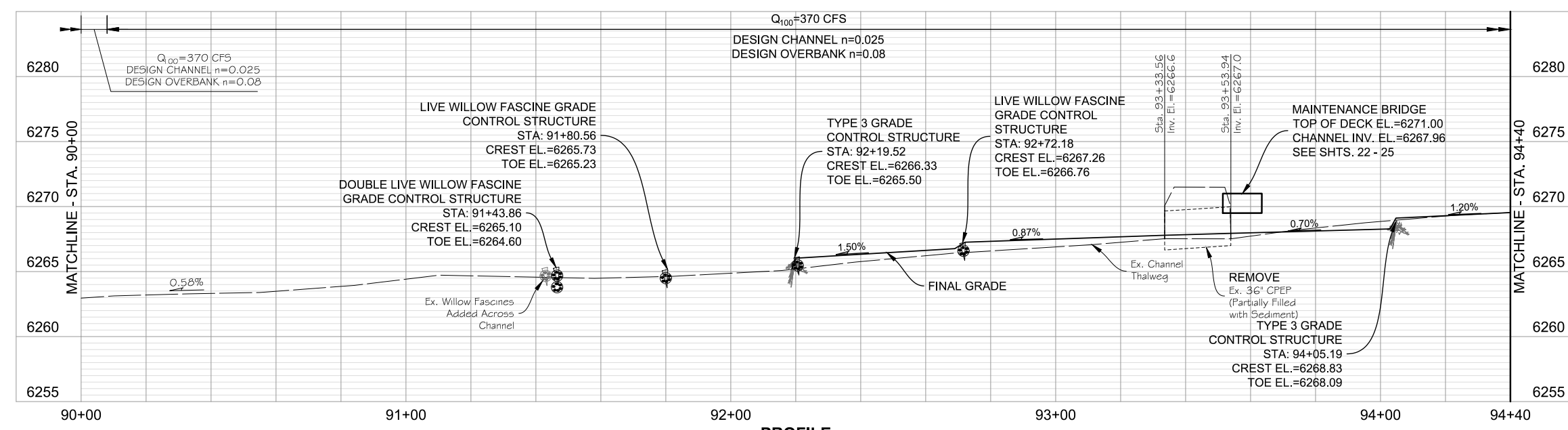
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SCALE: 1"=1500'

LEGEND:

- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- - - - LIMITS OF CONSTRUCTION
- - - - EXISTING 100-YR FLOODPLAIN
- PROPOSED 100-YR FLOODPLAIN



PLAN



PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=10'

NOTES:

1. TYPE 3 GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PROFILE FOR LEFT AND RIGHT DEVIATIONS. ALL "LEFT" AND "RIGHT" CALLOUTS ARE BASED LOOKING DOWNSTREAM.
4. ALL SLOPES CALCULATED USING THALWEG INFORMATION SHOWN ON GRADING PLANS.

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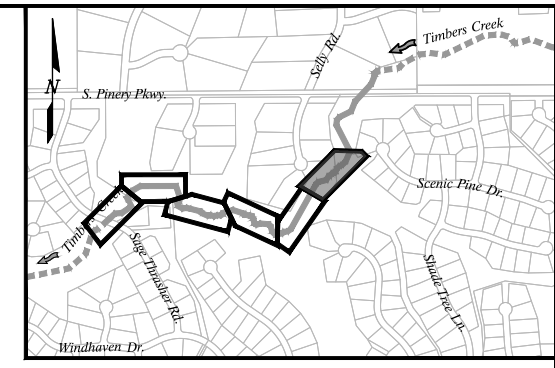
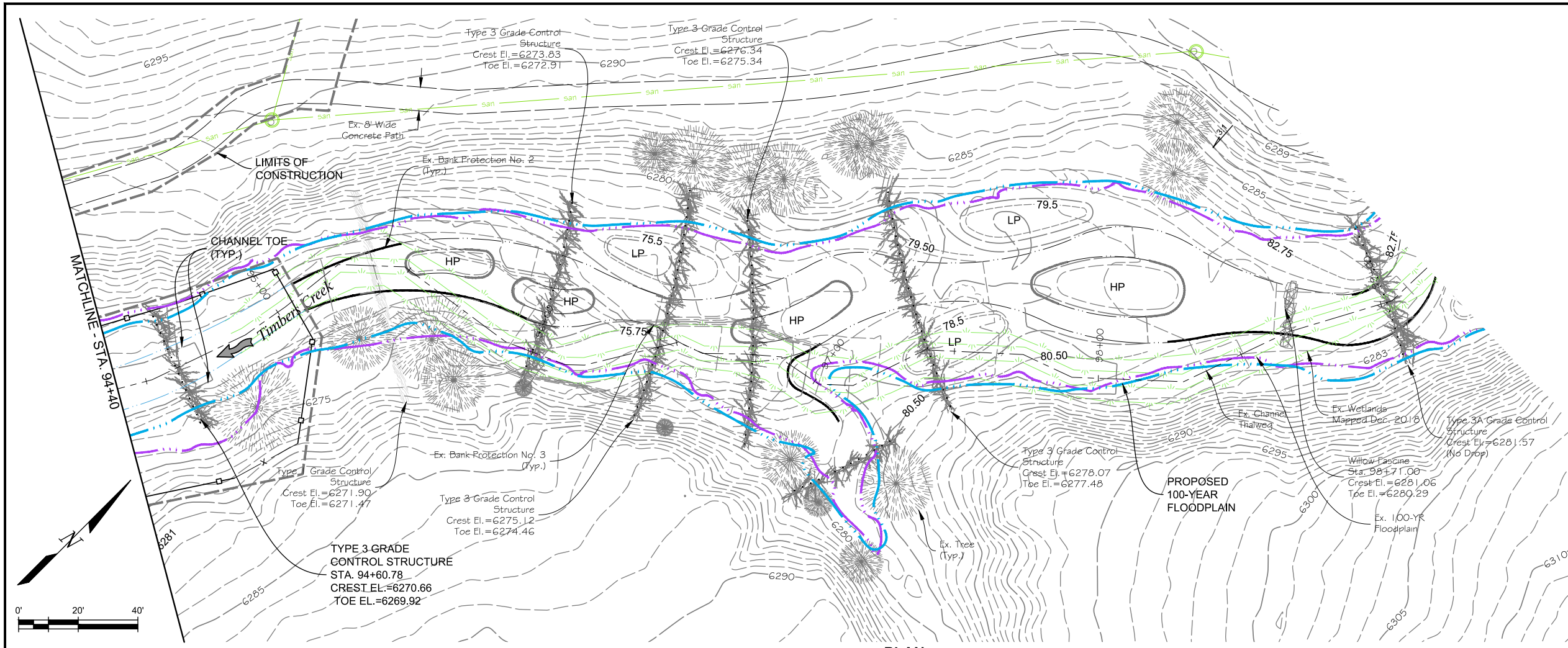
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NO.	DATE	DESCRIPTION



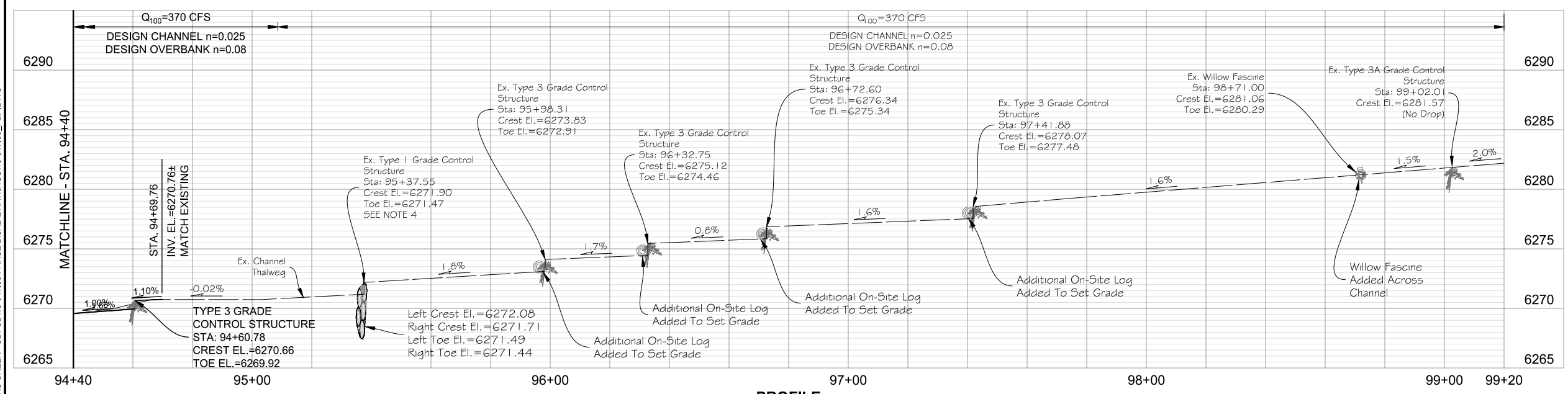
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CIVIL		1/9/2023
PLAN & PROFILE		DRAWING NO.
		C-17
		SHEET NO.
		20 OF 44



KEYMAP
SCALE: 1"=1500'

- LEGEND:**
- BANK PROTECTION NO. 2
 - BANK PROTECTION NO. 3
 - LIMITS OF CONSTRUCTION
 - EXISTING 100-YR FLOODPLAIN
 - PROPOSED 100-YR FLOODPLAIN

PLAN



PROFILE
SCALE: HORIZ. 1"=40'
VERT. 1"=10'

- NOTES:**
1. GRADE CONTROL STRUCTURES SHALL BE INSTALLED WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS AND ALSO MATCHING THE FINAL GRADES SHOWN WITHIN THE OVERBANKS. STRUCTURES SHALL NOT BE BURIED WITHIN THE EMBANKMENTS.
 2. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.
 3. ALL TYPE 1 & TYPE 2 CREST AND TOE ELEVATIONS ARE AVERAGE VALUES. SEE PROFILE FOR LEFT AND RIGHT DEVIATIONS. ALL "LEFT" AND "RIGHT" CALLOUTS ARE BASED LOOKING DOWNSTREAM.
 4. ALL SLOPES CALCULATED USING THALWEG INFORMATION SHOWN ON GRADING PLANS.

PLOTTED: 1/15/2023 10:32:53 PM
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 COLORADO LICENSED PROFESSIONAL ENGINEER 57459 1/15/2023
 NAME: P:2018 PROJECTS\18-047.01 TIMBERS CREEK - UDFCD\18-047.05 PHASE 2\CADD\DRAWINGS\18-047.05_P&P.DWG

PREPARED UNDER THE SUPERVISION OF

FINAL DESIGN

DESIGNED: AAG
 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION

MULLER ENGINEERING COMPANY

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRODISTRICT

TIMBERS CREEK IMPROVEMENTS (PHASE 2)

CIVIL

PLAN & PROFILE

DATE: 1/9/2023
 DRAWING NO.: C-18
 SHEET NO.: 21 OF 44

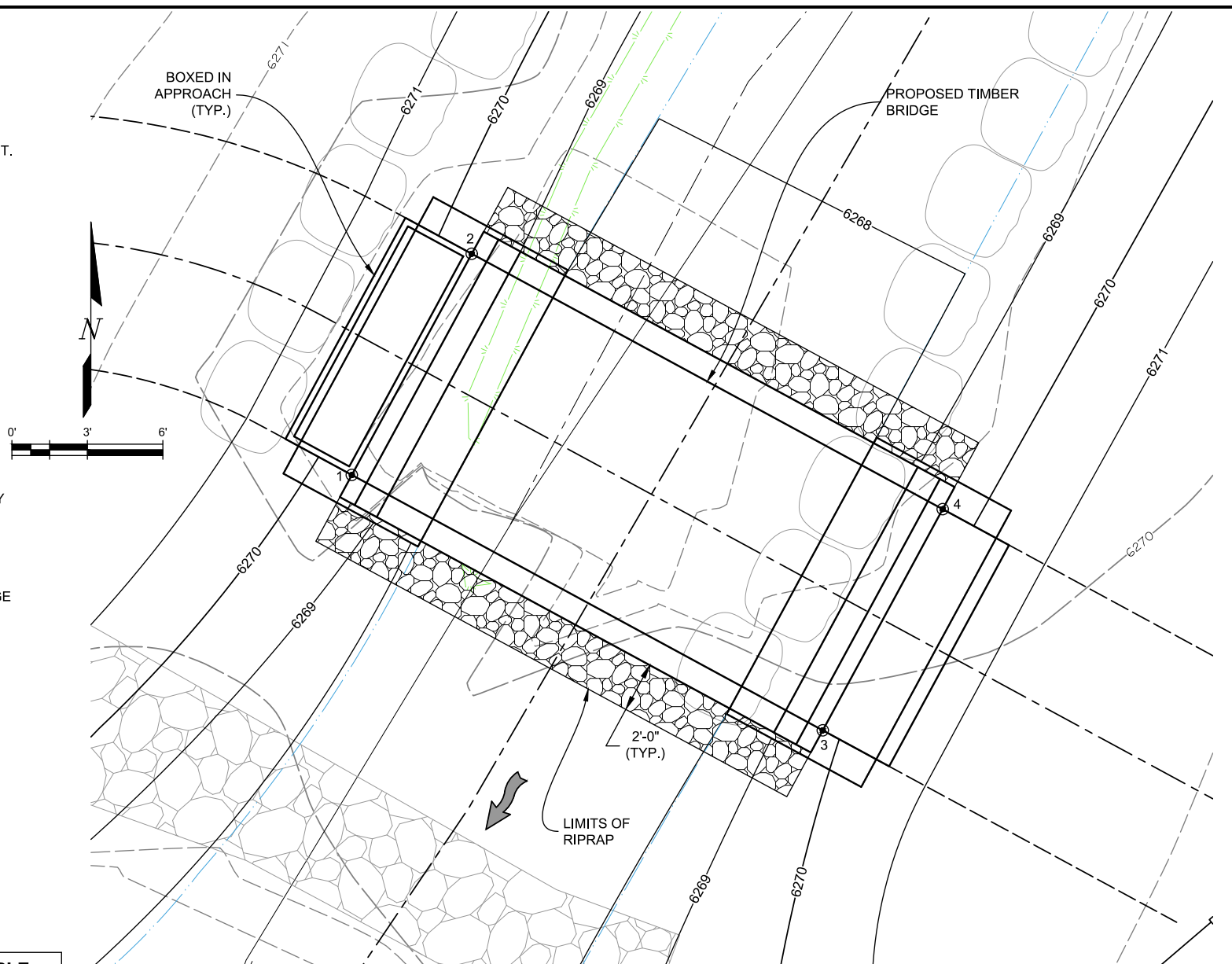
GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", COLORADO DEPARTMENT OF TRANSPORTATION, 2022 EDITION, AS MODIFIED BY THE PROJECT SPECIAL PROVISIONS AND THESE PLANS.
2. STRUCTURE EXCAVATION AND BACKFILL FOR BRIDGE ABUTMENTS SHALL BE IN ACCORDANCE WITH THE EXCAVATION AND BACKFILL DETAILS ON THIS SHEET. STRUCTURE EXCAVATION AND BACKFILL, CLASS A FILTER MATERIAL, AND GEOTEXTILE SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE INCLUDED IN THE COST OF STRUCTURAL CONCRETE.
3. STRUCTURE BACKFILL SHALL CONFORM TO THE STRUCTURE BACKFILL (CLASS 1) SPECIFICATIONS, AND SHALL BE PLACED IN ACCORDANCE WITH CDOT SPECIFICATIONS, SECTION 206.
4. ALL REINFORCING STEEL SHALL BE NON-COATED UNLESS OTHERWISE NOTED. REINFORCING STEEL SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE INCLUDED IN THE COST OF THE STRUCTURAL CONCRETE.
5. COVERAGE FROM THE FACE OF CONCRETE TO THE FACE OF REINFORCEMENT SHALL BE 2 INCHES, UNLESS NOTED OTHERWISE.
6. ALL EXPOSED CONCRETE CORNERS SHALL HAVE A 3/4" X 3/4" CHAMFER.
7. THE CONTRACTOR SHALL NOT BACKFILL STRUCTURES UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 3600 PSI. AND THE BRIDGE BEAMS HAVE BEEN SET AND ANCHORED.
8. ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.
9. CONSTRUCTION JOINTS AT LOCATIONS OTHER THAN AS SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
11. THE CONTRACTOR IS RESPONSIBLE FOR HAVING BEARING CAPACITY OF FOUNDATION SOIL VERIFIED BY A GEOTECHNICAL ENGINEER LICENSED BY THE STATE OF COLORADO PRIOR TO THE PLACEMENT OF CONCRETE FOOTINGS.
12. STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.
13. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR WILL HAVE THE PLAN SET AND CONTRACT DOCUMENTS ON-SITE WHILE WORK IS IN PROGRESS.
14. TREE PROTECTION AND REMOVAL: ALL TREES/SHRUBS ARE TO BE PROTECTED DURING CONSTRUCTION UNLESS IDENTIFIED ON THE PLANS FOR REMOVAL. CONTRACTOR IS TO FLAG TREES TO BE REMOVED AND VERIFY WITH THE ENGINEER PRIOR TO REMOVING ANY TREES. CONTRACTOR SHALL INSTALL ORANGE FENCING AROUND TREES TO BE PROTECTED.

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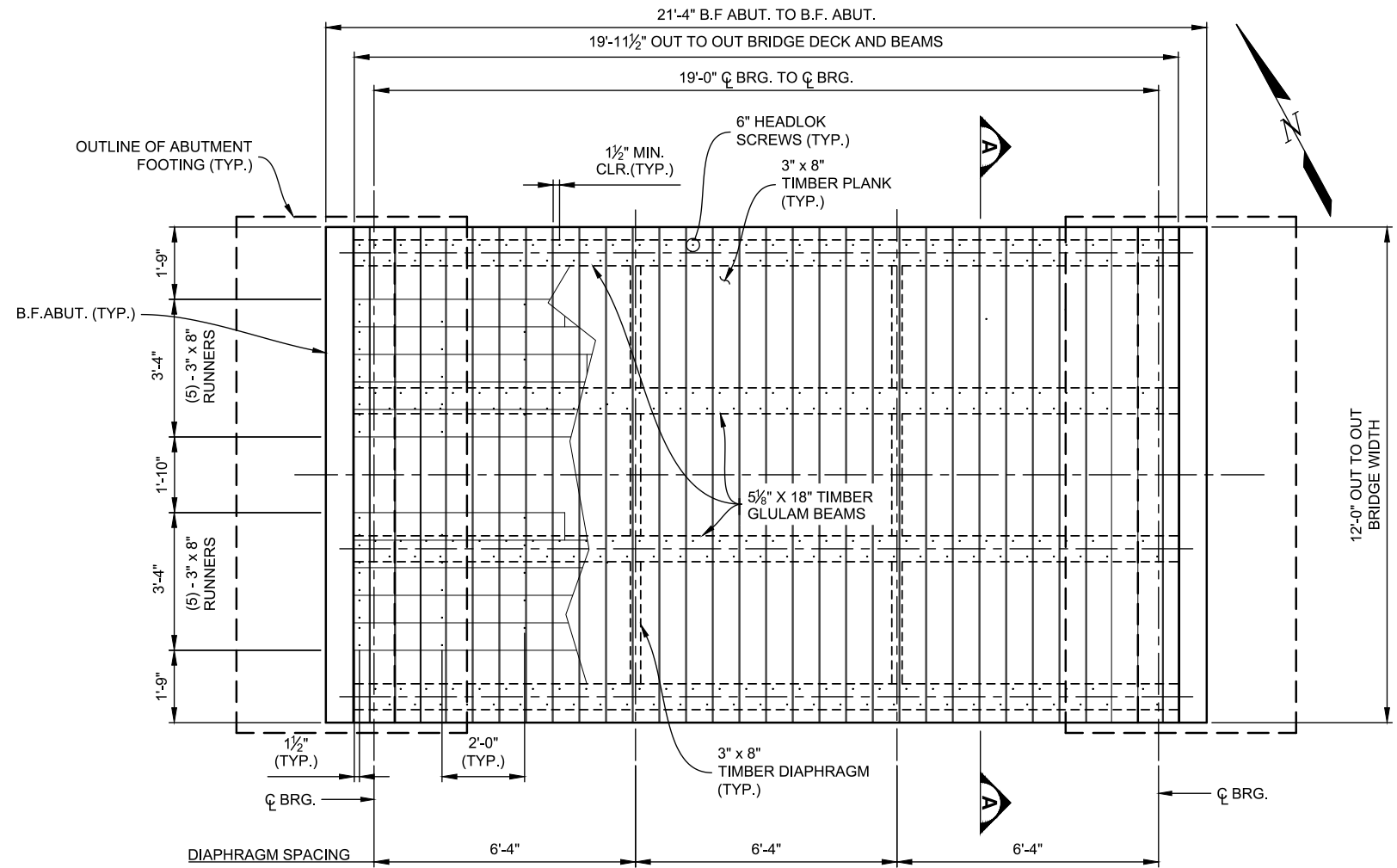
1. AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES, 2ND. ED. WITH 2015 INTERIM REVISIONS.
2. MATERIALS SHALL CONFORM TO CDOT STANDARD SPECIFICATION, 2022 EDITION.
3. DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN
4. LIVE LOAD: MAINTENANCE TRACTOR (H-8 EQUIVALENT)
5. DEAD LOAD: SELF-WT AND WEIGHT OF SOIL OVERBURDEN (WHERE APPLICABLE)
6. SOIL PARAMETERS:
 UNIT WEIGHT: 135 PCF
 EQUIV. FLUID PRESSURE: 80 PCF (AT-REST, SATURATED)
 ALLOWABLE BEARING PRESSURE: 4000 PSF,
7. REINFORCED CONCRETE:
 CDOT CLASS D: $f_c = 4,500$ psi.
 REINFORCING STEEL: $f_y = 60,000$ psi.

MAINTENANCE BRIDGE CONTROL TABLE			
POINT	NORTHING	EASTING	T.O. DECK ELEVATION
1	1586010.58	3219790.66	6271.00
2	1586019.37	3219795.42	6271.00
3	1586000.43	3219809.37	6271.00
4	1586009.22	3219814.14	6271.00

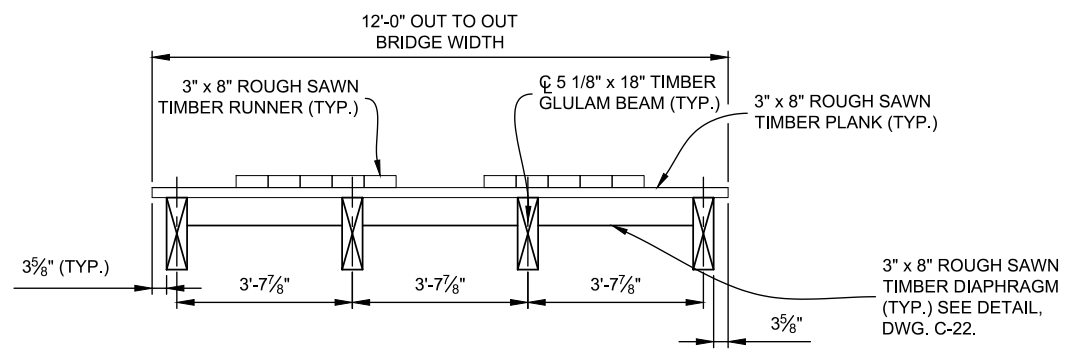


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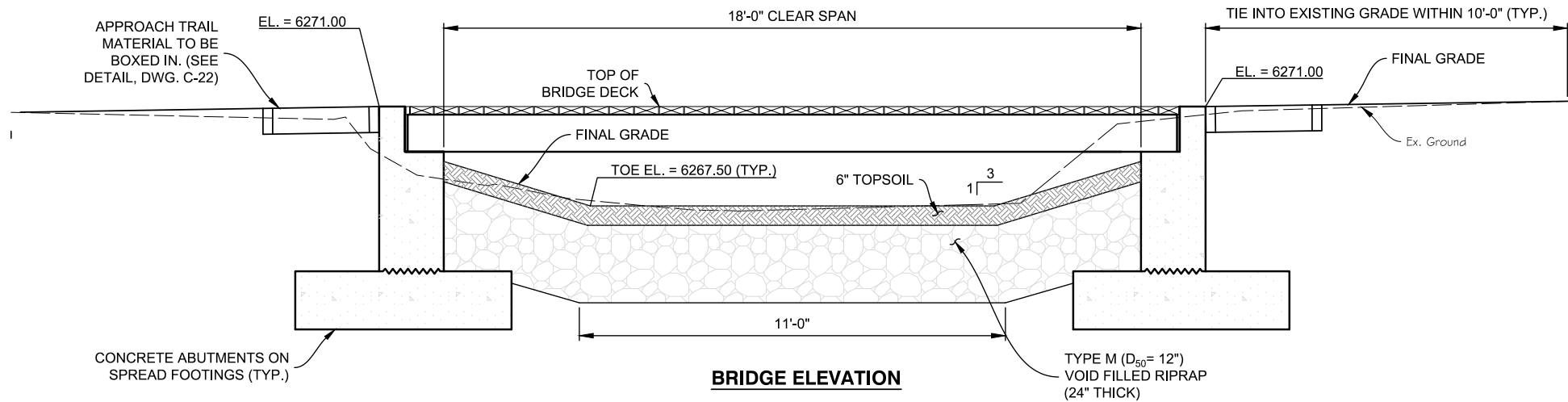
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	DRAWN: JGG														
	CHECKED: CLK														
CIVIL									BRIDGE NOTES AND LAYOUT						
									DRAWING NO. C-19	SHEET NO. 22 OF 44					



BRIDGE PLAN



SECTION A



BRIDGE ELEVATION

MATERIALS NOTES:

1. GLULAM TIMBER BEAMS SHALL BE DOUGLAS FIR-LARCH (SELECT STRUCTURAL).
2. GLULAM TIMBER BEAMS SHALL BE TREATED WITH AMINE COPPER QUART (ACQ) OR COPPER AZOLE (CA).
3. GLULAM BEAMS TO BE CAMBERED 3" AT CENTERLINE OF SPAN.
4. FIELD CUTS SHALL BE TREATED WITH COPPER NAPHTHENATE (3 BRUSH COATS MINIMUM).
5. ROUGH SAWN TIMBER PLANKS SHALL BE DOUGLAS FIR-LARCH (SELECT STRUCTURAL).
6. ROUGH SAWN TIMBER PLANKS SHALL BE UNTREATED.
7. FASTEN DECK PLANKS TO BEAMS WITH TWO ROWS OF 6" HEADLOK SCREWS PER PLANK AT EACH BEAM, ALTERNATE CENTERS.
8. MAINTAIN 3/8" ± GAP BETWEEN PLANKS.
9. ANCHOR BOLTS SHALL MEET ASTM F1554 SPECIFICATION AND SHALL BE GRADE 36.
10. ALL HARDWARE SHALL BE HOT DIP GALVANIZED PER ASTM A153.
11. HARDWARE SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE INCLUDED IN THE LUMP SUM COST FOR BRIDGE BEAMS AND DECK.
12. RUNNERS SHALL BE 3" X 8" ROUGH SAWN TIMBER PLANKS. RUNNERS TO BE FULL LENGTH OF BRIDGE DECK. JOINTS TO BE CENTERED OVER PLANK BELOW. MINIMUM LENGTH = 8'-0". STAGGER JOINTS 4'-0" MINIMUM BETWEEN ADJACENT PLANKS.
13. FASTEN RUNNERS TO DECK PLANKS WITH 5" HEADLOK SCREWS. TWO SCREWS PER EACH END OF PLANK PLUS SCREWS STAGGERED ALONG EACH SIDE EVERY 2-FEET OF LENGTH.

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PREPARED UNDER THE SUPERVISION OF

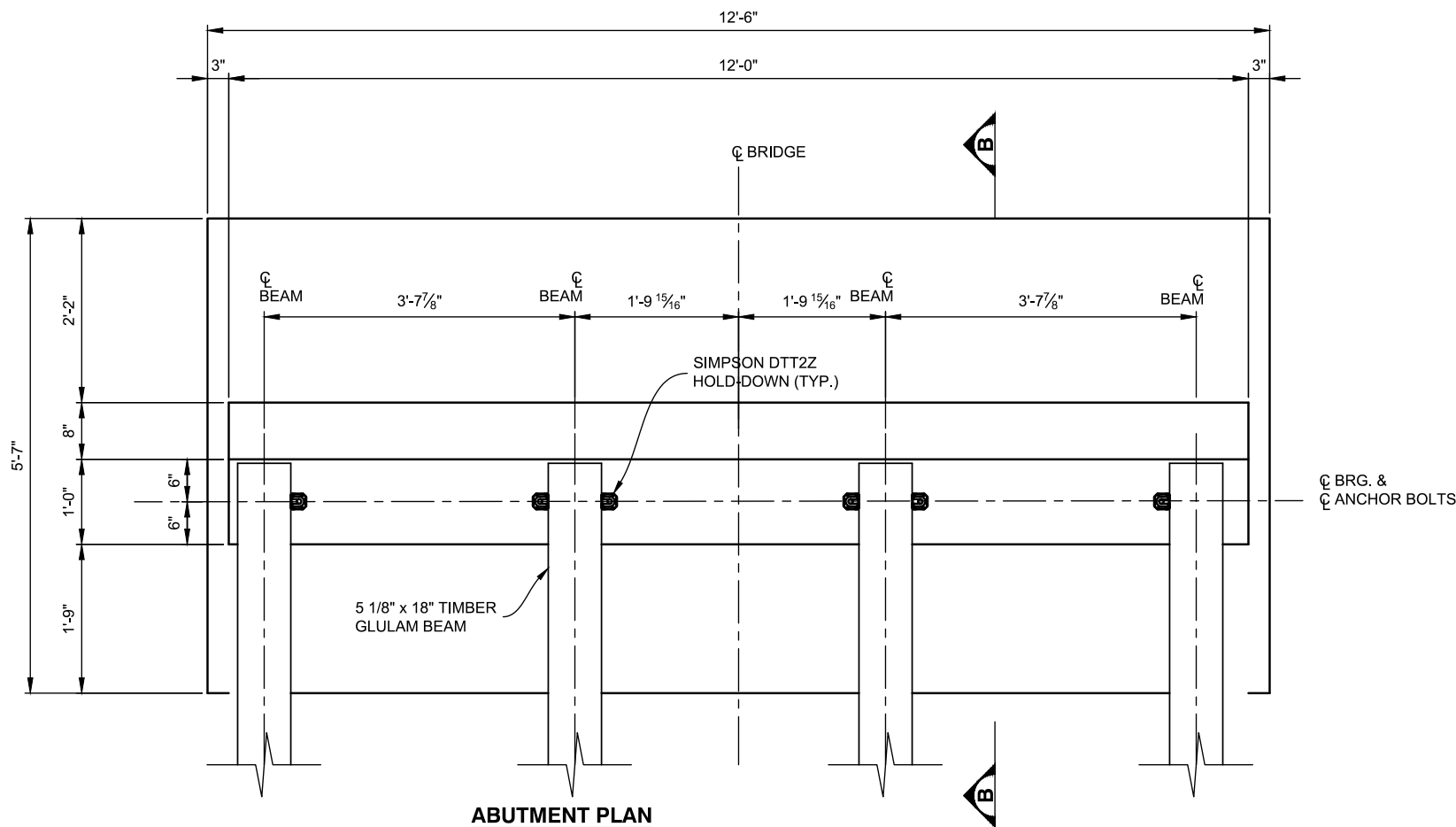
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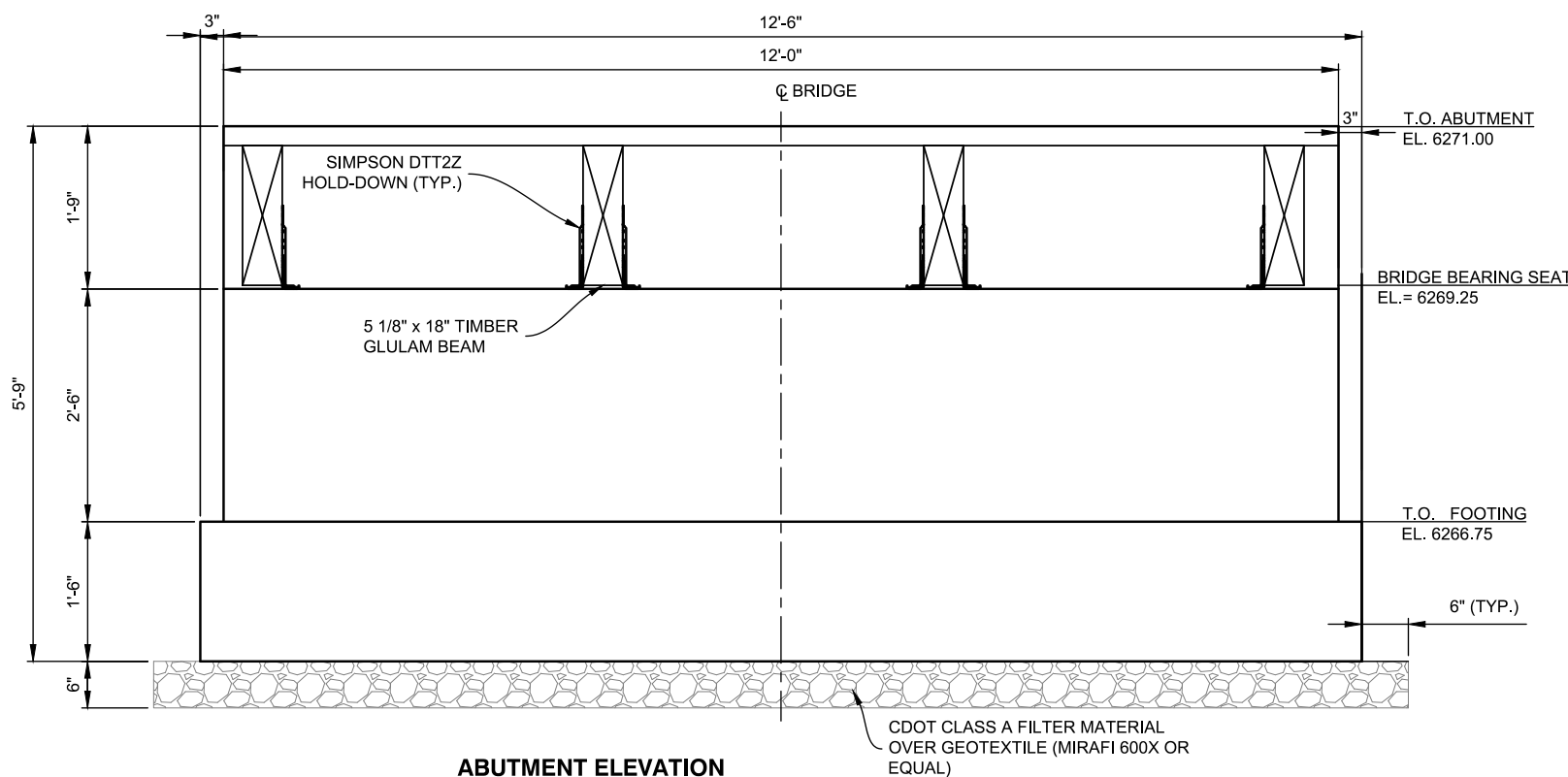
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NO.	DATE	DESCRIPTION



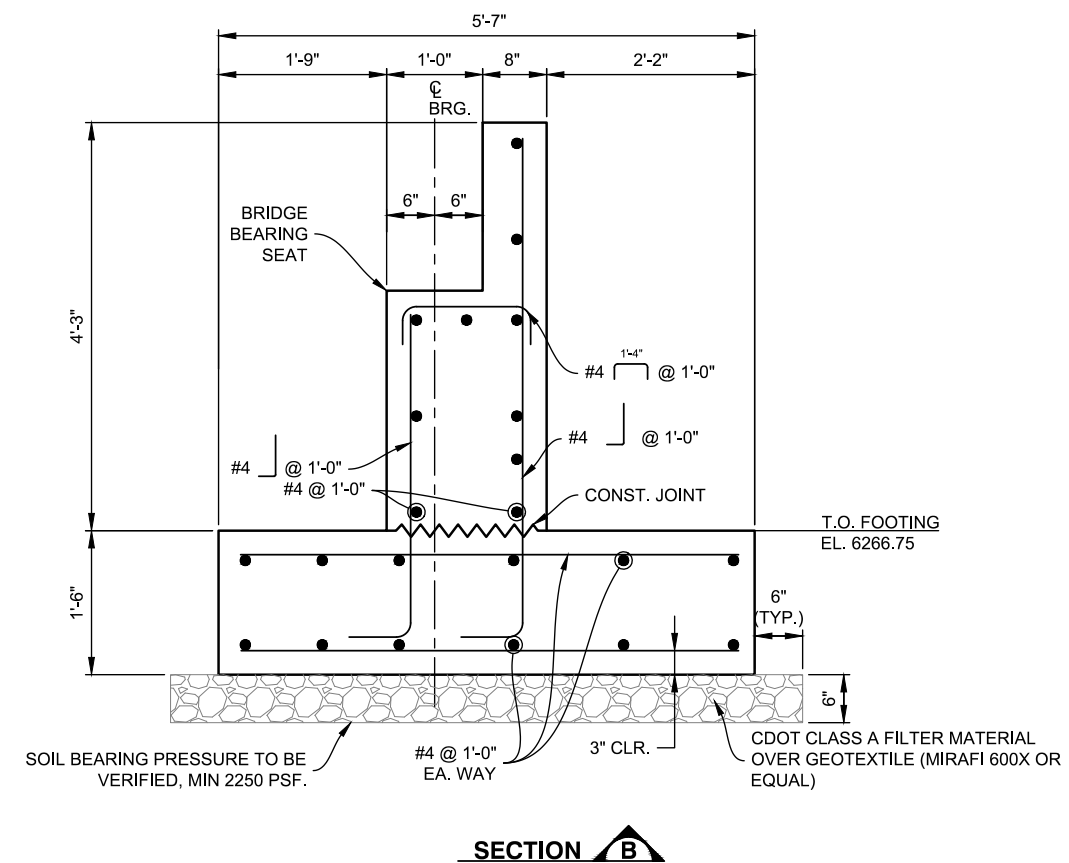
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CIVIL		DRAWING NO. C-20
BRIDGE GENERAL PLAN		SHEET NO. 23 OF 44



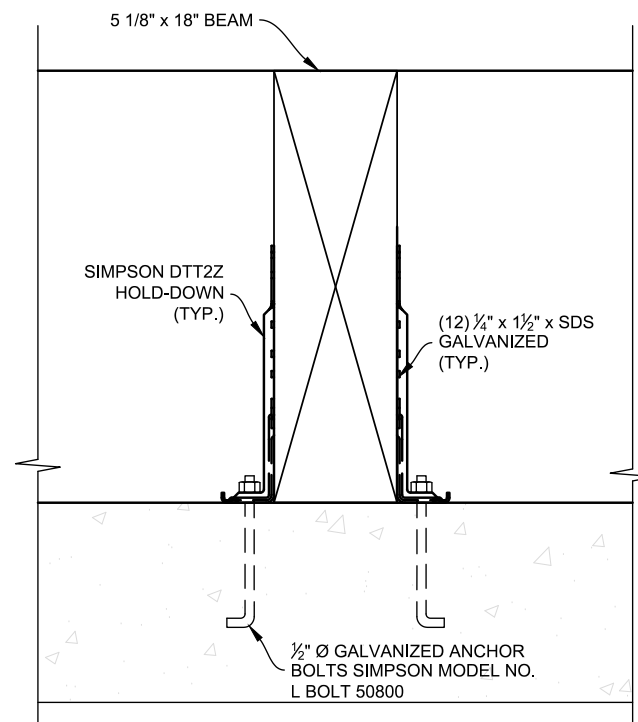
ABUTMENT PLAN



ABUTMENT ELEVATION



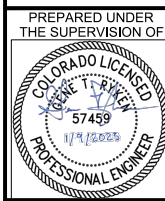
SECTION B



BEAM CONNECTION DETAIL

(NOTE: ONLY ONE HOLD-DOWN AND ANCHOR BOLT REQUIRED FOR EACH EXTERIOR BEAM PER ABUTMENT.)

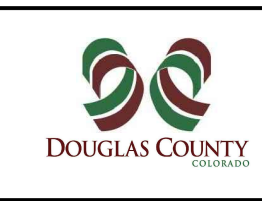
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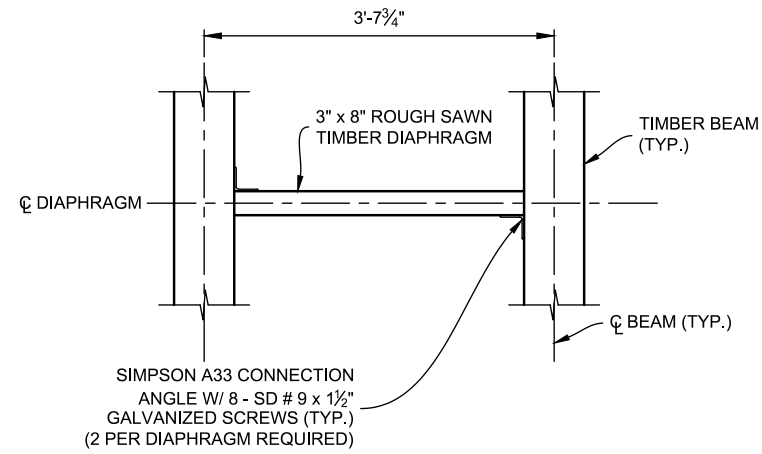
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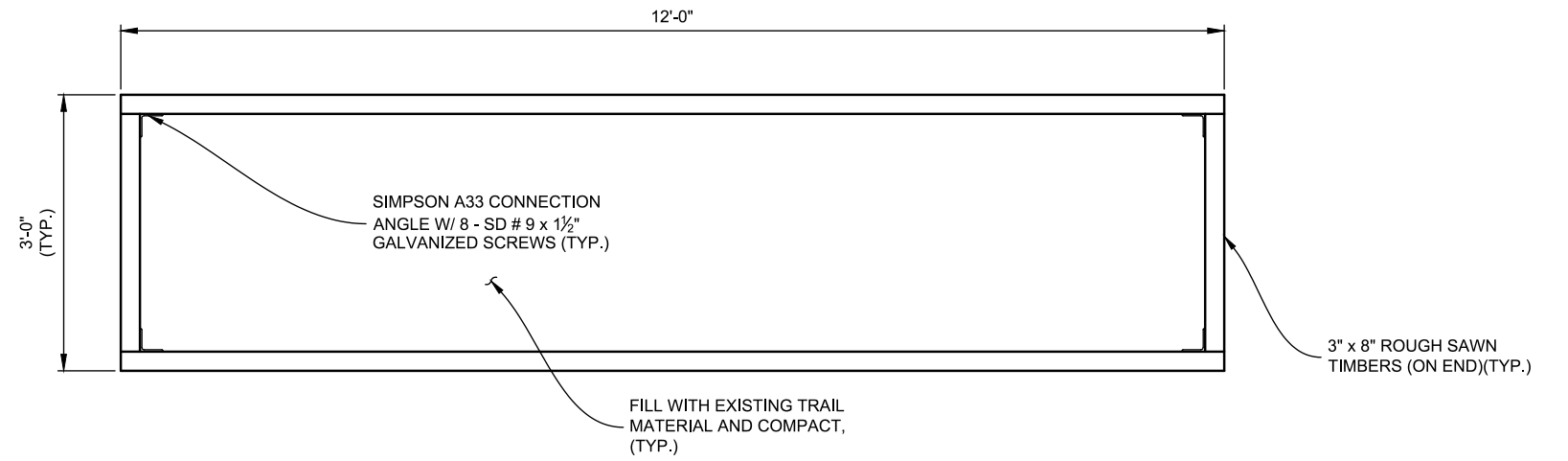
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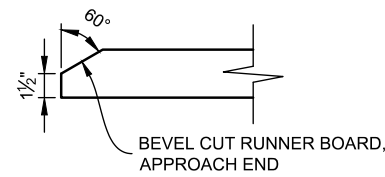
DIAPHRAGM CONNECTION DETAIL



APPROACH MATERIAL BOX DETAIL

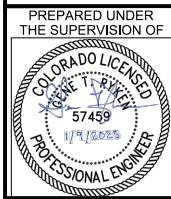
NOTES:

1. THE COST OF TIMBER BOXES, CONNECTION HARDWARE, LABOR, AND SOIL COMPACTION TO BE INCLUDED IN THE PAY ITEM FOR BRIDGE APPROACH (SY).



RUNNER BOARD CUT DETAIL

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 DRAWN: **JGG**
 CHECKED: **ASB**

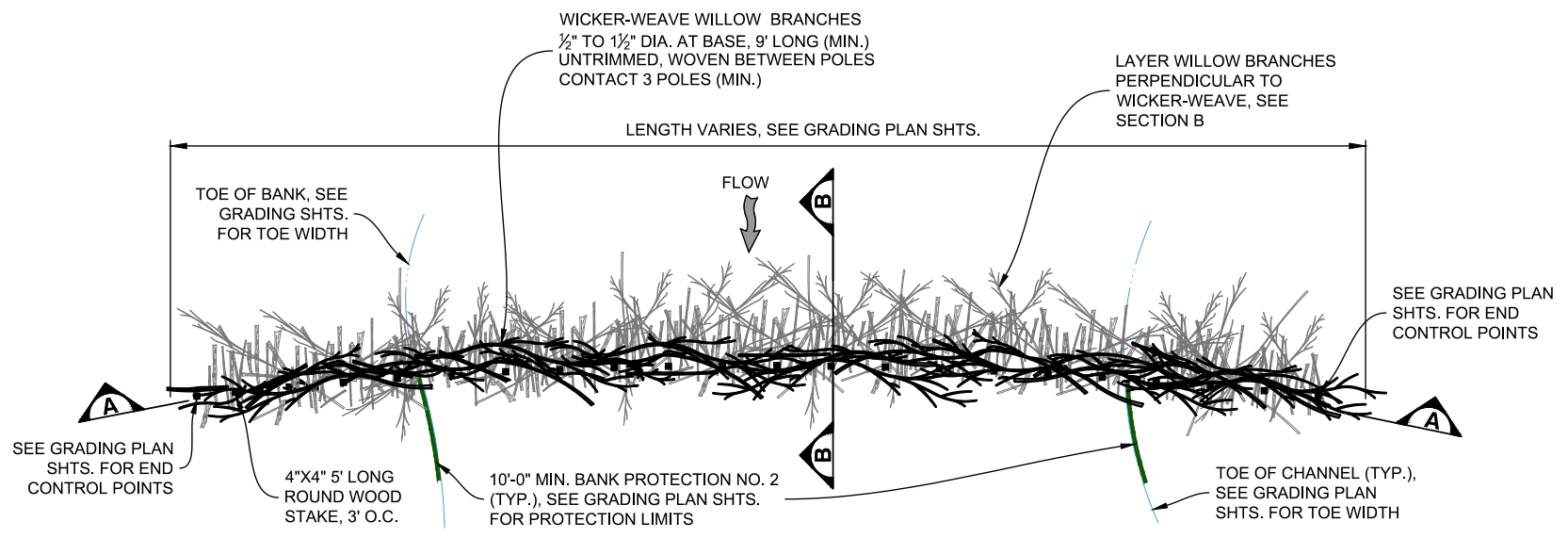
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NO.	DATE	DESCRIPTION	BY

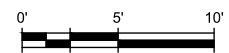


TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
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BRIDGE APPROACH & DIAPHRAGM DETAILS		SHEET NO. 25 OF 44

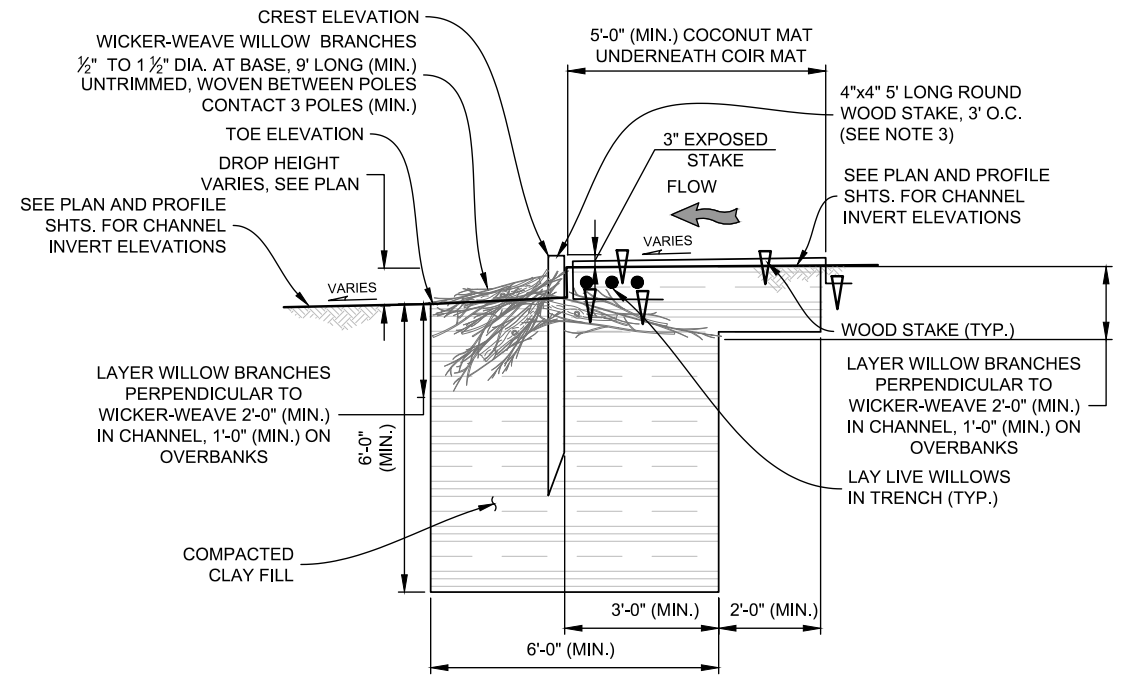
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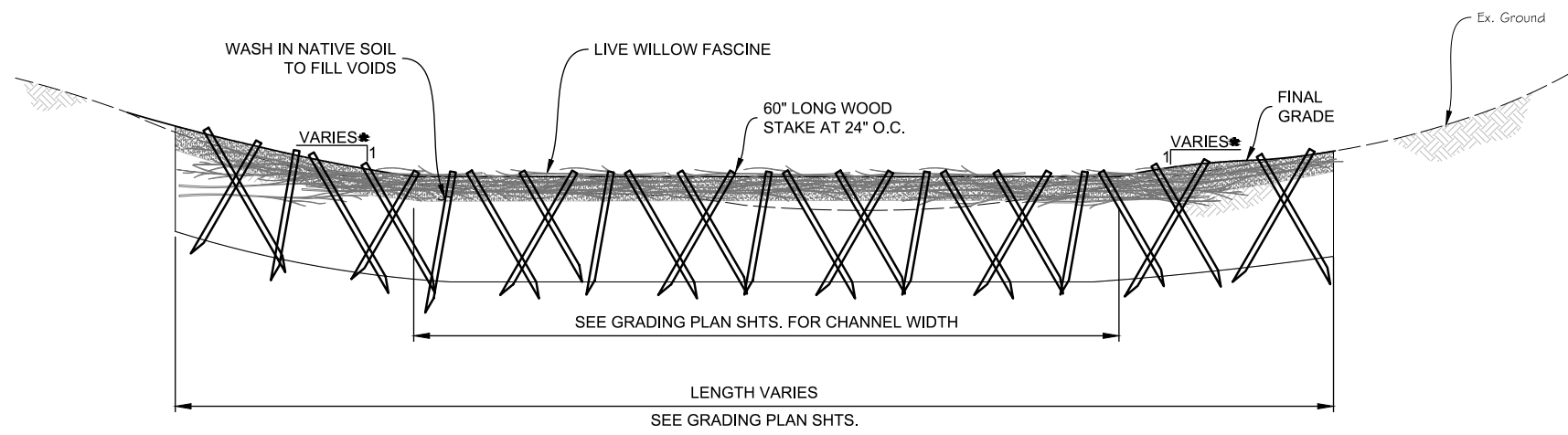
GRADE CONTROL STRUCTURE PLAN



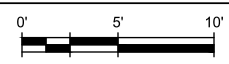
- NOTES:**
- SEE GRADING PLAN SHTS. FOR GRADING AROUND EACH GRADE CONTROL STRUCTURE. BACKFILL MATERIAL SHALL BE CLAY WITH AT LEAST 60% BY WEIGHT PASSING THE #200 SIEVE. BACKFILL SHALL BE ADJUSTED TO A MOISTURE CONTENT WITHIN 2 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR (ASTM D698) MAXIMUM DRY DENSITY.
 - THE ANGLE OF WOOD STAKES SHALL BE VARIED TO PROVIDE INTERLOCKING THROUGH THE STRUCTURE. NO STAKE SHALL BE INSTALLED PLUMB.



GRADE CONTROL <1 FT DROP STRUCTURE SECTION B



GRADE CONTROL STRUCTURE SECTION A



PREPARED UNDER THE SUPERVISION OF

57459
1/9/2023
PROFESSIONAL ENGINEER

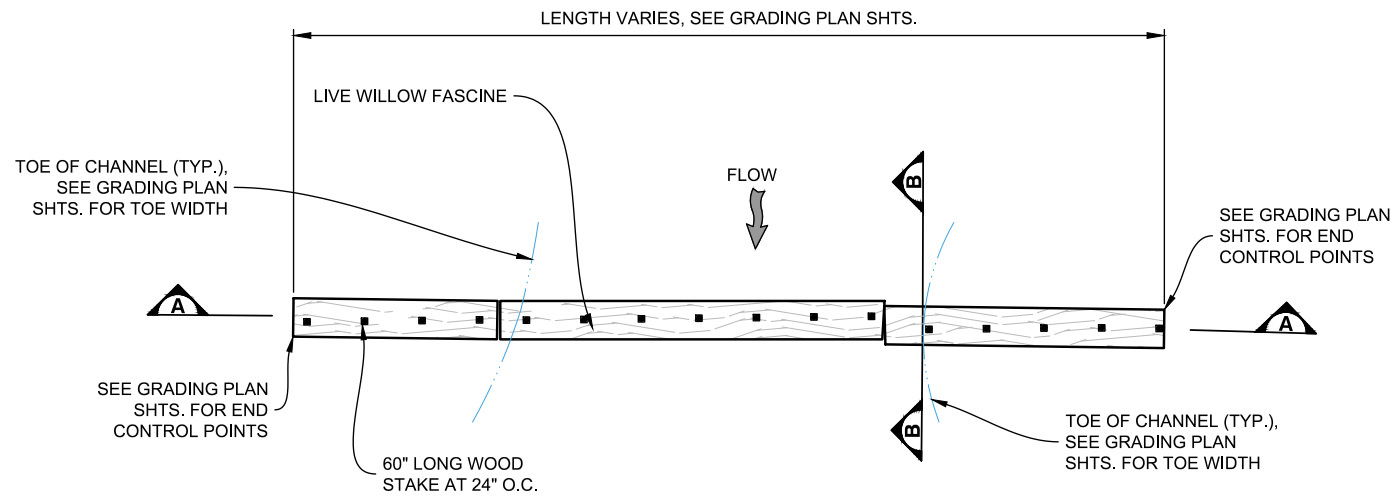
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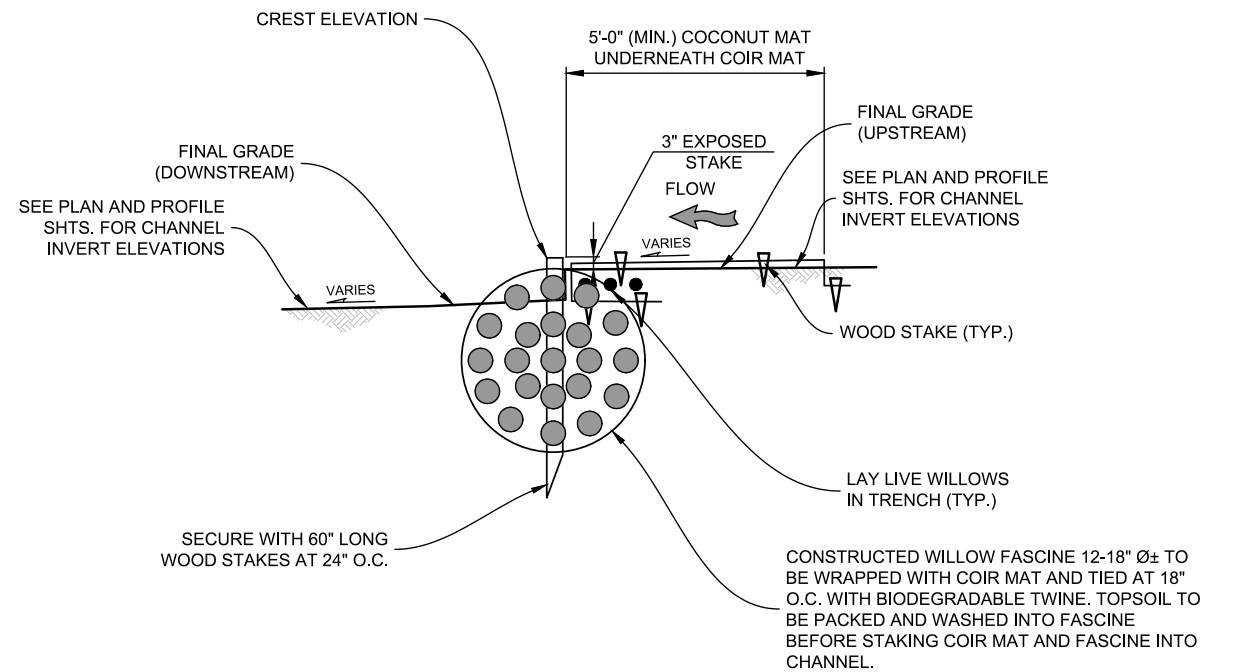
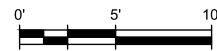


TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-23
TYPE 3 GRADE CONTROL STRUCTURE DETAILS		SHEET NO. 26 OF 44

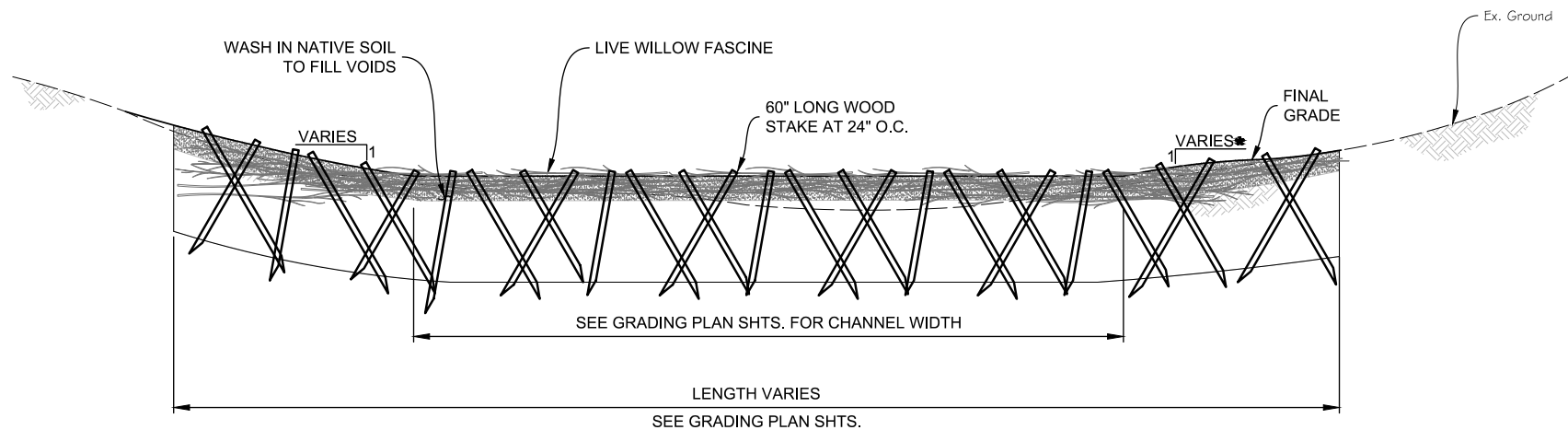


- NOTES:**
- SEE GRADING PLAN SHTS. FOR GRADING AROUND EACH GRADE CONTROL STRUCTURE. THE ANGLE OF WOOD STAKES SHALL BE VARIED TO PROVIDE INTERLOCKING THROUGH THE STRUCTURE. NO STAKE SHALL BE INSTALLED PLUMB.
 - WILLOW FASCINES SHALL BE INSTALLED TO INTERLOCK WITH ADJACENT FASCINES AND PROVIDE A CONSISTENT DIAMETER.

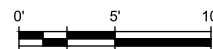
TYPE 1 GRADE CONTROL STRUCTURE PLAN



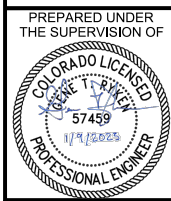
GRADE CONTROL STRUCTURE SECTION B



GRADE CONTROL STRUCTURE SECTION A



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DESIGNED: AAG
 DRAWN: JGG
 CHECKED: CLK

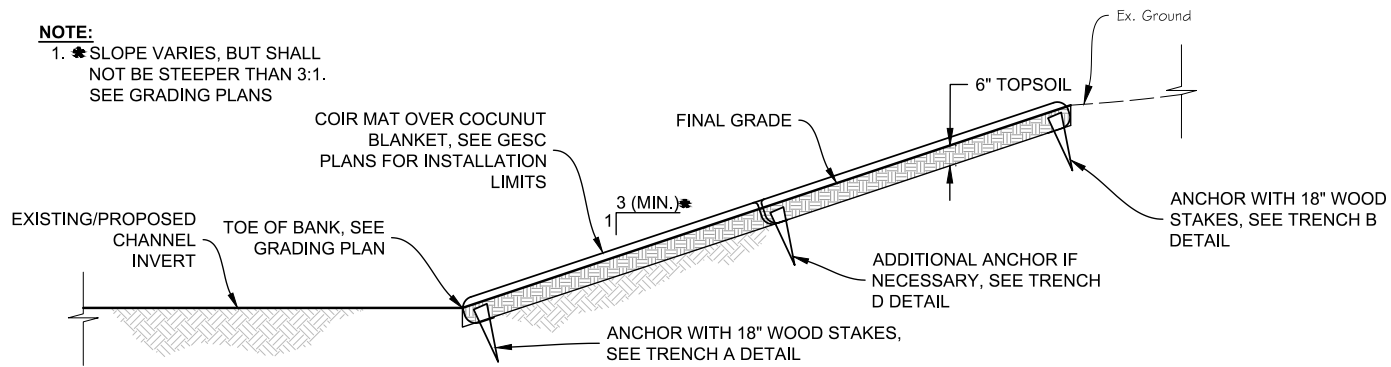
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SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY

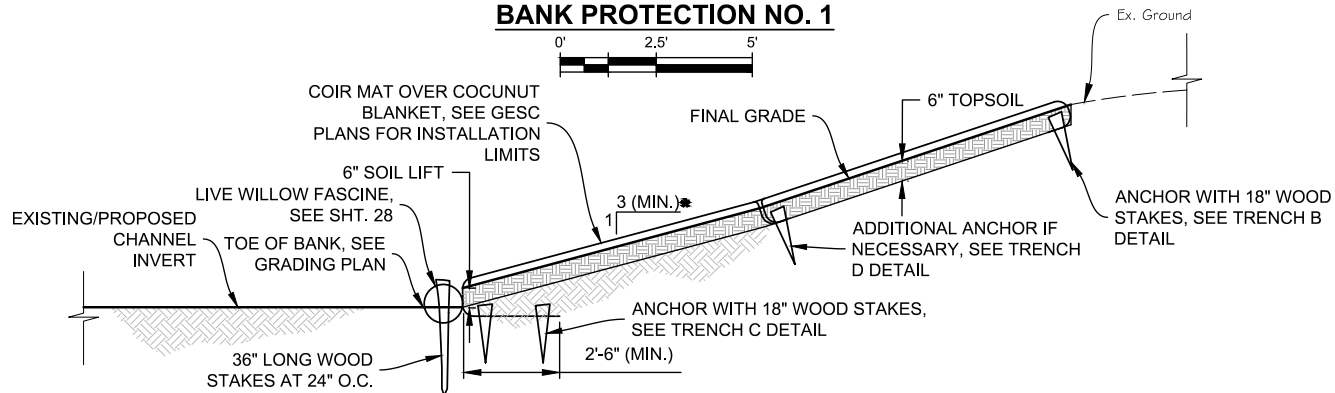


TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-24
LIVE WILLOW FASCINE GRADE CONTROL STRUCTURE DETAILS		SHEET NO. 27 OF 44

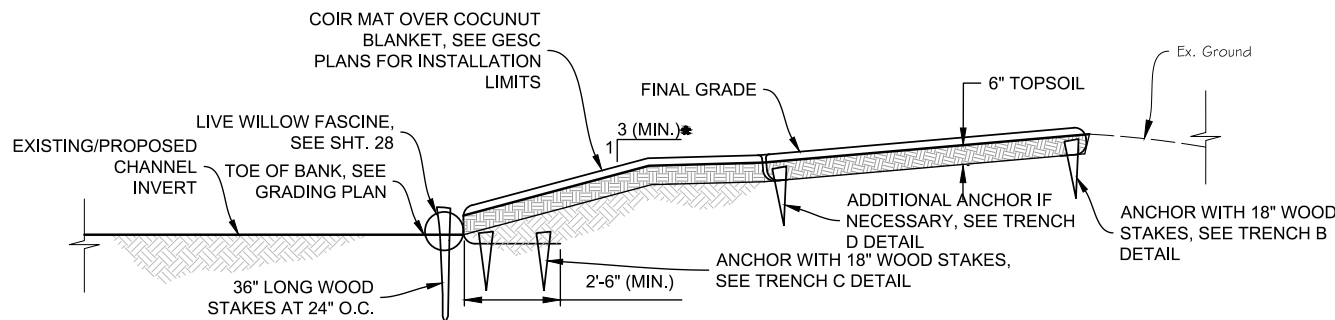
NOTE:
 1. *SLOPE VARIES, BUT SHALL NOT BE STEEPER THAN 3:1. SEE GRADING PLANS



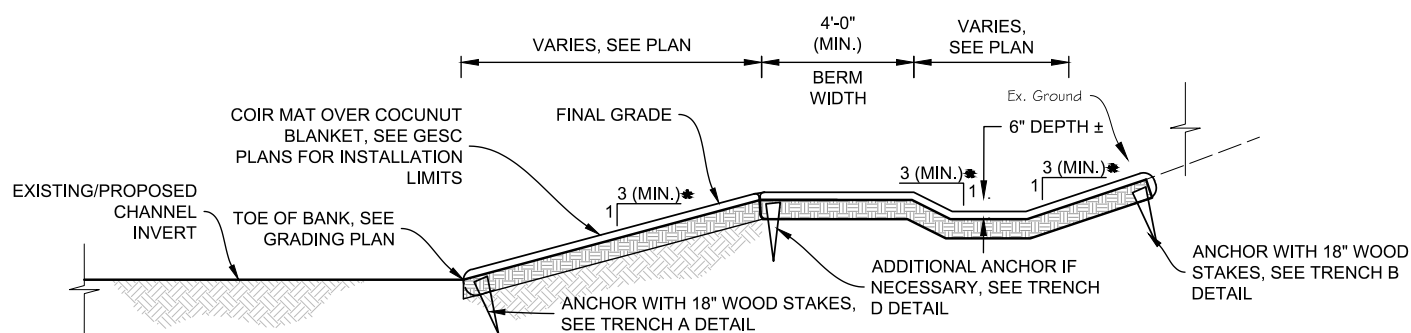
BANK PROTECTION NO. 1



BANK PROTECTION NO. 2



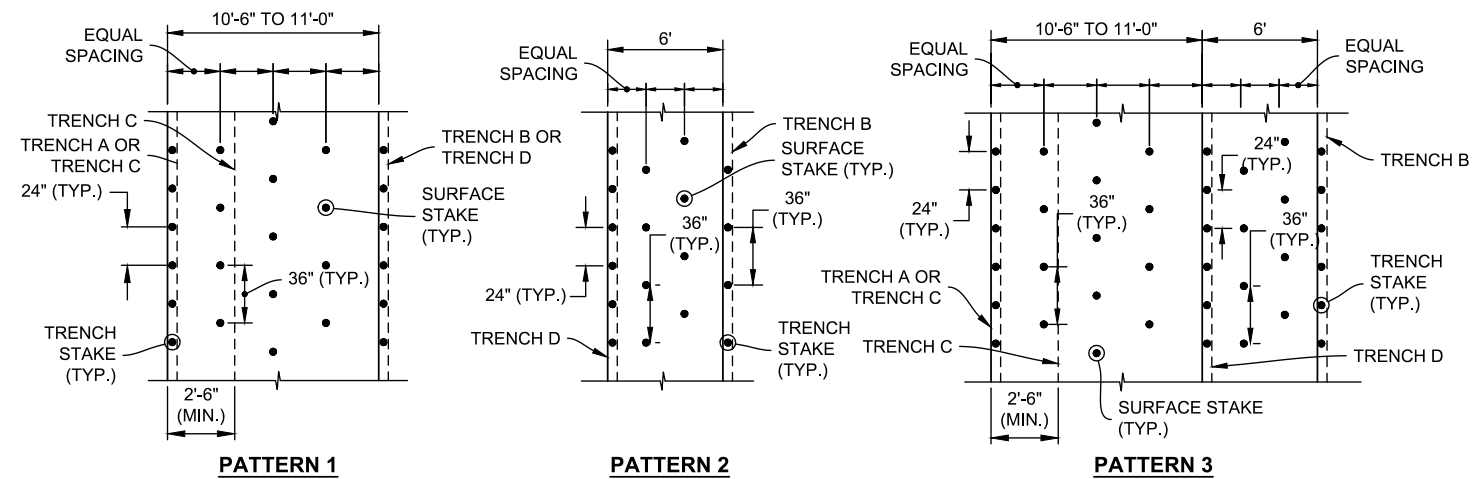
BANK PROTECTION NO. 3 (ISLAND)



TYPICAL OFF-CHANNEL WETLAND DETAIL

GENERAL NOTES:

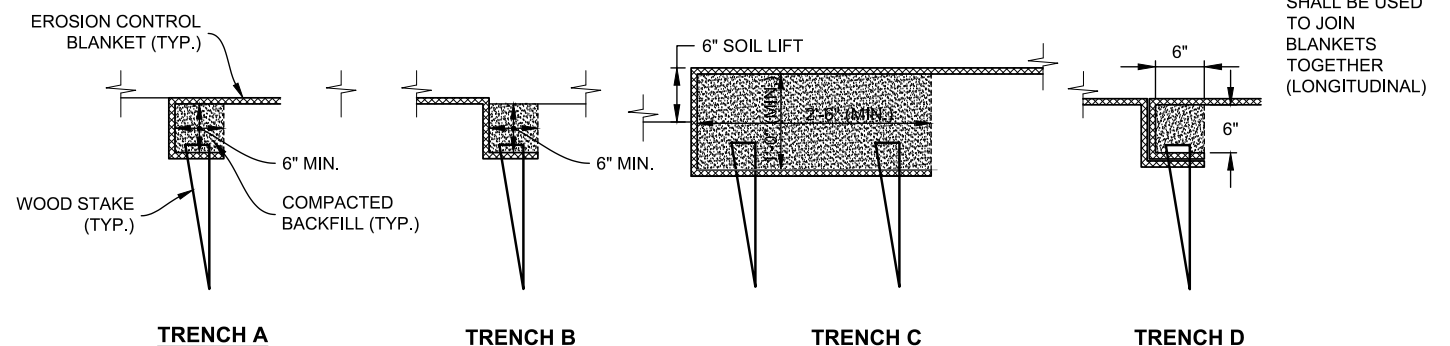
1. COIR MAT SHALL BE KOIRMAT 700 COCONUT FIBER EROSION CONTROL MATTING (WOVEN MATTING OF COIR YARN) MANUFACTURED BY NEDIA ENTERPRISES, INC. OR APPROVED EQUIVALENT.
2. COCONUT BLANKET SHALL BE C400B STRAW/COCONUT FIBER BLANKET WITH BIODEGRADABLE NETTING ON BOTH SIDES AS MANUFACTURED BY NEDIA ENTERPRISES, INC. OR APPROVED EQUIVALENT.
3. SEED AND MULCH PRIOR TO INSTALLING COIR MAT AND COCONUT BLANKET.
4. POSITION ROW STAKES IN AN ALTERNATING STAGGER PATTERN SO THAT STAKES FOR THE ROW ARE POSITIONED IN BETWEEN STAKES FOR ADJACENT ROWS.
5. STAKES SHALL BE INSTALLED FULL-DEPTH TO SECURELY FASTEN THE BLANKET TO THE SOIL.



NOTE:

1. INSTALL WOOD STAKES SUCH THAT ONLY 1\"/>
- 2. BOTTOM STAKES FOR TRENCH C NOT DISPLAYED FOR CLARITY.

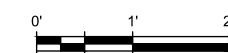
STAKING PATTERNS FOR EROSION CONTROL BLANKET



NOTE:

1. TRENCH D SHALL BE USED TO JOIN BLANKETS TOGETHER (LONGITUDINAL)

ANCHOR TRENCH DETAILS FOR EROSION CONTROL BLANKETS



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DESIGNED: AAG

DRAWN: JGG

CHECKED: CLK

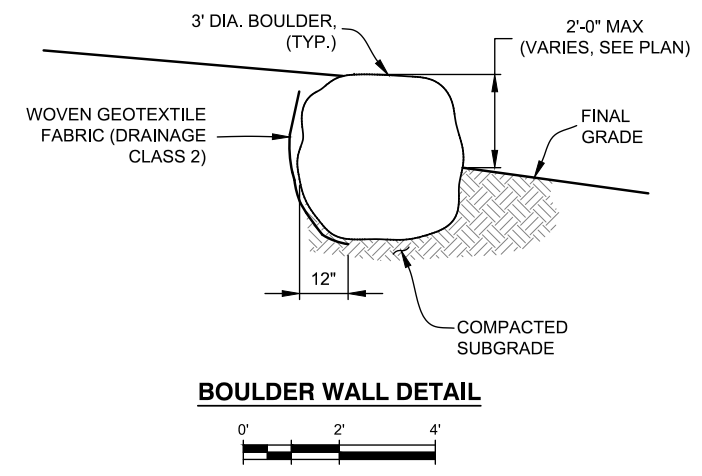
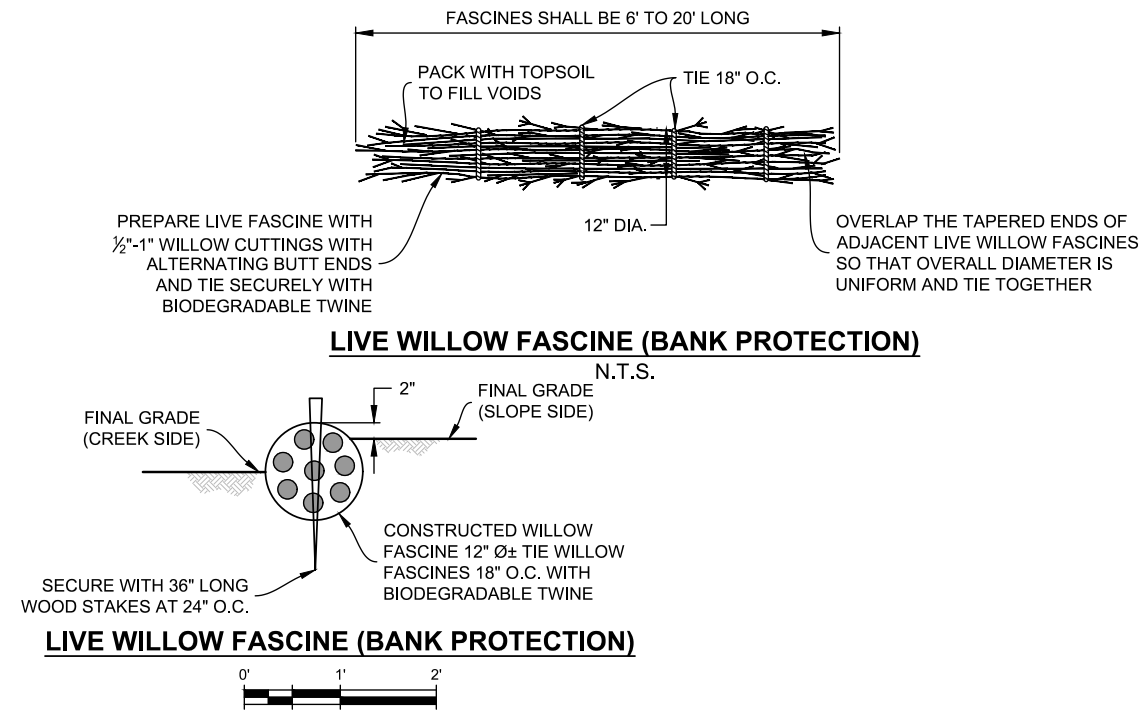
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NO.	DATE	DESCRIPTION	BY



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CIVIL		1/9/2023
BANK PROTECTION DETAILS		DRAWING NO.
		C-25
		SHEET NO.
		28 OF 44

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PREPARED UNDER THE SUPERVISION OF

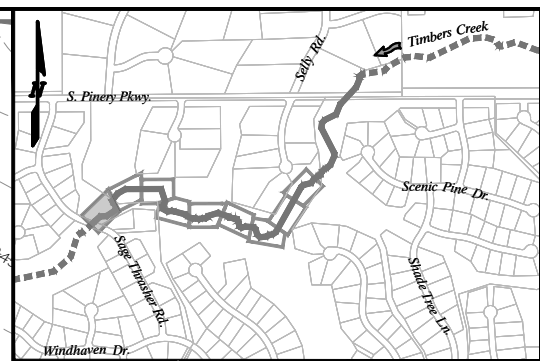
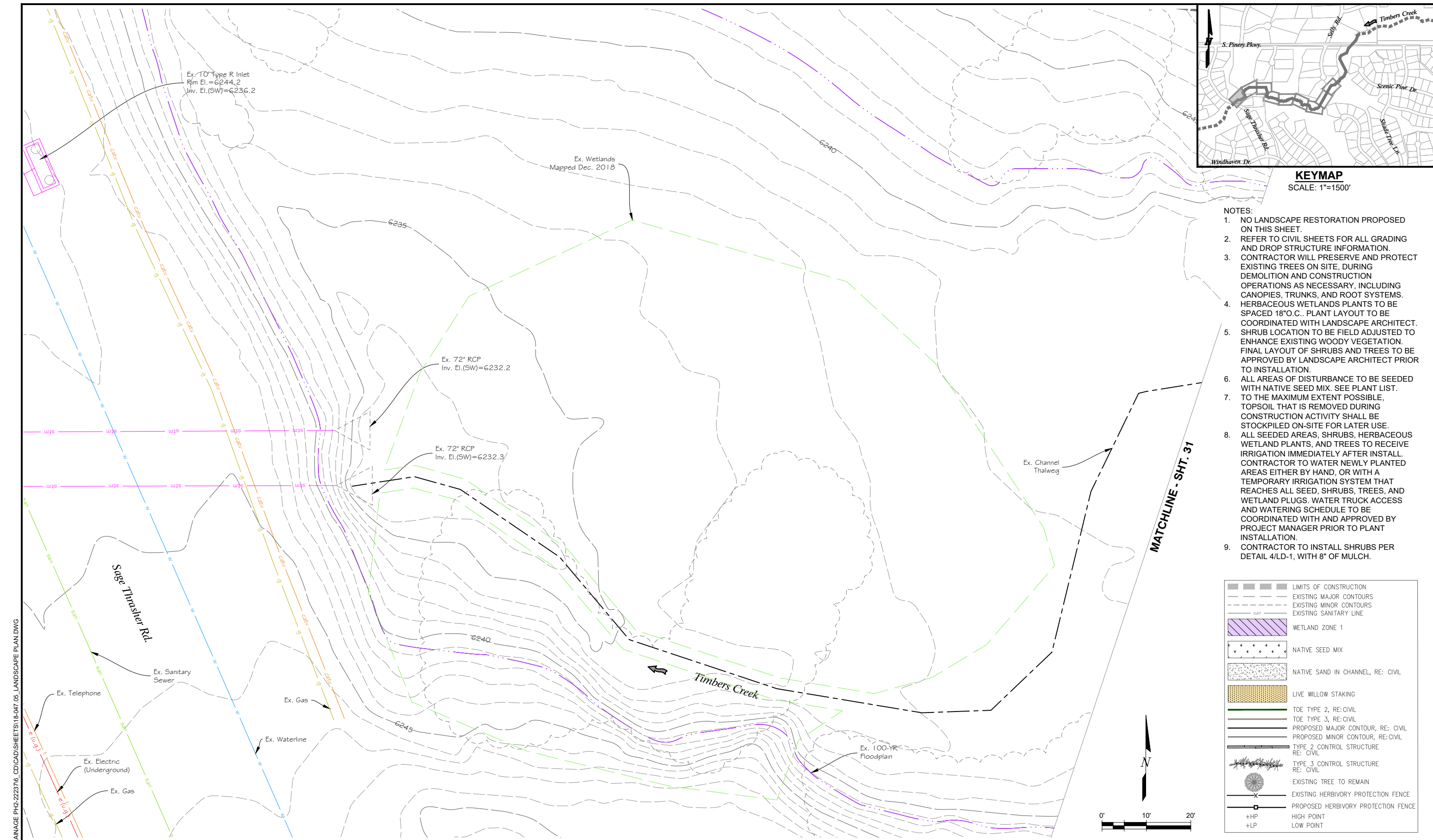
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 DRAWN: JGG
 CHECKED: CLK

FINAL DESIGN

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NO.	DATE	DESCRIPTION	BY



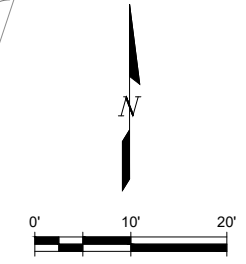
TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE 1/9/2023
CIVIL		DRAWING NO. C-26
BANK PROTECTION DETAILS		SHEET NO. 29 OF 44



KEYMAP
SCALE: 1"=1500'

- NOTES:**
1. NO LANDSCAPE RESTORATION PROPOSED ON THIS SHEET.
 2. REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
 3. CONTRACTOR WILL PRESERVE AND PROTECT EXISTING TREES ON SITE, DURING DEMOLITION AND CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING CANOPIES, TRUNKS, AND ROOT SYSTEMS.
 4. HERBACEOUS WETLANDS PLANTS TO BE SPACED 18" O.C. PLANT LAYOUT TO BE COORDINATED WITH LANDSCAPE ARCHITECT. SHRUB LOCATION TO BE FIELD ADJUSTED TO ENHANCE EXISTING WOODY VEGETATION. FINAL LAYOUT OF SHRUBS AND TREES TO BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
 5. ALL AREAS OF DISTURBANCE TO BE SEEDED WITH NATIVE SEED MIX. SEE PLANT LIST. TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE.
 6. ALL SEEDED AREAS, SHRUBS, HERBACEOUS WETLAND PLANTS, AND TREES TO RECEIVE IRRIGATION IMMEDIATELY AFTER INSTALL. CONTRACTOR TO WATER NEWLY PLANTED AREAS EITHER BY HAND, OR WITH A TEMPORARY IRRIGATION SYSTEM THAT REACHES ALL SEED, SHRUBS, TREES, AND WETLAND PLUGS. WATER TRUCK ACCESS AND WATERING SCHEDULE TO BE COORDINATED WITH AND APPROVED BY PROJECT MANAGER PRIOR TO PLANT INSTALLATION.
 7. CONTRACTOR TO INSTALL SHRUBS PER DETAIL 4/LD-1, WITH 8" OF MULCH.

	LIMITS OF CONSTRUCTION
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	EXISTING SANITARY LINE
	WETLAND ZONE 1
	NATIVE SEED MIX
	NATIVE SAND IN CHANNEL, RE: CIVIL
	LIVE WILLOW STAKING
	TOE TYPE 2, RE: CIVIL
	TOE TYPE 3, RE: CIVIL
	PROPOSED MAJOR CONTOUR, RE: CIVIL
	PROPOSED MINOR CONTOUR, RE: CIVIL
	TYPE 2 CONTROL STRUCTURE RE: CIVIL
	TYPE 3 CONTROL STRUCTURE RE: CIVIL
	EXISTING TREE TO REMAIN
	EXISTING HERBIVORY PROTECTION FENCE
	PROPOSED HERBIVORY PROTECTION FENCE
	+HP HIGH POINT
	+LP LOW POINT

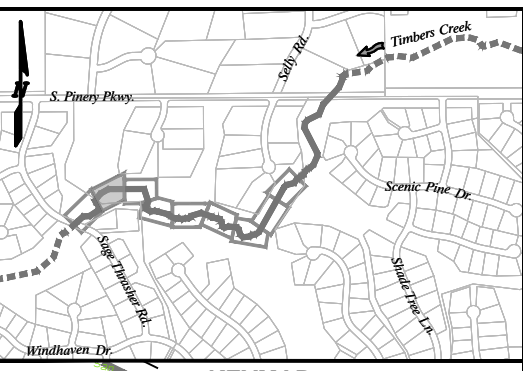
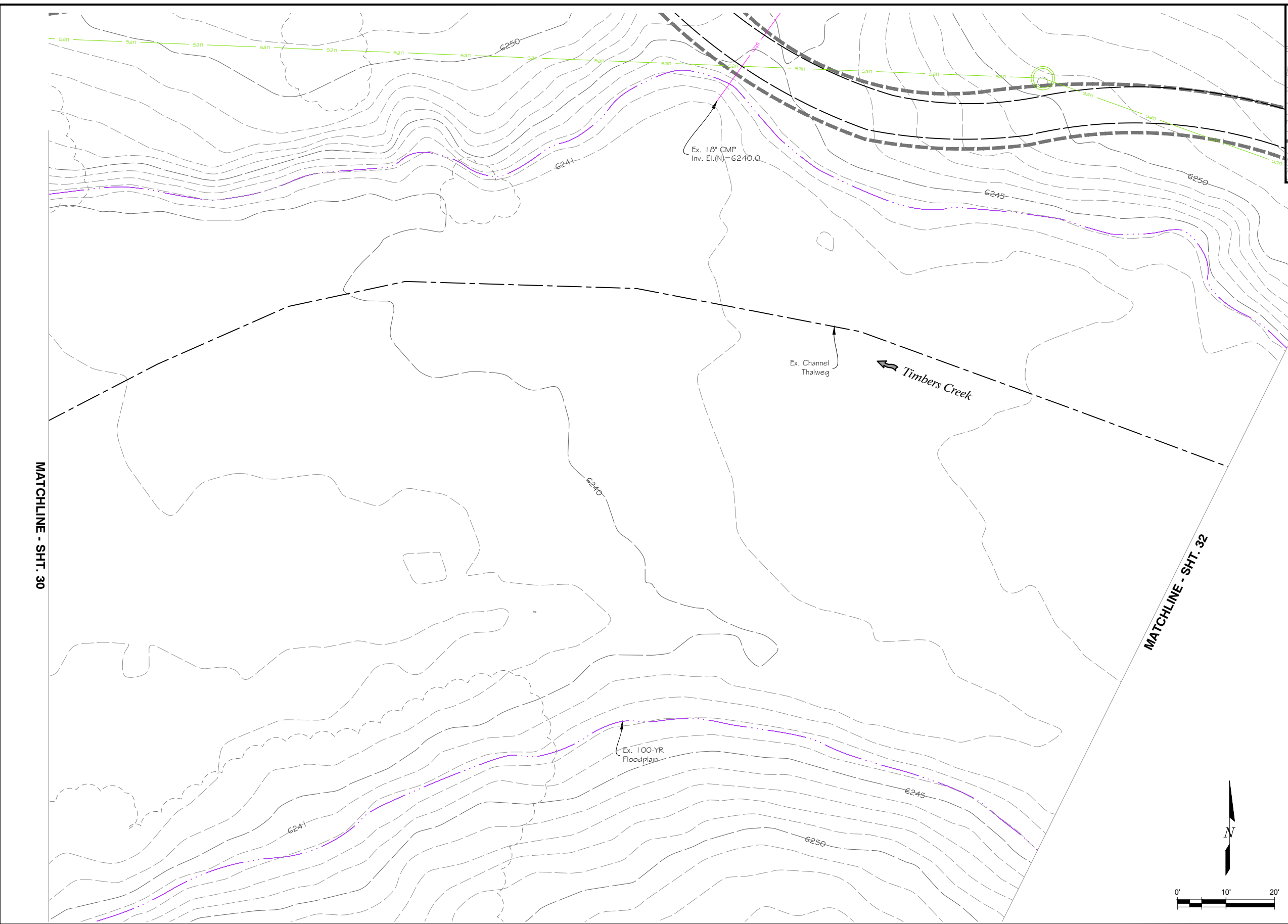


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			NO.	DATE	DESCRIPTION	BY

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE	01/09/23
LANDSCAPE		DRAWING NO.	L-1
LANDSCAPE PLAN		SHEET NO.	30 OF 44

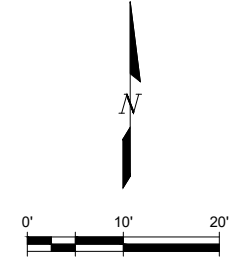
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KEYMAP
SCALE: 1"=1500'

- NOTES:**
- NO LANDSCAPE RESTORATION PROPOSED ON THIS SHEET.
 - REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
 - CONTRACTOR WILL PRESERVE AND PROTECT EXISTING TREES ON SITE, DURING DEMOLITION AND CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING CANOPIES, TRUNKS, AND ROOT SYSTEMS.
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 - CONTRACTOR TO INSTALL SHRUBS PER DETAIL 4/LD-1, WITH 8" OF MULCH.

	LIMITS OF CONSTRUCTION
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	EXISTING SANITARY LINE
	WETLAND ZONE 1
	NATIVE SEED MIX
	NATIVE SAND IN CHANNEL, RE: CIVIL
	LIVE WILLOW STAKING
	TOE TYPE 2, RE: CIVIL
	TOE TYPE 3, RE: CIVIL
	PROPOSED MAJOR CONTOUR, RE: CIVIL
	PROPOSED MINOR CONTOUR, RE: CIVIL
	TYPE 2 CONTROL STRUCTURE RE: CIVIL
	TYPE 3 CONTROL STRUCTURE RE: CIVIL
	EXISTING TREE TO REMAIN
	EXISTING HERBIVORY PROTECTION FENCE
	PROPOSED HERBIVORY PROTECTION FENCE
	+HP HIGH POINT
	+LP LOW POINT



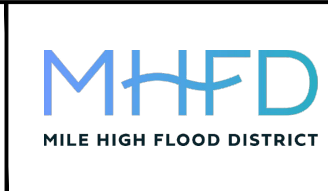
MATCHLINE - SHT. 30

MATCHLINE - SHT. 32

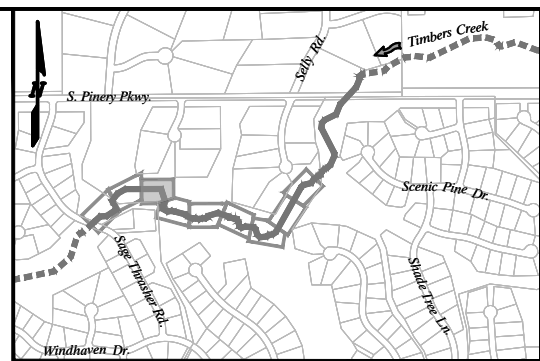
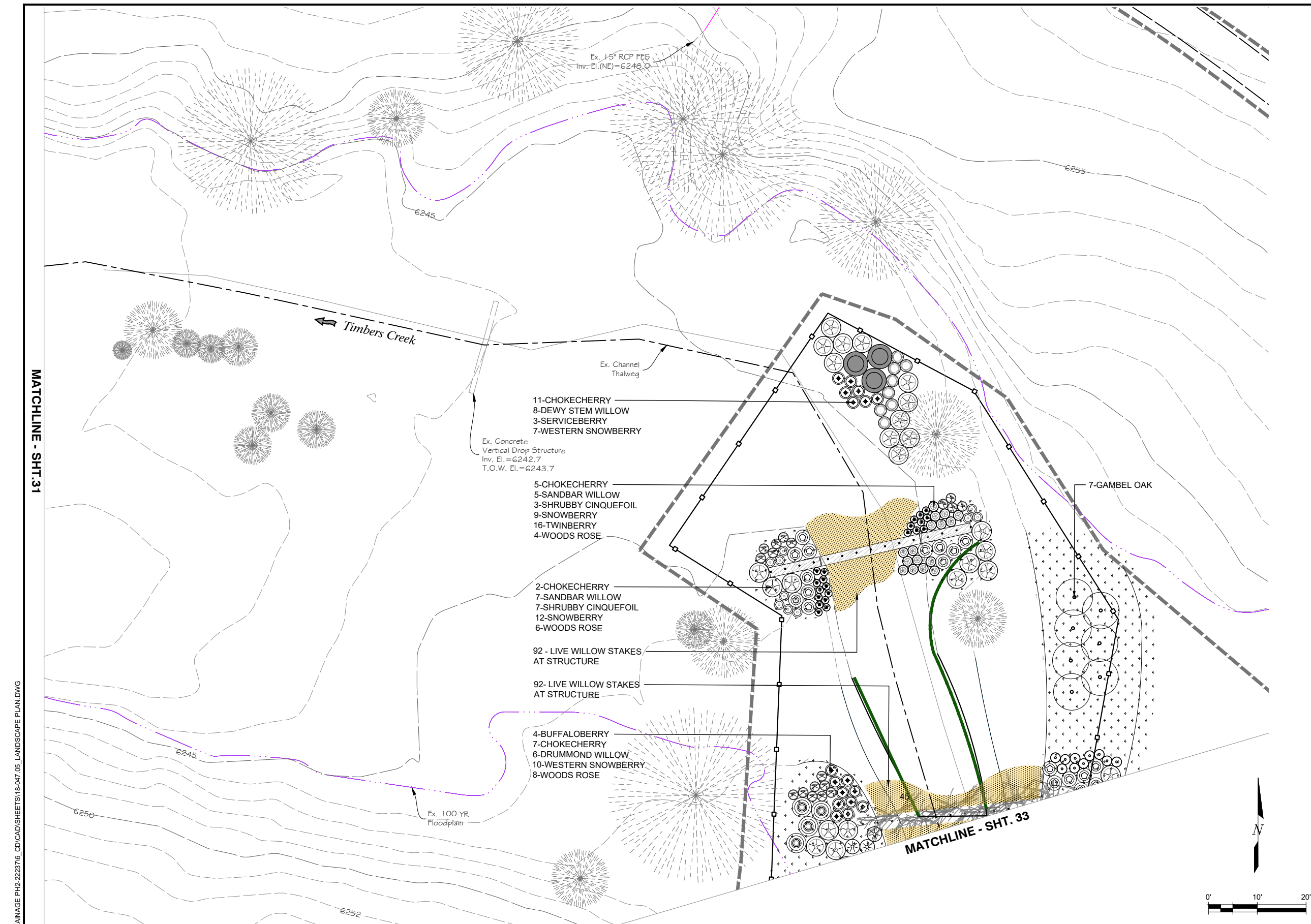
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FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
LANDSCAPE		01/09/23
LANDSCAPE PLAN		DRAWING NO.
		L-2
		SHEET NO.
		31 OF 44



KEYMAP
SCALE: 1"=1500'

LEGEND

[Dashed line]	LIMITS OF CONSTRUCTION
[Dotted line]	EXISTING MAJOR CONTOURS
[Dotted line]	EXISTING MINOR CONTOURS
[Dotted line]	EXISTING SANITARY LINE
[Purple hatched area]	WETLAND ZONE 1
[Star symbol]	NATIVE SEED MIX
[Stippled area]	NATIVE SAND IN CHANNEL, RE: CIVIL
[Yellow hatched area]	LIVE WILLOW STAKING
[Green line]	TOE TYPE 2, RE: CIVIL
[Green line]	TOE TYPE 3, RE: CIVIL
[Dashed line]	PROPOSED MAJOR CONTOUR, RE: CIVIL
[Dashed line]	PROPOSED MINOR CONTOUR, RE: CIVIL
[Circle with cross]	TYPE 2 CONTROL STRUCTURE RE: CIVIL
[Circle with cross]	TYPE 3 CONTROL STRUCTURE RE: CIVIL
[Tree symbol]	EXISTING TREE TO REMAIN
[X symbol]	EXISTING HERBIVORY PROTECTION FENCE
[X symbol]	PROPOSED HERBIVORY PROTECTION FENCE
[+HP]	HIGH POINT
[+LP]	LOW POINT

- NOTES:**
- REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
 - CONTRACTOR WILL PRESERVE AND PROTECT EXISTING TREES ON SITE, DURING DEMOLITION AND CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING CANOPIES, TRUNKS, AND ROOT SYSTEMS.
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 - ALL AREAS OF DISTURBANCE TO BE SEEDED WITH NATIVE SEED MIX. SEE PLANT LIST.
 - TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE.
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 - CONTRACTOR TO INSTALL SHRUBS PER DETAIL 4/LD-1, WITH 8" OF MULCH.

MATCHLINE - SHT. 31

MATCHLINE - SHT. 33

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CHECKED:	

SHEET REVISIONS		
NO.	DATE	DESCRIPTION

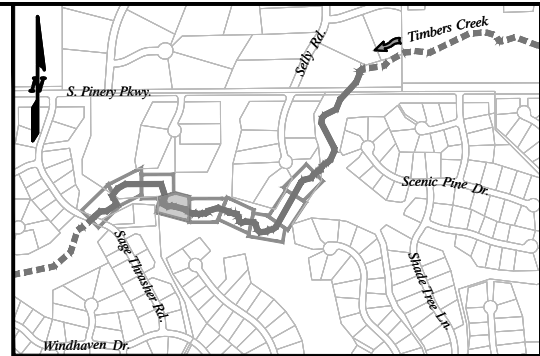
DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRODISTRICT

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE	01/09/23
LANDSCAPE		DRAWING NO.	L-3
LANDSCAPE PLAN		SHEET NO.	32 OF 44

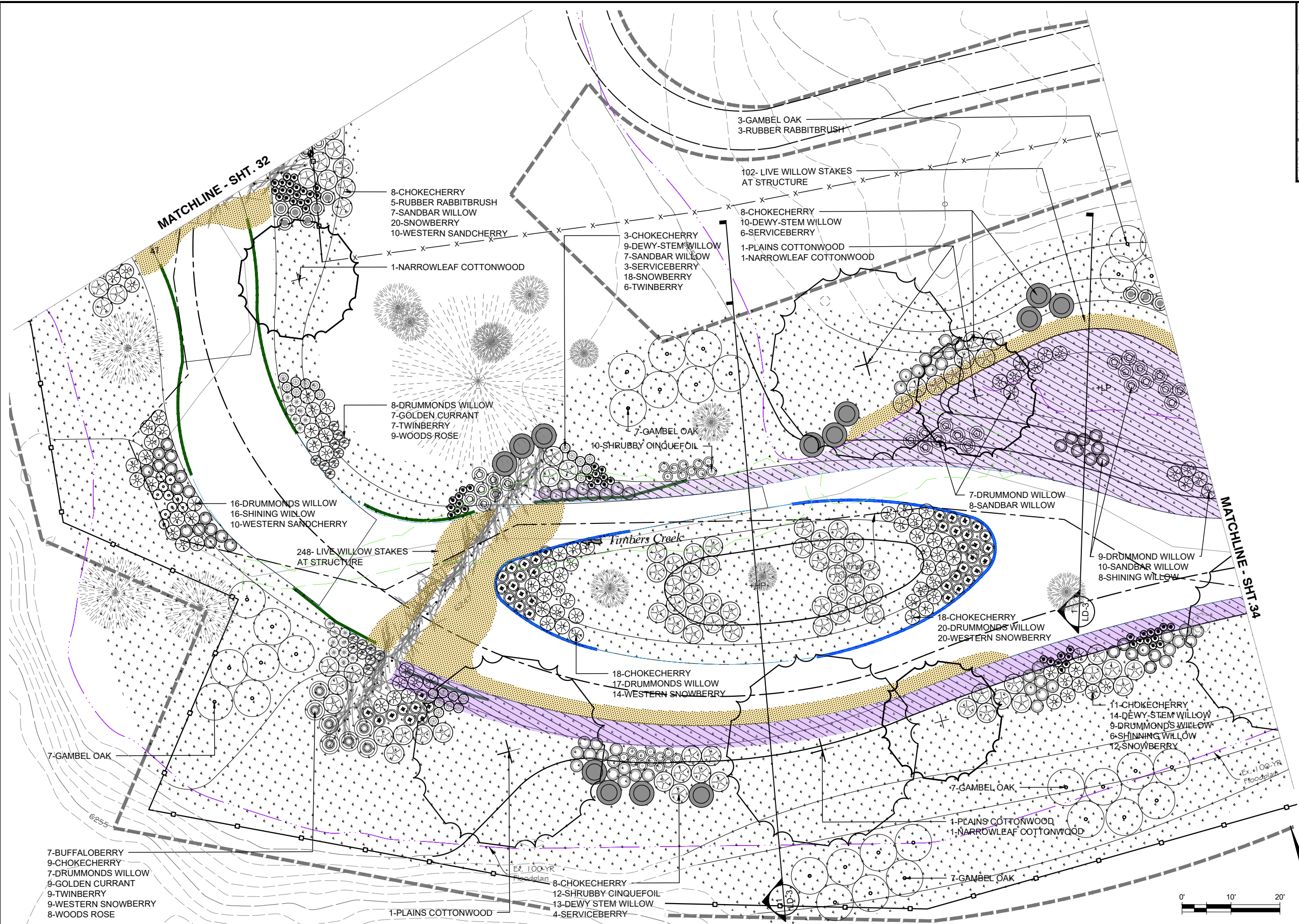


KEYMAP
SCALE: 1"=1500'

LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- EXISTING SANITARY LINE
- WETLAND ZONE 1
- NATIVE SEED MIX
- NATIVE SAND IN CHANNEL, RE: CIVIL
- LIVE WILLOW STAKING
- TOE TYPE 2, RE: CIVIL
- TOE TYPE 3, RE: CIVIL
- PROPOSED MAJOR CONTOUR, RE: CIVIL
- PROPOSED MINOR CONTOUR, RE: CIVIL
- TYPE 2 CONTROL STRUCTURE, RE: CIVIL
- TYPE 3 CONTROL STRUCTURE, RE: CIVIL
- EXISTING TREE TO REMAIN
- EXISTING HERBIVORY PROTECTION FENCE
- PROPOSED HERBIVORY PROTECTION FENCE
- +HP HIGH POINT
- +LP LOW POINT

- NOTES:**
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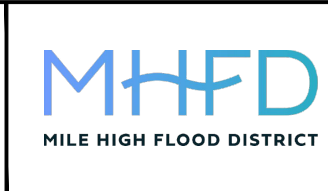


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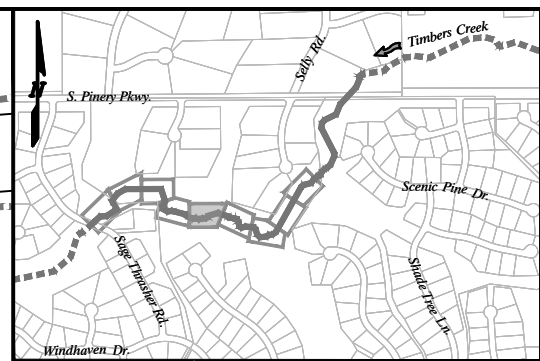
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FINAL DESIGN

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



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LANDSCAPE		DRAWING NO.	L-4
LANDSCAPE PLAN		SHEET NO.	33 OF 44



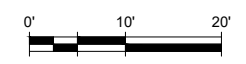
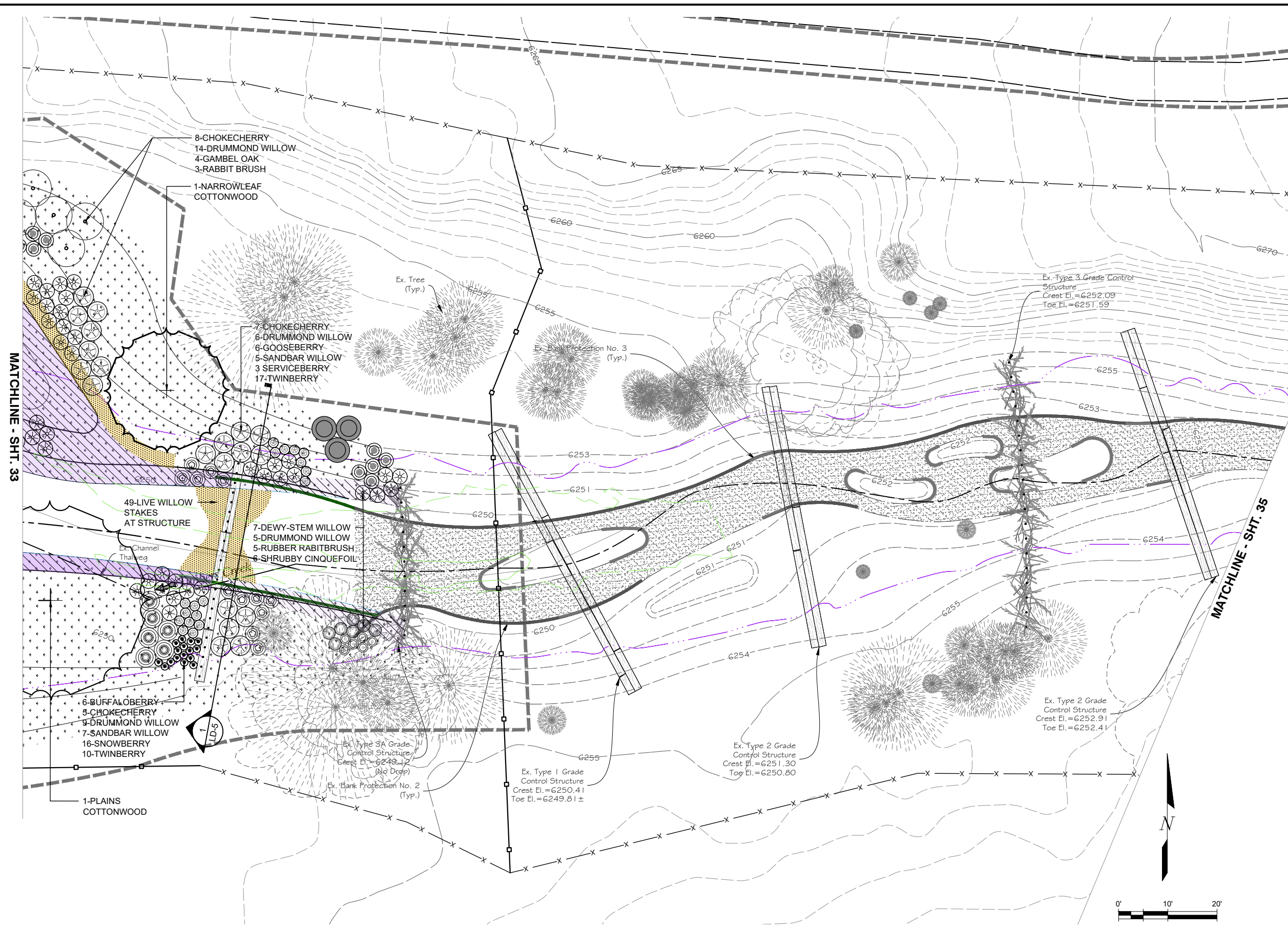
KEYMAP
SCALE: 1"=1500'

NOTES:

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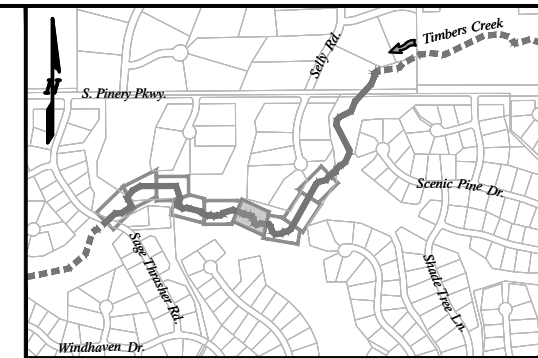
LEGEND

	LIMITS OF CONSTRUCTION
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	EXISTING SANITARY LINE
	WETLAND ZONE 1
	NATIVE SEED MIX
	NATIVE SAND IN CHANNEL, RE: CIVIL
	LIVE WILLOW STAKING
	TOE TYPE 2, RE: CIVIL
	TOE TYPE 3, RE: CIVIL
	PROPOSED MAJOR CONTOUR, RE: CIVIL
	PROPOSED MINOR CONTOUR, RE: CIVIL
	TYPE 2 CONTROL STRUCTURE RE: CIVIL
	TYPE 3 CONTROL STRUCTURE RE: CIVIL
	EXISTING TREE TO REMAIN
	EXISTING HERBIVORY PROTECTION FENCE
	PROPOSED HERBIVORY PROTECTION FENCE
	+HP HIGH POINT
	+LP LOW POINT



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SHEET REVISIONS																														
NO.	DATE	DESCRIPTION																												
DATE	01/09/23																													
DRAWING NO.	L-5																													
SHEET NO.	34 OF 44																													

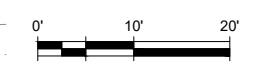
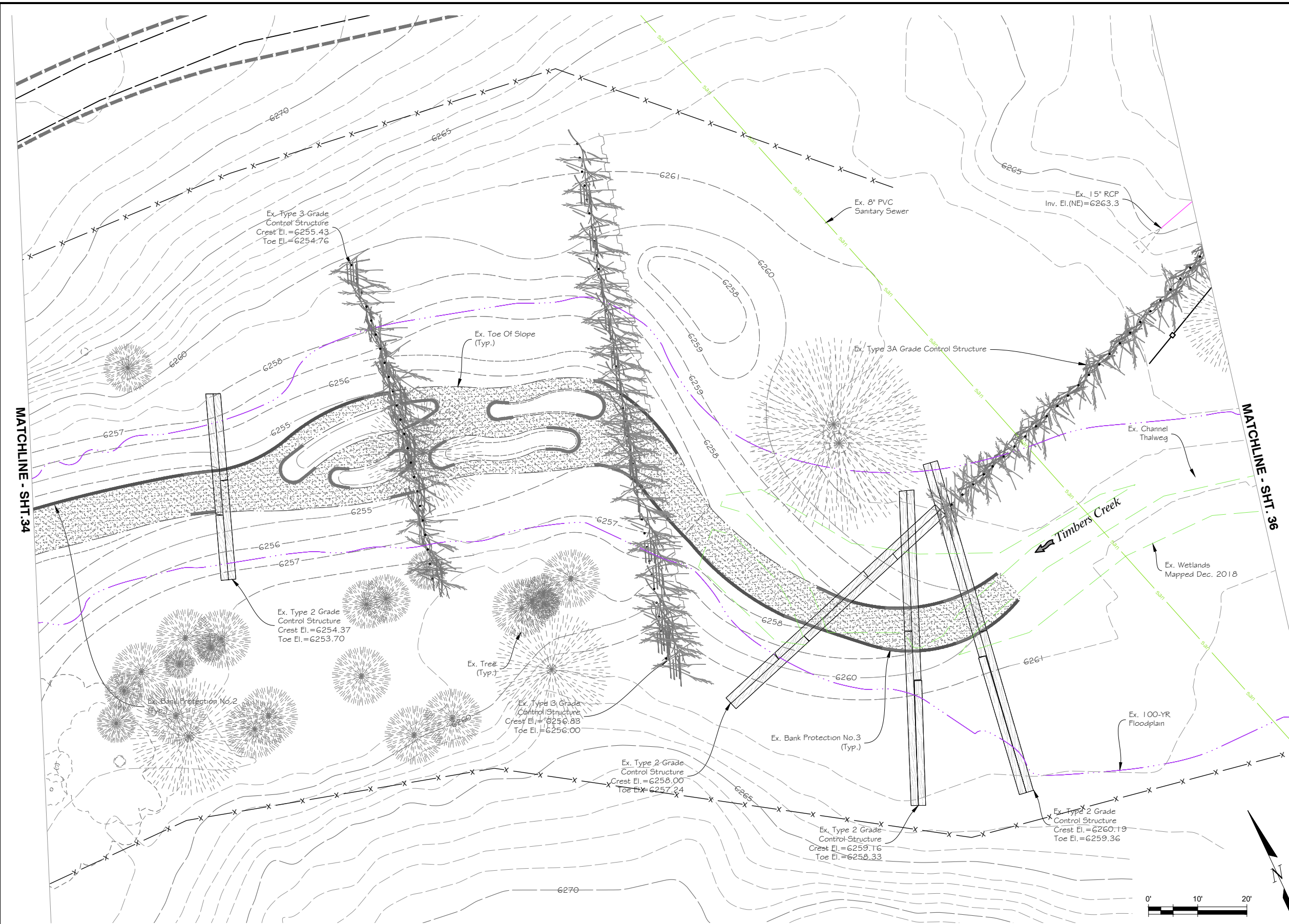


KEYMAP
SCALE: 1"=1500'

LEGEND

[Symbol]	LIMITS OF CONSTRUCTION
[Symbol]	EXISTING MAJOR CONTOURS
[Symbol]	EXISTING MINOR CONTOURS
[Symbol]	EXISTING SANITARY LINE
[Symbol]	WETLAND ZONE 1
[Symbol]	NATIVE SEED MIX
[Symbol]	NATIVE SAND IN CHANNEL, RE: CIVIL
[Symbol]	LIVE WILLOW STAKING
[Symbol]	TOE TYPE 2, RE: CIVIL
[Symbol]	TOE TYPE 3, RE: CIVIL
[Symbol]	PROPOSED MAJOR CONTOUR, RE: CIVIL
[Symbol]	PROPOSED MINOR CONTOUR, RE: CIVIL
[Symbol]	TYPE 2 CONTROL STRUCTURE RE: CIVIL
[Symbol]	TYPE 3 CONTROL STRUCTURE RE: CIVIL
[Symbol]	EXISTING TREE TO REMAIN
[Symbol]	EXISTING HERBIVORY PROTECTION FENCE
[Symbol]	PROPOSED HERBIVORY PROTECTION FENCE
[Symbol]	HIGH POINT
[Symbol]	LOW POINT

- NOTES:**
- NO LANDSCAPE RESTORATION PROPOSED ON THIS SHEET.
 - REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
 - CONTRACTOR WILL PRESERVE AND PROTECT EXISTING TREES ON SITE, DURING DEMOLITION AND CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING CANOPIES, TRUNKS, AND ROOT SYSTEMS.
 - HERBACEOUS WETLANDS PLANTS TO BE SPACED 18" O.C.. PLANT LAYOUT TO BE COORDINATED WITH LANDSCAPE ARCHITECT. SHRUB LOCATION TO BE FIELD ADJUSTED TO ENHANCE EXISTING WOODY VEGETATION. FINAL LAYOUT OF SHRUBS AND TREES TO BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
 - ALL AREAS OF DISTURBANCE TO BE SEEDED WITH NATIVE SEED MIX. SEE PLANT LIST. TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE.
 - ALL SEEDED AREAS, SHRUBS, HERBACEOUS WETLAND PLANTS, AND TREES TO RECEIVE IRRIGATION IMMEDIATELY AFTER INSTALL. CONTRACTOR TO WATER NEWLY PLANTED AREAS EITHER BY HAND, OR WITH A TEMPORARY IRRIGATION SYSTEM THAT REACHES ALL SEED, SHRUBS, TREES, AND WETLAND PLUGS. WATER TRUCK ACCESS AND WATERING SCHEDULE TO BE COORDINATED WITH AND APPROVED BY PROJECT MANAGER PRIOR TO PLANT INSTALLATION.
 - CONTRACTOR TO INSTALL SHRUBS PER DETAIL 4/LD-1, WITH 8" OF MULCH.

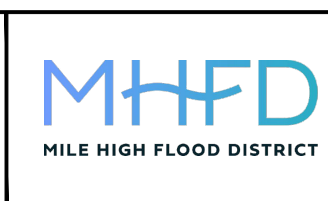


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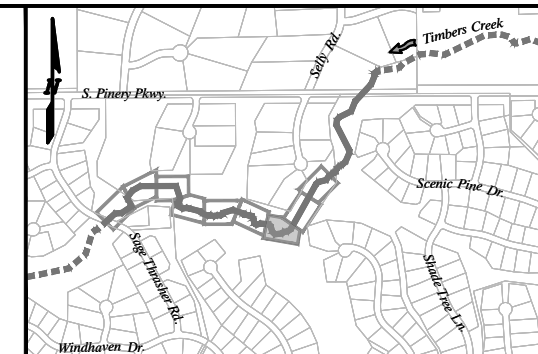
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FINAL DESIGN

SHEET REVISIONS		
NO.	DATE	DESCRIPTION



TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
LANDSCAPE		01/09/23
LANDSCAPE PLAN		DRAWING NO.
		L-6
		SHEET NO.
		35 OF 44

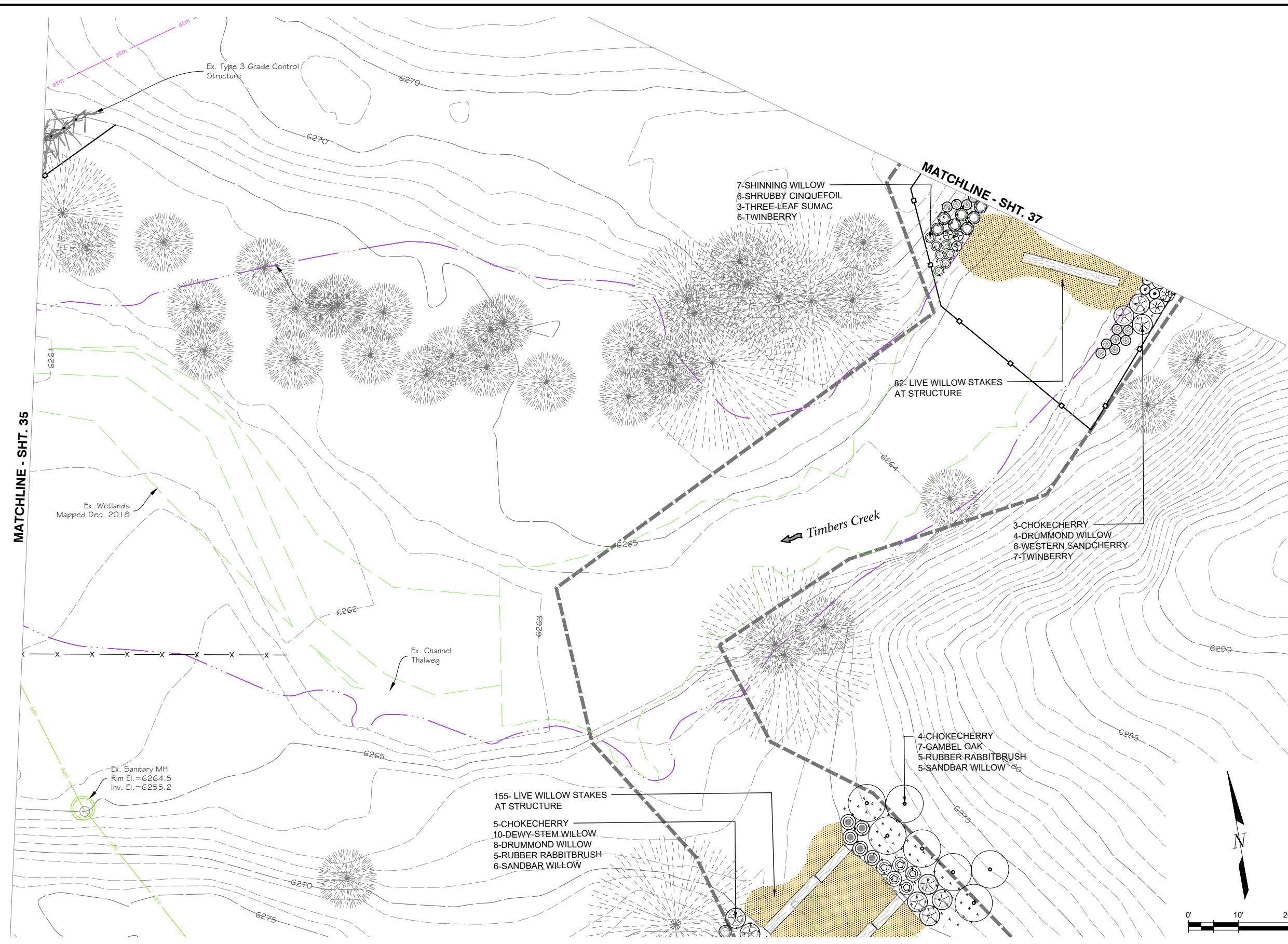


KEYMAP
SCALE: 1"=1500'

LEGEND

[Symbol]	LIMITS OF CONSTRUCTION
[Symbol]	EXISTING MAJOR CONTOURS
[Symbol]	EXISTING MINOR CONTOURS
[Symbol]	EXISTING SANITARY LINE
[Symbol]	WETLAND ZONE 1
[Symbol]	NATIVE SEED MIX
[Symbol]	NATIVE SAND IN CHANNEL, RE: CIVIL
[Symbol]	LIVE WILLOW STAKING
[Symbol]	TOE TYPE 2, RE: CIVIL
[Symbol]	TOE TYPE 3, RE: CIVIL
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[Symbol]	+HP +LP
[Symbol]	HIGH POINT
[Symbol]	LOW POINT

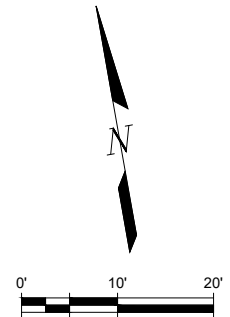
- NOTES:**
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 - CONTRACTOR TO INSTALL SHRUBS PER DETAIL 4/LD-1, WITH 8" OF MULCH.
 - ALL PLANT SYMBOLS ARE NOT SHOWN ON SHEET. PLANTING TO BE LAID OUT IN THE FIELD IN COORDINATION WITH LANDSCAPE ARCHITECT.



MATCHLINE - SHT. 35

MATCHLINE - SHT. 37

Timbers Creek

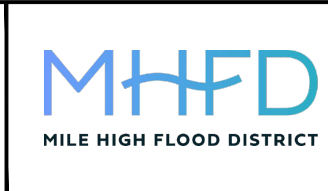


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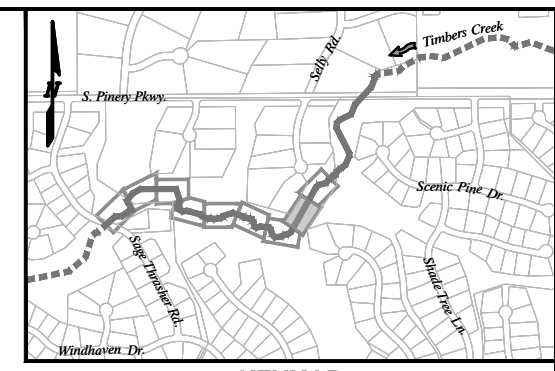
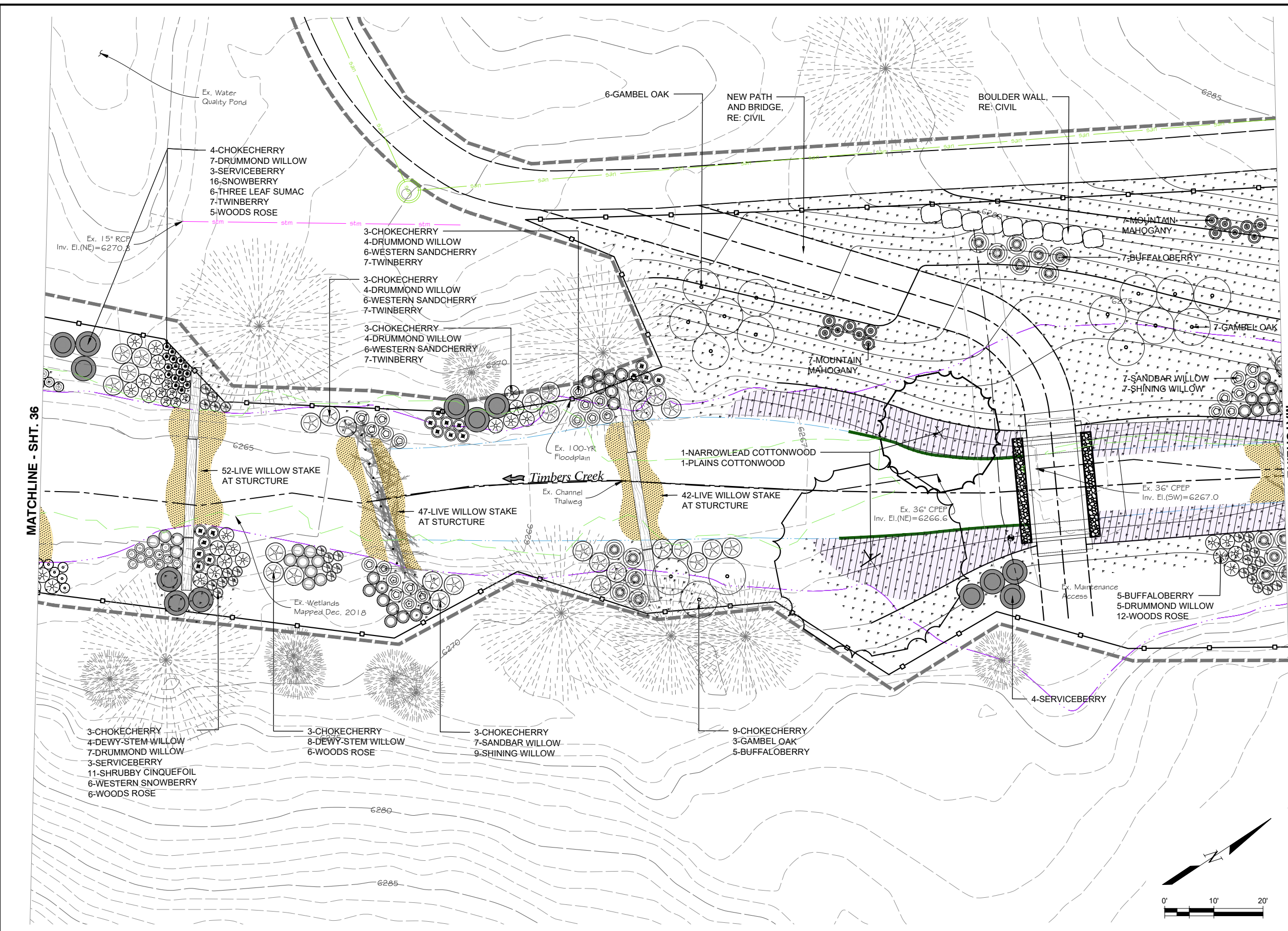
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SHEET REVISIONS		
NO.	DATE	DESCRIPTION

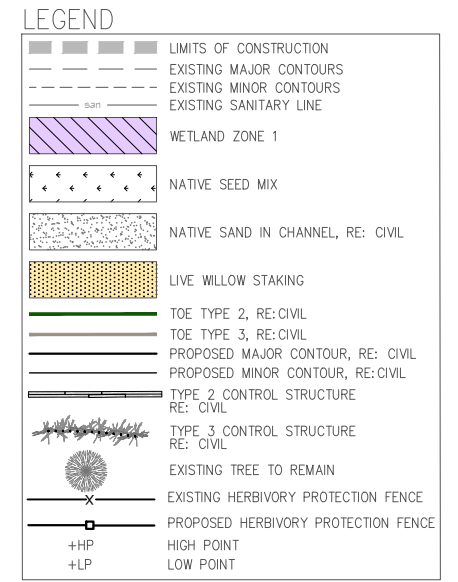


TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
LANDSCAPE		01/09/23
LANDSCAPE PLAN		DRAWING NO.
		L-7
		SHEET NO.
		36 OF 44

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KEYMAP
SCALE: 1"=1500'



- NOTES:**
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SHEET REVISIONS		
NO.	DATE	DESCRIPTION

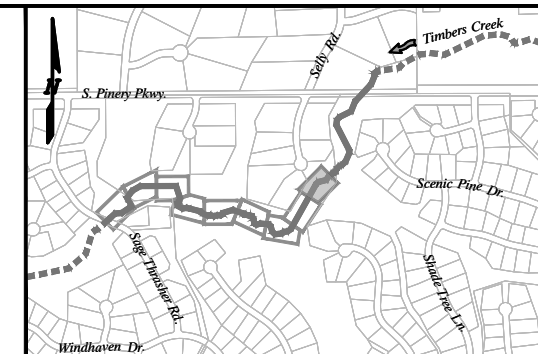
DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRODISTRICT

TIMBERS CREEK IMPROVEMENTS (PHASE 2)		DATE
LANDSCAPE		01/09/23
LANDSCAPE PLAN		DRAWING NO.
		L-8
		SHEET NO.
		37 OF 44



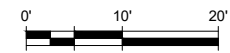
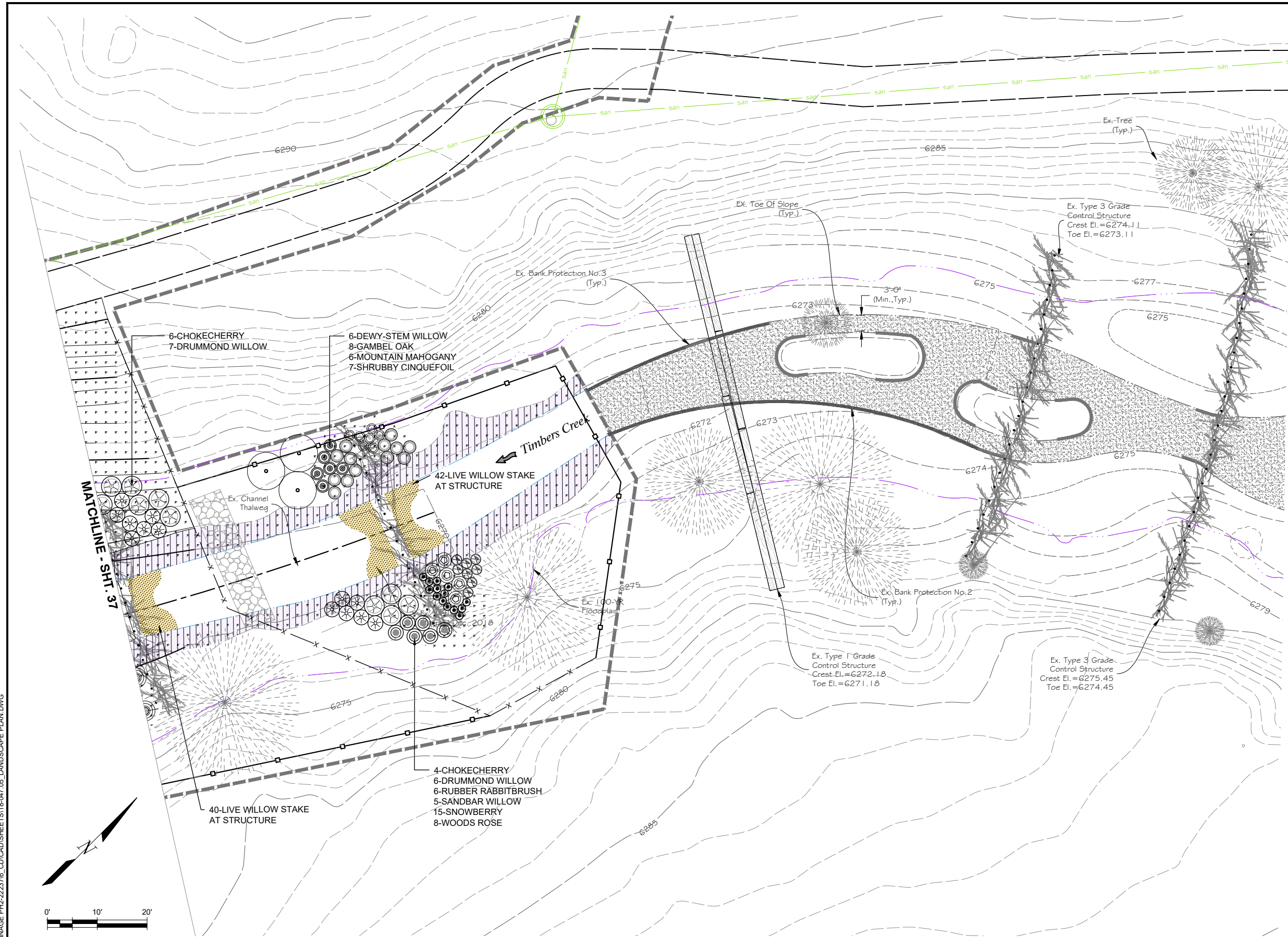
KEYMAP
SCALE: 1"=1500'

LEGEND

	LIMITS OF CONSTRUCTION
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	EXISTING SANITARY LINE
	WETLAND ZONE 1
	NATIVE SEED MIX
	NATIVE SAND IN CHANNEL, RE: CIVIL
	LIVE WILLOW STAKING
	TOE TYPE 2, RE: CIVIL
	TOE TYPE 3, RE: CIVIL
	PROPOSED MAJOR CONTOUR, RE: CIVIL
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	EXISTING TREE TO REMAIN
	EXISTING HERBIVORY PROTECTION FENCE
	PROPOSED HERBIVORY PROTECTION FENCE
	+HP HIGH POINT
	+LP LOW POINT

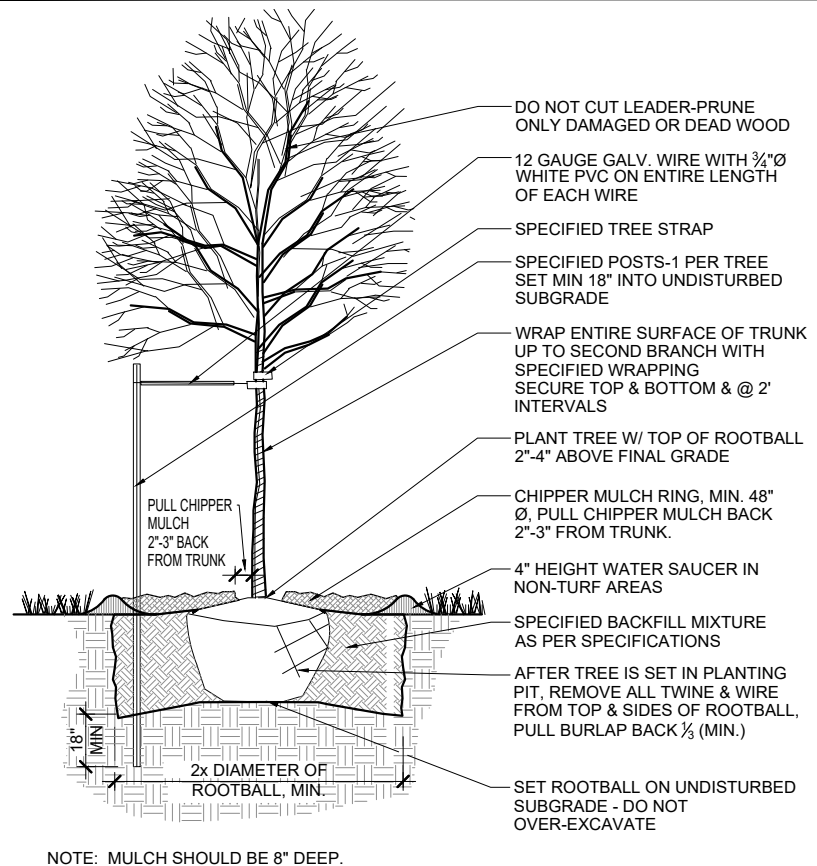
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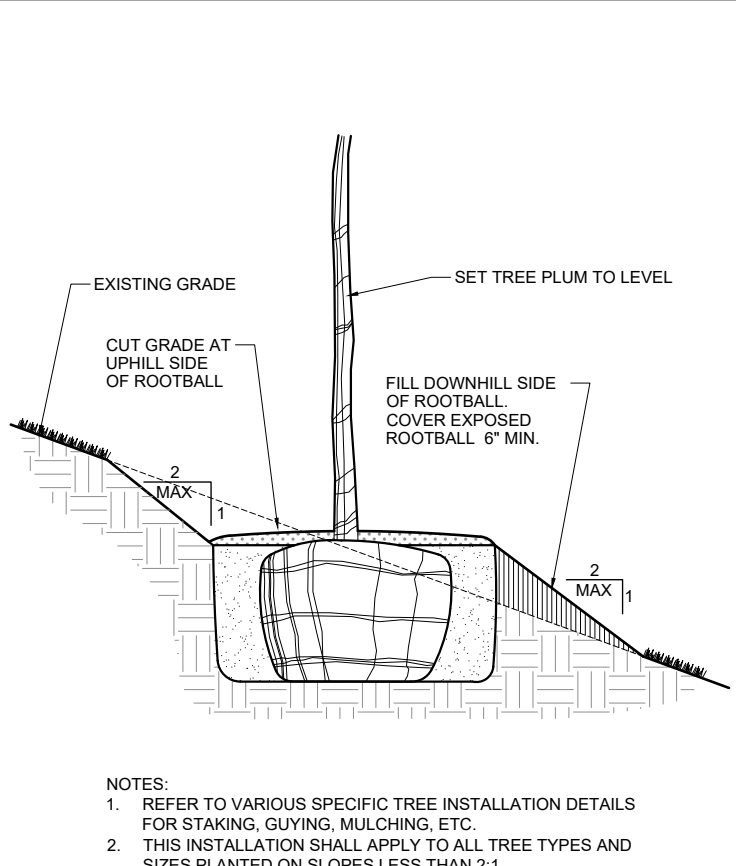


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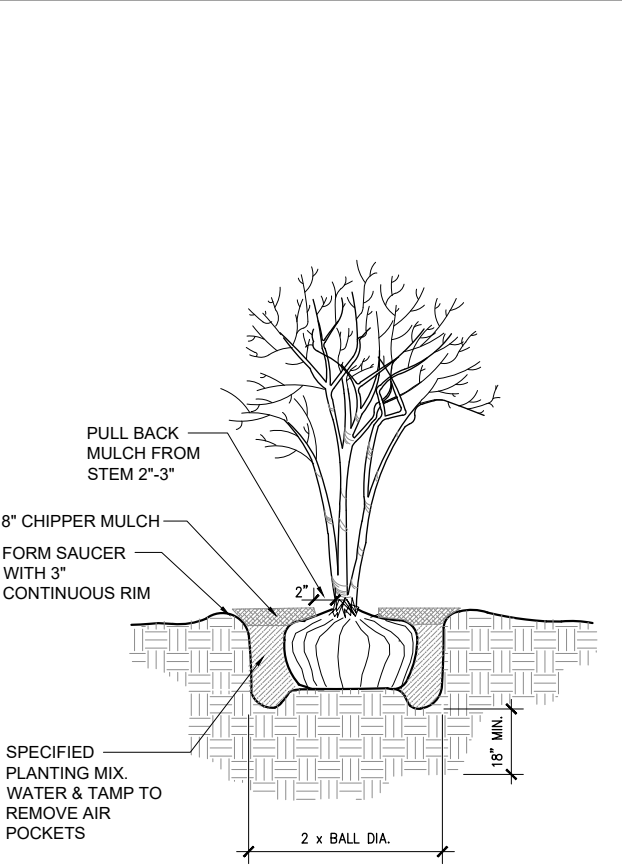
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		NO.	DATE	DESCRIPTION					BY	LANDSCAPE		01/09/23
		LANDSCAPE PLAN		DRAWING NO.							L-9	
								LANDSCAPE PLAN		SHEET NO.		
										38 OF 44		



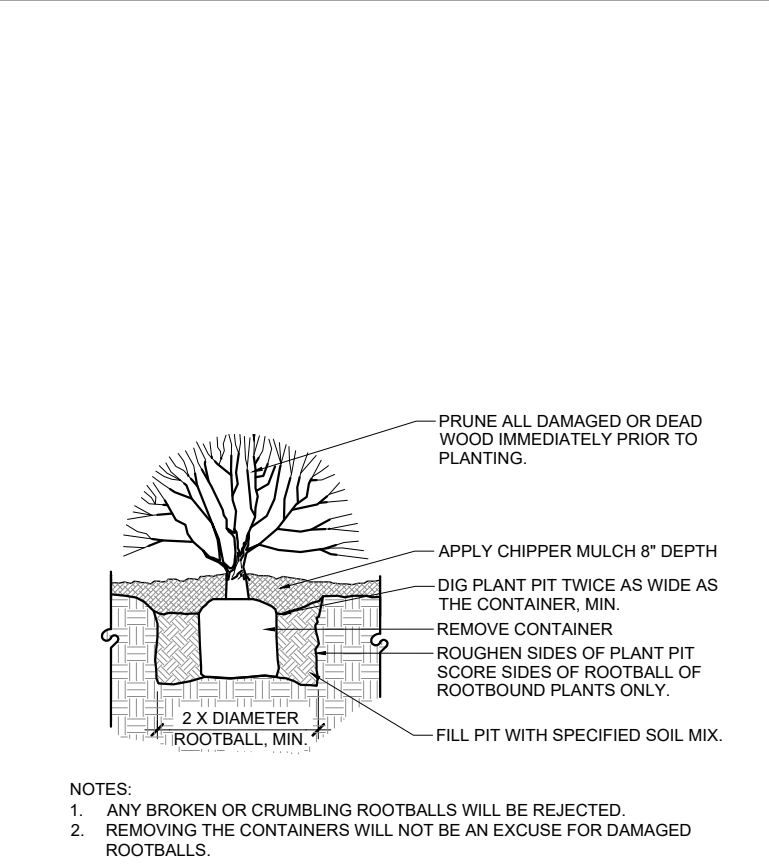
1 DECIDUOUS TREE PLANTING
LD-1 NOT TO SCALE



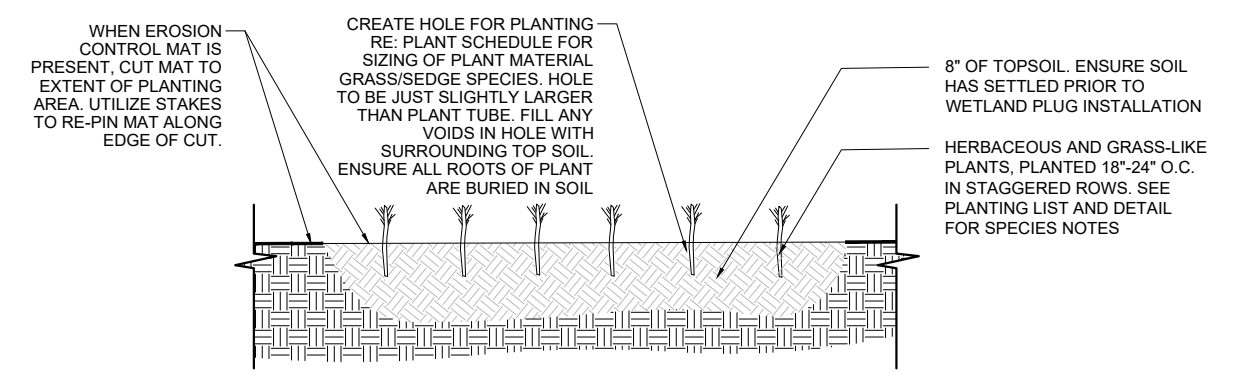
2 TREE PLANTING ON SLOPE
LD-1 NOT TO SCALE



3 MULTI-TRUNK TREE, 5' B&B CLUMP
LD-1 NOT TO SCALE



4 SHRUB PLANTING
LD-1 NOT TO SCALE

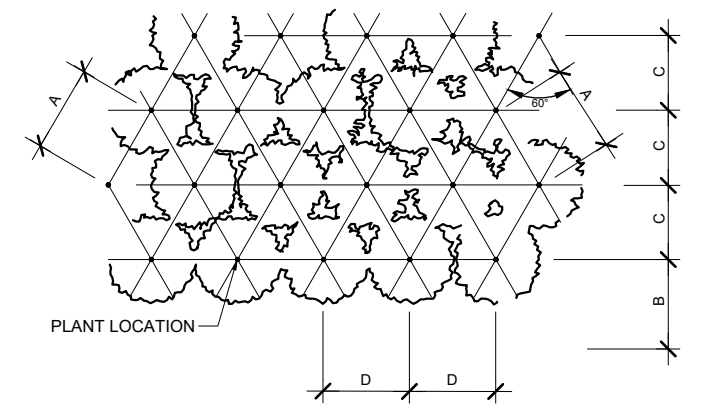


SECTION- PLANTING

NOTES:

1. ALL HERBACEOUS PLANT MATERIAL TO BE PLACED IN APPROPRIATE, FIELD VERIFIED HYDROLOGIC ZONE. THESE ZONES WILL CONSIST OF TWO PLANTING PODS ON LOWER ELEVATIONS OF THE "PLUG."
2. EVENLY SPACE AND TRIANGULATE PLUGS 18" O.C. AND EVENLY DISTRIBUTE BETWEEN THE TWO PLANTING PODS.
3. ALL WETLAND PLANT MATERIAL TO BE INSPECTED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
4. ALL WETLAND PLANTING ZONES TO BE MARKED IN FIELD AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PLANT INSTALLATION.

5 TYPICAL WETLAND PLANTING INSTALLATION
LD-1 NOT TO SCALE



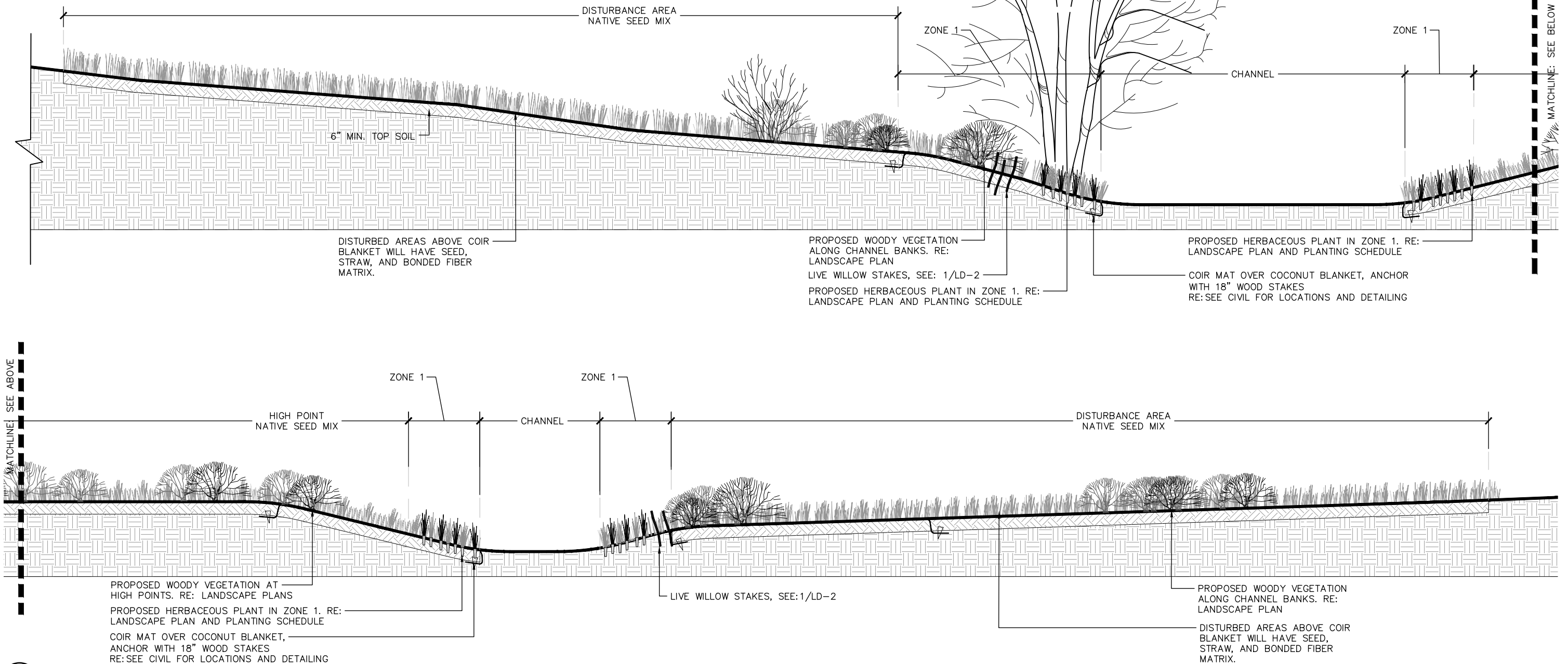
PLANT SPACING	A	B	C	D
6"	6"	6"	5"	6"
8"	8"	6"	7"	8"
12"	12"	8"	10"	12"
18"	18"	9"	15 1/2"	18"
24"	24"	18"	21"	24"
30"	30"	15"	26"	30"
36"	36"	30"	31"	36"
48"	48"	30"	42"	48"
60"	60"	36"	52"	60"

6 WETLAND PLANT TRIANGULAR SPACING FOR PLANTING LAYOUT
LD-1 NOT TO SCALE

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NO.	DATE	DESCRIPTION	BY																		

NOTE: SECTIONS HAVE BEEN PROVIDED TO ILLUSTRATE DESIGN INTENT AND CHARACTER OF TYPICAL SCENARIOS IN EACH WETLAND CONDITION. FOR LAYOUT, PLANTING ZONES, AND PLANT TYPE AND DISTRIBUTION, REFER TO SHEETS L-1 THRU L-8. REFER TO CIVIL ENGINEER'S GRADING PLANS FOR ALL GRADING INFORMATION.



1 CONSTRUCTED WETLAND #1 - CROSS SECTION
LD-3

NOT TO SCALE

PLANTING NOTES:

- ALL WOODY AND HERBACEOUS PLANT MATERIAL TO BE PLACED IN APPROPRIATE, FIELD VERIFIED HYDROLOGIC ZONE. TO BE VERIFIED IN FIELD BY LANDSCAPE ARCHITECT PRIOR TO COMPLETION.
- ALL DISTURBED SOIL SHALL BE SEEDED WITH THE SEED MIX PROVIDED IN THE PLANTING PLAN.

ZONE 1 HERBACEOUS PLANTS

- 0"-4" ABOVE WATER
- Carex nebrascensis-Nebraska sedge
 - Carex rostrata-beaked sedge
 - Eleocharis palustris-creeping spikerush
 - Equisetum hyemale-scouring rush
 - Schoenoplectus pungens-three-square rush
 - Scirpus americanus-bulrush

WOODY PLANTS

- Amelanchier alnifolia-serviceberry
- Cercocarpus montanus-mountain mahogany
- Chrysothamus viscidiflorus-rabbitbrush
- Ericameria nauseosa-rubber rabbitbrush
- Lonicera involucrata-twinberry
- Pentaptyloides floribunda-shrubby cinquefoil
- Prunus besseyi-western sand cherry
- Prunus virginiana var. melanocarpa-chokecherry

WOODY PLANTS

- Purshia tridentata-antelope bitterbrush
- Quercus gambelii-Gambel oak
- Rhus trilobata-three-leaf sumac
- Ribes aureum-golden currant
- Ribes cereum-wax currant
- Ribes inerme-gooseberry
- Rosa woodsii-wood's rose
- Salix drummondiana-drummond willow

WOODY PLANTS

- Salix exigua-sandbar willow
- Shepherdia argentea-buffaloberry
- Symphoricarpos occidentalis-western snowberry
- Symphoricarpos oreophilus-snowberry

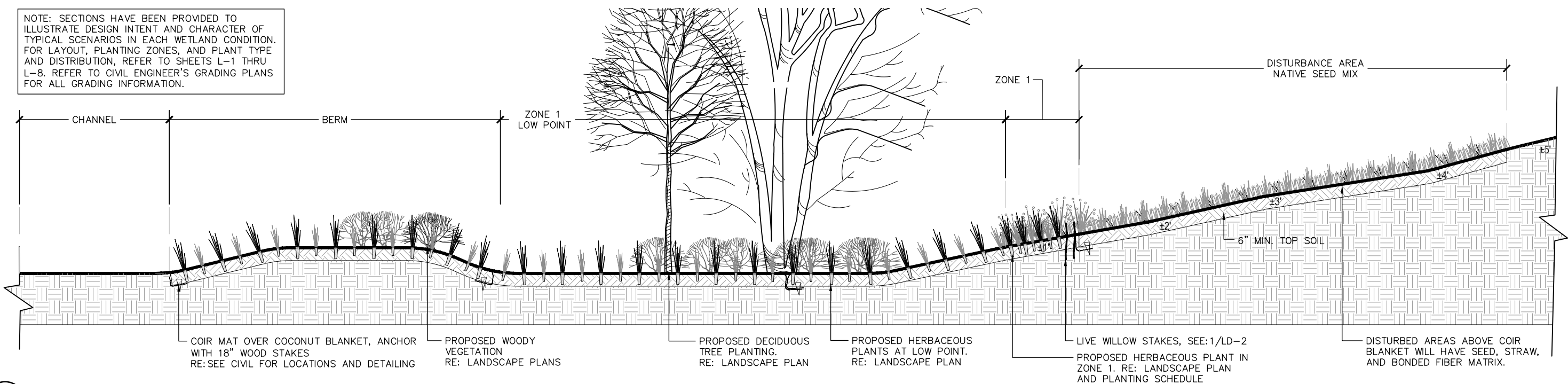
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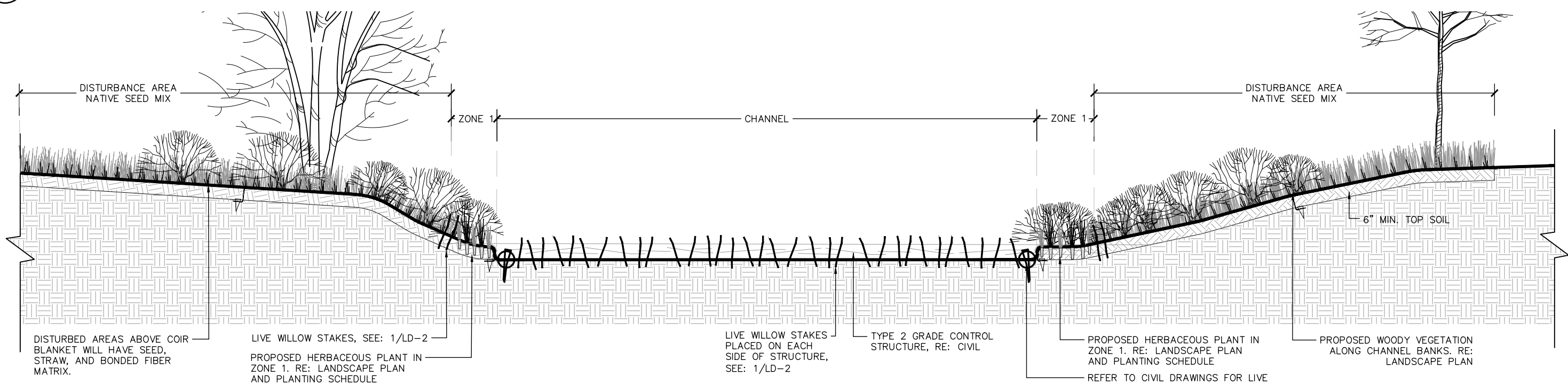
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LANDSCAPE		DRAWING NO. LD-3
CHANNEL CROSS-SECTIONS		SHEET NO. 41 OF 44

NOTE: SECTIONS HAVE BEEN PROVIDED TO ILLUSTRATE DESIGN INTENT AND CHARACTER OF TYPICAL SCENARIOS IN EACH WETLAND CONDITION. FOR LAYOUT, PLANTING ZONES, AND PLANT TYPE AND DISTRIBUTION, REFER TO SHEETS L-1 THRU L-8. REFER TO CIVIL ENGINEER'S GRADING PLANS FOR ALL GRADING INFORMATION.



1 LD-4 CONSTRUCTED WETLAND #2 - CROSS SECTION

NOT TO SCALE



1 LD-5 CONSTRUCTED WETLAND #3 - CROSS SECTION

NOT TO SCALE

- PLANTING NOTES:
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Equisetum hyemale-scouring rush
Schoenoplectus pungens-three-square rush
Scirpus americanus-bulrush

WOODY PLANTS
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Cercocarpus montanus-mountain mahogany
Chrysothamus viscidiflorus-rabbitbrush
Ericameria nauseosa-rubber rabbitbrush
Lonicera involucrata-twinberry
Pentaptyloides floribunda-shrubby cinquefoil
Prunus besseyi-western sand cherry
Prunus virginiana var. *melanocarpa*-chokecherry

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Ribes aureum-golden currant
Ribes cereum-wax currant
Ribes inerme-gooseberry
Rosa woodsii-wood's rose
Salix drummondiana-drummond willow

WOODY PLANTS
Salix exigua-sandbar willow
Shepherdia argentea-buffaloberry
Symphoricarpos occidentalis-western snowberry
Symphoricarpos oreophilus-snowberry

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		LANDSCAPE						DRAWING NO. LD-4	
		CHANNEL CROSS-SECTIONS						SHEET NO. 42 OF 44	

PLANTING SCHEDULE

TIMBERS DRAINAGE PH. 2 PLANTING SCHEDULE					
TREES					
COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY	
narrowleaf cottonwood	<i>Populus augustifolia</i>	10 gal	specimen quality	5	
plains cottonwood	<i>Populus deltoides monilifera</i>	10 gal	specimen quality	5	
				10	
SHRUBS					
COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY	
serviceberry	<i>Amelanchier alnifolia</i>	5 gal	cont., 5 canes min., 12"-18" ht.	16	
serviceberry	<i>Amelanchier alnifolia</i>	1 gal	cont., 12"-18" ht.	16	
mountain mahogany	<i>Cercocarpus montanus</i>	5 gal	cont., 5 canes min., 12"-18" ht.	10	
mountain mahogany	<i>Cercocarpus montanus</i>	1 gal	cont., 12"-18" ht.	10	
rubber rabbitbrush	<i>Ericameria nauseosa</i>	5 gal	cont., 5 canes min., 12"-18" ht.	17	
rubber rabbitbrush	<i>Ericameria nauseosa</i>	1 gal	cont., 12"-18" ht.	16	
twinberry	<i>Lonicera involucrata</i>	5 gal	cont., 5 canes min., 12"-18" ht.	34	
twinberry	<i>Lonicera involucrata</i>	1 gal	cont., 12"-18" ht.	35	
shrubby cinquefoil	<i>Pentaphylloides floribunda</i>	5 gal	cont., 5 canes min., 12"-18" ht.	32	
shrubby cinquefoil	<i>Pentaphylloides floribunda</i>	1 gal	cont., 12"-18" ht.	31	
western sand cherry	<i>Prunus besseyi</i>	5 gal	cont., 5 canes min., 12"-18" ht.	14	
western sand cherry	<i>Prunus besseyi</i>	1 gal	cont., 12"-18" ht.	14	
chokecherry	<i>Prunus virginiana var. melanocarpa</i>	5 gal	cont., 5 canes min., 12"-18" ht.	60	
chokecherry	<i>Prunus virginiana var. melanocarpa</i>	60 c.i.	cont., 5 canes min., 12"-18" ht.	60	
chokecherry	<i>Prunus virginiana var. melanocarpa</i>	1 gal	cont., 12"-18" ht.	60	
Gambel oak	<i>Quercus gambellii</i>	5 gal	cont., 5 canes min., 12"-18" ht.	34	
Gambel oak	<i>Quercus gambellii</i>	1 gal	cont., 12"-18" ht.	34	
three-leaf sumac	<i>Rhus trilobata</i>	5 gal	cont., 5 canes min., 12"-18" ht.	4	
three-leaf sumac	<i>Rhus trilobata</i>	1 gal	cont., 12"-18" ht.	5	
golden currant	<i>Ribes aureum</i>	5 gal	cont., 5 canes min., 12"-18" ht.	8	
golden currant	<i>Ribes aureum</i>	1 gal	cont., 12"-18" ht.	8	
wood's rose	<i>Rosa woodsii</i>	5 gal	cont., 5 canes min., 12"-18" ht.	36	
wood's rose	<i>Rosa woodsii</i>	1 gal	cont., 12"-18" ht.	36	
Drummond willow	<i>Salix drummondiana</i>	5 gal	cont., 5 canes min., 12"-18" ht.	57	
Drummond willow	<i>Salix drummondiana</i>	60 c.i.	cont., 5 canes min., 12"-18" ht.	57	
Drummond willow	<i>Salix drummondiana</i>	1 gal	cont., 12"-18" ht.	57	
sandbar willow	<i>Salix exigua</i>	5 gal	cont., 5 canes min., 12"-18" ht.	49	
sandbar willow	<i>Salix exigua</i>	1 gal	cont., 12"-18" ht.	48	
dewey-stem willow	<i>Salix irrorata</i>	5 gal	cont., 5 canes min., 12"-18" ht.	48	
dewey-stem willow	<i>Salix irrorata</i>	1 gal	cont., 12"-18" ht.	48	
shining willow	<i>Salix lucida</i>	5 gal	cont., 5 canes min., 12"-18" ht.	15	
shining willow	<i>Salix lucida</i>	60 c.i.	cont., 5 canes min., 12"-18" ht.	15	
shining willow	<i>Salix lucida</i>	1 gal	cont., 12"-18" ht.	15	
shining willow	<i>Salix lucida</i>	40 c.i.	cont., 5 canes min., 12"-18" ht.	15	
buffaloberry	<i>Shepherdia argentea</i>	5 gal	cont., 5 canes min., 12"-18" ht.	17	
buffaloberry	<i>Shepherdia argentea</i>	1 gal	cont., 12"-18" ht.	17	
western snowberry	<i>Symphoricarpos occidentalis</i>	5 gal	cont., 5 canes min., 12"-18" ht.	25	
western snowberry	<i>Symphoricarpos occidentalis</i>	60 c.i.	cont., 5 canes min., 12"-18" ht.	26	
western snowberry	<i>Symphoricarpos occidentalis</i>	1 gal	cont., 12"-18" ht.	26	
snowberry	<i>Symphoricarpos oreophilus</i>	5 gal	cont., 5 canes min., 12"-18" ht.	63	
snowberry	<i>Symphoricarpos oreophilus</i>	1 gal	cont., 12"-18" ht.	63	
				1251	
WETLAND PLUGS					
COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY	
Nebraska sedge	<i>Carex nebrascensis</i>	varies		427	
beaked sedge	<i>Carex rostrata</i>	varies		427	
creeping spikerush	<i>Eleocharis palustris</i>	varies		427	
scouring rush	<i>Equisetum hyemale</i>	varies		427	
three-square rush	<i>Schoenoplectus pungens</i>	varies		427	
bulrush (hardstem)	<i>Scirpus americanus</i>	varies		427	
			NOTE: 2562 EA (different sizes: 640 @10 ci, 640@ 16 ci, 640 @40 ci, and 640 @60ci)	2562	
WILLOW STAKES (FOR LIVE WILLOW STAKES ONLY)					
COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY	
Bebb willow	<i>Salix bebbiana</i>	36" cutting		10%	106
coyote willow	<i>Salix exigua</i>	36" cutting		30%	318
dewey-stem willow	<i>Salix irrorata</i>	36" cutting		30%	318
shining willow	<i>Salix lucida</i>	36" cutting		30%	318
					1,060
NATIVE SEED MIX					
COMMON NAME	BOTANICAL NAME	% IN MIX	LBS OF PLS/ACRE		
Grasses					
Big bluestem	<i>Andropogon gerardi</i>	11%	1.1		
Sideoats Grama, Vaughn	<i>Bouteloua curtipendula 'Vaughn'</i>	11%	0.9		
Blue Grama, Alma	<i>Bouteloua gracilis 'Alma'</i>	11%	0.3		
Prairie sandreed	<i>Calamovilfa longifolia</i>	11%	0.7		
Slender wheatgrass	<i>Elymus trachycaulus</i>	7%	0.6		
Streambank wheatgrass	<i>Elymus lanceolatus</i>	11%	0.6		
Yellow Indiangrass	<i>Linum lewisii</i>	11%	1.0		
Green needlegrass	<i>Nassella viridula</i>	11%	1.0		
Switchgrass	<i>Panicum virgatum</i>	11%	0.4		
			95.00%		
Forbs/ Woody					
Fringed Sage	<i>Artemisia frigida</i>	0.07%	0.015		
Smooth Aster	<i>Aster laevis</i>	0.43%	0.09		
Blanketflower	<i>Gaillardia aristata</i>	3.31%	0.1		
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.95%	0.2		
Showy Goldeneye	<i>Viguiera multiflora</i>	0.24%	0.05		
			5.00%		
			Native Seed .86 AC		
			Herbivory Protection Fence 1710 LF		

GENERAL PLANTING NOTES

- CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS, AREA DISCREPANCIES AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.
 - CONTRACTOR TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO BEFORE DIGGING, INCLUDING BUT NOT LIMITED TO, TRENCHING AND SHRUB AND TREE PLANTING PITS. IF UTILITIES OCCUR AT LOCATIONS OF PROPOSED SHRUBS, OR WITHIN EIGHT (8) FEET OF PROPOSED TREES, THE CONTRACTOR SHALL REPORT SUCH CONDITIONS TO THE OWNER'S REPRESENTATIVE. DAMAGE TO EXISTING UTILITIES BY THE LANDSCAPE CONTRACTOR IS THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR.
 - THE LANDSCAPE PLAN AND DETAILS ARE TO BE USED IN CONJUNCTION WITH THE CIVIL PLANS TO FORM COMPLETE INFORMATION REGARDING SITE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH SUBCONTRACTORS AS REQUIRED TO ACCOMPLISH ALL CONSTRUCTION OPERATIONS. ALL PIPING, CONDUIT, SLEEVES, ETC., SHALL BE SET IN PLACE PRIOR TO INSTALLATION OF CONSTRUCTION ITEMS.
 - ALL EXISTING IMPROVEMENTS TO REMAIN, INCLUDING BUT NOT LIMITED TO UTILITIES, CURB AND GUTTER, WALKWAYS, EXISTING IRRIGATION, AND EXISTING STRUCTURES TO REMAIN, SHALL BE PROPERLY AND ADEQUATELY PROTECTED FROM DAMAGE DURING CONSTRUCTION OPERATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESTORE TO THE ORIGINAL CONDITION ANY EXISTING ITEMS THAT ARE DAMAGED OR DISTURBED IN ANY WAY, AND AT NO ADDITIONAL COST TO THE OWNER.
 - TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE. REFER TO SPECIFICATION SECTION 32 91 13 FOR ADDITIONAL TOPSOIL DIRECTION AND INFORMATION.
 - LANDSCAPE CONTRACTOR TO REMOVE ALL ROCK AND DEBRIS OVER 1 1/2" IN SIZE AND REMOVED OFF-SITE PRIOR TO INSTALLATION OF PLANT MATERIAL. ALL MATERIALS SHALL BE DISPOSED OF OFF-SITE PER LOCAL CODES & REGULATIONS.
 - GRADING
 - LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUGH GRADING, AND FINE GRADING AFTER SOIL AMENDMENT OPERATIONS TO ALLOW FOR SEEDING, STRAW MULCH, AND HYDROMULCH INSTALLATION.
 - LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES.
 - CONTRACTOR TO NOTIFY OWNER'S REPRESENTATIVE OF ANY POORLY DRAINED AREAS PRIOR TO COMMENCING WORK.
 - CONTRACTOR SHALL OBTAIN APPROVAL OF THE OWNER'S REPRESENTATIVE OF THE GRADING PRIOR TO PLANTING.
- LANDSCAPE MATERIALS**
- CONTRACTOR SHALL FOLLOW THE LANDSCAPE PLAN. ANY DISCREPANCIES BETWEEN THE PLAN AND FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER'S AUTHORIZED REPRESENTATIVE BEFORE PROCEEDING WITH WORK. IF THERE IS A DISCREPANCY BETWEEN THE PLANT COUNTS ON THE CALL-OUTS ON THE PLANS & THE ACTUAL NUMBER OF PLANT SYMBOLS DEPICTED ON THE PLANS, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING THE ACTUAL NUMBER OF PLANTS AS SYMBOLICALLY DEPICTED ON THE PLANS.
 - CONTRACTOR SHALL USE LOCAL BEST MANAGEMENT PRACTICES FOR OBTAINING AND INSTALLING LANDSCAPE MATERIALS. COMPLETE THE WORK USING SKILLED PERSONNEL, PROFICIENT IN THE TRADES REQUIRED & IN A NEAT, ORDERLY AND RESPONSIBLE MANNER & WITH RECOGNIZED STANDARDS OF WORKMANSHIP.
 - ALL PLANTS TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. NOTIFY OWNER FOR INSPECTION AND APPROVAL OF PLANT MATERIAL AT TIME OF DELIVERY. ANY PLANT NOT MEETING OWNER'S APPROVAL MAY BE REJECTED AT ANY TIME PRIOR TO FINAL ACCEPTANCE.
 - PLANT MATERIAL MUST MEET CURRENT LANDSCAPE NURSERY STANDARDS &/OR ANSI Z60.1.
 - IF PLANTS ARE NOT AVAILABLE, NOTIFY OWNER FOR APPROVAL OF CHANGE BEFORE MAKING SUBSTITUTIONS.
 - THE LANDSCAPE ARCHITECT MUST APPROVE ALL PLANTING LAYOUTS PRIOR TO PLANTING. ALL ADJUSTMENTS SHALL BE MADE BY THE CONTRACTOR PRIOR TO INSTALLING PLANTS. THE CONTRACTOR SHALL NOT DIG PLANT PITS UNTIL LOCATIONS ARE APPROVED.
 - MINOR FIELD ADJUSTMENTS TO THE PLANTING PLANS MAY BE NECESSARY BASED ON THE ACTUAL LOCATION OF EXISTING VEGETATION, WALKWAYS AND SIMILAR FEATURES. CONTRACTOR MUST OBTAIN APPROVAL FROM THE OWNERS REPRESENTATIVE PRIOR TO ADJUSTING THE DESIGN. PROPOSED SHRUB AND TREE LOCATIONS TO BE FIELD ADJUSTED TO ENHANCE EXISTING WOODY VEGETATION
 - THE CONTRACTOR IS RESPONSIBLE FOR WEED CONTROL IN CHANNEL, AT TREES AND SHRUBS, AND SEEDED AREAS UNTIL FINAL ACCEPTANCE.
 - TREE AND SHRUB PLANTINGS TO BE TREATED WITH SPECIFIED FERTILIZER FROM SPECIFICATION SECTION 32 93 00, AS APPROVED BY THE LANDSCAPE ARCHITECT.
 - THE CONTRACTOR SHALL STAKE ALL KEY RESTORATION AREAS AND SHALL RECEIVE APPROVAL FROM THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH CONSTRUCTION.
 - BOUNDARY OF RESTORATION SEEDING TO BE OUTLINED IN THE FIELD BY THE CONTRACTOR, AND APPROVED BY THE LANDSCAPE ARCHITECT.
 - REFER TO MILE HIGH FLOOD DISTRICT SPECIFICATION SECTION 32 93 00 FOR COMPOST AND FERTILIZER TO BE ADDED TO SEEDED AREAS, WETLAND AREAS, AND SHRUBS/TREES.
 - THE OWNER, HIS SUCCESSORS AND ASSIGNS, SHALL BE RESPONSIBLE FOR INSTALLATION, MAINTENANCE AND REPLACEMENT OF ALL LANDSCAPING MATERIALS SHOWN OR INDICATED ON THE APPROVED SITE PLAN.
 - ALL LANDSCAPE AREAS WILL BE IRRIGATED IMMEDIATELY AFTER PLANT INSTALLATION, AS WELL AS POST CONSTRUCTION. ALL MATERIAL TO BE IRRIGATED BY CONTRACTOR UNTIL FINAL ACCEPTANCE.
 - ALL WOODY AND HERBACEOUS PLANT MATERIAL TO BE PLACED IN APPROPRIATE, FIELD VERIFIED HYDROLOGIC ZONE
 - ALL TREES AND SHRUBS TO RECEIVE MINIMUM OF 8" DEPTH OF MULCH, PER DETAIL.
 - DO NOT BURY PLANTS WITH MULCH
 - PULL MULCH BACK 6" FROM TRUNK OF TREES AS PER DETAIL.

INSTALLATION SCHEDULE:	
1.	HARVEST WILLOW - MARCH/APRIL 2023, AND INSTALL SPRING 2023
2.	WETLAND PLUGS - MARCH/ APRIL 2023
3.	WOODY VEGETATION - MARCH/APRIL 2023
4.	SEEDING - AFTER ALL VEGETATION INSTALLED
5.	CONTRACTOR TO COORDINATE WITH LANDSCAPE ARCHITECT TO DETERMINE SCHEDULE FOR LANDSCAPE ITEMS INSTALLATION+HARVEST. DATES ABOVE ARE DRAFT DATES FOR PLANNING PURPOSED ONLY.

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PREPARED UNDER THE SUPERVISION OF DRAWN: CHECKED:	<h1>FINAL DESIGN</h1>	SHEET REVISIONS								TIMBERS CREEK IMPROVEMENTS (PHASE 2)	DATE 01/09/23
										LANDSCAPE	DRAWING NO. LD-5
		LANDSCAPE NOTES AND PLANT SCHEDULE									

RIPARIAN VEGETATION AND WETLAND CUTTINGS/STAKES NOTES

SUMMARY

RIPARIAN PLANTING COVERS THE CREEK BANKS FROM THE EDGE OF WATER AT OR NEAR LOWFLOW WATER SURFACE ELEVATION UP TO AND INCLUDING PART OF THE OVERBANK/FLOODPLAIN. AREAS DESIGNATED FOR RIPARIAN PLANTING OF CONTAINERIZED MATERIALS AND WILLOW STAKES ARE SHOWN ON THE DRAWINGS AND PLANT SCHEDULES.

SOURCE MATERIAL

- 1. CONTAINERIZED PLANTS: CONTAINERIZED PLANT MATERIALS WILL BE GROWN FROM SEED OR CUTTINGS SOURCED WITHIN THE ROCKY MOUNTAIN REGION.
- 2. WILLOW CUTTINGS / STAKES: CUTTINGS / STAKES WILL BE COLLECTED IN A MANNER CONFORMING TO FEDERAL AND STATE LAW. MATERIALS WILL BE COLLECTED WITHIN THE NORTHERN FRONT RANGE OF THE STATE OF COLORADO, IN THE SAME WATERSHED AND AREAS OF SIMILAR ELEVATION AND HYDROLOGY TO THOSE EXISTING AT THE PLANTING SITE (I.E. ECOTYPIC MATERIAL).
- 3. CONTRACTOR TO COORDINATE WITH LANDSCAPE ARCHITECT REGARDING WILLOW HARVEST SITES.
- 4. CONTRACTOR SHALL COORDINATE WITH DOUGLAS COUNTY AND THE MILE HIGH FLOOD DISTRICT REGARDING ACCESS TO CHOSEN SITES, AND OBTAIN ACCESS AND COLLECTION APPROVAL FROM DOUGLAS COUNTY PRIOR TO WILLOW COLLECTION.
- 5. COLLECTIONS MADE ON PUBLIC LANDS MUST BE PERMITTED AND CARRIED OUT IN ACCORDANCE WITH STATE AND FEDERAL LAW.

INSTALLATION

- 1. CONTRACTOR SHALL BE ABLE TO DEMONSTRATE EXTENSIVE EXPERIENCE WITH PROJECTS OF SIMILAR HYDROLOGY, SPECIES COMPOSITION AND SOIL CONDITIONS.
- 2. CONTRACTOR SHALL BE ABLE TO DEMONSTRATE EXTENSIVE EXPERTISE IN THE ECOLOGY OF NATIVE PLANTS, PARTICULARLY IN THE IDENTIFICATION AND HYDROLOGIC PREFERENCES OF RIPARIAN WOODY SPECIES
- 3. CONTRACTOR SHALL BE ABLE TO DEMONSTRATE EXTENSIVE EXPERIENCE IN THE HARVEST AND MAINTENANCE OF VIABLE WILLOW STAKES PRIOR TO PLANTING.

DELIVERY / TRANSPORT

- 1. ALL PLANT MATERIALS ARE TO BE DELIVERED DIRECTLY TO THE PLANTING SITE FROM THE NURSERY FACILITY.
- 2. PLANT MATERIALS ARE TO BE DELIVERED TO THE PLANTING SITE IN THE SPECIES, SIZE AND QUANTITIES IDENTIFIED BY THIS DOCUMENT. PLANT MATERIALS WILL BE ACCOMPANIED BY A BILL OF LADING STATING SAME.
- 3. THE SUBCONTRACTOR SHALL COUNT AND CONFIRM THE DELIVERY IS ACCURATE AND INSPECT PLANT MATERIAL TO ENSURE THE PLANT MATERIAL IS IN GOOD CONDITION AND HEALTH.
- 4. ALL PLANTS WILL BE CHECKED AND APPROVED BY THE DESIGNER & CONTRACTOR PRIOR TO PLANTING TO ENSURE CONFORMITY OF SPECIES, QUALITY AND QUANTITY. PLANT MATERIAL SHALL:
 - a. BE WELL SHAPED, VIGOROUS AND HEALTHY WITH A WELL BRANCHED ROOT SYSTEM, FREE FROM DISEASE, HARMFUL INSECTS AND INSECT EGGS, SUN-SCALD INJURY, DISFIGUREMENT OR ABRASION;
 - b. BE CHECKED FOR UNAUTHORIZED SUBSTITUTION AND EXHIBIT TYPICAL FORM OF BRANCH TO HEIGHT RATIO;
 - c. MEET THE CONTAINER, CALIPER AND HEIGHT MEASUREMENTS SPECIFIED AND NOT BE CROPPED;
 - d. SHOW NEW FIBROUS ROOTS AND MAINTAIN ITS SHAPE WHEN REMOVED FROM THE CONTAINER AND NOT HAVE BROKEN OR CRACKED ROOTBALLS, OR BROKEN CONTAINERS;
 - e. CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN'S AMERICAN STANDARD FOR NURSERY STOCK.
- 5. IF WITHIN 24 HOURS OF DELIVERY THE DESIGNER DETERMINES THAT THE PLANT MATERIAL DOES NOT MEET THESE SPECIFICATIONS, THE UNACCEPTABLE MATERIAL SHALL BE REJECTED, REMOVED, AND REPLACED AT NO EXPENSE TO THE CLIENT.
- 6. IF OVER THE COURSE OF THE PROJECT THE DESIGNER DISCOVERS THE CONTRACTOR HAS FAILED TO PROPERLY STORE, INSTALL & MAINTAIN ANY PREVIOUSLY ACCEPTED PLANT MATERIAL, SAID MATERIAL WILL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIAL AT THE EXPENSE OF THE SUBCONTRACTOR.
- 7. DELIVERY IS TO BE MADE USING A VEHICLE WITH AN ENCLOSED, COVERED CARGO AREA TO PREVENT DAMAGE FROM WIND, RAIN, HAIL AND DEBRIS.
- 8. CONTAINERIZED MATERIALS ARE TO BE SECURED IN A RACK SYSTEM DESIGNED SPECIFICALLY FOR THE TRANSPORTATION OF PLANTS, IN ORDER TO PREVENT DAMAGE CAUSED BY SHIFTING LOADS.
- 9. PLANT MATERIAL SHALL BE STAGED BY SPECIES IN SEPARATE AND IDENTIFIABLE GROUPS DURING UNLOADING.
- 10. PLANT MATERIAL SHALL BE IDENTIFIED WITH ATTACHED, DURABLE, WATERPROOF LABELS AND WEATHER RESISTANT INK, STATING THE CORRECT SCIENTIFIC AND COMMON NAME.

STORAGE

- 1. CUTTINGS / STAKES: CUTTINGS / STAKES MUST BE STORED AT 32-40 DEGREES FAHRENHEIT IN A HUMID, DARK ENVIRONMENT. IMMEDIATELY AFTER HARVESTING, WILLOW STAKES SHALL BE FULLY SUBMERGED AND STORED IN A COLD/COOL WATER (EITHER IN A TANK OR NATURAL WATER BODY) IN A DARK OR SHADED LOCATION FOR A MINIMUM OF 5 TO 7 DAYS. FAILURE TO PROPERLY STORE AND HYDRATE WILLOW CUTTINGS OR IF CUTTINGS LINGER ON SITE MORE THAN 2 DAYS BEFORE PLANTING WILL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE CLIENT IF SAID CUTTINGS FAIL TO THRIVE.
- 2. CONTAINERIZED MATERIALS: PRIOR TO PLANTING, CONTAINERIZED MATERIALS MUST BE STORED IN A LICENSED, QUALIFIED NURSERY (SEE 1.02, B-1). MATERIALS SHALL BE PROPERLY PRUNED IN ACCORDANCE WITH RECOGNIZED STANDARD PRACTICE. ROOT SYSTEMS WILL BE KEPT MOIST AT ALL TIMES.
- 3. PLANT MATERIAL SHALL BE KEPT SHADED, WATERED AND MAINTAINED IN GOOD HEALTH DURING TRANSPORT AND THEREAFTER UNTIL THE PROJECT IS APPROVED.
- 4. COMMERCIALLY AVAILABLE PLANT MATERIALS NOT INSTALLED WITHIN 5 DAYS OF ARRIVAL AT THE SITE SHALL BE STORED AND PROTECTED IN DESIGNATED TEMPORARY ON-SITE NURSERY AREA. NURSERY GROWN PLANT MATERIAL SHALL NOT BE STORED ON SITE LONGER THAN 15 CALENDAR DAYS. PLANT MATERIAL SHALL BE PROTECTED FROM DIRECT EXPOSURE TO WIND AND SUN, KEPT SHADED AND MOIST BY WATERING, EITHER BY HAND OR A TEMPORARY IRRIGATION SYSTEM UNTIL INSTALLED.

HANDLING

- 1. CUTTINGS / STAKES: CARE WILL BE TAKEN TO AVOID DAMAGE TO BUDS DURING HANDLING. BARK MUST NOT BE SEPARATED FROM THE CAMBIUM LAYER. ONLY THE NUMBER OF WILLOW STAKES THAT CAN BE PLANTED IN ONE DAY WILL BE DELIVERED TO THE PLANTING SITE.
- 2. CONTAINERIZED MATERIALS: DO NOT INJURE PLANTS BY DROPPING THEM OR HANDLING THEM BY THE TRUNK, STEMS OR FOLIAGE. CONTAINERIZED MATERIALS ARE TO BE HAND-CARRIED BY THE CONTAINER ONLY. THESE MATERIALS SHALL BE KEPT MOIST AT ALL TIMES AND NOT ALLOWED TO DRY OUT.

MATERIALS

WILLOW STAKES

- 1. IDENTIFICATION: WILLOW STAKE COLLECTION MUST BE PERFORMED BY OR UNDER THE SUPERVISION OF AN ECOLOGIST OR BOTANIST EXPERIENCED IN THE IDENTIFICATION OF NATIVE WILLOW SPECIES.
- 2. COLLECTION: WILLOW STAKE COLLECTION/HARVESTING SHALL BE PERFORMED WHILE WILLOWS ARE DORMANT ACCORDING TO THE FOLLOWING PRIORITY:
 - a. IMMEDIATELY PRIOR TO SETTING BUD (APPROXIMATELY MID - MARCH TO MID - APRIL; THEN
 - b. FALL DORMANT SEASON (APPROXIMATELY NOV.1 TO MID-DEC) IMMEDIATELY AFTER LEAF DROP.
- 3. QUALITY: CUTTINGS SHOULD ONLY BE HARVESTED FROM HEALTHY, LIVE PLANTS THAT ARE AT LEAST TWO YEARS OLD AND ARE: RELATIVELY STRAIGHT, COVERED WITH SMOOTH BARK, AND HAVE NO INSECT/PATHOGEN DAMAGE. NO MORE THAN ONE-THIRD OF A LIVE PLANT SHOULD BE HARVESTED AND STEMS SHOULD BE HARVESTED EVENLY THROUGH THE STAND AND WITH INDIVIDUAL WILLOW PLANTS (I.E. DO NOT REMOVE 1/3 OF THE STEMS FROM THE SAME SIDE OF AN INDIVIDUAL PLANT).
- 4. SIZE:
 - a. CUTTINGS SHOULD BE A MINIMUM OF 1/2 INCH IN DIAMETER TO ENSURE SUFFICIENT ENERGY FOR ROOTING. CUTTINGS SHALL BE 24"-36" IN LENGTH. THE BOTTOM OF THE STEMS TO BE CUT WITH A CLEAN DIAGONAL CUT TO DIFFERENTIATE THE ROOTING END FROM THE ABOVE GROUND END, AND TO AID IN INSTALLATION.
 - b. WHEN PLANTED, CUTTINGS SHOULD EXTEND 6-8 INCHES INTO THE WATER TABLE OR CAPILLARY FRINGE.
 - c. THREE QUARTERS OF THE CUTTING SHOULD BE BELOW GROUND TO PREVENT BEING DISLODGED DURING HIGH FLOWS.
- 5. FORM: ALL SIDE BRANCHES WILL BE REMOVED, AVOIDING ANY DAMAGE TO THE STEM. THE TERMINAL BUD SHALL BE TRIMMED FROM STAKES WITH A HORIZONTAL CUT. THIS WILL DIVERT ENERGY TO THE LATERAL BUDS FOR EFFICIENT ROOT AND STEM SPROUTING.
- 6. BUNDLING: AT THE TIME OF HARVESTING, WILLOW STAKES SHALL BE BUNDLED IN GROUPS OF 10, 25, OR 50 BY LIKE SPECIES FOR EASE OF COUNTING.
- 7. SOAK WILLOWS PRIOR TO PLANTING, MAINTAINING WATER CONTACT WITH 50-80% OF THE LENGTH OF THE CUTTING.
- 8. INTERIM MAINTENANCE: HARVESTED WILLOW CUTTINGS SHOULD BE STORED AND MAINTAINED AT A QUALIFIED, LICENSED NURSERY FACILITY IN THE MANNER DESCRIBED IN 1.03, B-1 FOR NO MORE THAN SIXTY DAYS PRIOR TO PLANTING.

PLANTING/INSTALLATION

- 1. CUTTINGS: PLANTING OF RIPARIAN CUTTINGS SHALL OCCUR IN THE SPRING BEFORE BUD BREAK, AND AS SOON AS GROUND CONDITIONS PERMIT OR IMMEDIATELY AFTER SPRING RUN-OFF.

SITE PREPARATION

- 1. SITE SHALL BE FINISHED GRADED, TOPSOIL PLACED, AND FREE OF DEBRIS AND HEAVY EQUIPMENT IN PLANTING AREAS PRIOR TO THE COMMENCEMENT OF PLANTING OPERATIONS.
- 2. CONTRACTOR SHALL BECOME FAMILIAR WITH SITE HYDROLOGY AND SOIL CONDITIONS PRIOR TO BEGINNING RIPARIAN SEEDING AND PLANTING WORK.
- 3. PLANT LOCATIONS WILL BE DETERMINED PRIMARILY BY THE PROJECT DRAWINGS. PRECISE LOCATIONS FOR INDIVIDUAL PLANTS AND WETLAND SHRUBS WILL BE DETERMINED BY THE ECOLOGIST BASED ON IN-FIELD MACRO- AND MICRO-SITE AND HYDROLOGIC CONDITIONS AND PLANT ZONATION REQUIREMENTS.
- 4. PLANTING SITES WILL BE FLAGGED OR SPRAYED WITH GROUND PAINT BY THE ECOLOGIST AS TO PRECISE PLANT LOCATIONS PRIOR TO THE OCCURRENCE OF PLANTING WORK.

WILLOW STAKE PLANTING PROCEDURE

- 1. PLANTING HOLES FOR WILLOW STAKES SHALL BE CREATED WITH A PUNCH BAR, STINGER OR SIMILAR EQUIPMENT AS DESIGNATED BY THE CONTRACTOR. HOLES SHALL BE DEEP ENOUGH TO EXTEND WILLOW STAKE 2/3 OF THE LENGTH OF THE CUTTING INTO THE GROUND (PRIOR TO ANY NECESSARY TRIMMING).
- 2. CUTTINGS SHALL BE PLANTED IN A MANNER SO AS TO EXTEND ABOVE COMPETING HERBACEOUS VEGETATION, BUT SHOULD BE SHORT ENOUGH TO MINIMIZE THE CHANCE OF BEING RIPPED FROM THE GROUND BY HIGH FLOWS OR WIND - BLOWN DEBRIS. THE LENGTH OF CUTTINGS SHOULD BE TRIMMED TO WITHIN 6 TO 9 INCHES OF THE GROUND. TRIMMING THE TOPS OF WILLOW STAKES DOES NOT RELIEVE THE CONTRACTOR FROM INSTALLING 2/3RDS OF THE CUTTING IN THE GROUND.
- 3. ONE WILLOW CUTTING SHALL BE PLACED IN EACH HOLE. SPACING SHOULD BE 18"-24" O.C. IN DESIGNATED AREAS, AND SHOULD BE PLACED RANDOMLY TO APPEAR MORE NATURAL.
- 4. AFTER PLANTING, THE HOLE SHALL BE FILLED WITH A THICK MUD / WATER SLURRY IN ORDER TO PREVENT THE FORMATION OF AIR POCKETS AROUND THE STAKE.
- 5. AT LEAST TWO ROWS OF STAKES SHALL BE USED IN A PARTICULAR AREA TO COVER THE RANGE OF WATER LEVELS. ROWS SHALL BE STAGGERED TO CREATE DIAGONAL ON CENTER SPACING.
- 6. QUALIFIED CONTRACTOR PERSONNEL WITH EXTENSIVE EXPERTISE IN THE FIELD OF ECOLOGICAL RESTORATION SHALL REMAIN ON - SITE TO SUPERVISE PLANTING CREWS AND TO PROMPTLY

LIVE WILLOW FASCINES

- 1. A CONTINUOUS FASCINE SHALL BE BUILT IN A PREPARED TRENCH, AS OPPOSED TO INDIVIDUAL WILLOW BUNDLES LAID END-TO-END. CONTRACTOR SHALL CONTACT ENGINEER OR PLANT ECOLOGIST PRIOR TO BEGINNING THE WORK TO ARRANGE FOR OVERSIGHT AND GUIDANCE DURING THE CONSTRUCTION OF FASCINES. TRIMMINGS OF YOUNG SUCKERS AND SOME SMALLER BRANCHES MAY BE INCLUDED IN THE FASCINES, BUT HALF OF THE STEMS IN THE FASCINES SHALL BE AT LEAST ONE-HALF (1/2) INCH IN DIAMETER. COMPLETE LIVE WILLOW FASCINES SHALL BE AT LEAST TEN (10) INCHES IN DIAMETER, WITH THE GROWING TIPS AND BUTT ENDS ORIENTED IN ALTERNATING DIRECTIONS. CUTTINGS SHALL BE STAGGERED IN THE FASCINES SO THAT THE GROWING TIPS ARE EVENLY DISTRIBUTED THROUGHOUT THE LENGTH OF THE BUNDLE. SOIL SHALL BE WORKED INTO THE FASCINES TO FILL THE VOIDS (STEMS SHALL BE IN CLOSE CONTACT) AND FASCINES SHALL BE COMPRESSED AND TIGHTLY TIED WITH BIODEGRADABLE ROPE OR TWINE OF SUFFICIENT STRENGTH AND DURABILITY. FASCINES SHALL BE TIED AT TWO- (2-) FOOT INTERVALS.
- 2. THE TRENCH SHALL BE DUG INTO THE BASE OF THE SLOPE APPROXIMATELY ONE- (1-) FOOT DEEP OR AS SPECIFIED IN DRAWINGS. THE COIR MAT SHALL BE LAID IN THE EMPTY TRENCH WITH THE BULK OF THE FABRIC ALONG THE LOWER (WATER) SIDE OF THE TRENCH. THE FABRIC SHALL BE STAKED SECURELY INTO THE TRENCH ON TWO- (2-) FOOT INTERVALS WITH TWO- (2-) FOOT WOODEN STAKES. LAY TWINE CROSSWAYS IN THE TRENCH AT APPROXIMATELY TWO- (2-) FOOT INTERVALS, OVERLAPPING THE SIDES OF THE TRENCH SUFFICIENT LENGTH TO WRAP AROUND THE FASCINE AND TIE. LAY THE CUTTINGS WITHIN THE TRENCH AS NOTED ABOVE. BACKFILL THE TRENCH WITH SAND OR SOIL; FILLING VOIDS BETWEEN THE CUTTINGS. TIE THE TWINE SECURELY AROUND THE FASCINE. THE COIR MAT BLANKET FOR THE ADJACENT SLOPE SHALL BE WRAPPED AROUND THE FASCINE AS SHOWN IN THE DRAWINGS. THE TRENCH ON EACH SIDE OF THE FASCINE SHALL BE BACKFILLED WITH COMPACTED TOPSOIL. THE TOP OF THE FASCINE SHALL BE SLIGHTLY VISIBLE WHEN THE INSTALLATION IS COMPLETE.
- 3. FASCINES SHALL BE STAKED FIRMLY IN PLACE WITH ONE ROW OF TWO- (2-) FOOT LONG DIAGONALLY CUT TWO- (2-) INCH BY FOUR- (4-) INCH WOODEN STAKES EVERY TWENTY-FOUR (24) INCHES. ALTERNATING SIDES OF THE FASCINE. TAPERED ENDS OF ADJACENT FASCINES SHALL BE OVERLAPPED SO THAT THE OVERALL FASCINE DIAMETER IS UNIFORM AND CONTINUOUS. TWO (2) STAKES SHALL BE USED AT EACH FASCINE OVERLAP SUCH THAT A STAKE IS DRIVEN BETWEEN THE LAST TWO TIES OF EACH FASCINE.

HERBACEOUS WETLAND PLANTING NOTES

- 1. ALL WETLAND PLANTING SHALL OCCUR BY HAND WITH APPROPRIATE TOOLS.
- 2. WETLAND PLANT MATERIALS SHALL BE PLANTED WITHIN 4"-6" OF THE EXPECTED NORMAL WATER SURFACE ELEVATION.
- 3. LANDSCAPE ARCHITECT WILL PROVIDE PLANT LAYOUT DIRECTION FOR WETLAND PLANTING IN TERMS OF OVERALL PLANTING CONCEPT. LANDSCAPE ARCHITECT WILL ASSIST CONTRACTOR IN A POLYGONAL LAYOUT OF WETLAND PLANT SPECIES TO PROVIDE DIVERSITY AND NATURAL WETLAND LAYOUT.
- 4. WETLAND PLANT MATERIAL SHALL BE WATERED BEFORE INSTALLATION. WETLAND PLANT MATERIALS SHALL BE KEPT WET AT ALL TIMES, UNTIL INSTALLED.
- 5. HOLES FOR INSTALLING 10 T OR SMALL TUBELING PLANTS MAY BE CREATED WITH A DIBBLE OR SHARPENED DOWEL. OPEN THE HOLES JUST LARGE ENOUGH TO INSERT THE ENTIRE PLANT AND ALL THE NURSERY SOIL AT LEAST ONE-HALF (1/2) INCH BELOW THE NATIVE SOIL. THE HOLES SHOULD NOT BE FORMED MORE THAN ONE-HALF (1/2) INCH DEEPER THAN THE TUBES. ONCE INSERTED, THE HOLE SHALL BE BACKFILLED OR TAMPED FROM THE SIDE WITH A MALLET TO SECURE THE PLANT. IF WATERFOWL GRAZING IS A POSSIBILITY, EACH PLANT (GRAMINOIDS ONLY) SHALL BE TRIMMED TO TWO (2) INCHES PRIOR TO INSTALLATION AND EACH PLANT SHALL BE SECURED BY AN EIGHT (8) INCH LANDSCAPE STAPLE TO DISCOURAGE PULLING BY THE WATERFOWL. AREAS TO BE COVERED BY EROSION CONTROL MAT FOLLOWING PLANTING SHALL BE PLANTED WITH TRIMMED PLANTS (GRASSES AND GRASS-LIKE PLANTS TRIMMED TO A TWO (2) INCH HEIGHT WHILE IN THE POTS, THEN SEEDED (IF REQUIRED) WITH FABRIC INSTALLATION COMPLETED OVER THE TOP OF THE INSTALLED PLANTS.
- 6. WETLAND PLANTS TO BE INSTALLED IN THE DEEPEST ELEVATIONS FIRST.

SEEDING NOTES

SEEDING AREA PREPARATION

- 1. LIMIT SUBGRADE PREPARATION TO AREAS TO BE PLANTED WITHIN TWO WEEKS OF SUBGRADE PREPARATION. FOLLOWING SUBGRADE PREPARATION, NO VEHICLE TRACKING, EQUIPMENT ACCESS OR MATERIALS STAGING IS TO OCCUR IN PREPARED AREAS, EXCEPT FOR OPERATIONS DIRECTLY RELATED TO SEED INSTALLATION.
- 2. MOISTEN PREPARED AREA BEFORE PLANTING IF SOIL IS DRY. WATER THOROUGHLY AND ALLOW SURFACE TO DRY BEFORE PLANTING. DO NOT CREATE MUDDY SOIL.
- 3. LOOSEN THE SURFACE OF AREAS TO BE SEEDED WITH HAND RAKES BEFORE APPLYING SEED.

BROADCAST SEEDING

- 1. BROADCAST SEEDING PROTOCOL TO INCLUDE ALL NATIVE REVEGETATION ZONES.
- 2. DO NOT USE WET SEED OR SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE. DELIVER SEED TO JOB SITE IN THE ORIGINAL UNOPENED CONTAINERS AND SAVE LABELS.
- 3. SEED SHALL BE UNIFORMLY SOWN BY BROADCASTING.
- 4. BROADCAST SEEDING RATES SHALL BE TWICE THE AMOUNT SPECIFIED. BROADCAST SEEDING SHALL BE RAKED INTO THE SOIL TO A DEPTH OF APPROXIMATELY ONE-QUARTER INCH (1/4") TO ONE-HALF INCH (1/2").
- 5. THE SEEDING SHALL BE DONE IN TWO (2) SEPARATE APPLICATIONS CROSSING THE AREA AT RIGHT ANGLES TO ONE ANOTHER TO GUARANTEE EVEN COVERAGE.
- 6. DO NOT SEED DURING HIGH WINDS OR WHEN THE GROUND IS FROZEN OR OTHERWISE UNABLE TO BE WORKED.
- 7. STRAW MULCH SHALL BE STRAW BLOWER BLOWN, CERTIFIED WEED-FREE STRAW. AT LEAST SEVENTY PERCENT (70%) OF THE MULCH BY WEIGHT SHALL BE TEN (10) INCHES OR MORE IN LENGTH. MULCH SHALL NOT CONTAIN ANY NOXIOUS WEED, MUST, MOLD, CAKE, OR DECAY. NO HAY MAY BE USED ON THE PROJECT UNLESS APPROVED IN ADVANCE BY ECOLOGIST OR LANDSCAPE ARCHITECT.
- 8. PROTECT SEEDED AREAS AGAINST EROSION BY UNIFORMLY SPREADING STRAW MULCH AFTER COMPLETION OF SEEDING OPERATIONS. SPREAD UNIFORMLY AT A MINIMUM RATE OF 2 TONS PER ACRE (45 KG PER 100 SQ. M) TO FORM A CONTINUOUS BLANKET 1-1/2-INCHES (38-MM) LOOSE DEPTH OVER SEEDED AREAS. SPREAD BY HAND, BLOWER, OR OTHER SUITABLE EQUIPMENT.
- 9. FOLLOW STRAW APPLICATION BY BONDED FIBER MATRIX. ATTACH FIBER VIA. HYDRO MULCH AT MANUFACTURER RECOMMENDED RATES. HYDRO MULCH EXAMPLES: RAINIER FIBER, FLEXTERA.
- 10. PROTECT SEEDED SLOPES EXCEEDING 3:1 AGAINST EROSION WITH EROSION-CONTROL BLANKETS INSTALLED AND STAPLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- 11. PROTECTION OF SEEDED AREAS: PROVIDE BARRIERS AS REQUIRED TO PREVENT PEDESTRIAN OR VEHICULAR TRAFFIC OVER NEWLY SEEDED AREAS UNTIL COMPLETION.
- 12. AT THE END OF ONE GROWING SEASON, ALL SEEDED AREAS SHALL ACHIEVE 85% GERMINATION AND BE FREE OF WEEDS AND OTHER UNDESIRABLE VEGETATION.
- 13. USE SPECIFIED MATERIALS TO REESTABLISH SEEDING AREA THAT DOES NOT COMPLY WITH REQUIREMENTS AND CONTINUE MAINTENANCE UNTIL ESTABLISHMENT IS SATISFACTORY.

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