



Know what's below
Call before you dig.

CONCEPTUAL PLANNING DRAWINGS FOR TIMBERS CREEK IMPROVEMENTS

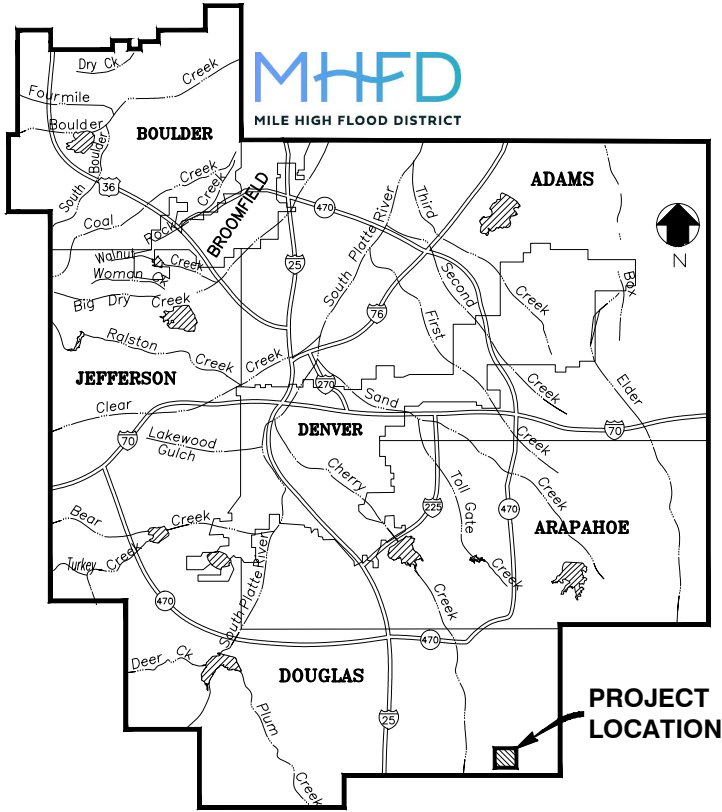
DOUGLAS COUNTY
MHFD PROJECT #106677
OCTOBER, 2019

- APPROVALS -



MILE HIGH FLOOD DISTRICT

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



VICINITY MAP

N.T.S.

PROJECT CONTACTS:

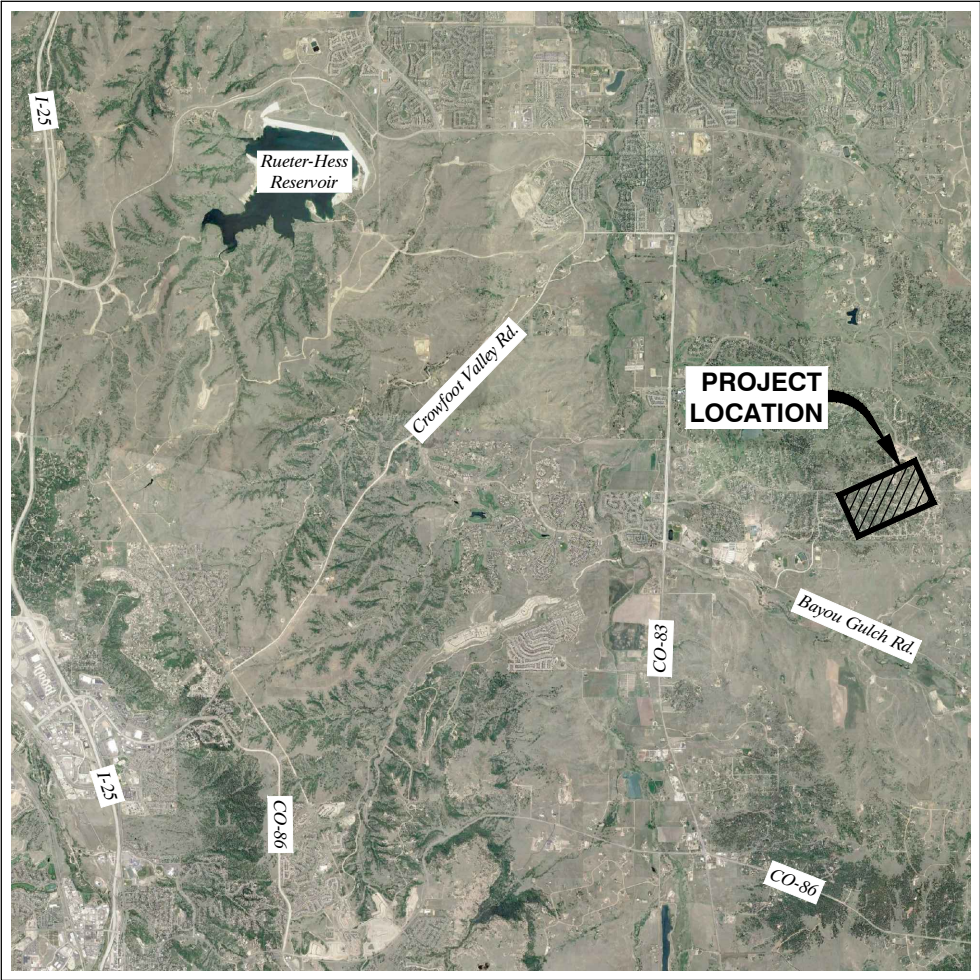
MHFD	BARBARA CHONGTOUA	303-455-6277
	KURT BAUER	303-455-6277
DOUGLAS COUNTY	BRAD ROENSTEIN	303-660-7490
MULLER ENGINEERING COMPANY	CHRIS KROEGER	303-988-4939
	MARK NYHOFF	303-988-4939

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).



LOCATION MAP: DOUGLAS COUNTY, CO

SCALE: 1"=10,000'

KEN MACKENZIE, EXECUTIVE DIRECTOR

DATE

LAURA KROEGER, MANAGER - STREAM SERVICES

DATE

BARBARA CHONGTOUA, PROJECT MANAGER - STREAM SERVICES

DATE

KURT BAUER, PROJECT MANAGER - STREAM SERVICES

DATE



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

BRAD ROENSTEIN, P.E., CFM

DATE



777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226

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

CHRISTOPHER L. KROEGER, P.E. (#37254) SENIOR PROJECT MANAGER

DATE

MARK K. NYHOFF, P.E. (#54329) PROJECT ENGINEER

DATE

COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

DATE

10/18/19

GENERAL

DRAWING NO.

G-1

TITLE SHEET

SHEET NO.

1 OF 45



Know what's below
Call before you dig.

LEGEND

	BEDDING (PROFILE)
	SOIL RIPRAP (PLAN AND PROFILE)
	CONCRETE (PROFILE)
	BOULDER (PLAN AND SECTIONS)
	TREES
	CONTROL POINT FOR TOPOGRAPHIC MAPPING
	DESIGN POINT
	PROPERTY LINE
	PROPOSED WOOD FENCE
	EXISTING WOOD FENCE
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	FINISHED MAJOR CONTOUR
	FINISHED MINOR CONTOUR
	FINISHED INTERMEDIATE CONTOUR
	EXISTING CHANNEL CENTERLINE
	EASEMENT LINE
	EXISTING SANITARY SEWER
	EXISTING COMMUNICATION LINE
	EXISTING FIBER OPTICS LINE
	EXISTING STORM LINE
	EXISTING WATERLINE
	EXISTING GAS LINE
	EXISTING UNDERGROUND ELECTRIC
	EXISTING OVERHEAD ELECTRIC
	EXISTING CABLE TV
	PROPOSED GAS LINE
	PROPOSED WATERLINE
	PROPOSED SANITARY LINE
	EXISTING LIGHT POLE
	NEW EMBANKMENT
	SLOPE AS INDICATED (HORIZ:VERT)
	SPOT ELEVATION
	PROPOSED CHANNEL CENTERLINE
	PROPOSED TOE OF CHANNEL
	LIMITS OF CONSTRUCTION
	DIRECTION OF SURFACE FLOW
	PROPOSED ITEM TEXT
	EXISTING ITEM TEXT
	EXISTING 100-YR FLOODPLAIN
	EFFECTIVE 100-YR FEMA FLOODWAY
	PROPOSED 100-YR FLOODPLAIN
	EXISTING WETLANDS

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
GENERAL		
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7 - 14	C-4 - C-11	GRADING PLAN
15 - 20	C-12 - C-17	PLAN AND PROFILE
21	C-18	TYPE 1 GRADE CONTROL STRUCTURE DETAILS
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44	LD-5	LANDSCAPE NOTES AND PLANT SCHEDULE
45	LD-6	LANDSCAPE NOTES

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)

COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

DATE
10/18/19

GENERAL

DRAWING NO.
G-2

INDEX OF DRAWINGS, LEGEND, AND NOTES

SHEET NO.
2 OF 45

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GENERAL NOTES:

- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD). THE UDFCD RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- 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.
- EXCEPT WHERE OTHERWISE PROVIDED FOR IN THESE PLANS AND SPECIFICATIONS, THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SHALL APPLY.
- 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 POT HOLE AND SURVEY THE LOCATION AND ELEVATION OF ALL EXISTING UTILITIES THAT MAY BE AFFECTED BY CONSTRUCTION PRIOR TO START OF CONSTRUCTION. THE POT HOLING AND SURVEY WORK SHALL BE INCLUDED AND PAID FOR AS PART OF MOBILIZATION
- CONTRACTOR SHALL CONTACT UTILITY POLE OWNERS THAT HAVE POLES WITHIN THE CONSTRUCTION LIMITS. CONTRACTOR SHALL COORDINATE WITH POLE OWNERS REGARDING TEMPORARY SUPPORT REQUIREMENTS.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER 24 HOURS PRIOR TO STARTING WORK AND 24 HOURS PRIOR TO EACH DESIRED AND REQUIRED INSPECTION.
- 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.
- 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.
- 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.
- 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.
- 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.
- EXISTING FACILITIES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED IN PLACE OR REMOVED AND REPLACED IN KIND, AS APPROVED BY ENGINEER.
- 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.
- 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.
- FOR CLARITY, ITEMS SHOWN FOR REMOVAL ON THE DEMOLITION AND REMOVAL PLANS MAY NOT BE SHOWN ON SUBSEQUENT SHEETS.
- 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.

- 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:
 - 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.
 - 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.
 - 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.
 - 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

PERMIT REQUIREMENTS

- THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A CONSTRUCTION ACTIVITIES STORMWATER DISCHARGE PERMIT (CASDP) THROUGH THE CITY CITY AND COUNTY OF DENVER. ENGINEER WILL PROVIDE THE CONTRACTOR WITH THE STORMWATER MANAGEMENT PLAN (SWMP) NECESSARY TO OBTAIN THE PERMIT.
 - CONTRACTOR AND SUBCONTRACTORS SHALL OBTAIN A RIGHT-OF-WAY OCCUPANCY PERMIT FROM THE CITY AND COUNTY OF DENVER PW-RWS-CONSTRUCTION ENGINEERING. ALLOW AT LEAST 5 WORKING DAYS FOR REVIEW AND ISSUING PERMIT FOR COLLECTOR OR ARTERIAL STREETS. CONTACT 303-446-3469, OR PWPERMITS@DENVERGOV.ORG. ALL WORK IN THE ROW SHALL COMPLY WITH CCD TRANSPORTATION STANDARDS AND DETAILS (JAN 2013).
 - AN INDUSTRIAL WASTEWATER DISCHARGE (DEWATERING) PERMIT HAS BEEN OBTAINED FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE). THIS PERMIT SHALL BE TRANSFERRED TO THE CONTRACTOR PRIOR TO THE FIRST ANTICIPATED DATE OF DEWATERING DISCHARGE.
- CONSTRUCTION PARKING SHALL BE COORDINATED WITH THE CITY AND COUNTY OF DENVER.
 - CONTACT PUBLIC WORKS - ROW SERVICES CONSTRUCTION ENGINEERING (RWSCE) SECTION FOR A PRECONSTRUCTION MEETING PRIOR TO START OF PERMITTING, (303)446-3469 OR PWPERMITS@DENVERGOV.ORG.
 - PERMIT APPLICANT MUST APPLY AT LEAST 5 BUSINESS DAYS BEFORE THE START OF WORK TO OBTAIN A REVOCABLE STREET OCCUPANCY PERMIT, A STREET CUT PERMIT OR A ROW CONSTRUCTION PERMIT. THE SUBMITTAL MUST INCLUDE A COMPLETED APPLICATION FORM AND A DETAILED SITE-SPECIFIC TRAFFIC CONTROL PLAN TO BEGIN A REVIEW OF THE WORK SCOPE, SCHEDULE AND LOCATION. SUBMIT TO PWPERMITS@DENVERGOV.ORG.

EARTHWORK NOTES AND QUANTITIES:

UNADJUSTED CUT	=	1,515	CY
UNADJUSTED FILL	=	1,513	CY
IMPORTED CLAY	=	2,000	CY
ADJUSTED NET	=	2,000	CY (HAUL OFF)

COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

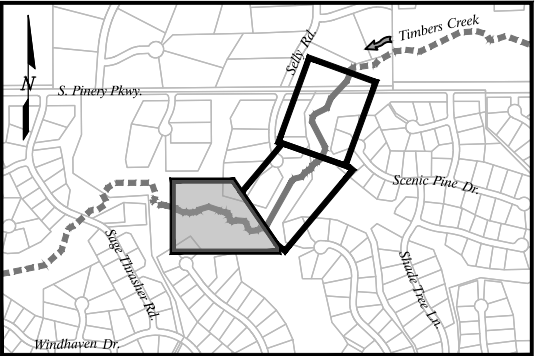
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10/18/19

GENERAL

DRAWING NO.
G-3

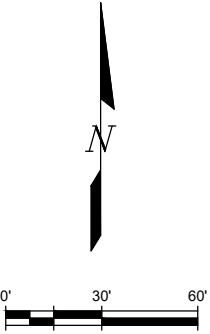
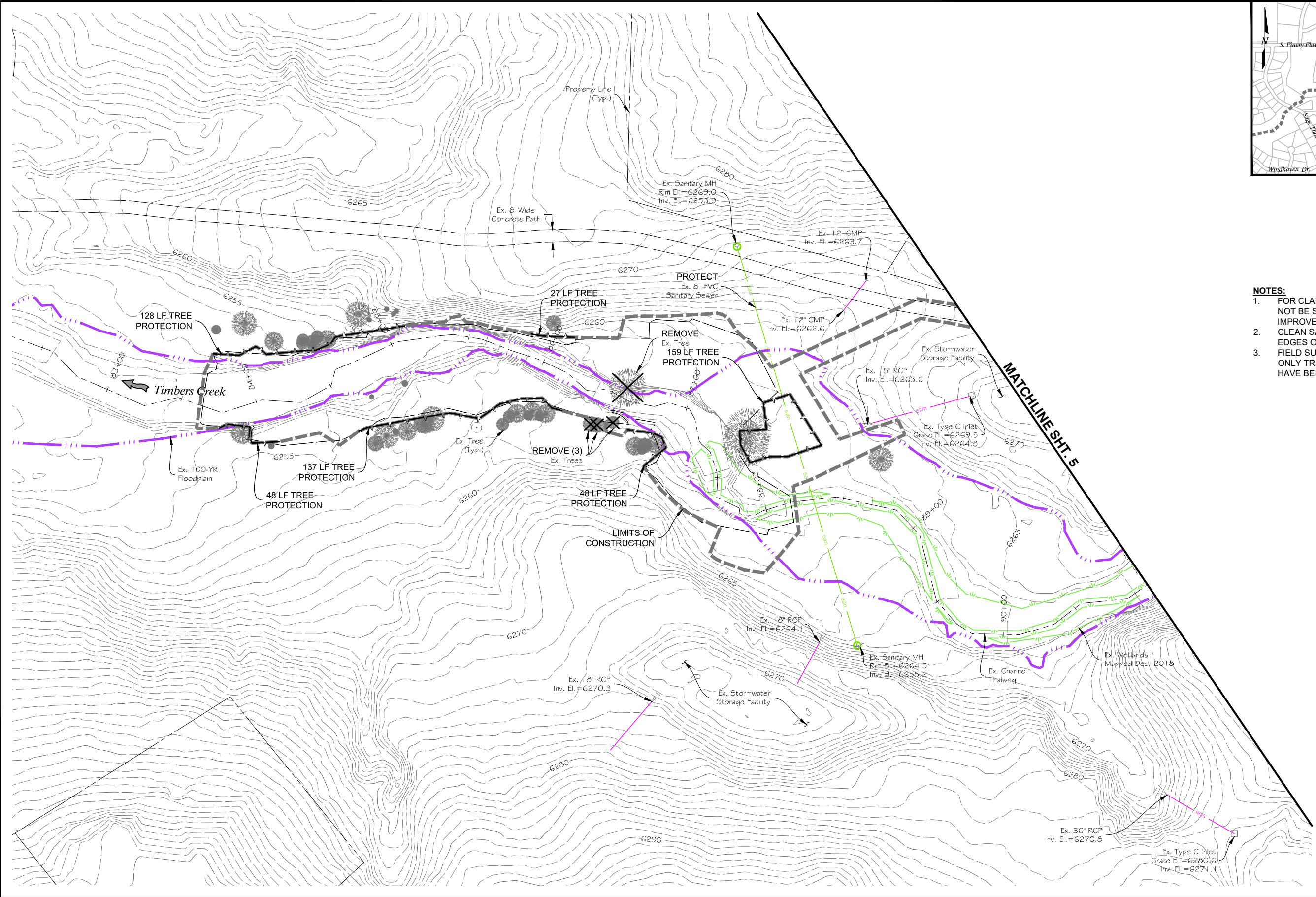
GENERAL NOTES

SHEET NO.
3 OF 45



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.



COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE

10/18/19

DRAWING NO.

C-1

SHEET NO.

4

OF 45

TIMBERS CREEK IMPROVEMENTS

CIVIL

DEMOLITION PLAN (SOUTH)

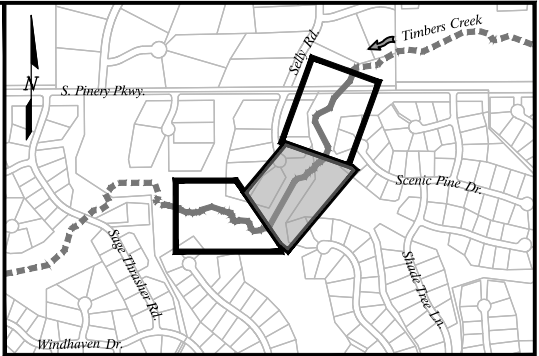
100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

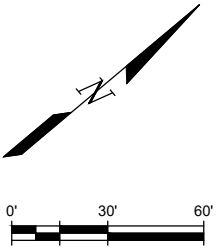
NO.	DATE	DESCRIPTION	BY





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.

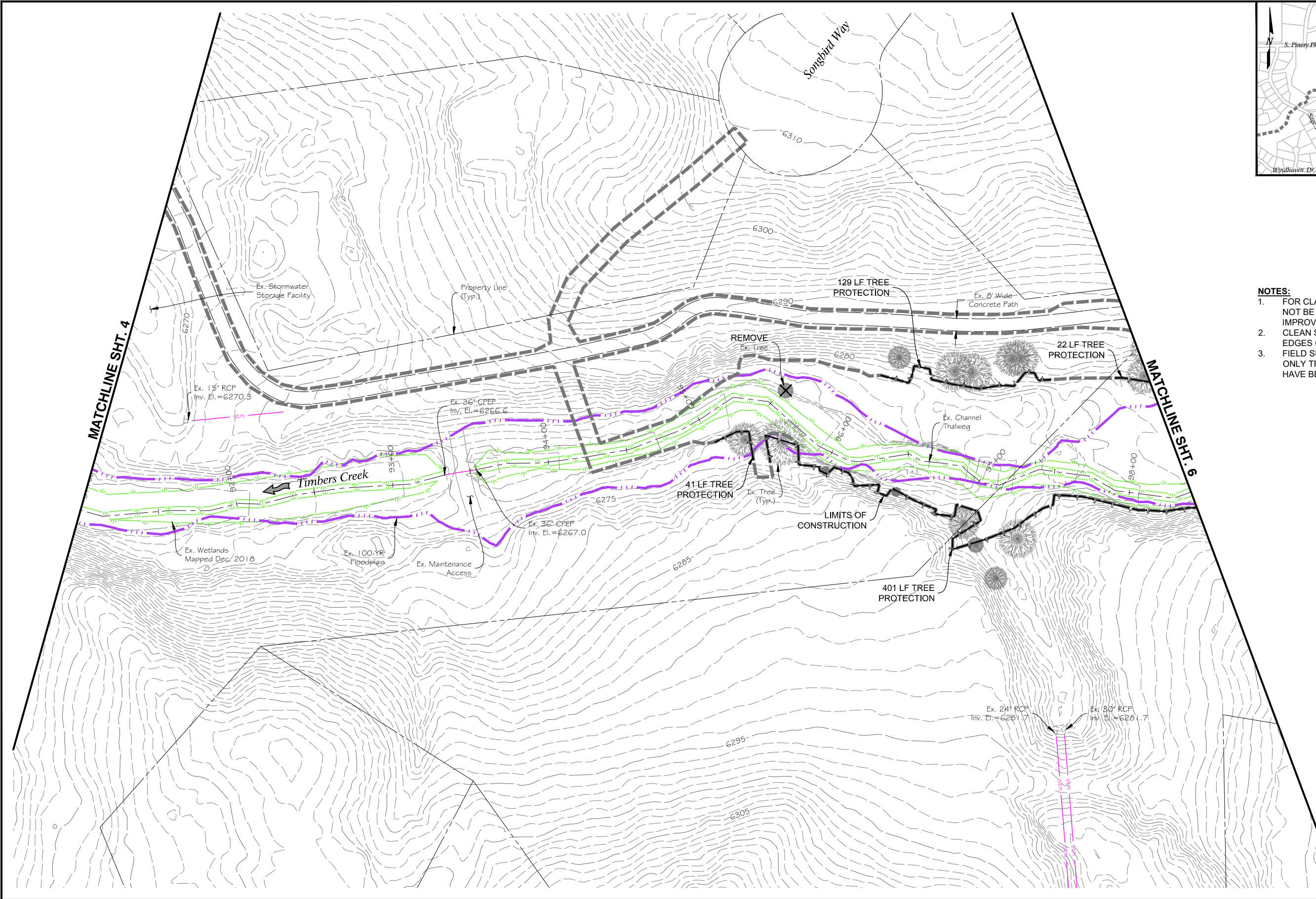


COUNTY ENGINEER _____

DATE _____

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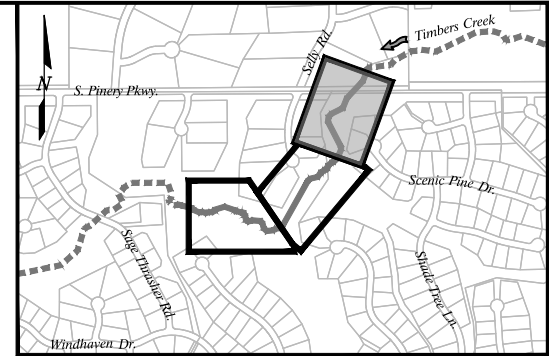
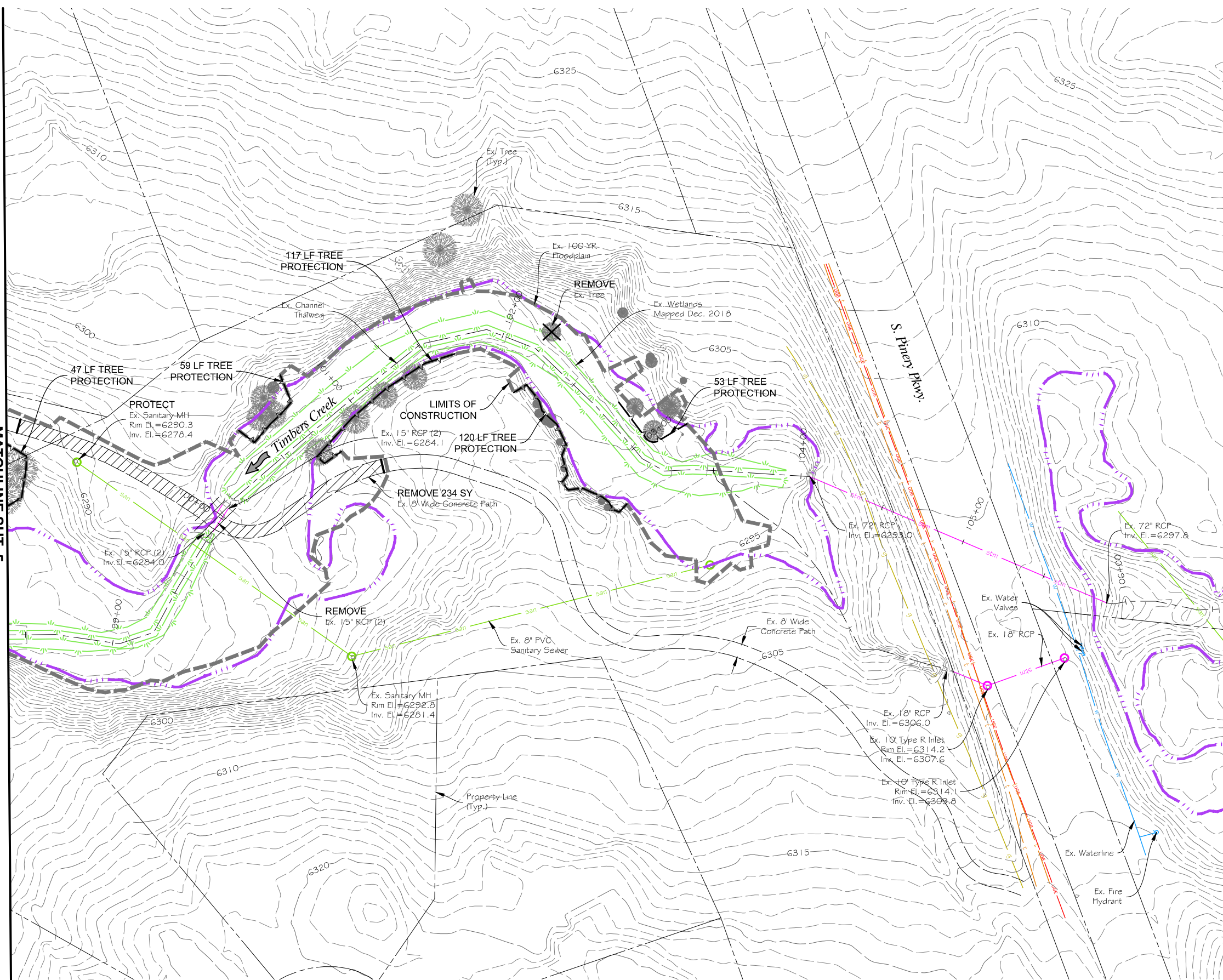


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PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HIGHLAND PARK DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
	DRAWN: CAS										CIVIL		DRAWING NO. C-2
	CHECKED: CLK										DEMOLITION PLAN (CENTER)		SHEET NO. 5 OF 45
PROJECT NO. 18-047.01													

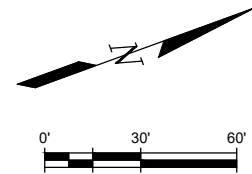
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MATCHLINE SHT. 5



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. REMOVE CONCRETE PATH TO NEAREST JOINT.
 4. FIELD SURVEY WAS LIMITED TO THE WORK LIMITS. ONLY TREES WITHIN THE LIMITS OF CONSTRUCTION HAVE BEEN SURVEYED.



COUNTY ENGINEER _____

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TIMBERS CREEK IMPROVEMENTS

CIVIL

DEMOLITION PLAN (NORTH)

DATE

10/18/19

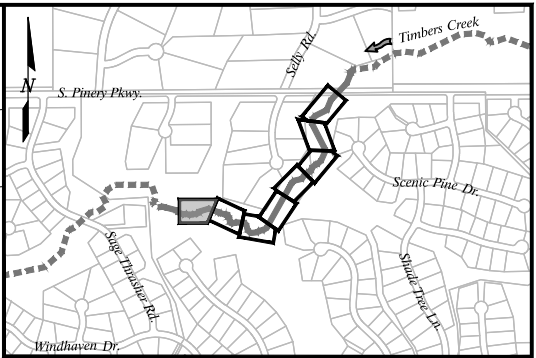
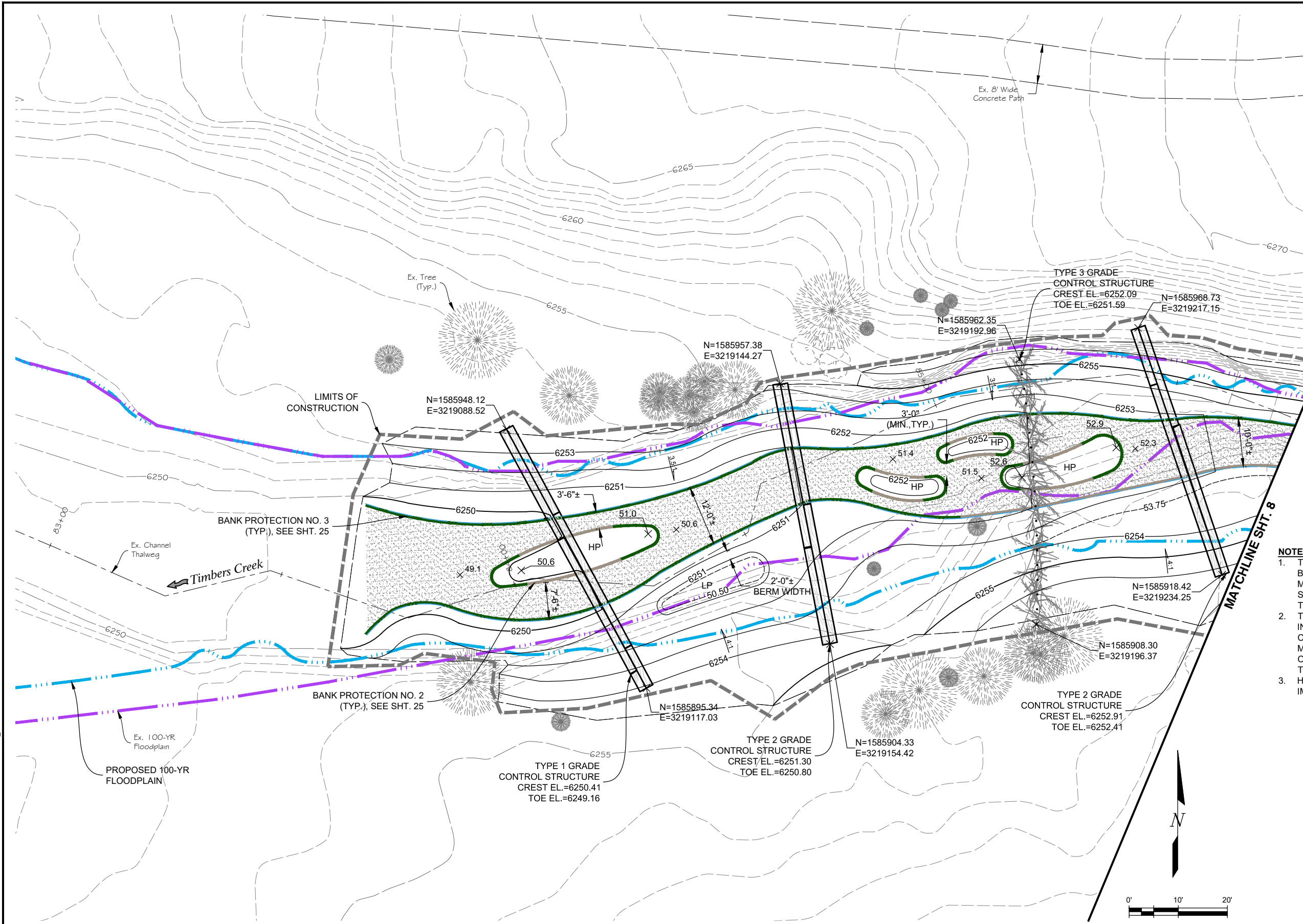
DRAWING NO.

C-3

SHEET NO.

6 OF 45

PLOTTED: 10/18/2019 3:32:26 PM
NAME: P:\2018 PROJECTS\18-047.01 TIMBERS CREEK - UDFCD\CAD\DRAWINGS\18-047.01 GRADING PLAN.DWG



KEYMAP
SCALE: 1"=1500'

LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION

NOTES:

- TYPE 1 AND TYPE 2 GRADE CONTROL STRUCTURES SHALL BE INSTALLED ON A FLAT GRADE WITH THE TOP ELEVATION MATCHING THE CREST ELEVATION LISTED ON THE PLANS. STRUCTURES WILL BE BURIED WITH EMBANKMENT FILL PER THE GRADING.
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- HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.

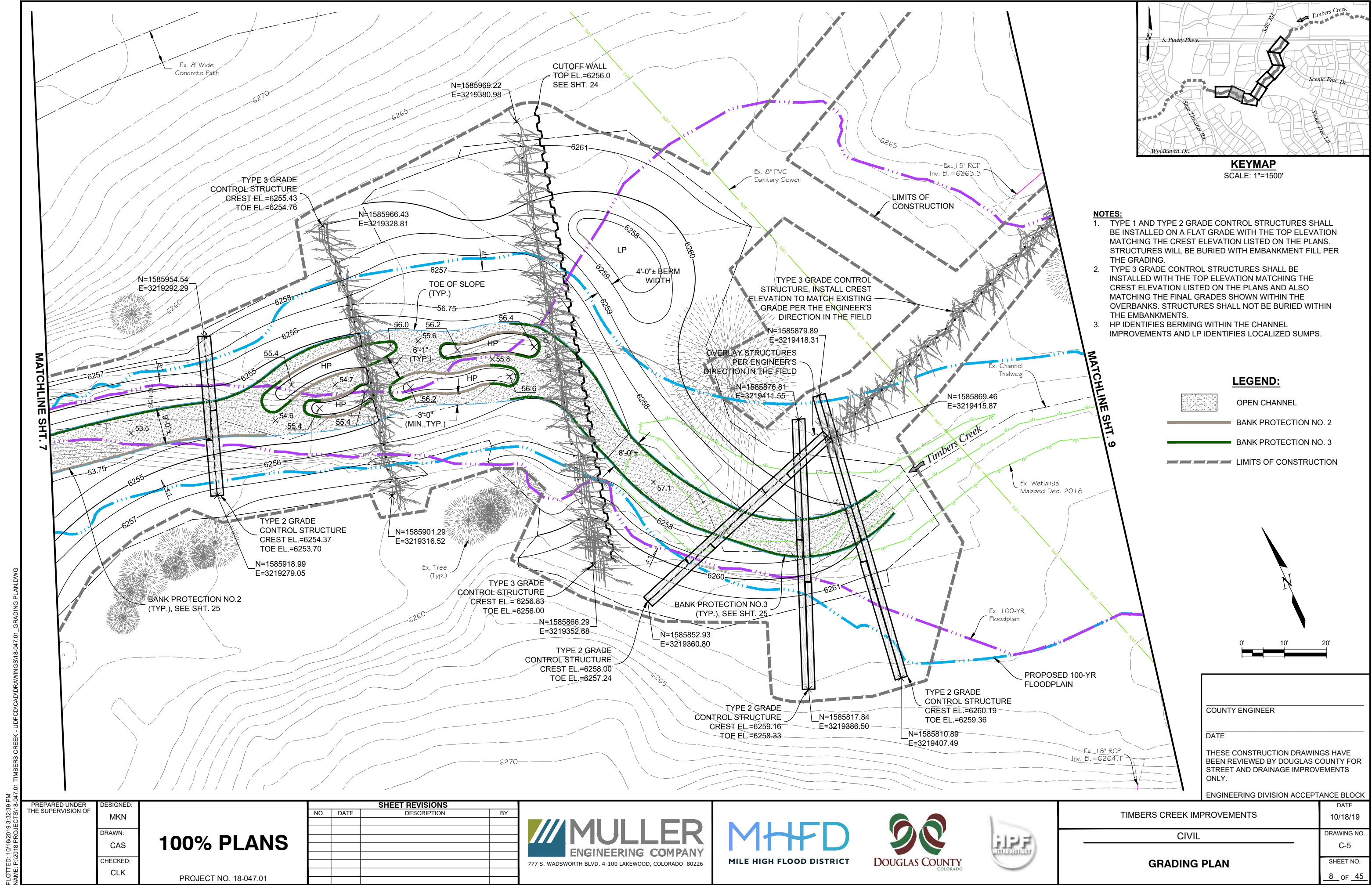
COUNTY ENGINEER

DATE

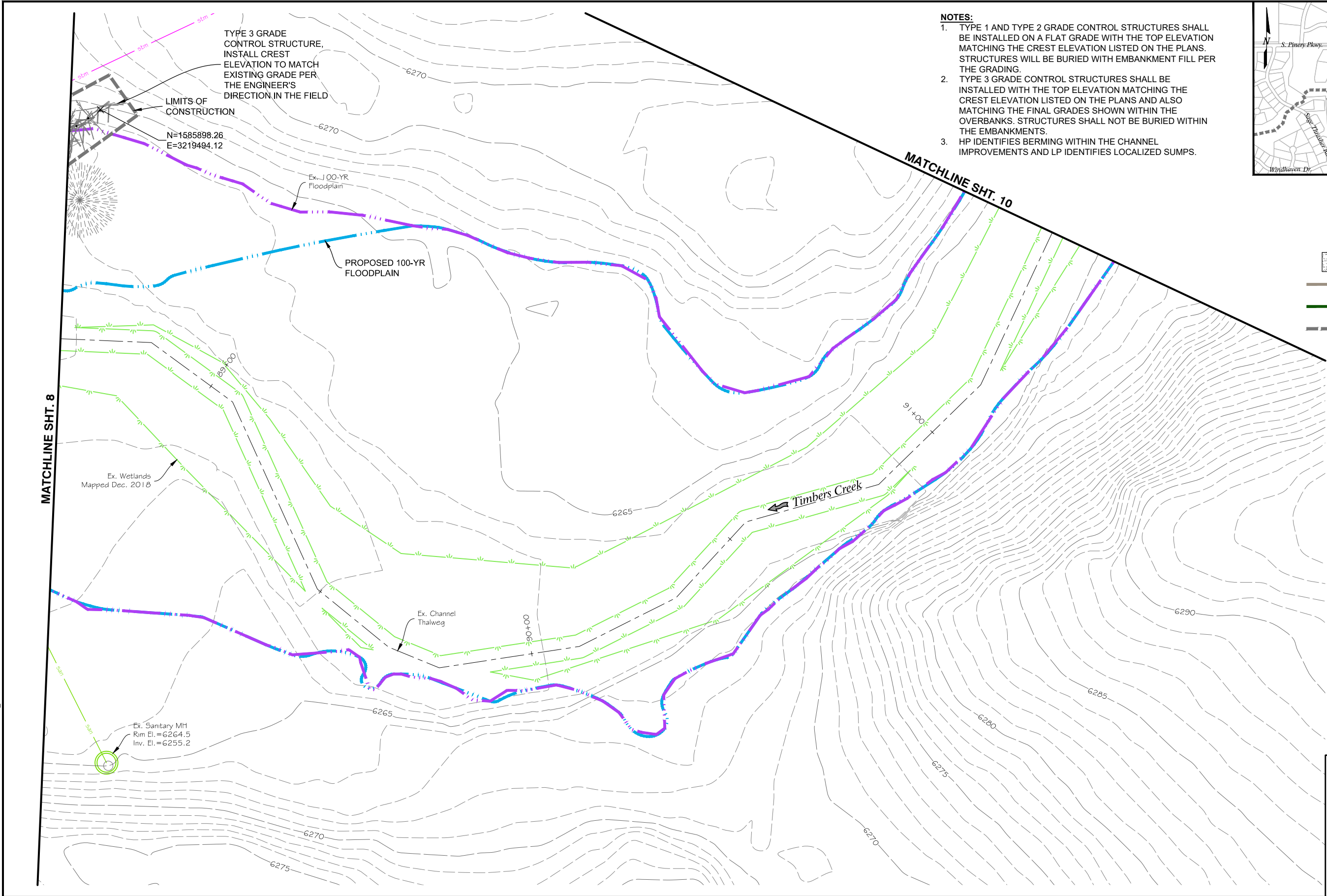
THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

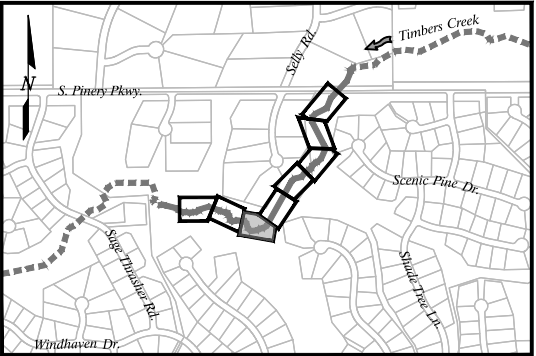
PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HIGHLAND PARK FLOOD DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE
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											PROJECT NO. 18-047.01		SHEET NO. 7 OF 45



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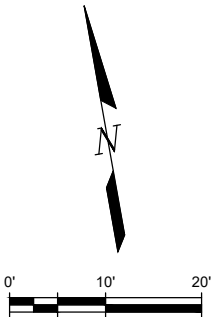
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 3. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.



KEYMAP
SCALE: 1"=1500'

LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION



COUNTY ENGINEER _____

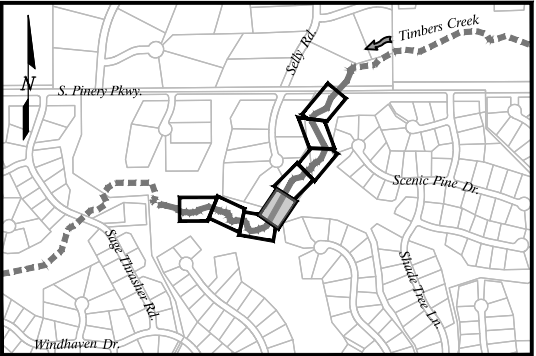
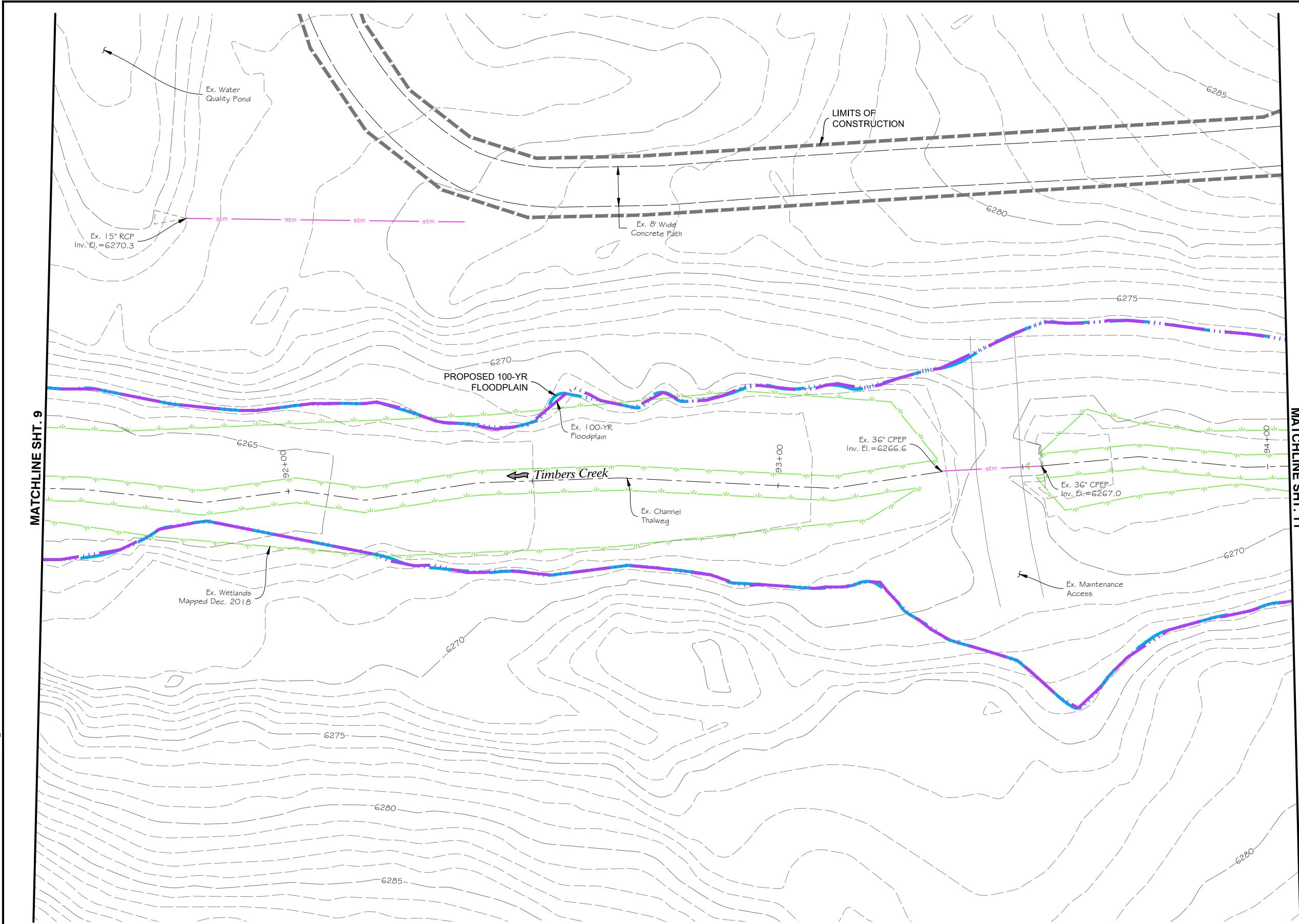
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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS PROJECT NO. 18-047.01	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HIGHLAND PARK FLOOD DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
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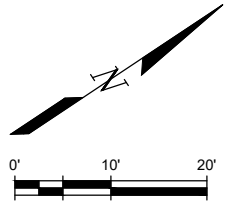


KEYMAP
SCALE: 1"=1500'

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LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION



COUNTY ENGINEER _____

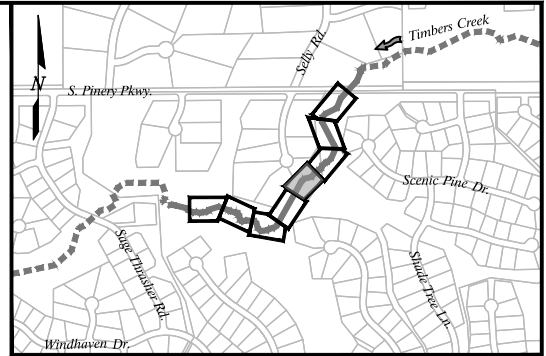
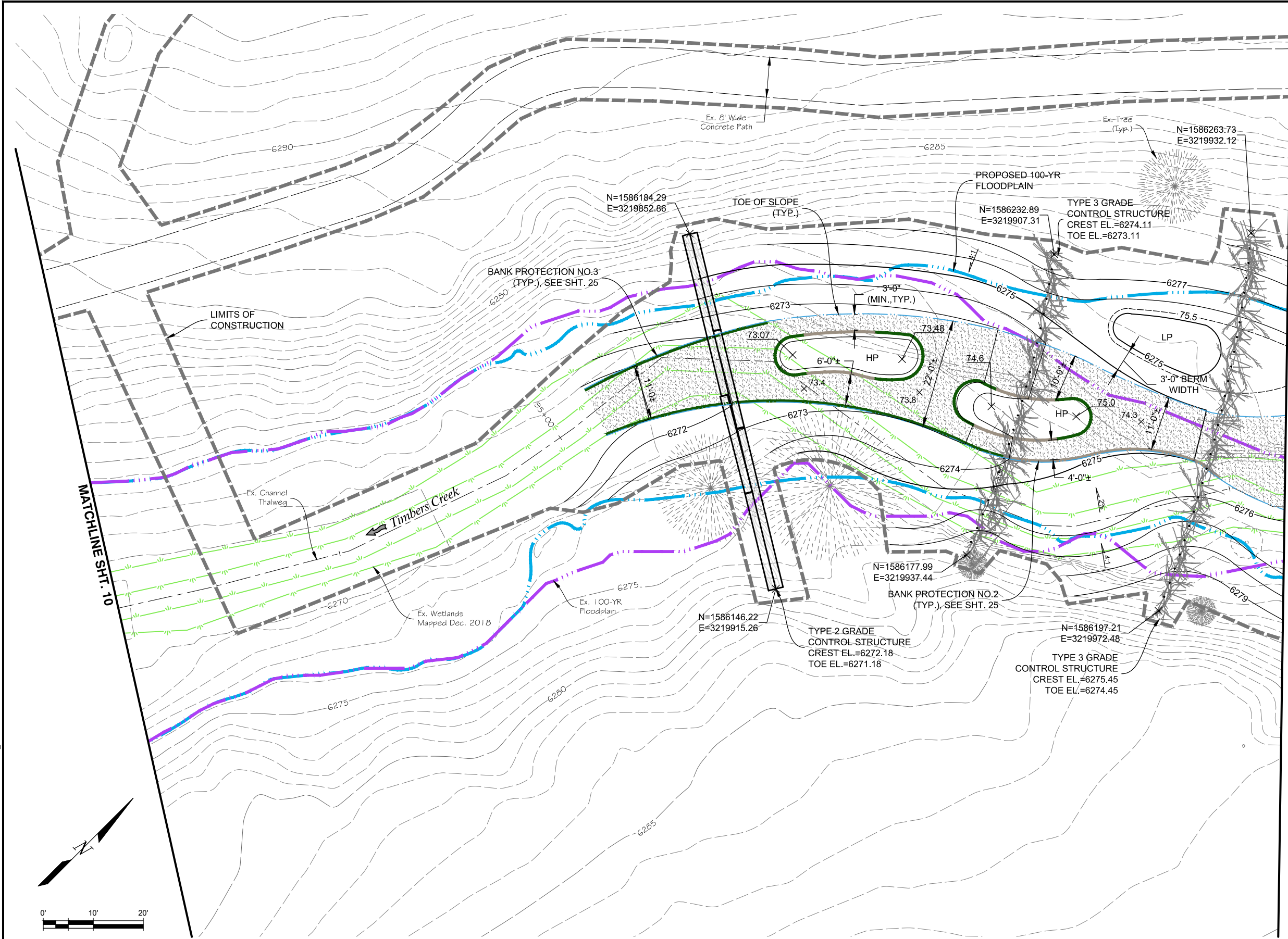
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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS PROJECT NO. 18-047.01	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HIGHLAND PARK FLOOD DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
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 NAME: P:\2018 PROJECTS\18-047.01 TIMBERS CREEK - UDFCD\CAD\DRAWINGS\18-047.01 GRADING PLAN.DWG



KEYMAP
 SCALE: 1"=1500'

LEGEND:

-  OPEN CHANNEL
-  BANK PROTECTION NO. 2
-  BANK PROTECTION NO. 3
-  LIMITS OF CONSTRUCTION

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COUNTY ENGINEER

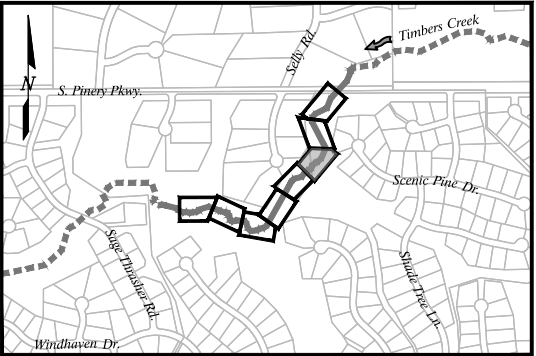
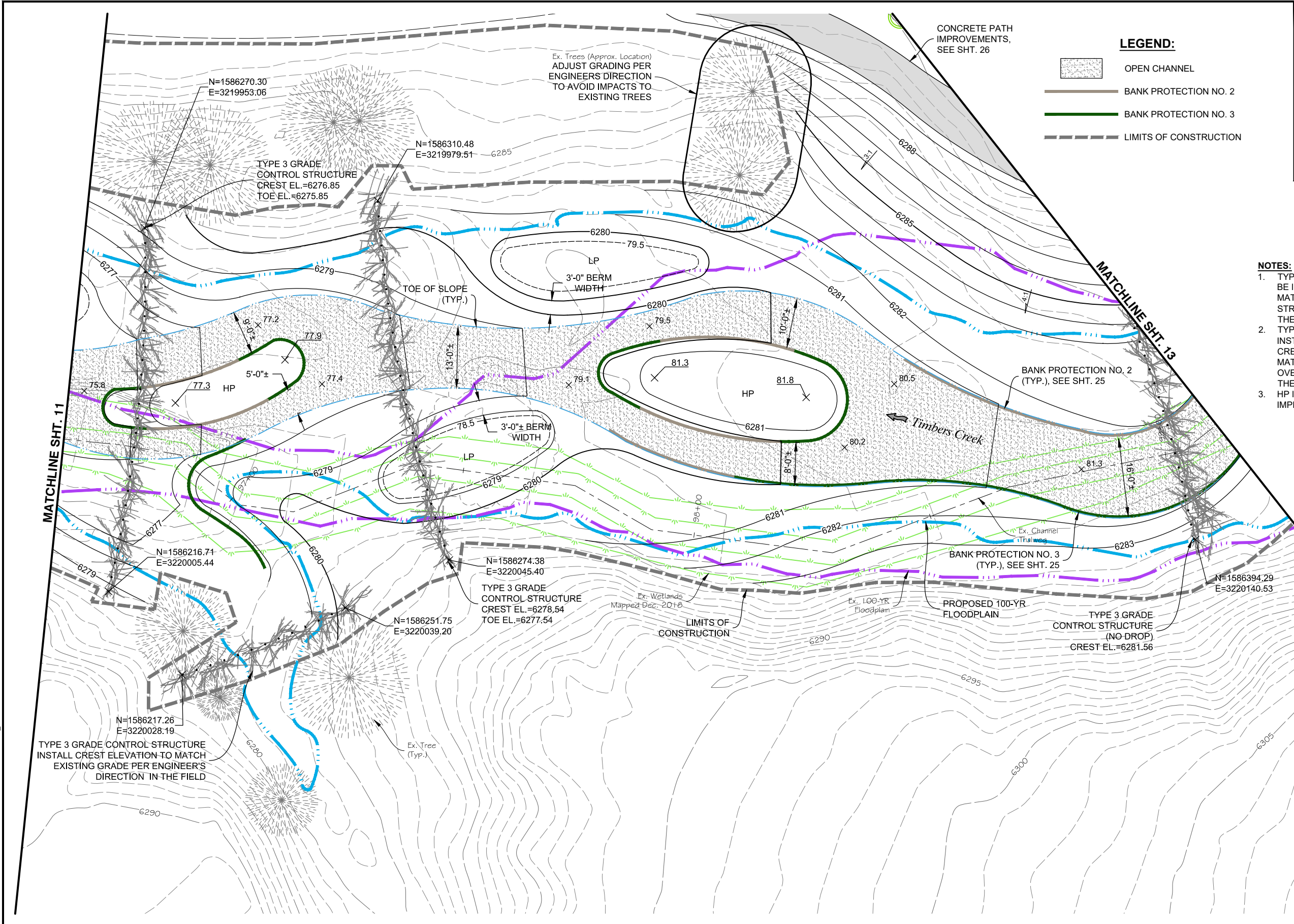
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THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

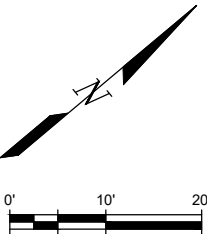
PREPARED UNDER THE SUPERVISION OF DESIGNED: MKN DRAWN: CAS CHECKED: CLK	100% PLANS PROJECT NO. 18-047.01	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HPF DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
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												11 OF 45

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KEYMAP
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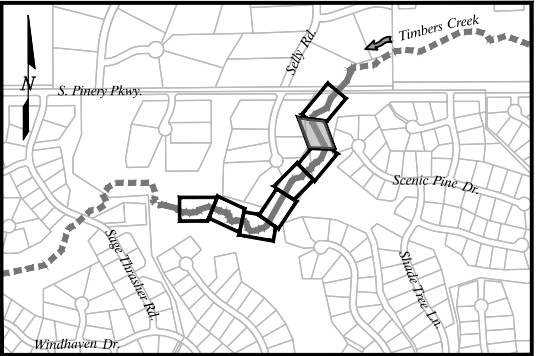
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COUNTY ENGINEER _____
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 ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	SHEET REVISIONS				 MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HPF METRO DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE
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	DRAWN:												DRAWING NO.
	CAS												C-9
	CHECKED:												SHEET NO.
CLK		PROJECT NO. 18-047.01									12 OF 45		

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KEYMAP
SCALE: 1"=1500'

LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION

COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

TIMBERS CREEK IMPROVEMENTS

CIVIL

GRADING PLAN

DATE

10/18/19

DRAWING NO.

C-10

SHEET NO.

13 OF 45

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PREPARED UNDER
THE SUPERVISION OF

DESIGNED:
MKN

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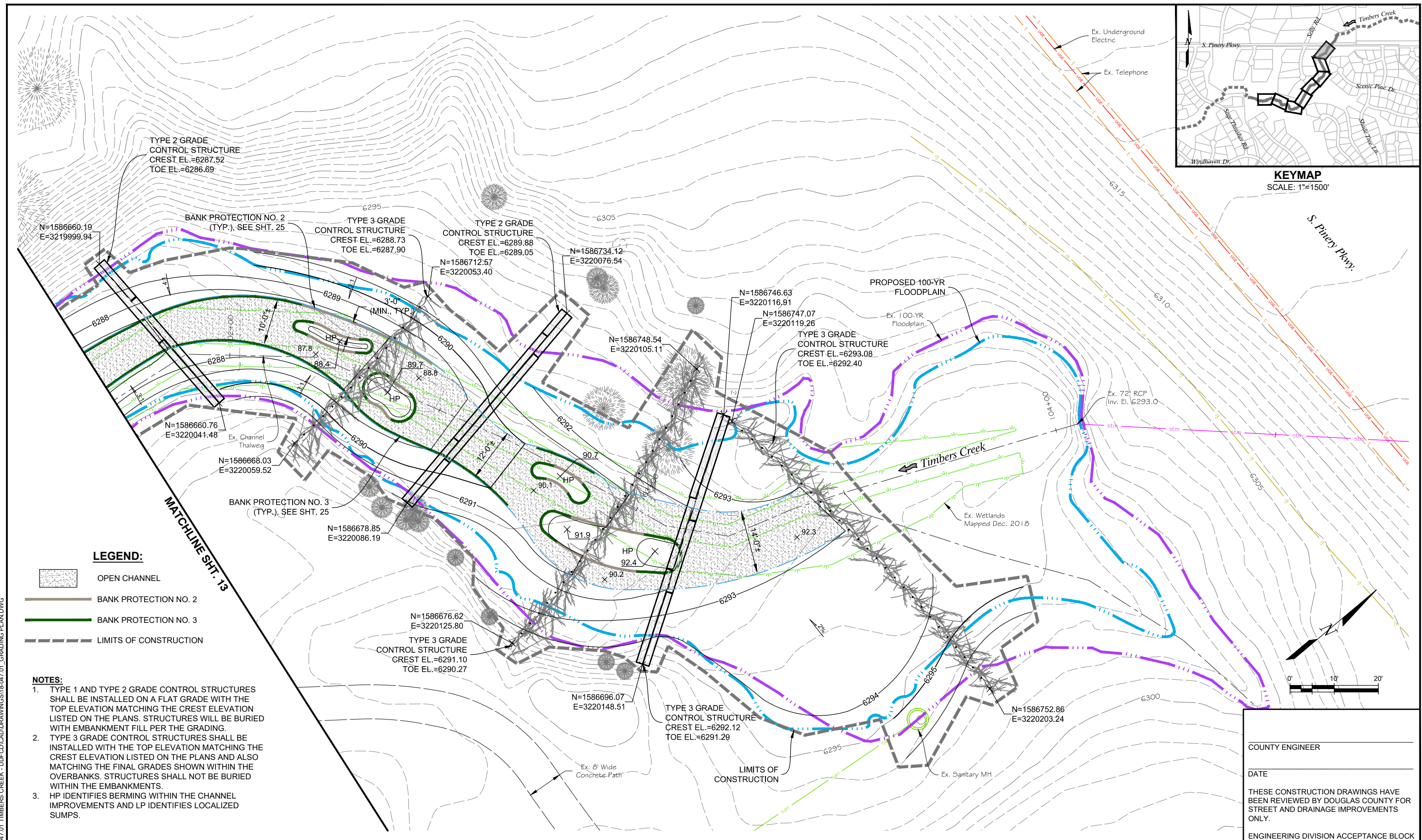
100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY





KEYMAP
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LEGEND:

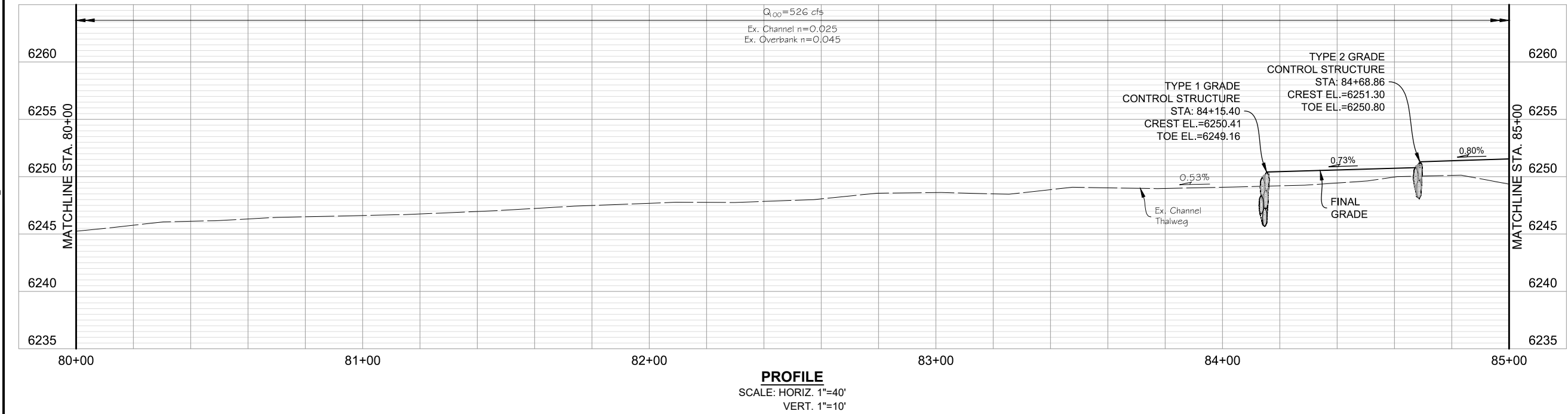
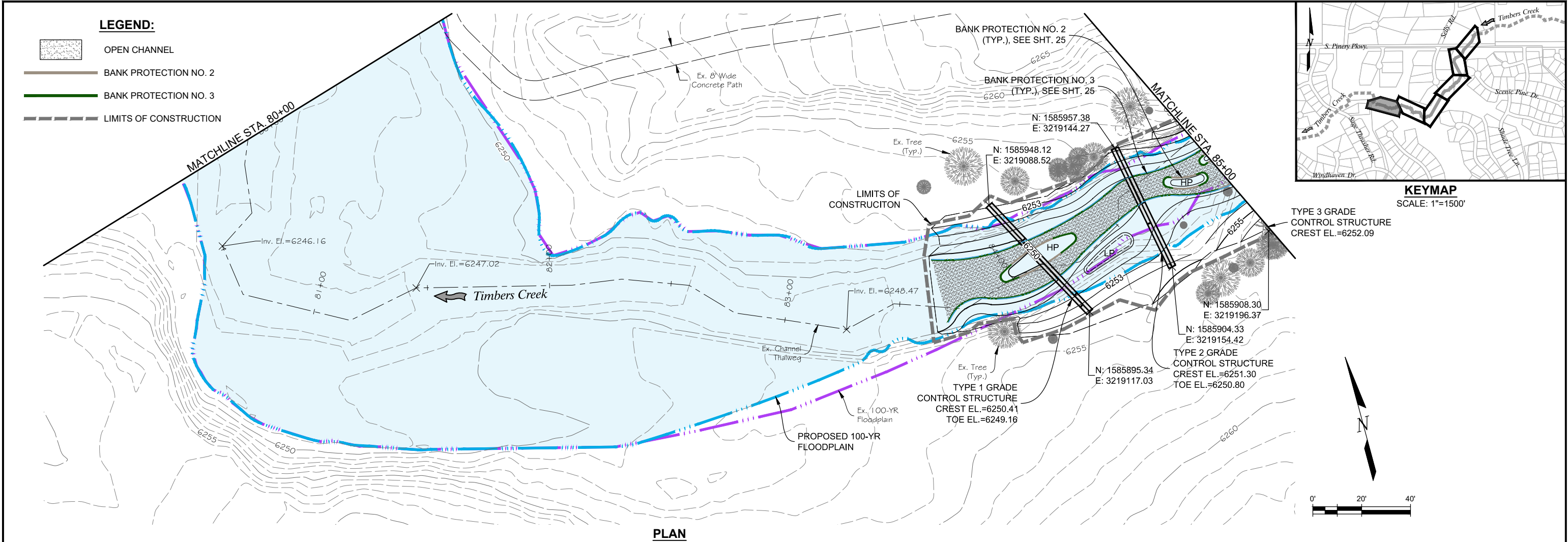
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TIMBERS CREEK IMPROVEMENTS

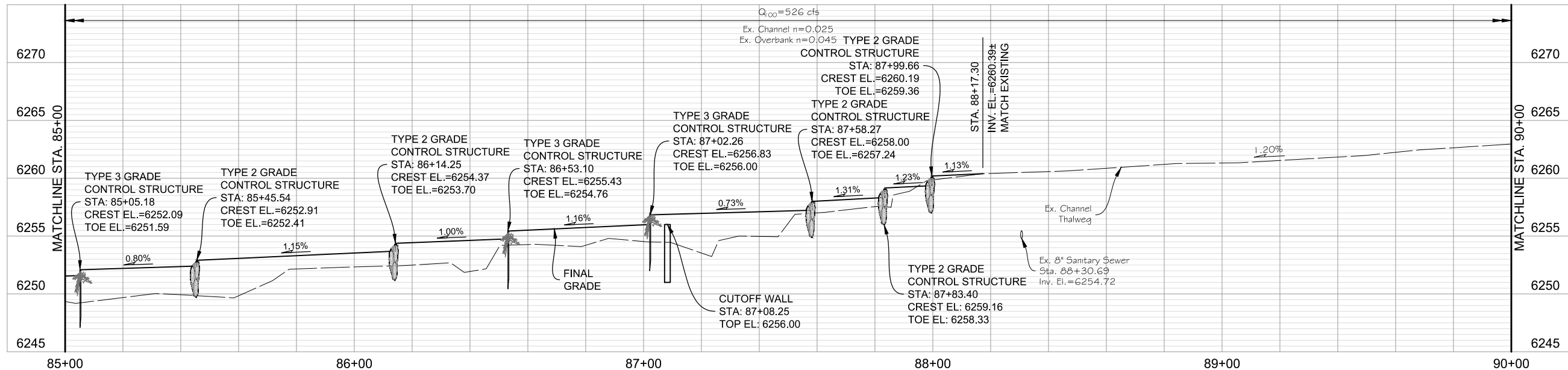
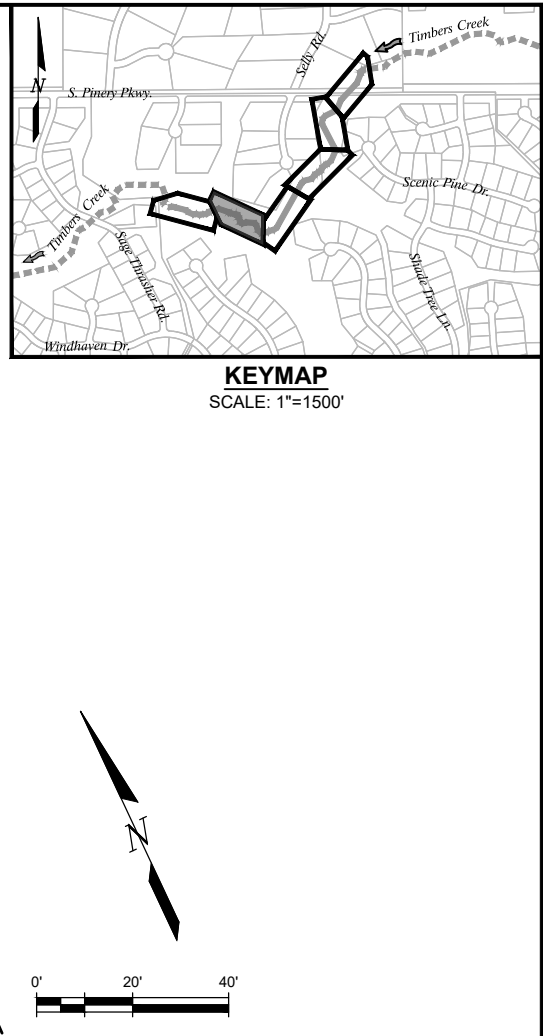
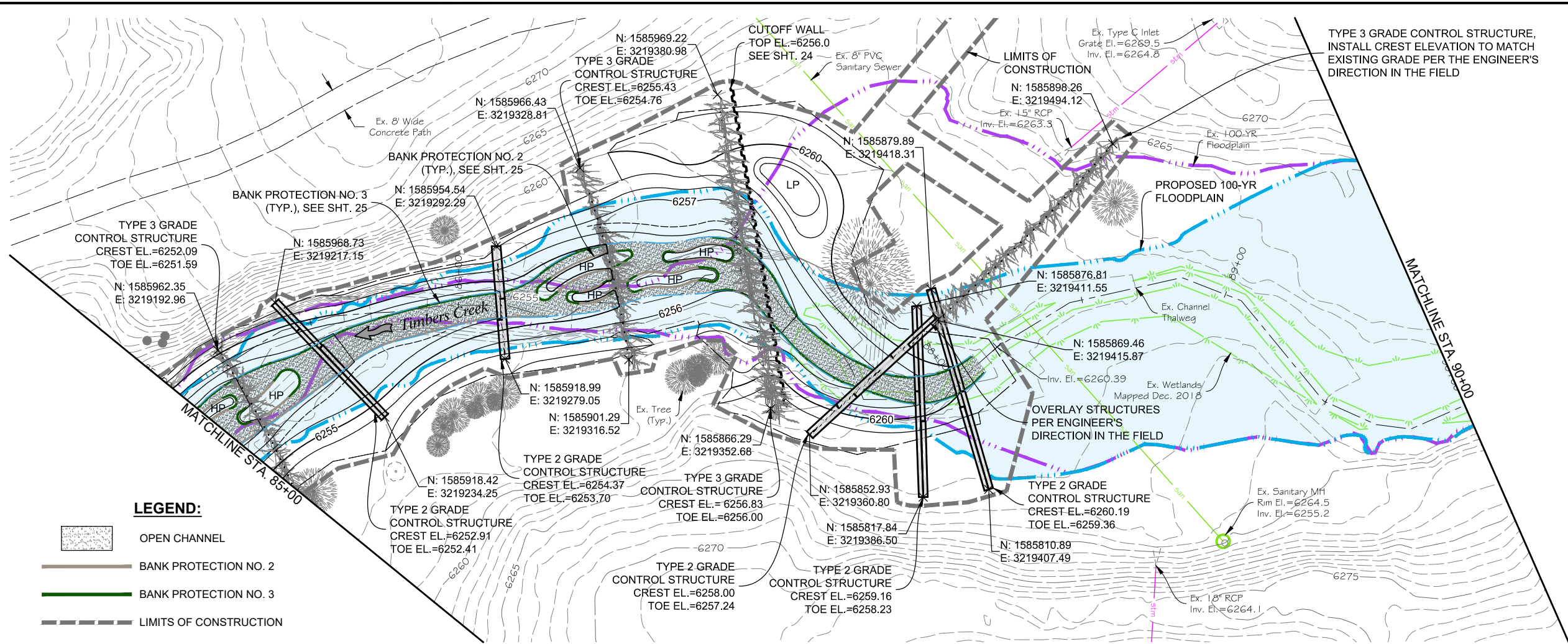
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PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS	SHEET REVISIONS				MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	MHFD MILE HIGH FLOOD DISTRICT	DOUGLAS COUNTY COLORADO	HPF HEALTHY PRAIRIE DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
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	CHECKED: CLK										PLAN AND PROFILE		SHEET NO. 15 OF 45

PLOTTED: 10/18/2019 3:35:15 PM
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COUNTY ENGINEER _____

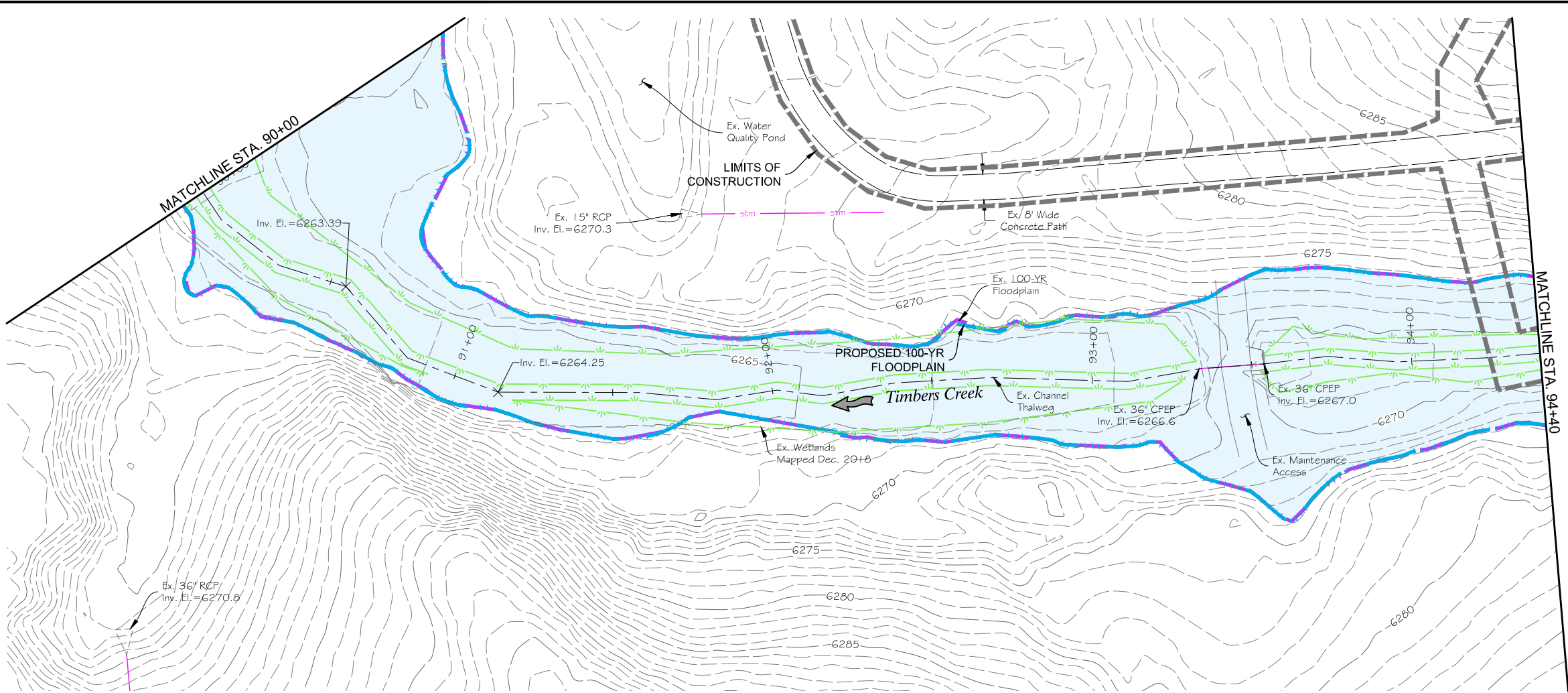
DATE _____

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

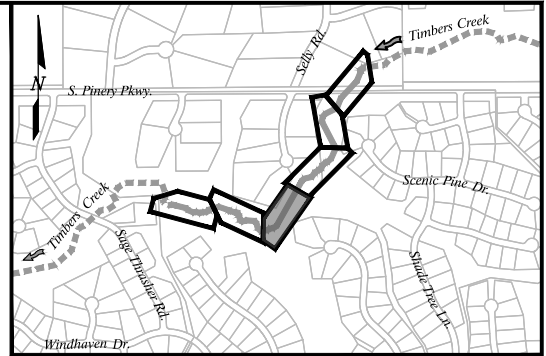
ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO		TIMBERS CREEK IMPROVEMENTS		DATE
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	CHECKED:												SHEET NO.
CLK	PROJECT NO. 18-047.01					PLAN AND PROFILE		16 OF 45					

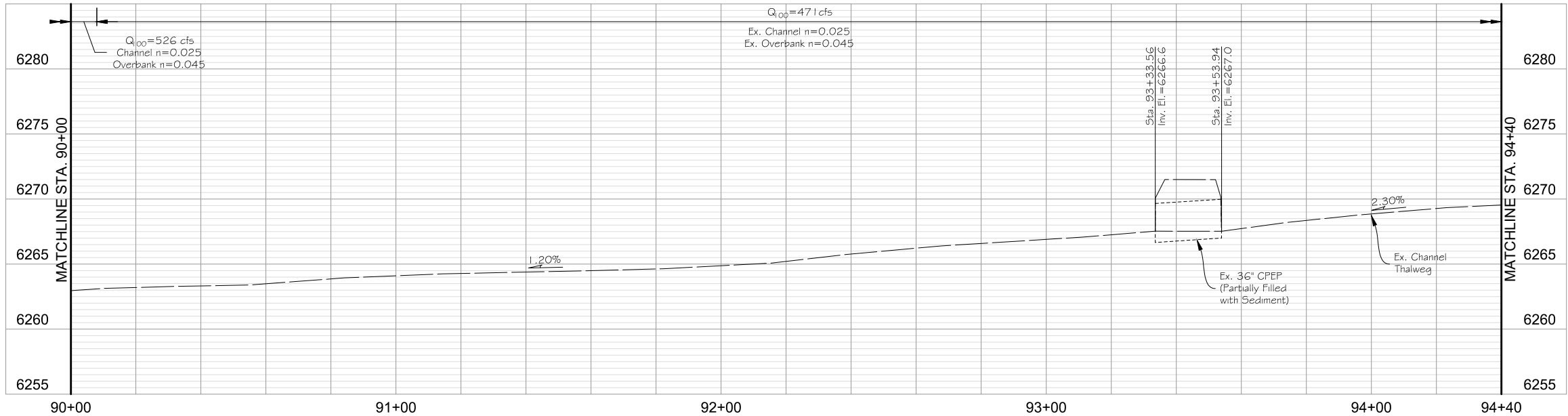
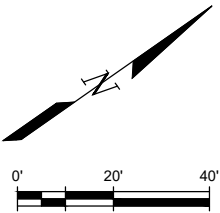
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PLAN



KEYMAP
SCALE: 1"=1500'



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

COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

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100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

CIVIL

PLAN AND PROFILE

DATE

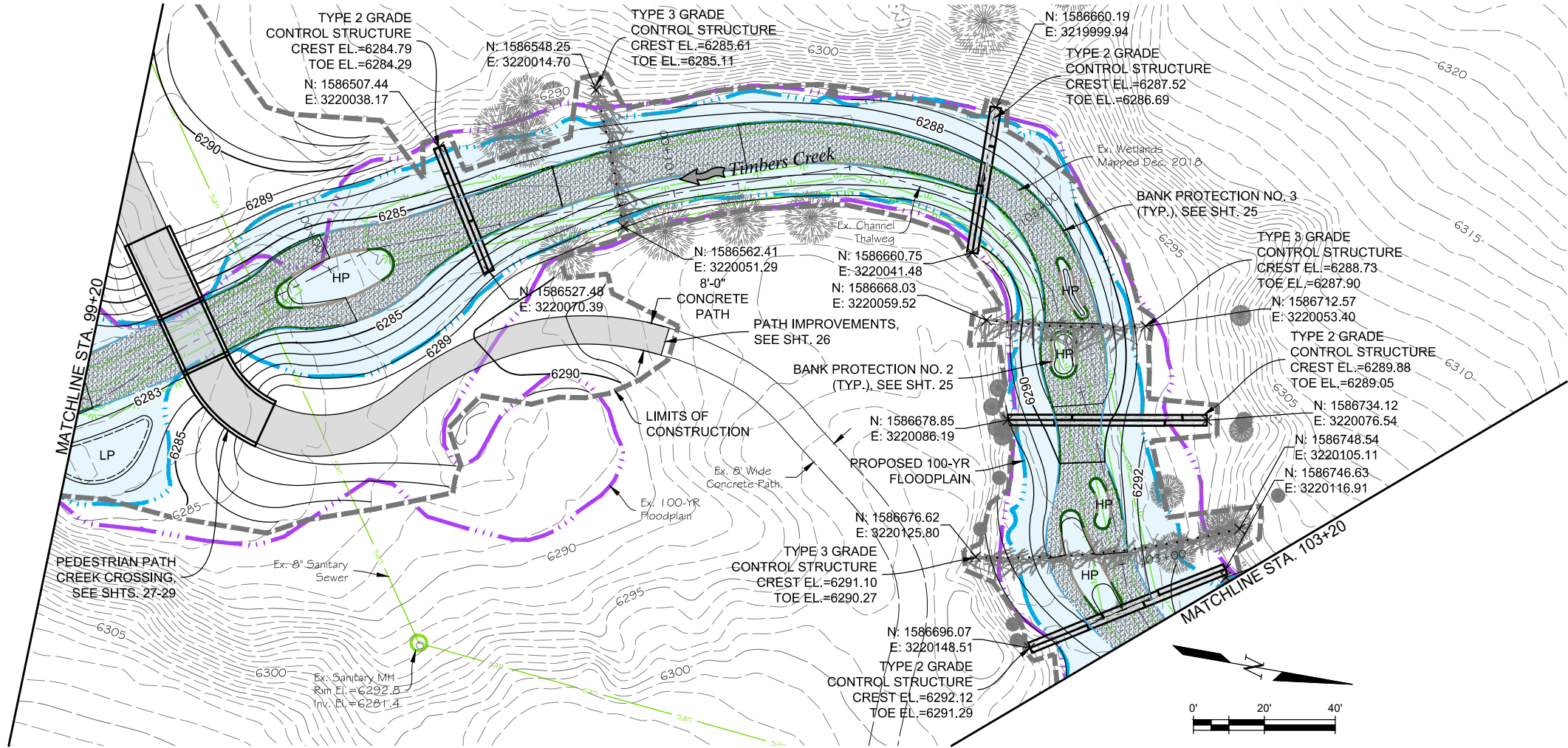
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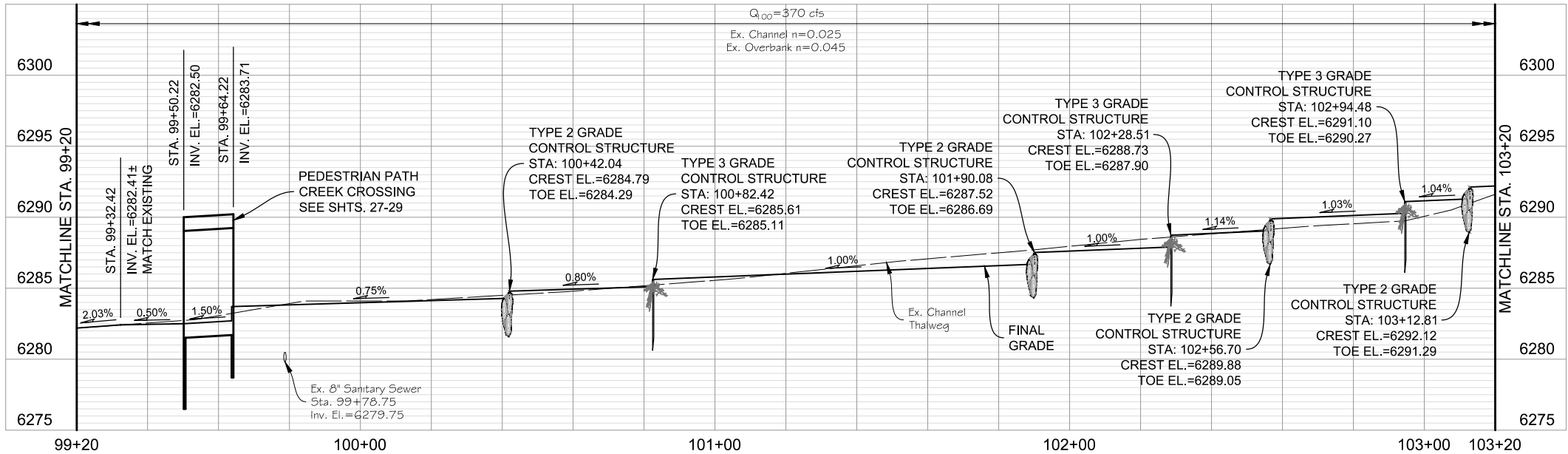
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SHEET NO.

17 OF 45

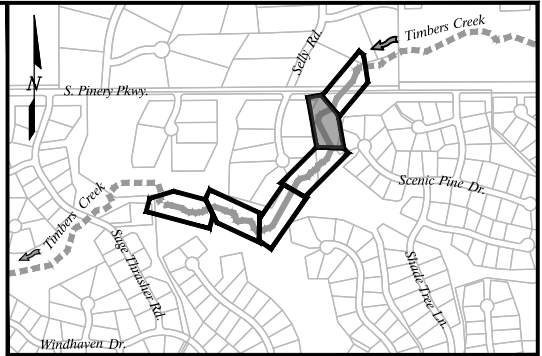


PLAN



PROFILE

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



KEYMAP
SCALE: 1"=1500'

LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION

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COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

TIMBERS CREEK IMPROVEMENTS

CIVIL

PLAN AND PROFILE

DATE

10/18/19

DRAWING NO.

C-16

SHEET NO.

19 OF 45

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

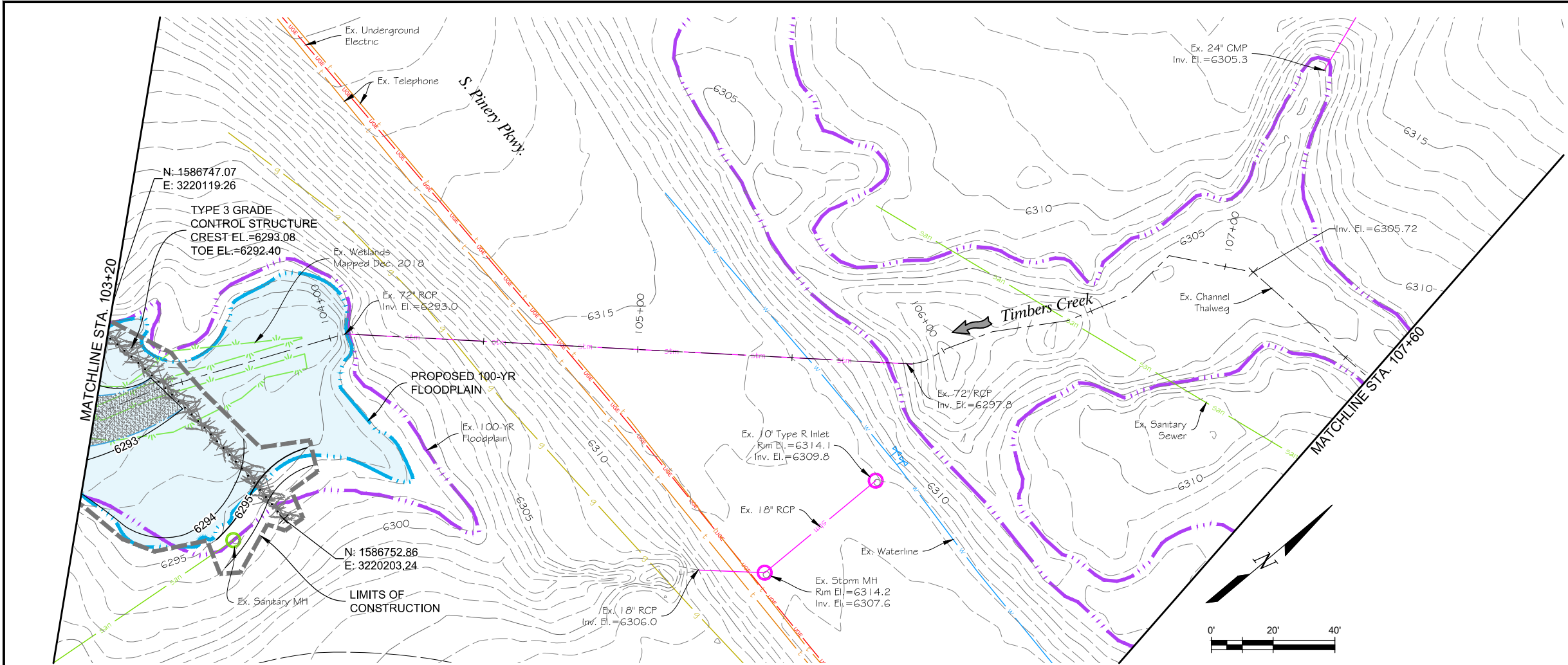
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SHEET REVISIONS

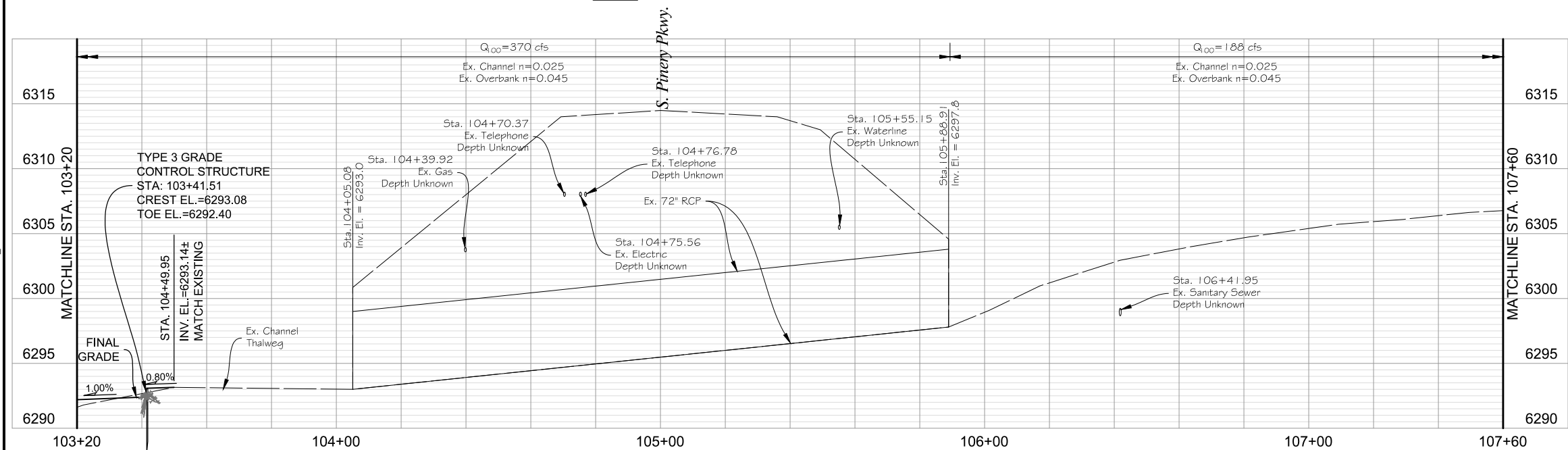
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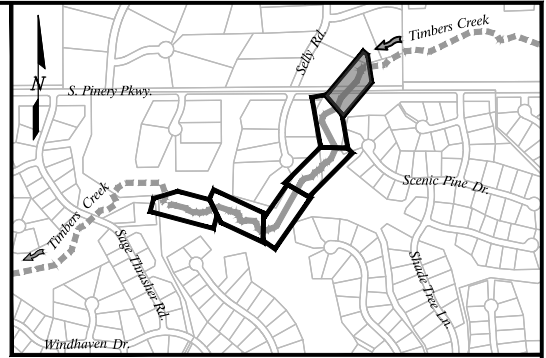
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PLAN



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



KEYMAP
SCALE: 1"=1500'

LEGEND:

- OPEN CHANNEL
- BANK PROTECTION NO. 2
- BANK PROTECTION NO. 3
- LIMITS OF CONSTRUCTION

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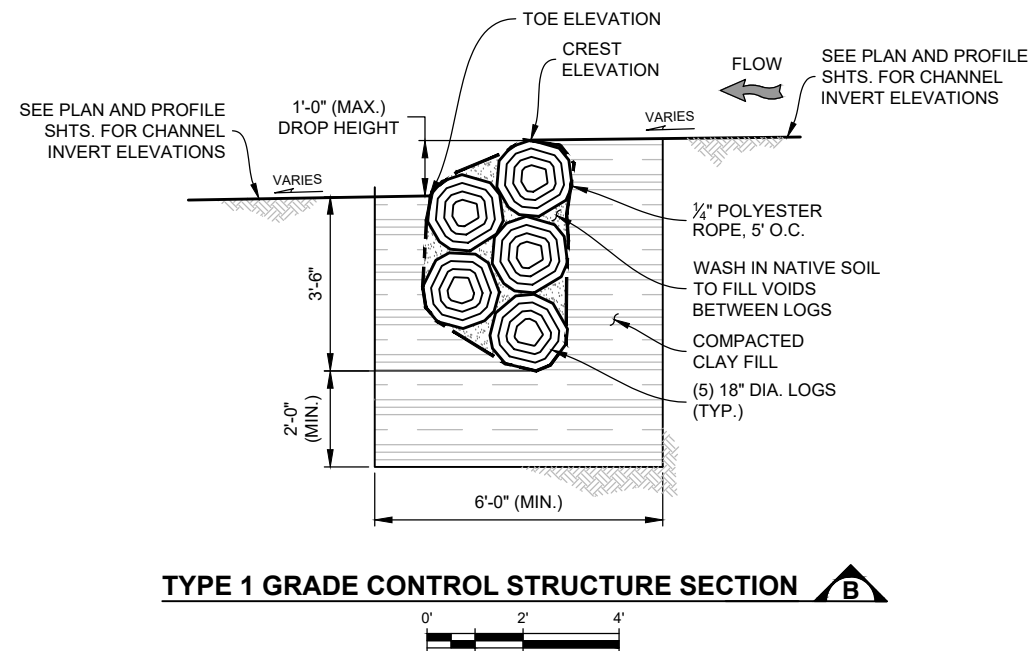
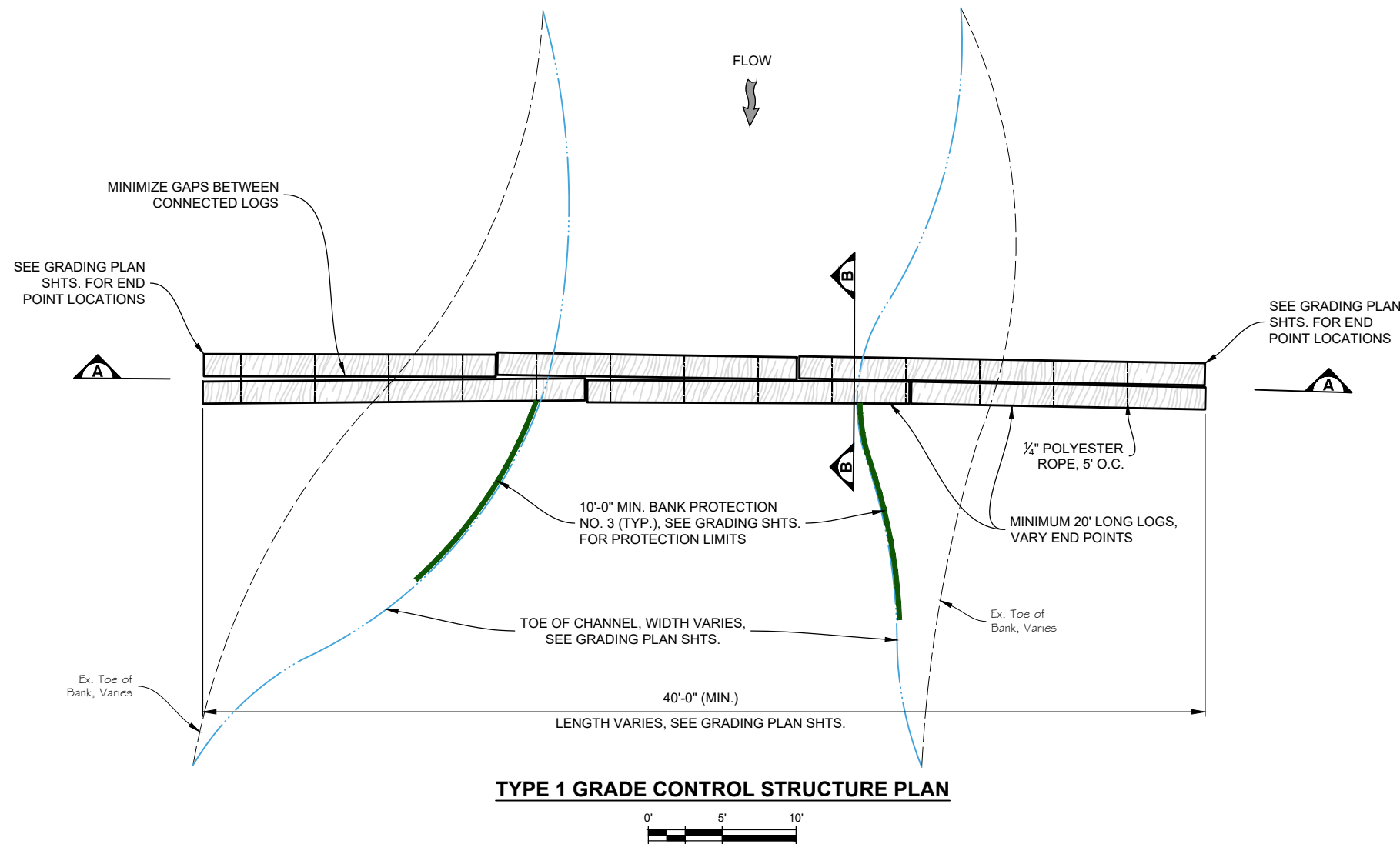
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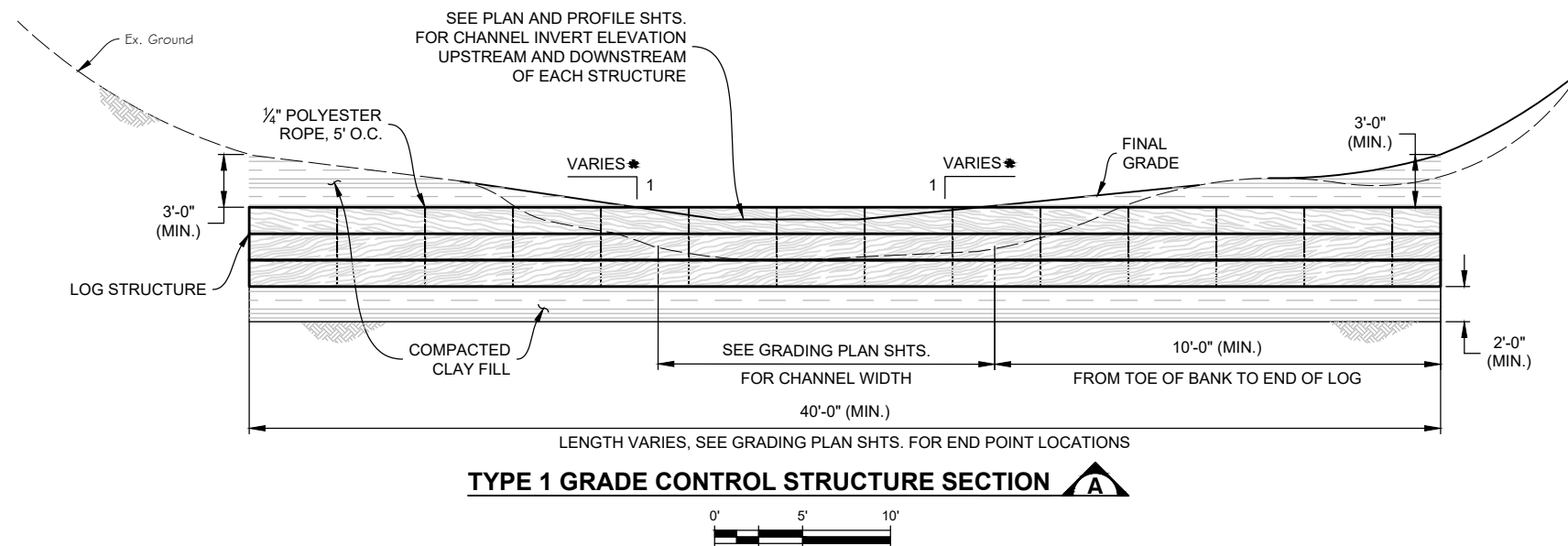
ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS	PROJECT NO. 18-047.01	SHEET REVISIONS			MULLER ENGINEERING COMPANY 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	MHFD MILE HIGH FLOOD DISTRICT	DOUGLAS COUNTY COLORADO	HPF HATCHER PETERSON FLOOD DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
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	CHECKED: CLK										PLAN AND PROFILE		SHEET NO. 20 OF 45

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- NOTES:**
1. * SEE GRADING PLAN SHTS. FOR GRADING AROUND EACH GRADE CONTROL STRUCTURE.
 2. 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.



COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

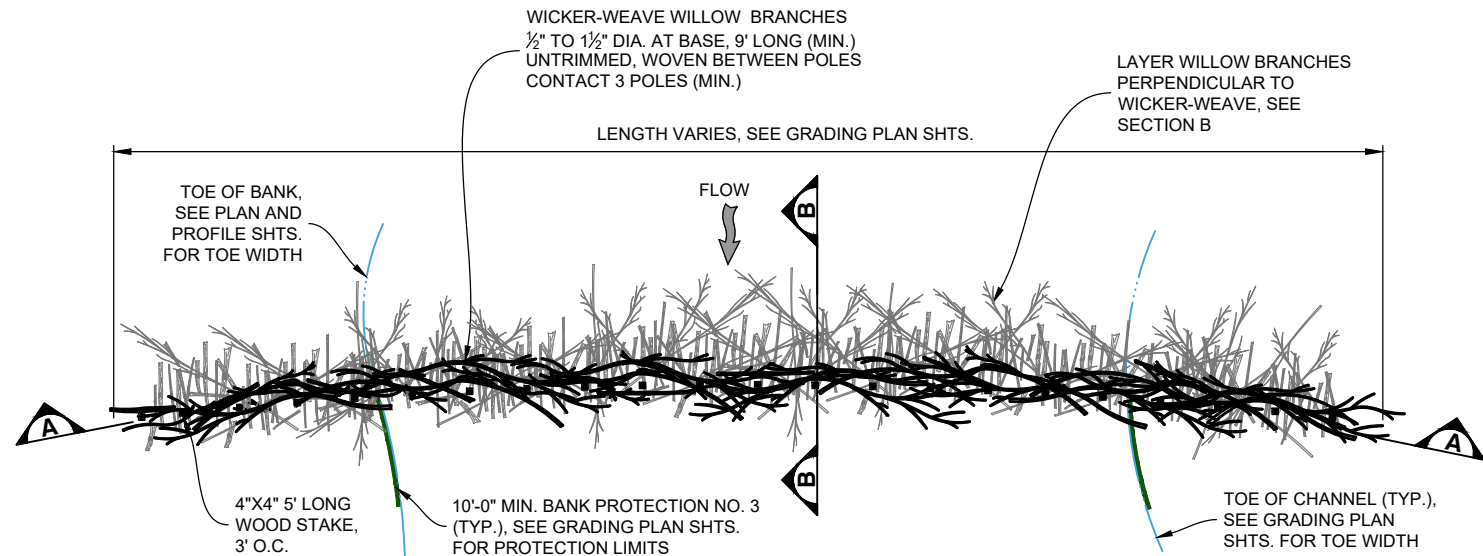
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TYPE 1 GRADE CONTROL
STRUCTURE DETAILS

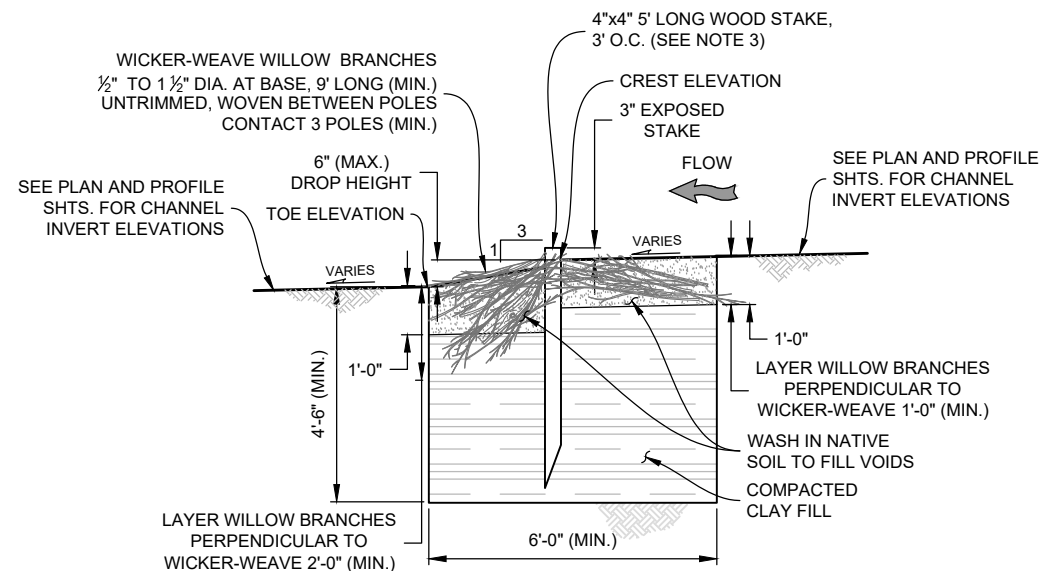
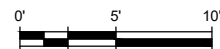
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10/18/19

DRAWING NO.
C-18

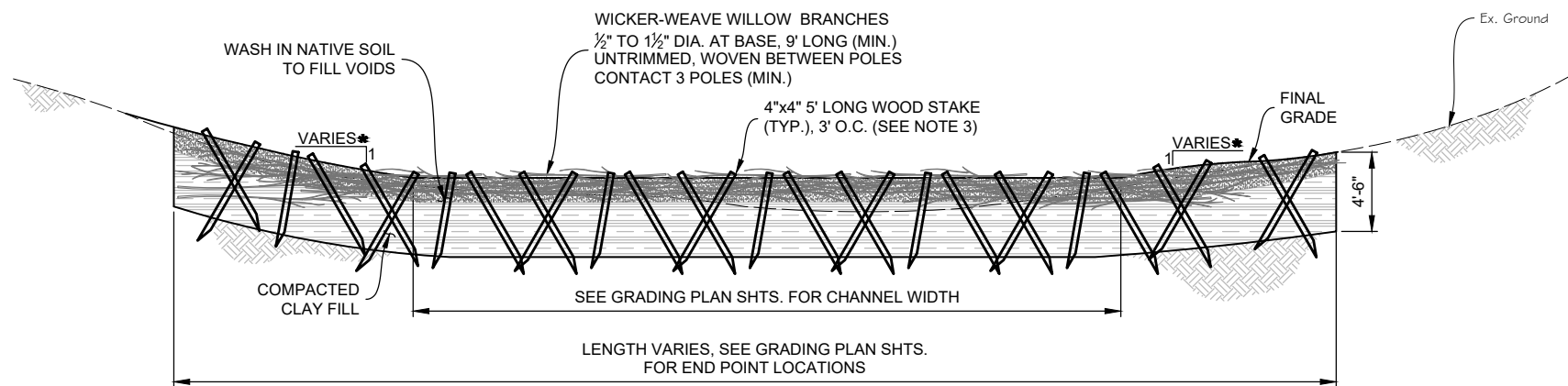
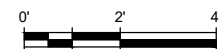
SHEET NO.
21 OF 45



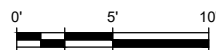
TYPE 3 GRADE CONTROL STRUCTURE PLAN



TYPE 3 GRADE CONTROL STRUCTURE SECTION B



TYPE 3 GRADE CONTROL STRUCTURE SECTION A



NOTES:

1. * SEE GRADING PLAN SHTS. FOR GRADING AROUND EACH GRADE CONTROL STRUCTURE.
2. 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.
3. THE ANGLE OF WOOD STAKES SHALL BE VARIED TO PROVIDE INTERLOCKING THROUGH THE STRUCTURE. NO STAKE SHALL BE INSTALLED PLUMB.

COUNTY ENGINEER

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TIMBERS CREEK IMPROVEMENTS

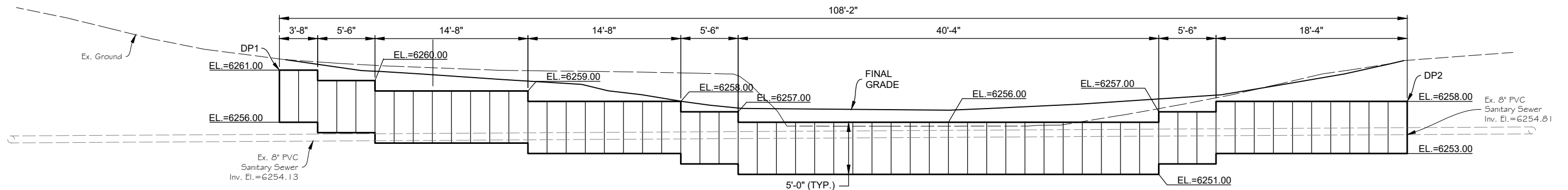
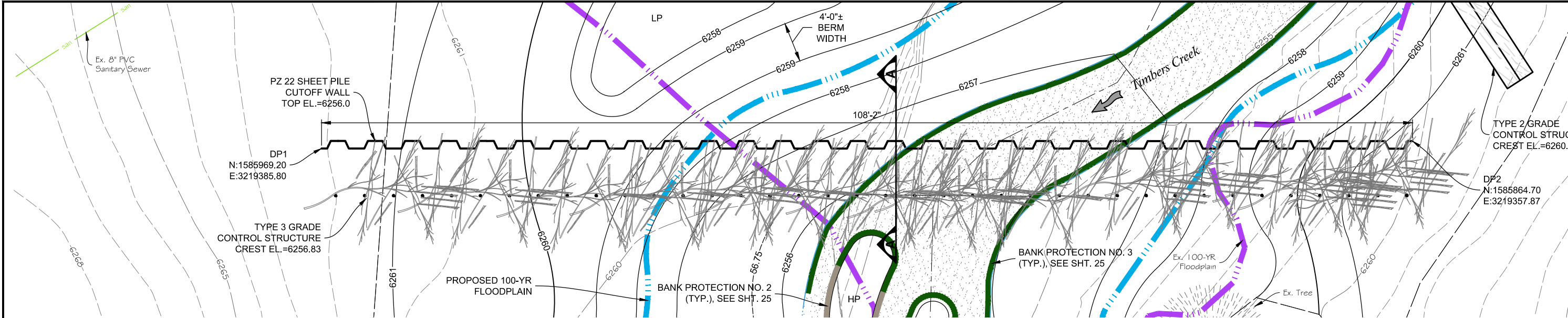
CIVIL

TYPE 3 GRADE CONTROL STRUCTURE DETAILS

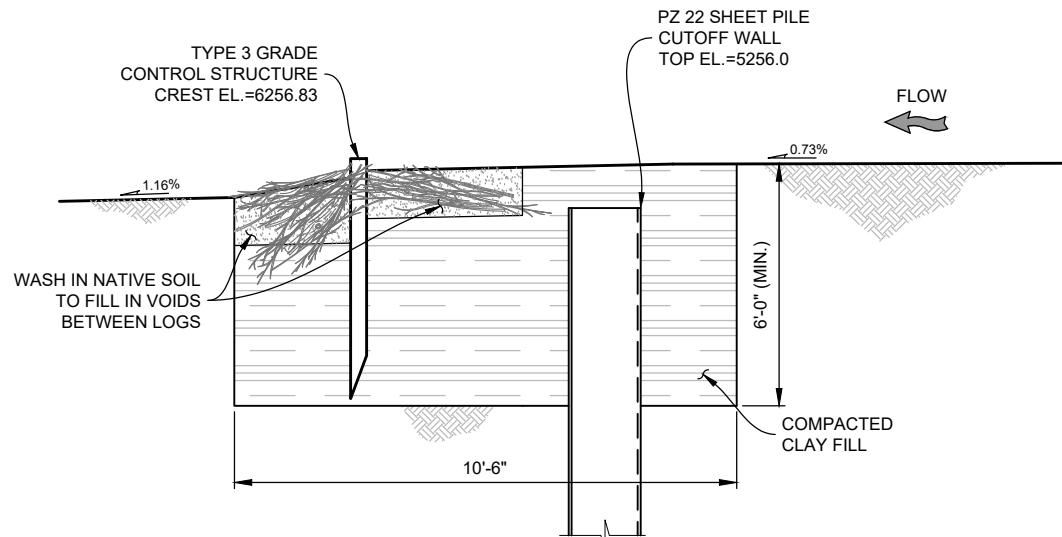
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10/18/19

DRAWING NO.
C-20

SHEET NO.
23 OF 45



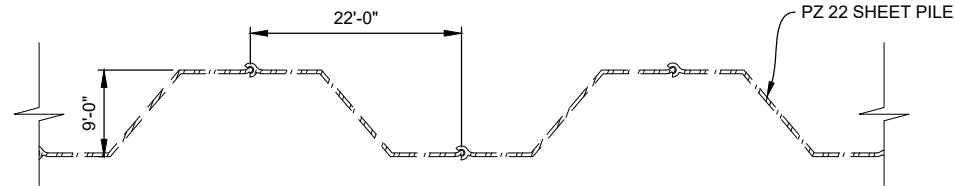
**SHEET PILE CUTOFF WALL SECTION DETAIL
(PZ 22 SHEET PILE)
LOOKING UPSTREAM**



SHEET PILE CAP SECTION A



NOTE:
1. SHEET PILE SHALL BE DRIVEN TO DEPTH SHOWN OR TO REFUSAL.



**SHEET PILE DETAIL
N.T.S.**

COUNTY ENGINEER

DATE

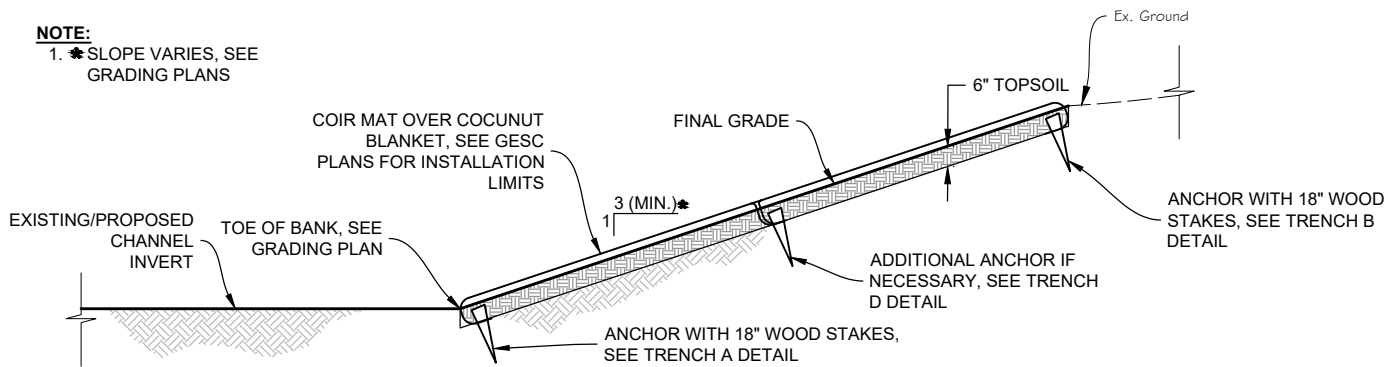
THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

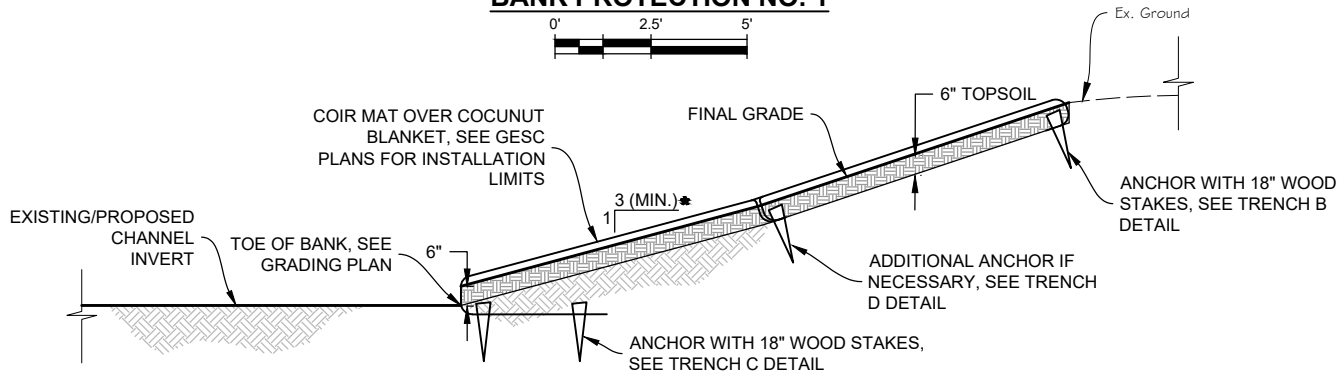
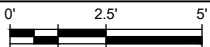
PREPARED UNDER THE SUPERVISION OF	DESIGNED: MKN	100% PLANS	PROJECT NO. 18-047.01	SHEET REVISIONS				 777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226	 MILE HIGH FLOOD DISTRICT	 DOUGLAS COUNTY COLORADO	 HIGHLAND PARK FLOOD PROTECTION DISTRICT	TIMBERS CREEK IMPROVEMENTS		DATE 10/18/19
	DRAWN: CAS			CIVIL		DRAWING NO. C-21								
	CHECKED: CLK			SHEET PILE CUTOFF WALL DETAILS		SHEET NO. 24 OF 45								

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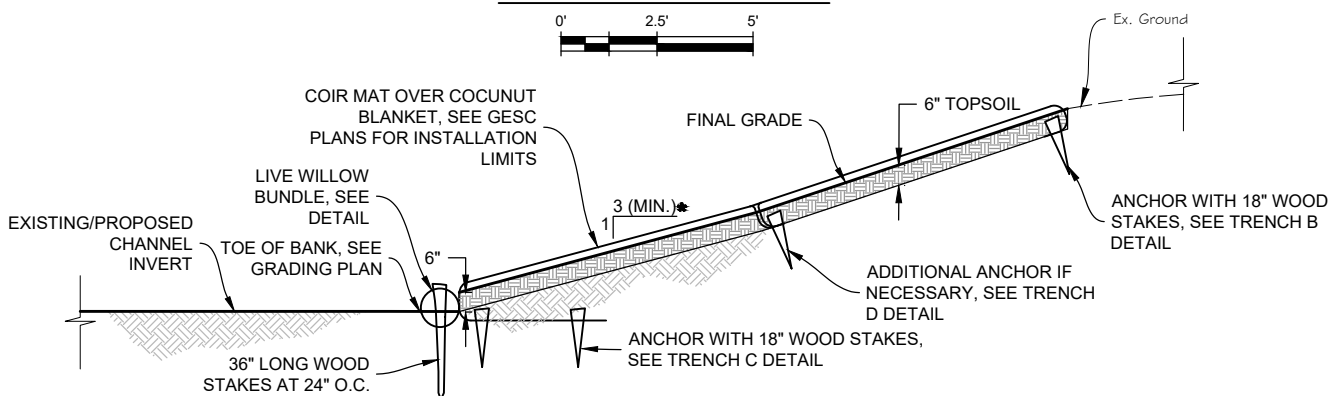
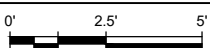
NOTE:
 1. *SLOPE VARIES, SEE GRADING PLANS



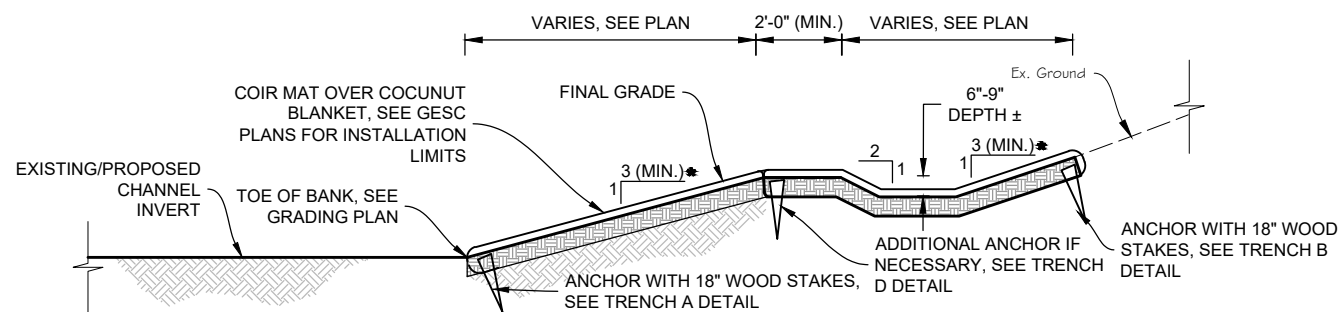
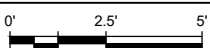
BANK PROTECTION NO. 1



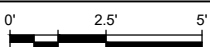
BANK PROTECTION NO. 2



BANK PROTECTION NO. 3

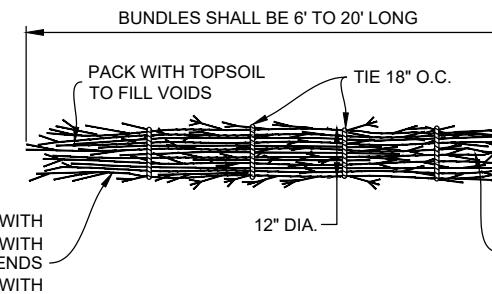


TYPICAL OFF-CHANNEL WETLAND DETAIL



GENERAL NOTES:

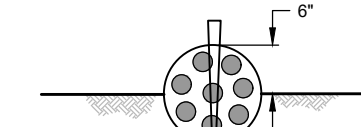
1. COIR MAT SHALL BE KOIRMAT 700 COCONUT FIBER EROSION CONTROL MATTING (WOVEN MATTING OF COIR YARN) MANUFACTURED BY NEDIA ENTERPRISES, INC. OR APPROVED EQUIVALENT.
2. COCONUT BLANKET SHALL BE C400B STRAW/COCONUT FIBER BLANKET WITH BIODEGRADABLE NETTING ON BOTH SIDES AS MANUFACTURED BY NEDIA ENTERPRISES, 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.



LIVE WILLOW BUNDLE

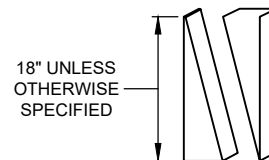
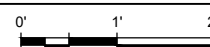
N.T.S.

PREPARE LIVE FASCINE WITH 1/2"-1" WILLOW CUTTINGS WITH ALTERNATING BUTT ENDS AND TIE SECURELY WITH BIODEGRADABLE TWINE



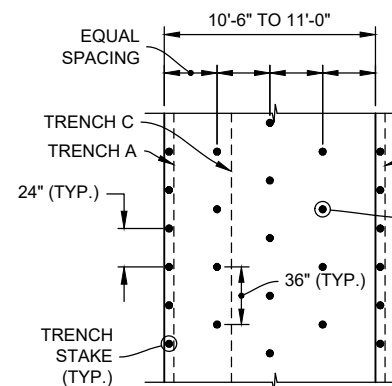
SECURE WITH 36" LONG WOOD STAKES AT 24" O.C.

LIVE WILLOW BUNDLE

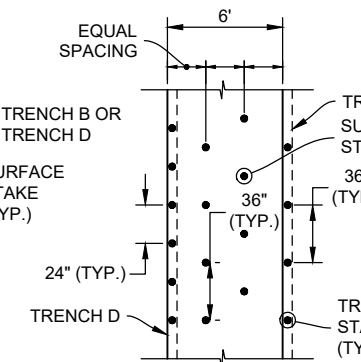


WOOD STAKE DETAIL (TRENCH)

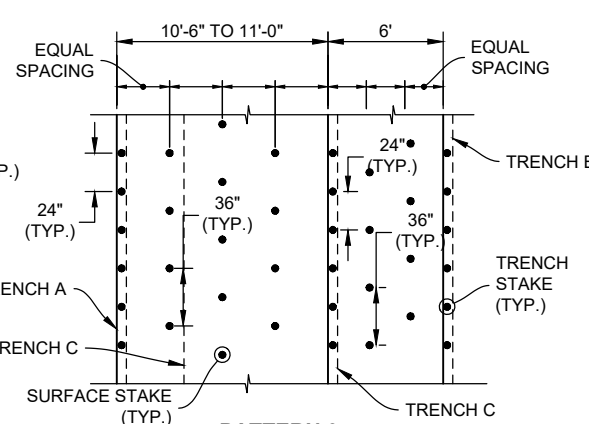
N.T.S.



PATTERN 1



PATTERN 2

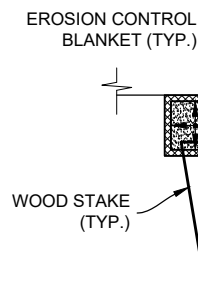
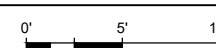


PATTERN 3

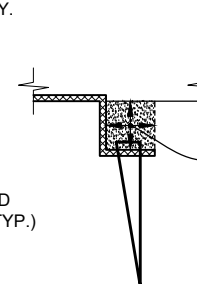
NOTE:

1. INSTALL WOOD STAKES SUCH THAT ONLY 1" IS EXPOSED ABOVE GROUND
2. BOTTOM STAKES FOR TRENCH C NOT DISPLAYED FOR CLARITY.

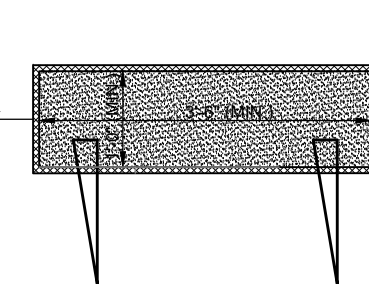
STAKING PATTERNS FOR EROSION CONTROL BLANKET



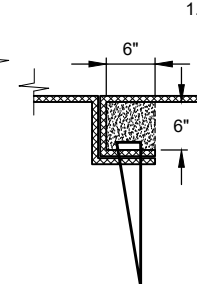
TRENCH A



TRENCH B



TRENCH C

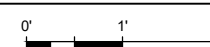


TRENCH D

NOTE:

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

ANCHOR TRENCH DETAILS FOR EROSION CONTROL BLANKETS



COUNTY ENGINEER

DATE

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DESIGNED: MKN

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100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

CIVIL

BANK PROTECTION DETAILS

DATE

10/18/19

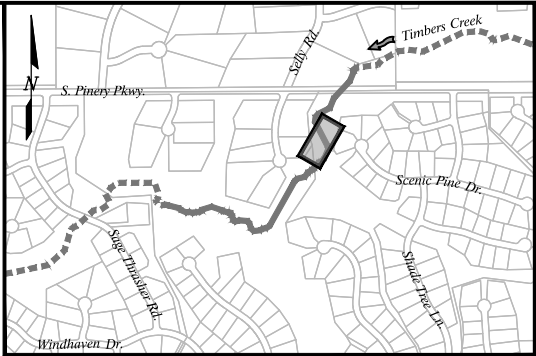
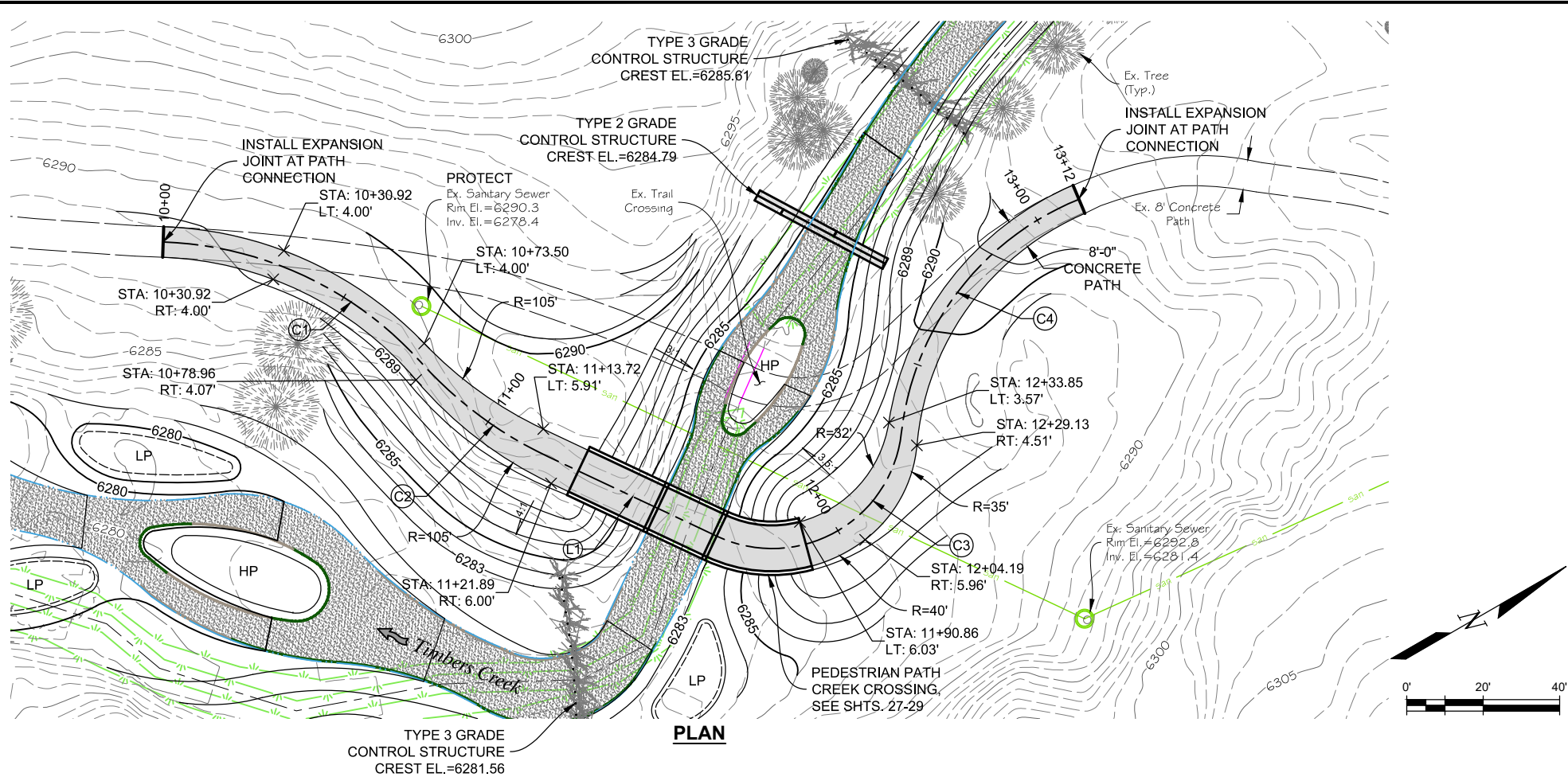
DRAWING NO.

C-22

SHEET NO.

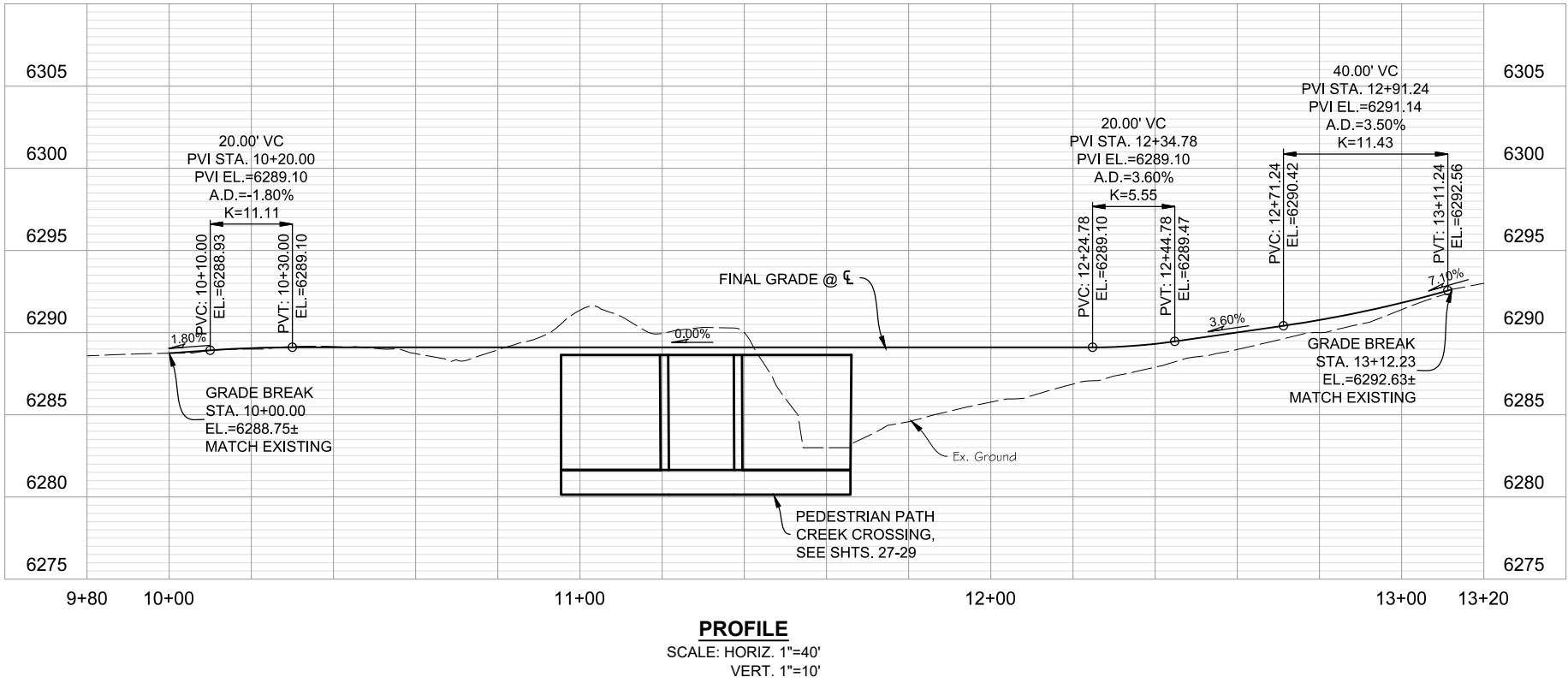
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KEYMAP
 SCALE: 1"=1500'

NOTE:
 1. HP IDENTIFIES BERMING WITHIN THE CHANNEL IMPROVEMENTS AND LP IDENTIFIES LOCALIZED SUMPS.



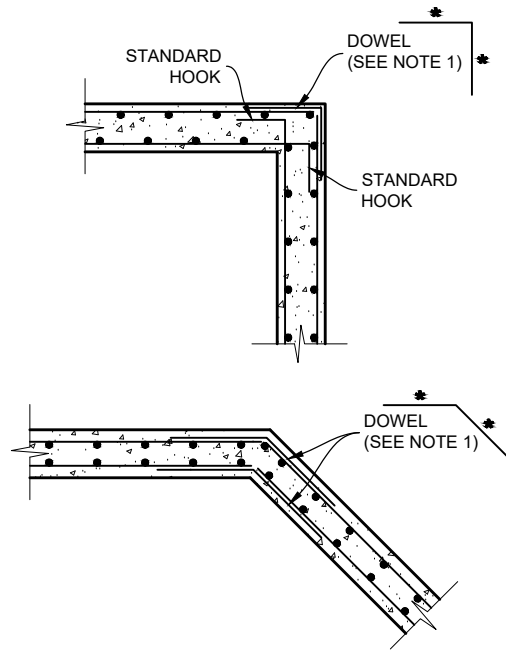
PATH CENTERLINE HORIZONTAL CONTROL TABLE									
LINE/CURVE #	LENGTH	CURVE RADIUS	LINE/CHORD DIRECTION	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING	END EASTING
C1	76.38	95.00	N54° 59' 40.32"E	10+00.00	1586366.69	3219971.11	10+76.38	1586409.34	3220032.01
C2	41.78	105.00	N66° 37' 40.80"E	10+76.38	1586409.34	3220032.01	11+18.16	1586425.80	3220070.11
L1	48.81		N55° 13' 42.19"E	11+18.16	1586425.80	3220070.11	11+66.98	1586453.64	3220110.20
C3	64.58	34.00	N00° 49' 02.95"E	11+66.98	1586453.64	3220110.20	12+31.55	1586508.93	3220110.99
C4	80.68	75.00	N22° 46' 34.52"W	12+31.55	1586508.93	3220110.99	13+12.23	1586579.79	3220081.24

COUNTY ENGINEER _____
 DATE _____
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 ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS PROJECT NO. 18-047.01	SHEET REVISIONS			
	MKN		NO.	DATE	DESCRIPTION	BY
	DRAWN:					
	CAS					
CHECKED:						
CLK						

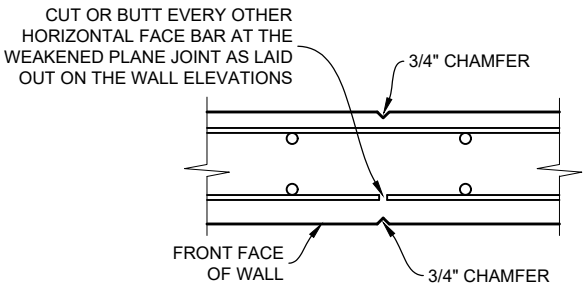


TIMBERS CREEK IMPROVEMENTS		DATE
CIVIL		10/18/19
PEDESTRIAN PATH PLAN AND PROFILE		DRAWING NO. C-23
		SHEET NO. 26 OF 45

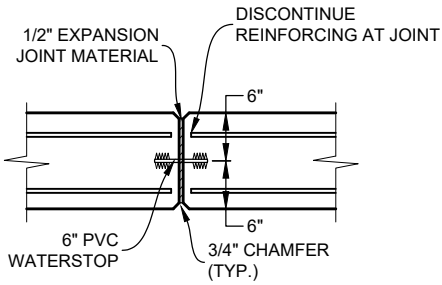


TYPICAL CORNER REINFORCEMENT
N.T.S.

- NOTES:**
1. CONTINUE SAME SIZE BARS FOR CORNER REINFORCEMENT DOWEL.
 2. * GAP + CLASS C LAP SPLICE LENGTH PER AASHTO LRFD.
 3. USE AT ALL CORNERS FOR ALL CONCRETE MEMBERS INCLUDING WALLS, SLABS, AND BEAMS, UNLESS INDICATED OTHERWISE.



WEAKENED PLANE
N.T.S.



EXPANSION JOINT
N.T.S.

- NOTES:**
1. COST OF WATERSTOP AND EXPANSION JOINT MATERIAL SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN COST OF CONCRETE.
 2. EXPANSION JOINTS SHALL BE LAID OUT AS SHOWN ON WALL ELEVATIONS.

- NOTES:**
1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) 2019 STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, AND DOUGLAS COUNTY STANDARD SPECIFICATIONS APPLICABLE TO THE PROJECT.
 2. EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH M-206-1 AND M-206-2 FOR CAST-IN-PLACE RETAINING WALLS AND BRIDGES.
 3. EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.
 4. ALL CONCRETE SHALL BE CDOT CLASS D. REINFORCING STEEL SHALL BE INCLUDED IN THE COST OF THE STRUCTURAL CONCRETE ITEM AND SHALL NOT BE PAID FOR SEPARATELY.
 5. GRADE 60 REINFORCING STEEL IS REQUIRED.
 6. ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.
 7. THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.
- | | | | | | | | | |
|------------------------------------|--------|-------|-------|--------|-------|-------|--------|-------|
| BAR SIZE | #4 | #5 | #6 | #7 | #8 | #9 | #10 | #11 |
| SPLICE LENGTH FOR CLASS D CONCRETE | 1'-10" | 2'-3" | 3'-4" | 3'-11" | 4'-5" | 5'-6" | 6'-10" | 8'-2" |
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
E.F. = EACH FACE T.O. = TOP OF T.O.W. = TOP OF WALL B.F. = BACK FACE
B.F. = BOTTOM OF BRG. = BEARING F.F. = FRONT FACE O.C. = ON CENTER
 9. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.
 10. ALL EXPOSED CONCRETE EDGES SHALL HAVE A 3/4" CHAMFER UNLESS DETAILED OR OTHERWISE NOTED.
 11. STRUCTURAL CONCRETE EXPOSED TO SOIL SHALL CONFORM TO CEMENTITIOUS MATERIALS REQUIREMENTS CLASS 2, CORRESPONDING TO SULFATE EXPOSURE CLASS 2.
 12. THE CONTRACTOR SHALL NOT BACKFILL AGAINST CAST-IN-PLACE CONCRETE RETAINING WALLS UNTIL ALL CONCRETE HAS REACHED 80% OF DESIGN STRENGTH (3,800 PSI).
 13. UNLESS OTHERWISE NOTED, ALL EXPOSED WALLS SHALL BE CONSTRUCTED WITH A CLASS 2 RUBBED FINISH (CDOT SPECIFICATION 601.14(b)2.) OR FORM LINER AS INDICATED.
 14. WALLS TO BE COVERED WITH EARTH SHALL BE CONSTRUCTED WITH A CLASS 1 ORDINARY SURFACE FINISH (CDOT SPECIFICATION 601.14(b)1.).

COUNTY ENGINEER

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PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS			
NO.	DATE	DESCRIPTION	BY

MULLER ENGINEERING COMPANY
777 S. WADSWORTH BLVD. 4-100 LAKEWOOD, COLORADO 80226

MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY COLORADO

HPF WETLAND DISTRICT

TIMBERS CREEK IMPROVEMENTS

CIVIL

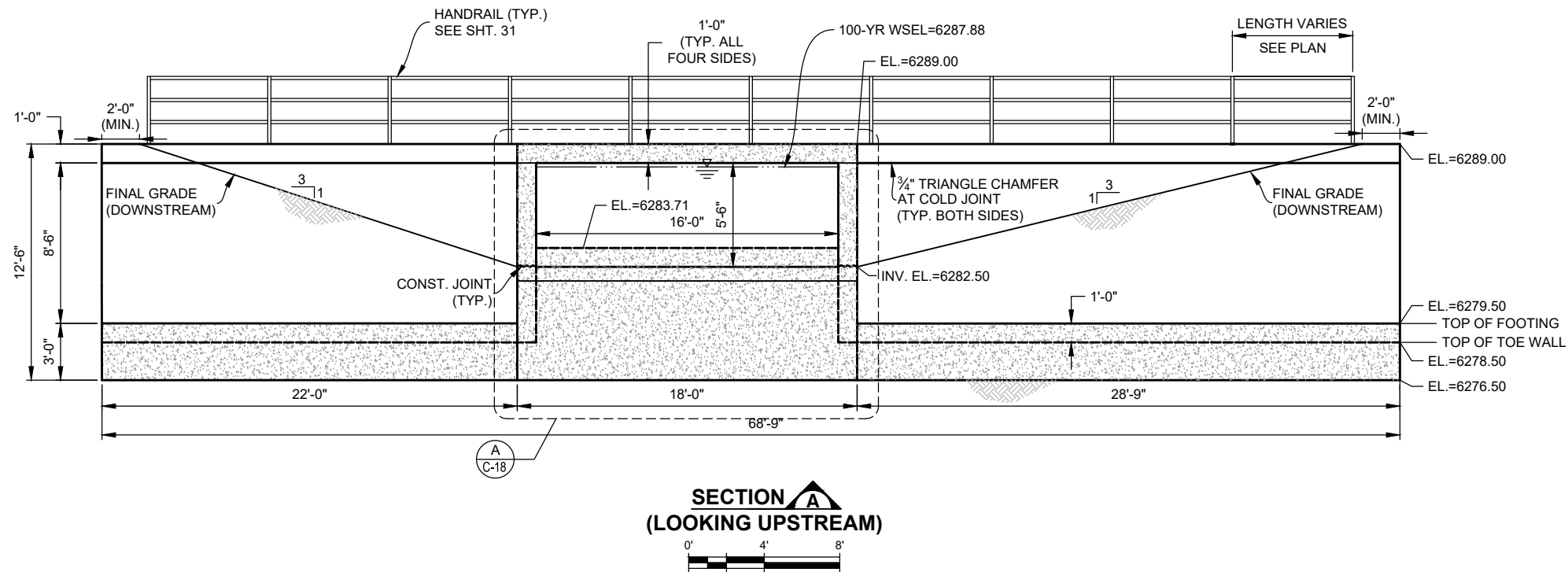
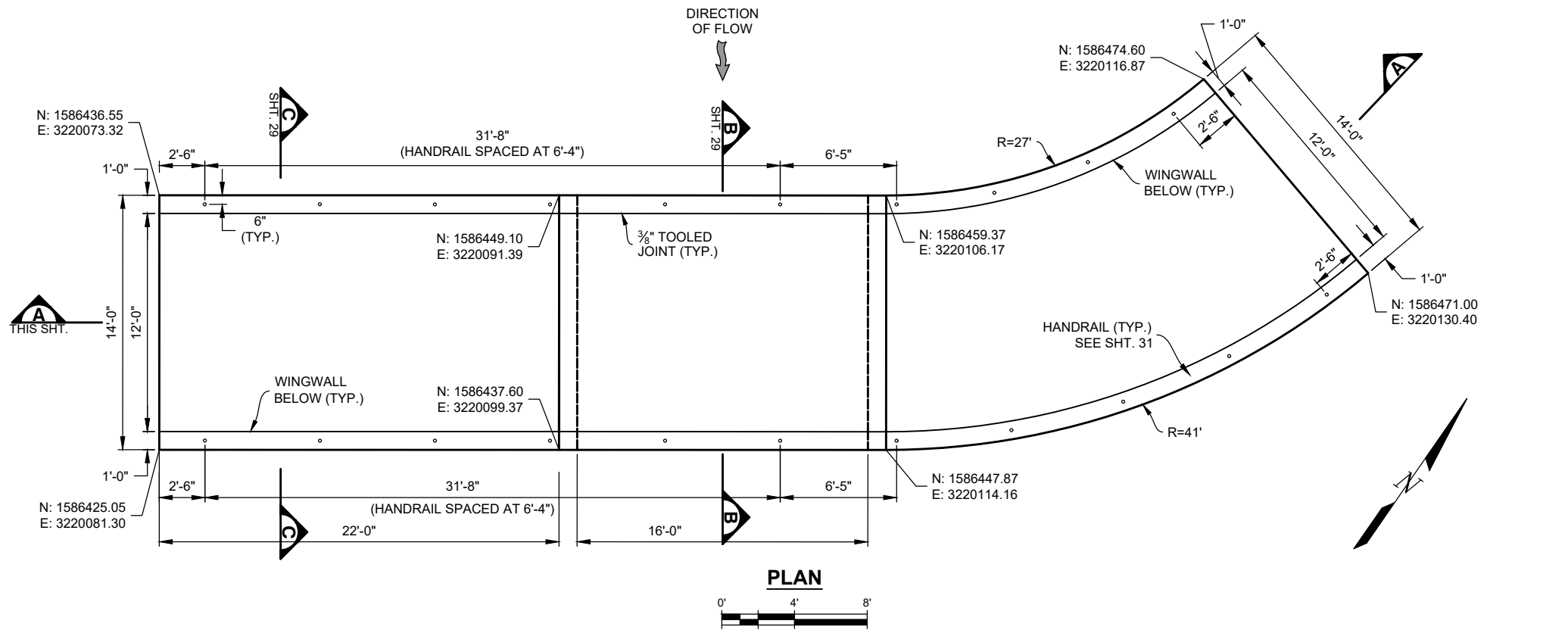
STRUCTURAL GENERAL NOTES AND DETAILS

DATE 10/18/19

DRAWING NO. C-24

SHEET NO. 27 OF 45

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- GRADE 60 REINFORCING STEEL IS REQUIRED.
- ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.
- THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B LAP SPICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
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- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

E.F. = EACH FACE	T.O. = TOP OF	T.O.W. = TOP OF WALL	B.F. = BACK FACE
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- STRUCTURAL CONCRETE EXPOSED TO SOIL SHALL CONFORM TO CEMENTITIOUS MATERIALS REQUIREMENTS CLASS 2, CORRESPONDING TO SULFATE EXPOSURE CLASS 2.
- THE CONTRACTOR SHALL NOT BACKFILL AGAINST CAST-IN-PLACE CONCRETE RETAINING WALLS UNTIL ALL CONCRETE HAS REACHED 80% OF DESIGN STRENGTH (3,800 PSI).
- UNLESS OTHERWISE NOTED, ALL EXPOSED WALLS SHALL BE CONSTRUCTED WITH A CLASS 2 RUBBED FINISH (CDOT SPECIFICATION 601.14(b).2.) OR FORM LINER AS INDICATED.
- WALLS TO BE COVERED WITH EARTH SHALL BE CONSTRUCTED WITH A CLASS 1 ORDINARY SURFACE FINISH (CDOT SPECIFICATION 601.14(b).1.).

COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED: MKN

DRAWN: CAS

CHECKED: CLK

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

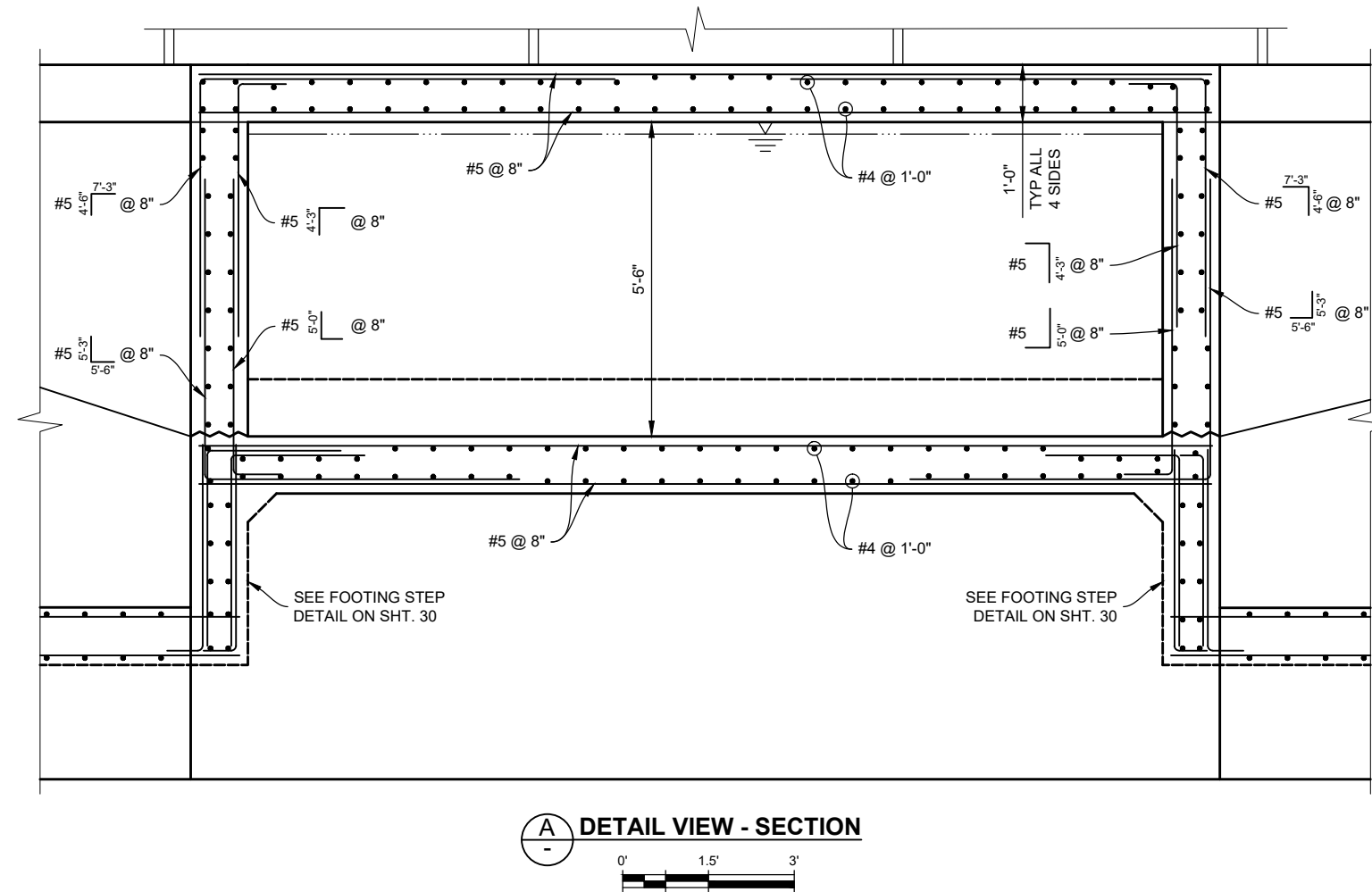
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PEDESTRIAN PATH CREEK CROSSING DETAILS

DATE
10/18/19

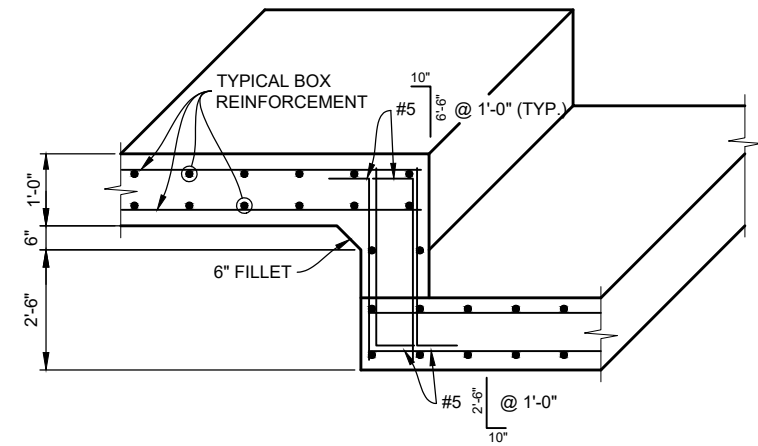
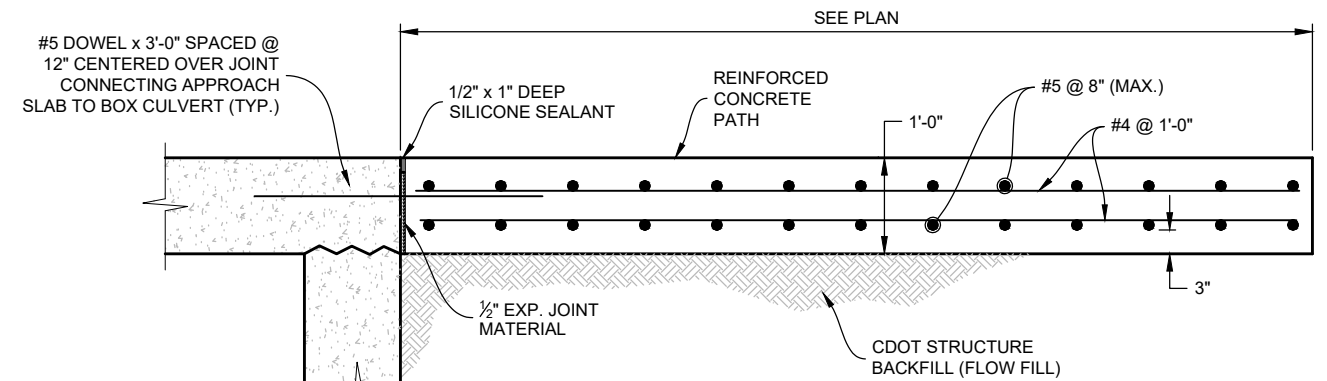
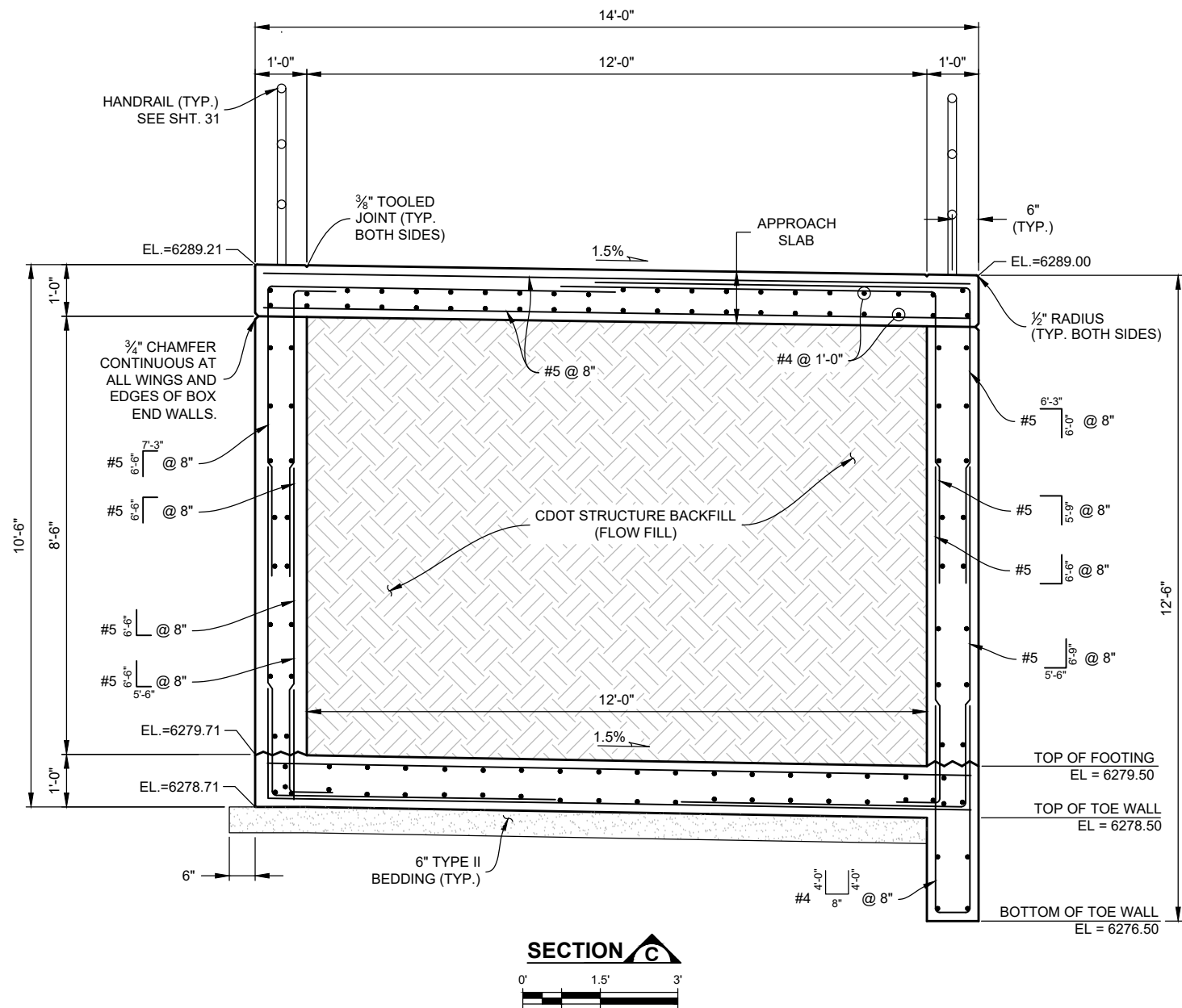
DRAWING NO.
C-25

SHEET NO.
28 OF 45



PEDESTRIAN PATH CREEK CROSSING DETAILS (CONT.)

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COUNTY ENGINEER

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PROJECT NO. 18-047.01

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TIMBERS CREEK IMPROVEMENTS

CIVIL

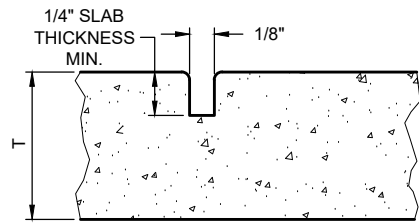
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DATE
10/18/19

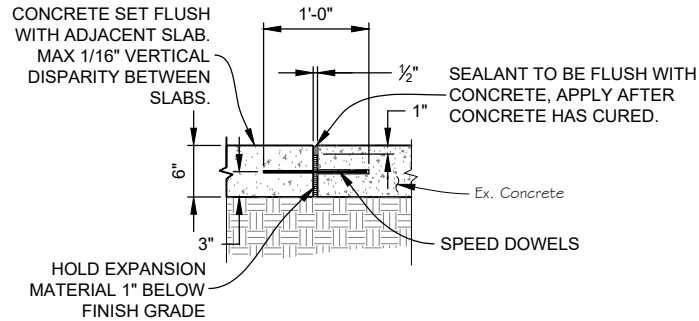
DRAWING NO.
C-27

SHEET NO.
30 OF 45

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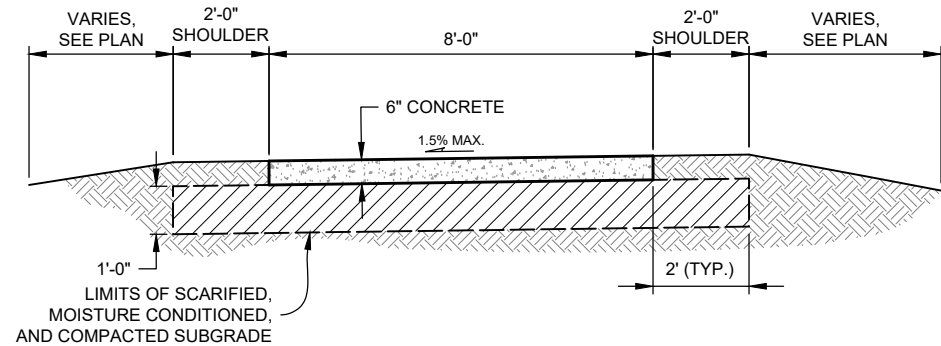


SAWED JOINT @ 10'-0" (TYP.)
N.T.S.



EXPANSION JOINT W/ PINNING
N.T.S.

CONCRETE PATH JOINT DETAILS



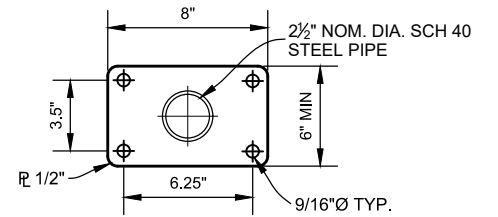
CONCRETE PATH DETAIL
0' 2' 4'

NOTES:

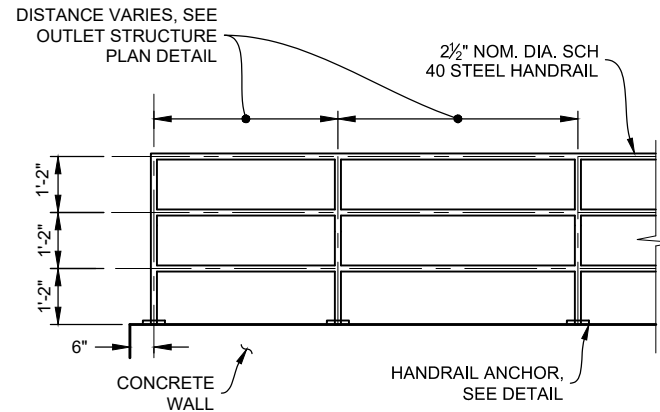
- DIRECTION OF THE PATH CROSS SLOPE IS INDICATED ON PLAN DRAWINGS.
- LONGITUDINAL PATH GRADE SHALL NOT EXCEED 5%, UNLESS OTHERWISE SHOWN ON THE PLAN.
- OWNER OR OWNER'S REPRESENTATIVE SHALL INSPECT SUBGRADE AND FORM GRADES PRIOR TO PLACEMENT OF CONCRETE.
- TRANSVERSE JOINTS SHALL BE INSTALLED EVERY TEN FEET (10') FOR 8', 10' AND 12' WIDE PATHS. TRANSVERSE JOINTS SHALL BE INSTALLED EVERY FIVE FEET (5') FOR 5' WIDE PATHS. JOINTS SHALL BE SAWED TO A MINIMUM DEPTH OF ONE-FOURTH (1/4) OF THE TOTAL THICKNESS, BUT NO LESS THAN 1.5 INCHES.
- EXPANSION JOINTS SHALL BE INSTALLED AT INTERVALS OF NOT MORE THAN 120 FEET, AND SHALL BE FILLED WITH 1/2 INCH THICK FULL DEPTH, PREFORMED EXPANSION JOINT FILLER.
- EXPANSION JOINTS SHALL BE SEALED WITH AN APPROVED SILICONE JOINT SEALANT.
- CONSTRUCTION JOINTS SHALL BE INSTALLED BETWEEN NEW CONCRETE AND EXISTING CONCRETE. PREFORMED EXPANSION JOINT FILLER 1/2 INCH THICK SHALL BE INSTALLED FULL DEPTH IN THESE JOINTS.
- SLIP JOINTS SHALL BE USED AT ALL EXPANSION JOINTS EXCLUDING BUILDINGS, CURBS, RAMPS, AND STAIRS.
- DOWELS SHALL BE A MINIMUM OF 12" FROM THE EDGE OF CONCRETE AND 24" O.C.
- CENTER OF BASE SHALL BE CENTERED ON FORM.
- DOWELS SHALL BE SPEED DOWEL MODEL PSD09/#4TX, 9" LONG SLEEVE TO ACCOMMODATE 18" SMOOTH STEEL ROUND BAR, 5/8" DIAMETER. MANUFACTURED BY SIKA/GREENSTREAK, OR APPROVED EQUAL.
- SAWED CONSTRUCTION JOINTS SHALL BE FORMED WITH POWER SAWS EQUIPPED WITH SHATTER PROOF ABRASINE OR DIAMOND-RIMMED BLADES.

HANDRAIL AND ANCHOR COATING:

HANDRAIL AND ANCHOR SHALL BE STEEL AND SAND BLASTED TO A NEAR WHITE FINISH PER STEEL STRUCTURES PAINTING COUNCIL (SSPC) SP10. HANDRAIL AND ANCHOR SHALL BE PRIMED AND PAINTED "BLACK".



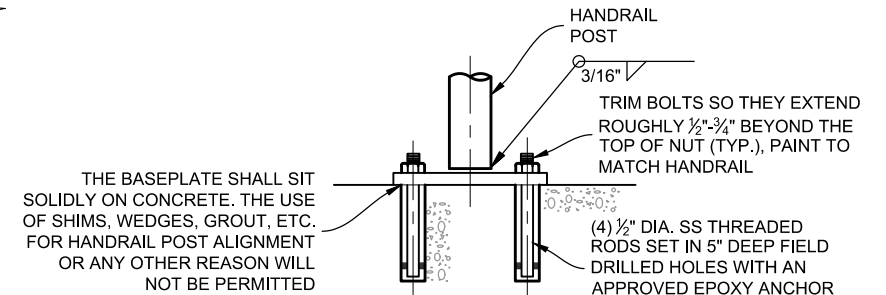
PLAN



HANDRAIL

NOTE:

- EXPANSION JOINTS (SLIP JOINTS) ARE REQUIRED AT INTERVALS NOT TO EXCEED 40 FEET. JOINTS SHALL BE LOCATED WITHIN 6 INCHES OF POSTS WITH INTERNAL SLEEVE EXTENDING 2 INCHES BEYOND JOINT.



HANDRAIL ANCHOR DETAIL
N.T.S.

THE BASEPLATE SHALL SIT SOLIDLY ON CONCRETE. THE USE OF SHIMS, WEDGES, GROUT, ETC. FOR HANDRAIL POST ALIGNMENT OR ANY OTHER REASON WILL NOT BE PERMITTED

COUNTY ENGINEER

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ENGINEERING DIVISION ACCEPTANCE BLOCK

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DESIGNED: MKN

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PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY



TIMBERS CREEK IMPROVEMENTS

CIVIL

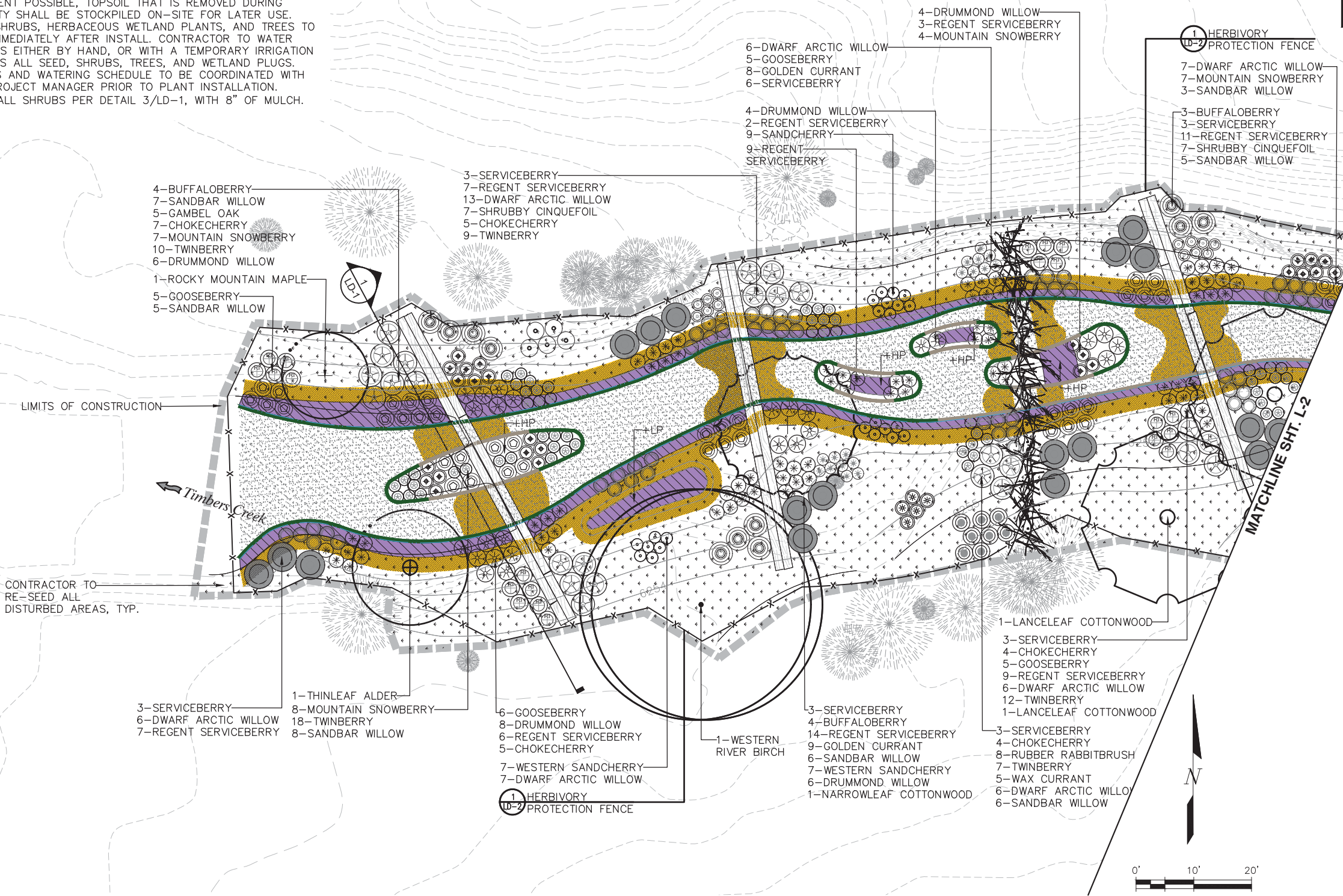
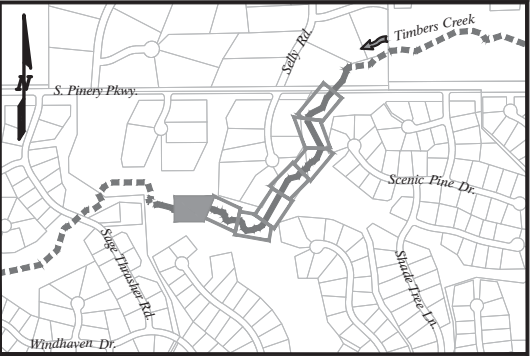
MISCELLANEOUS DETAILS

DATE
10/18/19

DRAWING NO.
C-28

SHEET NO.
31 OF 45

- NOTES:
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 8. CONTRACTOR TO INSTALL SHRUBS PER DETAIL 3/LD-1, WITH 8" OF MULCH.



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
- HERBIVORY PROTECTION FENCE
- HIGH POINT
- LOW POINT

COUNTY ENGINEER _____

DATE _____

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

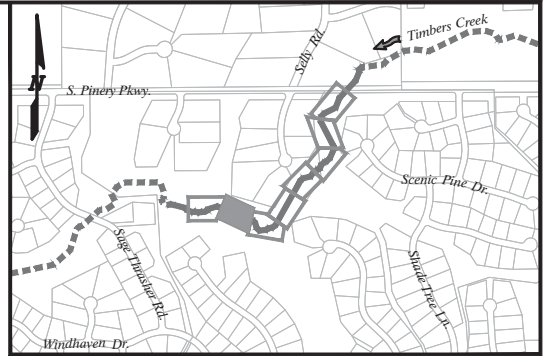
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PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	<table><tr><th colspan="4">SHEET REVISIONS</th></tr><tr><th>NO.</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table>	SHEET REVISIONS				NO.	DATE	DESCRIPTION	BY																																	DHM DESIGN	MHFD MILE HIGH FLOOD DISTRICT			LANDSCAPE	DATE 10-18-2019
SHEET REVISIONS																																																	
NO.	DATE			DESCRIPTION	BY																																												
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MATCHLINE SHT. L-1

MATCHLINE SHT. L-3



KEYMAP
SCALE: 1"=1500'

- NOTES:
1. REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
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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
	HERBIVORY PROTECTION FENCE
	HIGH POINT
	LOW POINT

COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE
10-18-2019

DRAWING NO.
L-2

SHEET NO.
33 OF 45

LANDSCAPE

LANDSCAPE PLAN

3-BUFFALOBERRY
9-THREE-LEAF SUMAC
3-CHOKECHERRY
9-TWINBERRY
7-DRUMMOND WILLOW
3-SERVICEBERRY
9-GOLDEN CURRANT
7-DWARF ARCTIC WILLOW
8-MOUNTAIN SNOWBERRY

1-WESTERN RIVER BIRCH
6-BUFFALOBERRY
1-BEBBS WILLOW
6-SERVICEBERRY
6-DRUMMOND WILLOW
8-DWARF ARCTIC WILLOW
8-MOUNTAIN SNOWBERRY
8-RUBBER RABBITBRUSH
8-REGENT SERVICEBERRY
8-DWARF ARCTIC WILLOW
10-THREE-LEAF SUMAC

9-TWINBERRY
8-GOLDEN CURRANT
5-DWARF ARCTIC WILLOW
5-SANDBAR WILLOW
6-GOOSEBERRY

5-SANDBAR WILLOW

1-WESTERN RIVER BIRCH

1-AMERICAN PLUM
LIMITS OF CONSTRUCTION

4-CHOKECHERRY
9-GOLDEN CURRANT
18-TWINBERRY
5-SANDBAR WILLOW
7-MOUNTAIN SNOWBERRY
7-DWARF ARCTIC WILLOW

5-RUBBER RABBITBRUSH
7-WOODS ROSE
5-WESTERN SANDCHERRY

5-DRUMMOND WILLOW
6-DWARF ARCTIC WILLOW
11-REGENT SERVICEBERRY

8-REGENT SERVICEBERRY
7-GOLDEN CURRANT
7-MOUNTAIN SNOWBERRY
12-WOODS ROSE
6-SANDBAR WILLOW
7-TWINBERRY

2-DRUMMOND WILLOW
3-REGENT SERVICEBERRY

5-CHOKECHERRY
8-REGENT SERVICEBERRY
8-SHRUBBY CINQUEFOIL
15-DWARF ARCTIC WILLOW
7-GOLDEN CURRANT
3-BUFFALOBERRY

7-REGENT SERVICEBERRY
5-TWINBERRY
7-MOUNTAIN SNOWBERRY
3-SERVICEBERRY
9-SHRUBBY CINQUEFOIL
6-DRUMMOND WILLOW
9-CHOKECHERRY
9-SANDBAR WILLOW
4-DWARF ARCTIC WILLOW
4-DRUMMOND WILLOW
6-BUFFALOBERRY

1-HERBIVORY PROTECTION FENCE
LIMITS OF CONSTRUCTION
7-GAMBEL OAK
7-RUBBER RABBITBRUSH
6-BUFFALOBERRY

CONTRACTOR TO RE-SEED ALL DISTURBED AREAS, TYP.

4-SERVICEBERRY
9-SANDBAR WILLOW
8-DWARF ARCTIC WILLOW
7-SANDBAR WILLOW
6-CHOKECHERRY
6-DWARF ARCTIC WILLOW
5-DRUMMOND WILLOW
10-RUBBER RABBITBRUSH

1-COMMON HACKBERRY

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY

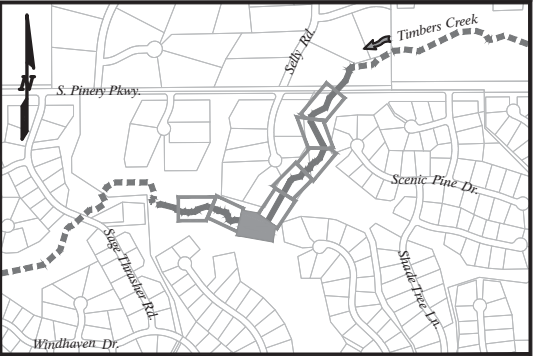
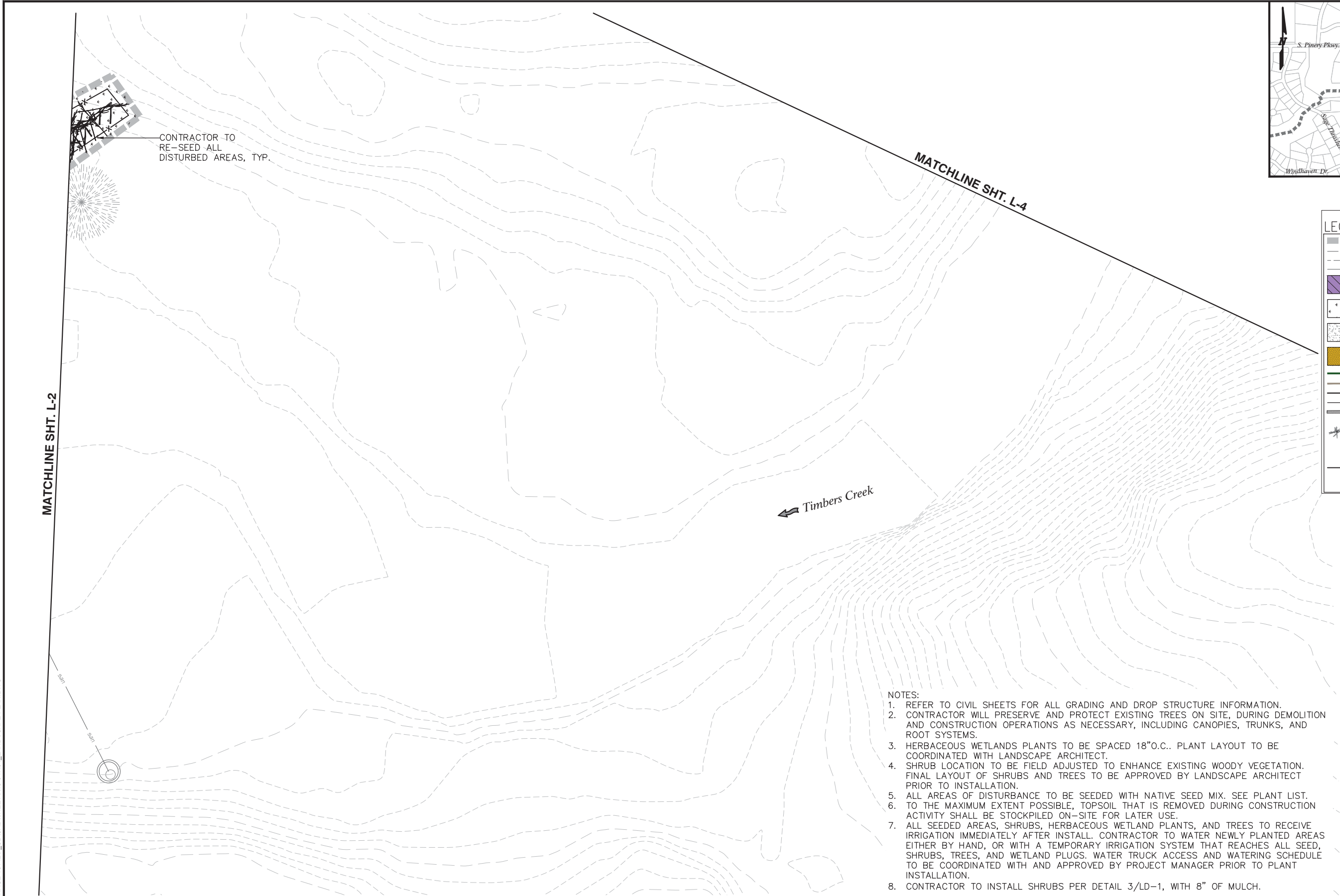
DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRO DISTRICT

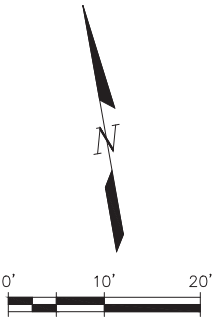
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KEYMAP
SCALE: 1"=1500'

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
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	TYPE 2 CONTROL STRUCTURE RE: CIVIL
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	EXISTING TREE TO REMAIN
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	+HP HIGH POINT
	+LP LOW POINT

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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED:

DRAWN:

CHECKED:

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY

DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRO DISTRICT

LANDSCAPE

LANDSCAPE PLAN

DATE

10-18-2019

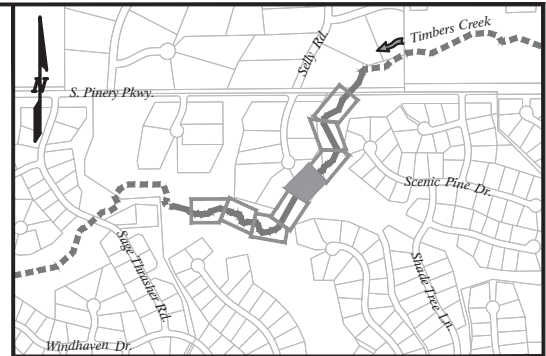
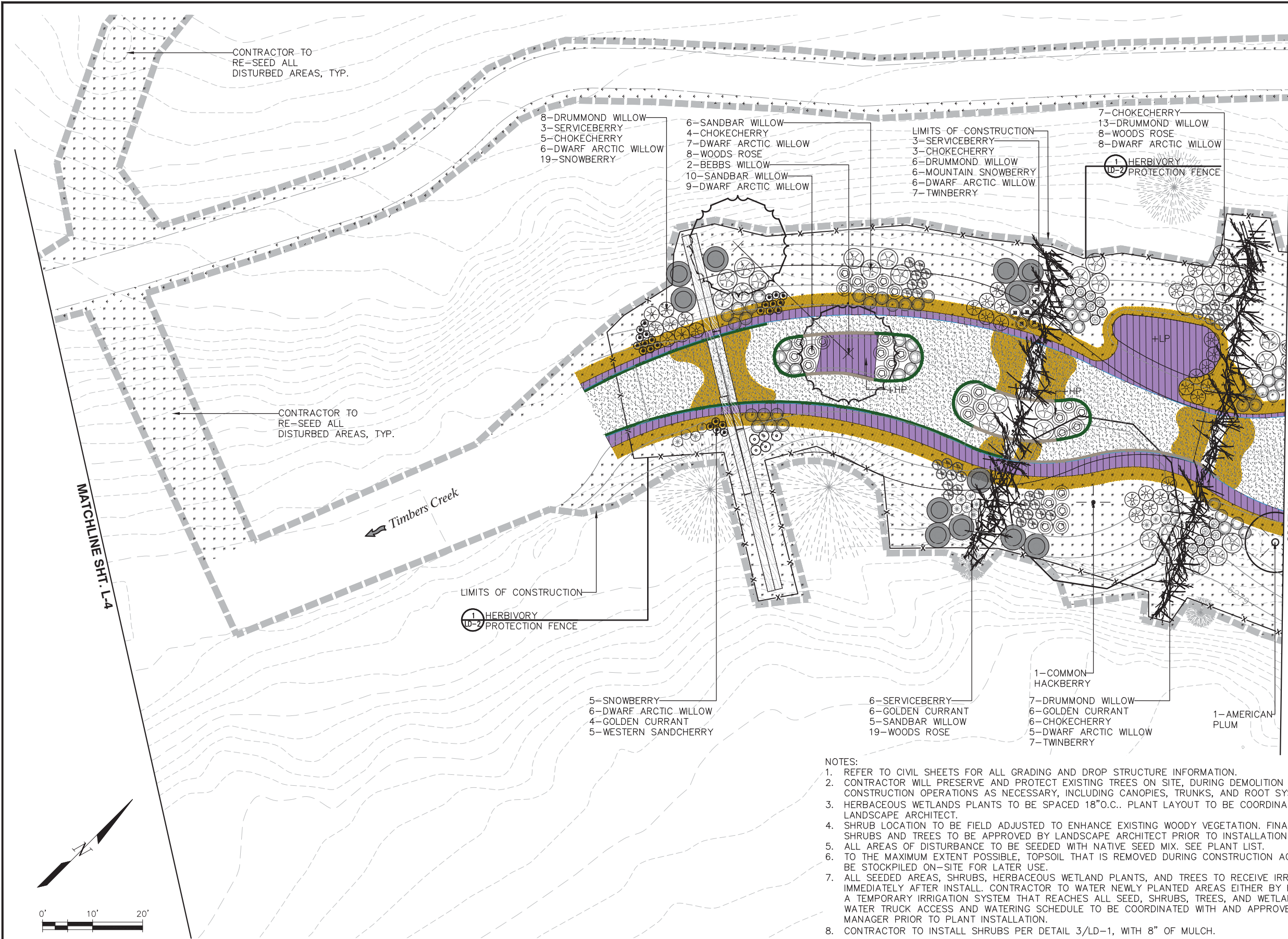
DRAWING NO.

L-3

SHEET NO.

34 OF 45

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KEYMAP
SCALE: 1"=1500'

LEGEND	
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	EXISTING MAJOR CONTOURS
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ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE
10-18-2019

DRAWING NO.
L-5

SHEET NO.

36 OF 45

PREPARED UNDER
THE SUPERVISION OF

DESIGNED:

DRAWN:

CHECKED:

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY

DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRO DISTRICT

LANDSCAPE

LANDSCAPE PLAN

- NOTES:
1. REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
 2. CONTRACTOR WILL PRESERVE AND PROTECT EXISTING TREES ON SITE, DURING DEMOLITION AND CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING CANOPIES, TRUNKS, AND ROOT SYSTEMS.
 3. HERBACEOUS WETLANDS PLANTS TO BE SPACED 18"O.C.. PLANT LAYOUT TO BE COORDINATED WITH LANDSCAPE ARCHITECT.
 4. 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.
 6. TO THE MAXIMUM EXTENT POSSIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE STOCKPILED ON-SITE FOR LATER USE.
 7. 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.
 8. CONTRACTOR TO INSTALL SHRUBS PER DETAIL 3/LD-1, WITH 8" OF MULCH.

CONTRACTOR TO RE-SEED ALL DISTURBED AREAS, TYP.

LIMITS OF CONSTRUCTION

3-CHOKECHERRY
6-DRUMMOND WILLOW
5-SANDBAR WILLOW
5-BUFFALOBERRY
6-WAX CURRANT
8-SHRUBBY CINQUEFOIL

5-CHOKECHERRY
6-GOOSEBERRY
7-WESTERN SANDCHERRY
2-SERVICEBERRY
7-MOUNTAIN SNOWBERRY
7-DRUMMOND WILLOW
8-GAMBEL OAK
5-DWARF ARCTIC WILLOW

10-CHOKECHERRY
6-SHRUBBY CINQUEFOIL
5-MOUNTAIN MAHOGANY
5-RUBBER RABBITBRUSH
6-MOUNTAIN SNOWBERRY

6-DRUMMOND WILLOW
7-MOUNTAIN SNOWBERRY
7-THREE-LEAF SUMAC
5-RUBBER RABBITBRUSH
6-WAX CURRANT
5-GOOSEBERRY
3-CHOKECHERRY

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
- HERBIVORY PROTECTION FENCE
- HIGH POINT
- LOW POINT

COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE

10-18-2019

DRAWING NO.

L-7

SHEET NO.

38 OF 45

PLOTTED: 10/18/2019 3:33:38 PM
NAME: P:\DENVER\TIMBERS DRAINAGE-181427_CD\CAD\SHEETS\18-047.01_LANDSCAPE PLAN.DWG

PREPARED UNDER THE SUPERVISION OF

DESIGNED:

DRAWN:

CHECKED:

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY

DHM DESIGN

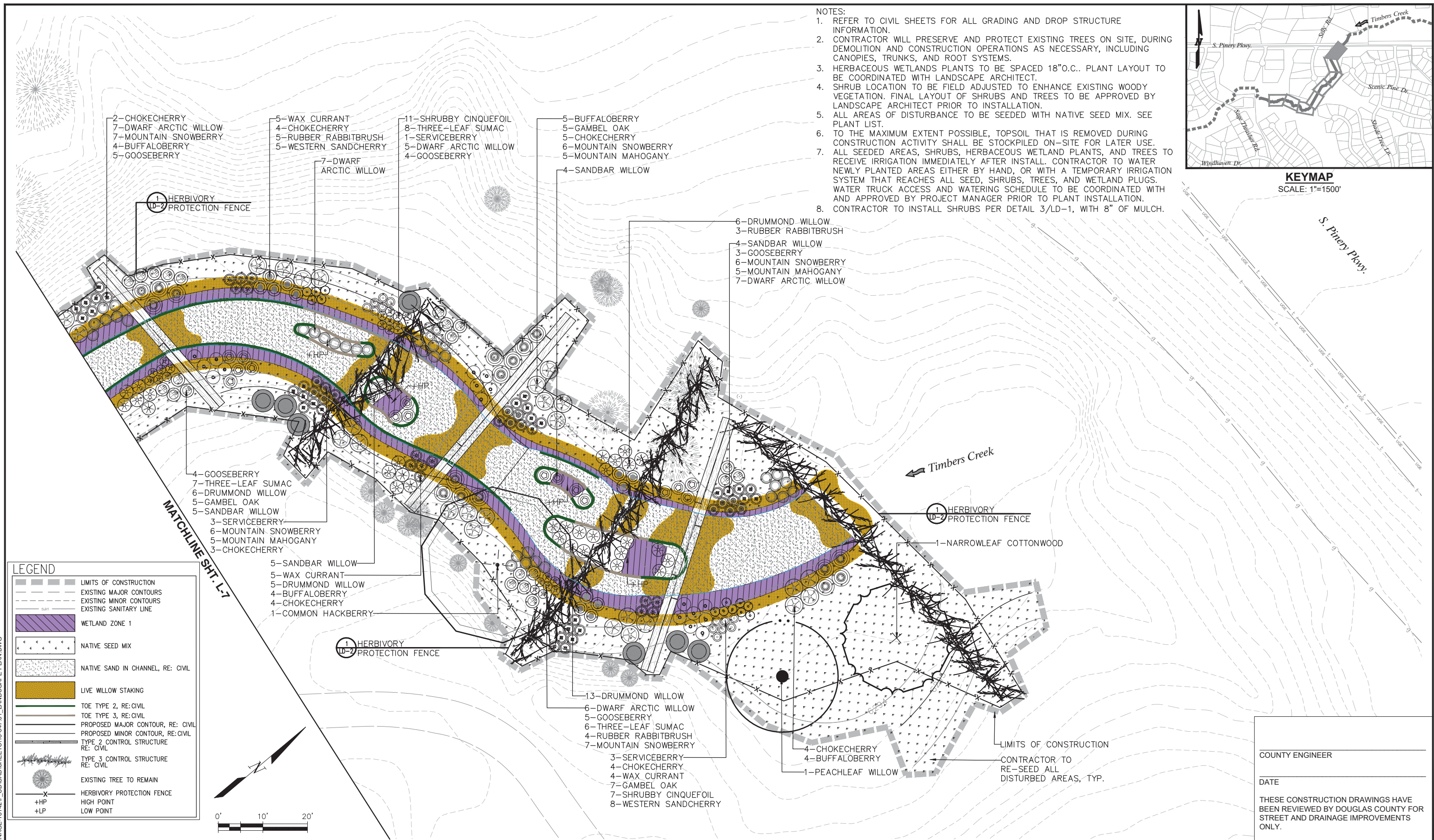
MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
METRO DISTRICT

LANDSCAPE

LANDSCAPE PLAN



KEYMAP
SCALE: 1"=1500'

- NOTES:
1. REFER TO CIVIL SHEETS FOR ALL GRADING AND DROP STRUCTURE INFORMATION.
2. 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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5. ALL AREAS OF DISTURBANCE TO BE SEEDED WITH NATIVE SEED MIX. SEE PLANT LIST.
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7. 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.
8. CONTRACTOR TO INSTALL SHRUBS PER DETAIL 3/LD-1, WITH 8" OF MULCH.

← Timbers Creek

—1—NARROWLEAF COTTONWOOD

—LIMITS OF CONSTRUCTION
—CONTRACTOR TO
RE-SEED ALL
DISTURBED AREAS, TYP.

COUNTY ENGINEER

DATE _____

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ENGINEERING DIVISION ACCEPTANCE BLOCK

DATE
0-18-2019

DRAWING NO.

SHEET NO.

9 OF 45

LANDSCAPE

LANDSCAPE PLAN

2-CHOKECHERRY
7-DWARF ARCTIC WILLOW
7-MOUNTAIN SNOWBERRY
4-BUFFALOBERRY
5-GOOSEBERRY

5-WAX CURRANT
4-CHOKECHERRY
5-RUBBER RABBITBRUSH
5-WESTERN SANDCHERRY

11-SHRUBBY CINQUEFOIL
8-THREE-LEAF SUMAC
1-SERVICEBERRY
5-DWARF ARCTIC WILLOW
4-GOOSEBERRY

5-BUFFALOBERRY
5-GAMBEL OAK
5-CHOKECHERRY
6-MOUNTAIN SNOWBERRY
5-MOUNTAIN MAHOGANY

4-SANDBAR WILLOW

6-DRUMMOND WILLOW
3-RUBBER RABBITBRUSH
4-SANDBAR WILLOW
3-GOOSEBERRY
6-MOUNTAIN SNOWBERRY
5-MOUNTAIN MAHOGANY
7-DWARF ARCTIC WILLOW

4-GOOSEBERRY
7-THREE-LEAF SUMAC
6-DRUMMOND WILLOW
5-GAMBEL OAK
5-SANDBAR WILLOW
3-SERVICEBERRY
6-MOUNTAIN SNOWBERRY
5-MOUNTAIN MAHOGANY
3-CHOKECHERRY

5-SANDBAR WILLOW
5-WAX CURRANT
5-DRUMMOND WILLOW
4-BUFFALOBERRY
4-CHOKECHERRY
1-COMMON HACKBERRY

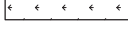
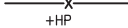
1 HERBIVORY
LD-2 PROTECTION FENCE

13-DRUMMOND WILLOW
6-DWARF ARCTIC WILLOW
5-GOOSEBERRY
6-THREE-LEAF SUMAC
4-RUBBER RABBITBRUSH
7-MOUNTAIN SNOWBERRY

—4-CHOKECHERRY
4-BUFFALOBERRY
—1-PEACHLEAF WILLOW

3-SERVICEBERRY
4-CHOKECHERRY
4-WAX CURRANT
7-GAMBEL OAK
7-SHRUBBY CINQUEFOIL
8-WESTERN SANDCHERRY

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
	HERBIVORY PROTECTION FENCE
	HIGH POINT
	LOW POINT

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

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DHM DESIGN

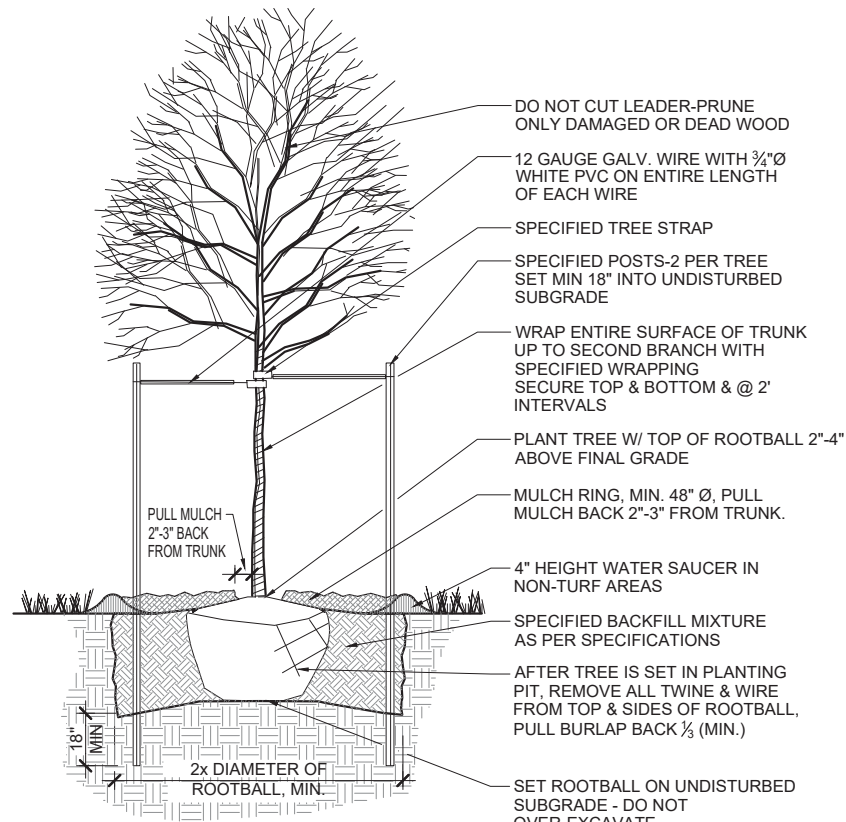


MHFD
MILE HIGH FLOOD DISTRICT



DOUGLAS COUNTY
COLORADO



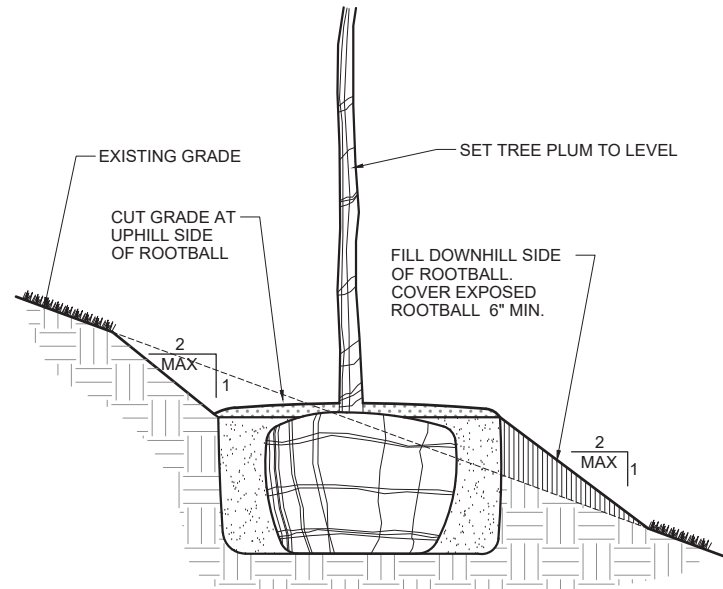


NOTE: MULCH SHOULD BE 8" DEEP.

1 DECIDUOUS TREE PLANTING

LD-1

NOT TO SCALE

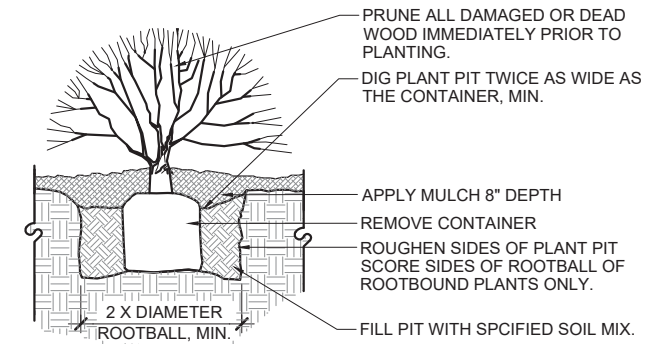


- NOTES:
1. REFER TO VARIOUS SPECIFIC TREE INSTALLATION DETAILS FOR STAKING, GUYING, MULCHING, ETC.
 2. THIS INSTALLATION SHALL APPLY TO ALL TREE TYPES AND SIZES PLANTED ON SLOPES LESS THAN 2:1.

2 TREE PLANTING ON SLOPE

LD-1

NOT TO SCALE

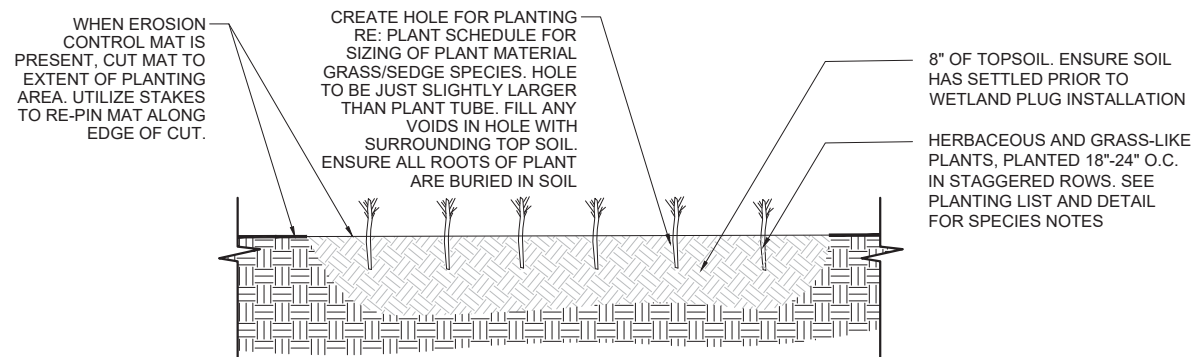


- NOTES:
1. ANY BROKEN OR CRUMBLING ROOTBALLS WILL BE REJECTED.
 2. REMOVING THE CONTAINERS WILL NOT BE AN EXCUSE FOR DAMAGED ROOTBALLS.

3 SHRUB PLANTING

LD-1

NOT TO SCALE



SECTION- PLANTING

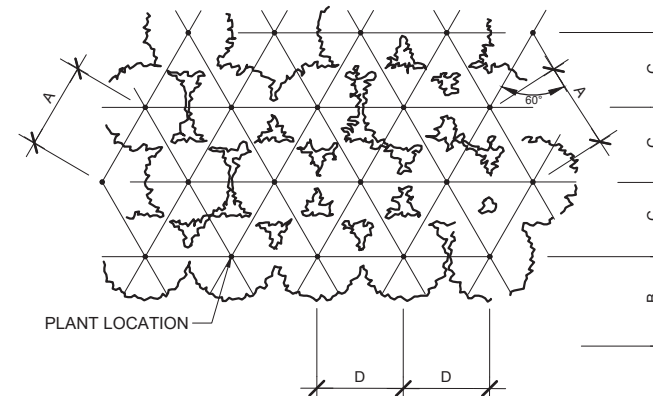
NOTES:

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.

4 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"	15½"	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"

5 WETLAND PLANT TRIANGULAR SPACING FOR PLANTING LAYOUT

LD-1

NOT TO SCALE

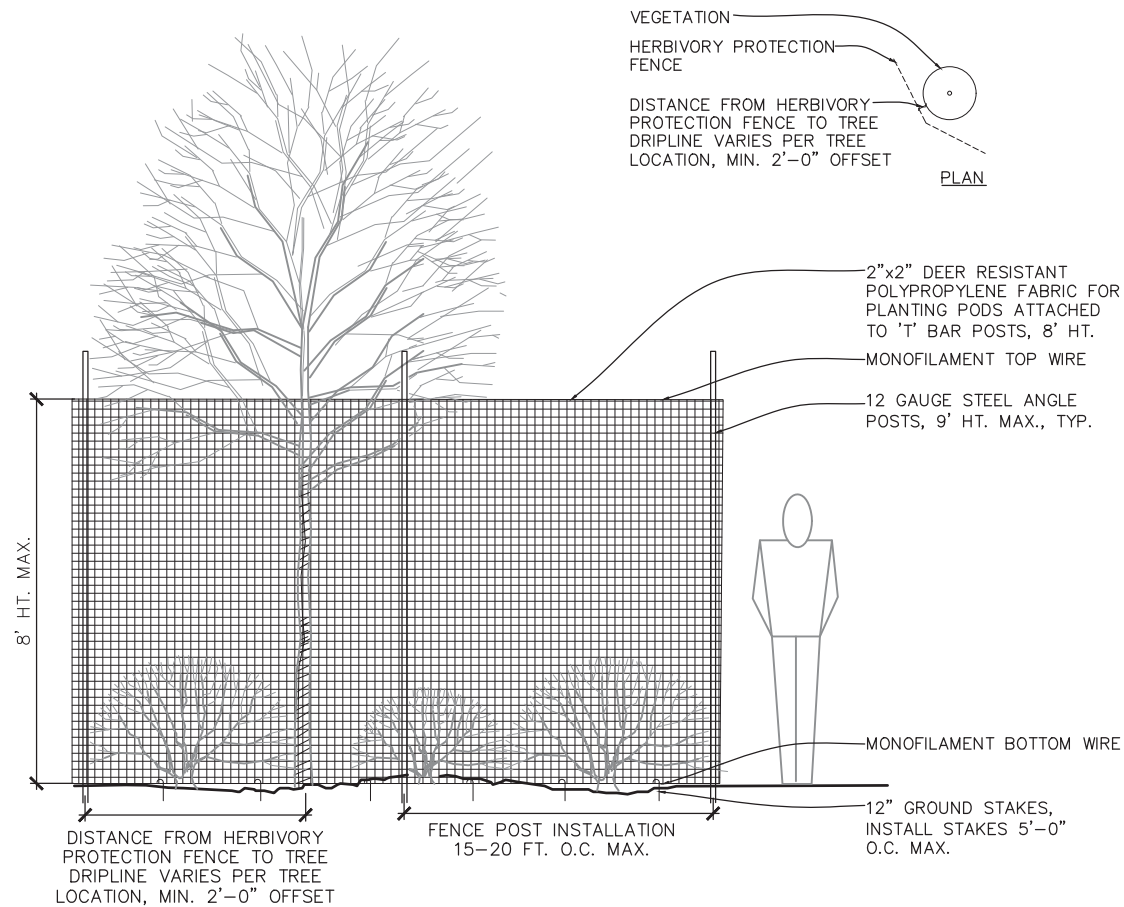
COUNTY ENGINEER

DATE

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ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	PROJECT NO. 18-047.01	SHEET REVISIONS				DHM DESIGN	Mile High Flood District	Douglas County Colorado	HPF Wetland District	LANDSCAPE	DATE 10-18-2019
	DRAWN:			NO.	DATE	DESCRIPTION	BY						DRAWING NO. LD-1
	CHECKED:												SHEET NO. 40 OF 45

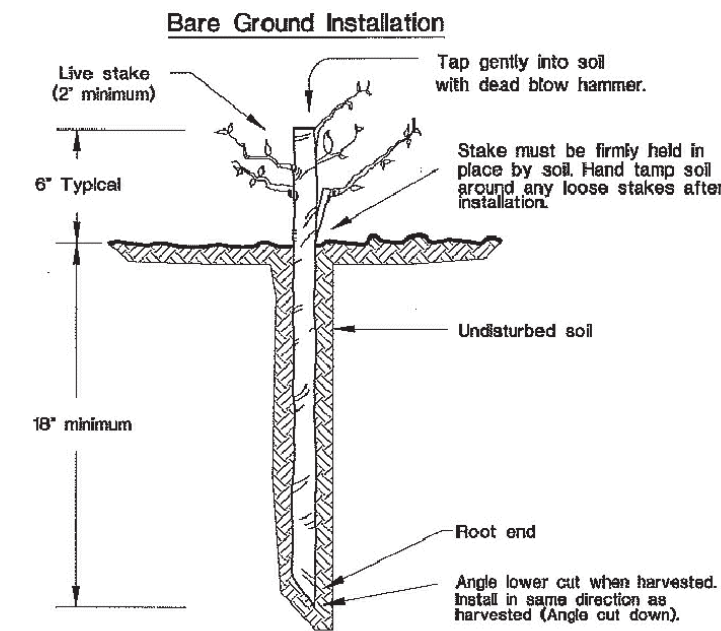


- NOTES:
1. REFER TO LANDSCAPE PLANS FOR HERBIVORY PROTECTION FENCING PLAN.
 2. 12 GAUGE STEEL ANGLE POSTS WITH MANUFACTURER-DRILLED EYE HOLES FOR FASTENING FENCE FABRIC, TO BE SPACED APPROPRIATELY TO ENSURE INTEGRITY OF FENCE.
 3. LOCATION OF FENCING TO BE FIELD APPROVED BY LANDSCAPE ARCHITECT. INSTALL ACCESS GATES AT LOCATIONS AS DIRECTED BY THE PM PER PLANTING POD FOR MAINTENANCE ACCESS.
 4. INSTALL SPECIFIED GROUND STAKES. DRIVE 12" ALUMINUM STAKES AS PROVIDED BY THE MANUFACTURER EVERY 5'-0" O.C. MAX AT FENCE LINE. INSTALL VERTICALLY PLUMB.

1
LD-2

HERBIVORY PROTECTION FENCE

NOT TO SCALE



- NOTE:
1. DETAIL OF WILLOW STAKE REFERENCED FROM MILE HIGH FLOOD DISTRICTS SPECIFICATIONS "SOIL BIOENGINEERING OR SHORELINE STABILIZATION - 329343". REFER TO SPECIFICATION SECTION FOR ADDITIONAL NOTES AND INFORMATION.
 2. LIVE STAKES SHALL BE SINGLE STICKS. THEY SHALL BE TWENTY-FOUR (24) INCHES LONG, TAKEN FROM LOWER STEMS OF HEALTHY, ACTIVELY GROWING PLANTS, APPROXIMATELY ONE-HALF (1/2) TO ON (1) INCH IN DIAMETER.
 3. ALL SIDE BRANCHES SHALL BE TRIMMED.
 4. CUTTINGS SHALL BE PLANTED IN A STAGGERED PATTERN OR RANDOM PATTERN IN THE LOCATIONS SHOWN ON THE DRAWINGS AT THE DESIGNATED DENSITY.
 5. CUTTING SHALL PROTRUDE FROM THE GROUND FOUR (4) TO SIX (6) INCHES. AT LEAST TWO-THIRDS (2/3) OF EACH CUTTING SHALL BE INSERTED INTO THE SOIL.
 6. HOLES SHALL BE BACKFILLED WITH AN APPROVED SOIL, AS NECESSARY, SO THAT NO VOIDS REMAIN AROUND THE CUTTING.

2
LD-2

LIVE WILLOW STAKING

NOT TO SCALE

COUNTY ENGINEER

DATE

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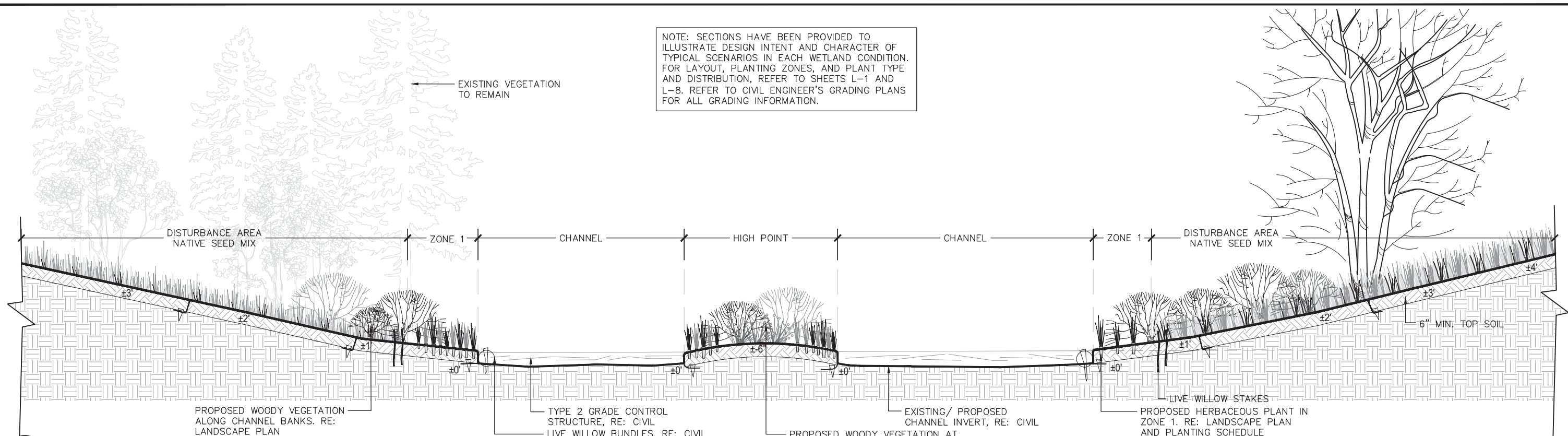
ENGINEERING DIVISION ACCEPTANCE BLOCK

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PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	PROJECT NO. 18-047.01	SHEET REVISIONS				DHM DESIGN	MILE HIGH FLOOD DISTRICT	DOUGLAS COUNTY COLORADO	HPF WETLAND DISTRICT	LANDSCAPE	DATE 10-18-2019
	DRAWN:			DRAWING NO. LD-2									
	CHECKED:			SHEET NO. 41 OF 45									

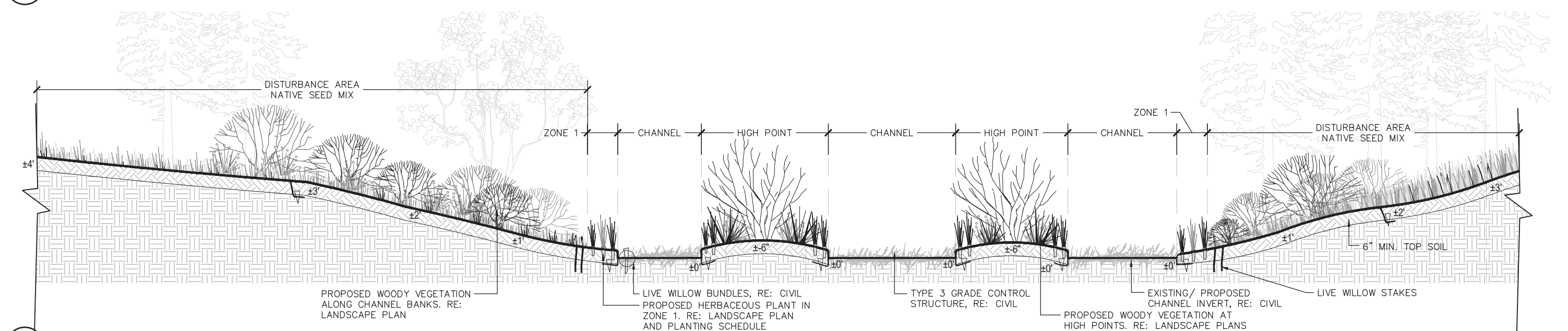
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NOTE: SECTIONS HAVE BEEN PROVIDED TO ILLUSTRATE DESIGN INTENT AND CHARACTER OF TYPICAL SCENARIOS IN EACH WETLAND CONDITION. FOR LAYOUT, PLANTING ZONES, AND PLANT TYPE AND DISTRIBUTION, REFER TO SHEETS L-1 AND L-8. REFER TO CIVIL ENGINEER'S GRADING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



1
LD-3
CONSTRUCTED WETLAND #1 - CROSS SECTION

NOT TO SCALE



2
LD-3
CONSTRUCTED WETLAND #2 - CROSS SECTION

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
Typha latifolia-broad-leaved cattail

WOODY PLANTS

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

WOODY PLANTS

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
Salix exigua-sandbar willow

WOODY PLANTS

Salix purpurea nana-dwarf arctic willow
Shepherdia argentea-buffaloberry
Symphoricarpos occidentalis-western snowberry
Symphoricarpos oreophilus-snowberry

COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK

PREPARED UNDER THE SUPERVISION OF

DESIGNED:

DRAWN:

CHECKED:

100% PLANS

PROJECT NO. 18-047.01

SHEET REVISIONS

NO.	DATE	DESCRIPTION	BY

DHM DESIGN

MHFD
MILE HIGH FLOOD DISTRICT

DOUGLAS COUNTY
COLORADO

HPF
WETLAND DISTRICT

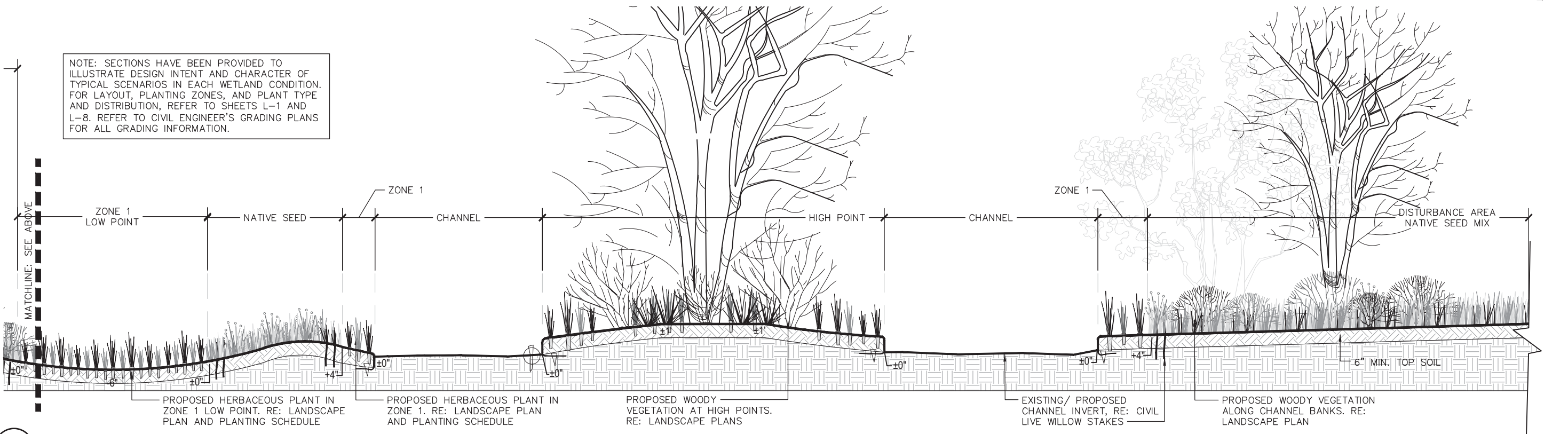
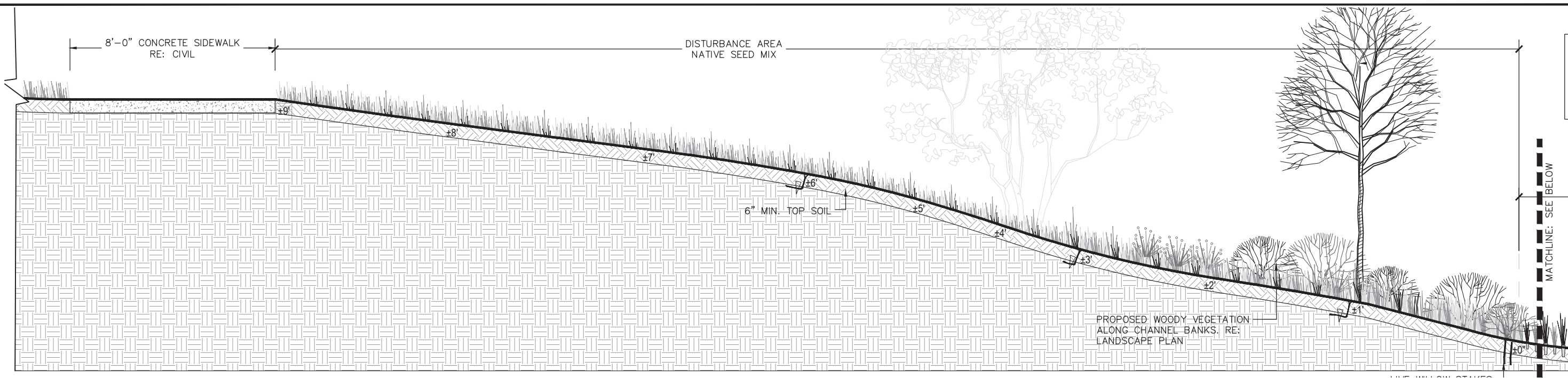
LANDSCAPE

CHANNEL CROSS-SECTIONS

DATE
10-18-2019

DRAWING NO.
LD-3

SHEET NO.
42 OF 45



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 AND L-8. REFER TO CIVIL ENGINEER'S GRADING PLANS FOR ALL GRADING INFORMATION.

1 LD-3 CONSTRUCTED WETLAND #3 - CROSS SECTION

- PLANTING NOTES:
1. 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.
 2. 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
Typha latifolia-broad-leaved cattail

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

WOODY PLANTS
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
Salix exigua-sandbar willow

WOODY PLANTS
Salix purpurea nana-dwarf arctic willow
Shepherdia argentea-buffaloberry
Symphoricarpos occidentalis-western snowberry
Symphoricarpos oreophilus-snowberry

NOT TO SCALE

COUNTY ENGINEER
DATE
THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.
ENGINEERING DIVISION ACCEPTANCE BLOCK

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NAME: P:\DENVER\TIMBERS DRAINAGE-181427_CDCAD\SHEETS\18142-DETAILS.DWG

PREPARED UNDER THE SUPERVISION OF	DESIGNED:	100% PLANS	PROJECT NO. 18-047.01	SHEET REVISIONS				DHM DESIGN	Mile High Flood District	Douglas County Colorado	HPF Wetland District	LANDSCAPE	CHANNEL CROSS-SECTIONS	DATE
	DRAWN:			NO.	DATE	DESCRIPTION	BY							10-18-2019
	CHECKED:													DRAWING NO. LD-4
													SHEET NO.	43 OF 45

TIMBERS DRAINAGE PLANTING SCHEDULE					
TREES					
	COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY
	Rocky Mountain Maple	<i>Acer glabrum</i>	10 gal	specimen quality	1
	thinleaf alder	<i>Ainus incana ssp.Tenuifolia</i>	10 gal	specimen quality	2
	western river birch	<i>Betula occidentalis</i>	10 gal	specimen quality	4
	common hackberry	<i>Celtis occidentalis</i>	10 gal	specimen quality	5
	narrowleaf cottonwood	<i>Populus augustifolia</i>	10 gal	specimen quality	1
	narrowleaf cottonwood	<i>Populus augustifolia</i>	#5	specimen quality	1
	narrowleaf cottonwood	<i>Populus augustifolia</i>	#7	specimen quality	1
	plains cottonwood	<i>Populus deltoides monilifera</i>	10 gal	specimen quality	2
	lanceleaf cottonwood	<i>Populus x acuminata</i>	10 gal	specimen quality	5
	American plum	<i>Prunus americana</i>	10 gal	specimen quality	2
	peachleaf willow	<i>Salix amygdaloides</i>	10 gal	specimen quality	2
	Bebb's willow	<i>Salix bebbiana</i>	10 gal	specimen quality	4

COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	QUANTITY
serviceberry	<i>Amelanchier alnifolia</i>	5 gal	cont., 5 canes min., 12"-18" ht.	28
serviceberry	<i>Amelanchier alnifolia</i>	1 gal	cont., 5 canes min., 12"-18" ht.	56
Regent serviceberry	<i>Amelanchier alnifolia</i> 'Regent'	5 gal	cont., 5 canes min., 12"-18" ht.	42
Regent serviceberry	<i>Amelanchier alnifolia</i> 'Regent'	1 gal	cont., 5 canes min., 12"-18" ht.	85
mountain mahogany	<i>Cercocarpus montanus</i>	5 gal	cont., 5 canes min., 12"-18" ht.	7
mountain mahogany	<i>Cercocarpus montanus</i>	1 gal	cont., 5 canes min., 12"-18" ht.	13
rubber rabbitbrush	<i>Ericameria nauseosa</i>	5 gal	cont., 5 canes min., 12"-18" ht.	22
rubber rabbitbrush	<i>Ericameria nauseosa</i>	1 gal	cont., 5 canes min., 12"-18" ht.	43
twinberry	<i>Loniceria involucrata</i>	5 gal	cont., 5 canes min., 12"-18" ht.	53
twinberry	<i>Loniceria involucrata</i>	1 gal	cont., 5 canes min., 12"-18" ht.	107
shrubby cinquefoil	<i>Pentaphylloides floribunda</i>	5 gal	cont., 5 canes min., 12"-18" ht.	31
shrubby cinquefoil	<i>Pentaphylloides floribunda</i>	1 gal	cont., 5 canes min., 12"-18" ht.	62
western sand cherry	<i>Prunus besseyi</i>	5 gal	cont., 5 canes min., 12"-18" ht.	23
western sand cherry	<i>Prunus besseyi</i>	1 gal	cont., 5 canes min., 12"-18" ht.	47
chokecherry	<i>Prunus virginiana</i> var. <i>melanocarpa</i>	5 gal	cont., 5 canes min., 12"-18" ht.	78
chokecherry	<i>Prunus virginiana</i> var. <i>melanocarpa</i>	1 gal	cont., 5 canes min., 12"-18" ht.	157
Gambel oak	<i>Quercus gambelii</i>	5 gal	cont., 5 canes min., 12"-18" ht.	16
Gambel oak	<i>Quercus gambelii</i>	1 gal	cont., 5 canes min., 12"-18" ht.	33
three-leaf sumac	<i>Rhus trilobata</i>	5 gal	cont., 5 canes min., 12"-18" ht.	18
three-leaf sumac	<i>Rhus trilobata</i>	1 gal	cont., 5 canes min., 12"-18" ht.	36
golden currant	<i>Ribes aureum</i>	5 gal	cont., 5 canes min., 12"-18" ht.	24
golden currant	<i>Ribes aureum</i>	1 gal	cont., 5 canes min., 12"-18" ht.	49
wax currant	<i>Ribes cereum</i>	5 gal	cont., 5 canes min., 12"-18" ht.	16
wax currant	<i>Ribes cereum</i>	1 gal	cont., 5 canes min., 12"-18" ht.	32
gooseberry	<i>Ribes inerme</i>	5 gal	cont., 5 canes min., 12"-18" ht.	19
gooseberry	<i>Ribes inerme</i>	1 gal	cont., 5 canes min., 12"-18" ht.	40
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., 5 canes min., 12"-18" ht.	71
Drummond willow	<i>Salix drummondiana</i>	5 gal	cont., 5 canes min., 12"-18" ht.	67
Drummond willow	<i>Salix drummondiana</i>	1 gal	cont., 5 canes min., 12"-18" ht.	136
sandbar willow	<i>Salix exigua</i>	5 gal	cont., 5 canes min., 12"-18" ht.	85
sandbar willow	<i>Salix exigua</i>	1 gal	cont., 5 canes min., 12"-18" ht.	170
dwarf Artic willow	<i>Salix purpurea nana</i>	5 gal	cont., 5 canes min., 12"-18" ht.	105
dwarf Artic willow	<i>Salix purpurea nana</i>	1 gal	cont., 5 canes min., 12"-18" ht.	210
buffalobery	<i>Shepherdia argentea</i>	5 gal	cont., 5 canes min., 12"-18" ht.	20
buffalobery	<i>Shepherdia argentea</i>	1 gal	cont., 5 canes min., 12"-18" ht.	41
western snowberry	<i>Symphoricarpos occidentalis</i>	5 gal	cont., 5 canes min., 12"-18" ht.	45
western snowberry	<i>Symphoricarpos occidentalis</i>	1 gal	cont., 5 canes min., 12"-18" ht.	89
snowberry	<i>Symphoricarpos oreophilus</i>	5 gal	cont., 5 canes min., 12"-18" ht.	19
snowberry	<i>Symphoricarpos oreophilus</i>	1 gal	cont., 5 canes min., 12"-18" ht.	37

COMMON NAME	BOTANICAL NAME	SIZE	QUANTITY
Nebraska sedge	<i>Carex nebrascensis</i>		3885
beaked sedge	<i>Carex rostrata</i>		
creeping spikerush	<i>Eleocharis palustris</i>		
scouring rush	<i>Equisetum hyemale</i>		
three-square rush	<i>Schoenoplectus pungens</i>		
bulrush	<i>Scirpus americanus</i>		
broad-leaved cattail	<i>Typha latifolia</i>		

COMMON NAME	BOTANICAL NAME	SIZE	QUANTITY
Bebb willow	<i>Salix bebbiana</i>	36" cutting	15% 418
coyote willow	<i>Salix exigua</i>	36" cutting	55% 1530
dewey-stem willow	<i>Salix irrorata</i>	36" cutting	15% 418
shining willow	<i>Salix lucida</i>	36" cutting	15% 418
			2784

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NATIVE SEED MIX		
COMMON NAME	BOTANICAL NAME	%PLS/ACRE
Big bluestem	<i>Andropogon gerardi</i>	11%
Sideoats Grama, Vaughn	<i>Bouteloua curtipendula</i> 'Vaughn'	11%
Blue Grama, Alma	<i>Bouteloua gracilis</i> 'Alma'	11%
Prairie sandreed	<i>Calamovilfa longifolia</i>	11%
Slender wheatgrass	<i>Elymus trachycaulus</i>	7%
Streambank wheatgrass	<i>Elymus lanceolatus</i>	11%
Yellow Indisgrass	<i>Linum lewisii</i>	11%
Green needlegrass	<i>Nassella viridula</i>	11%
Switchgrass	<i>Panicum virgatum</i>	11%
		95.00%
Fringed Sage	<i>Artemisia frigida</i>	0.07%
Smooth Aster	<i>Aster laevis</i>	0.43%
Blanketflower	<i>Gaillardia aristata</i>	3.31%
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.95%
Showy Goldeneye	<i>Viguiera multiflora</i>	0.24%
		5.00%

12. IF PLANTS ARE NOT AVAILABLE, NOTIFY OWNER FOR APPROVAL OF CHANGE BEFORE MAKING SUBSTITUTIONS.
13. 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.
14. 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
15. THE CONTRACTOR IS RESPONSIBLE FOR WEED CONTROL IN CHANNEL, AT TREES AND SHRUBS, AND SEEDED AREAS UNTIL FINAL ACCEPTANCE.
16. TREE AND SHRUB PLANTINGS TO BE TREATED WITH SPECIFIED FERTILIZER FROM SPECIFICATION SECTION 32 93 00, AS APPROVED BY THE LANDSCAPE ARCHITECT.
17. THE CONTRACTOR SHALL STAKE ALL KEY RESTORATION AREAS AND SHALL RECEIVE APPROVAL FROM THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH CONSTRUCTION.
18. BOUNDARY OF RESTORATION SEEDING TO BE OUTLINED IN THE FIELD BY THE CONTRACTOR, AND APPROVED BY THE LANDSCAPE ARCHITECT.
19. 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..
20. 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.
21. 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.
22. ALL WOODY AND HERBACEOUS PLANT MATERIAL TO BE PLACED IN APPROPRIATE, FIELD VERIFIED HYDROLOGIC ZONE
23. ALL TREES AND SHRUBS TO RECEIVE MINIMUM OF 8" DEPTH OF MULCH, PER DETAIL.

ENGINEERING DIVISION ACCEPTANCE BLOCK

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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 OR CHAIN DRAGGED 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 CRIMPED 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.

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. (FROM MILE HIGH FLOOD DISTRICT'S SPECIFICATION SECTION 32 93 00) 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 (½) INCH BELOW THE NATIVE SOIL. THE HOLES SHOULD NOT BE FORMED MORE THAN ONE-HALF (½) 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.

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 OVBANK/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 RANCH 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. 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 FORM 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. COMMERCIALY 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. NO MORE THAN TWO-THIRDS OF A LIVE PLANT SHOULD BE HARVESTED.
- 4. SIZE:
 - a. CUTTINGS SHOULD BE A MINIMUM OF ½ INCH IN DIAMETER TO ENSURE SUFFICIENT ENERGY FOR ROOTING. CUTTINGS SHALL BE 24"-36" IN LENGTH.
 - 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 AND THE TERMINAL BUD SHALL BE TRIMMED FROM STAKES. 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. 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 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

HERBIVORY PROTECTION FENCE

- 1. REFER TO DETAIL 1/LD-2 FOR FENCING DETAILS.
- 2. REFER TO LANDSCAPE PLANS FOR FENCING LOCATION.

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COUNTY ENGINEER

DATE

THESE CONSTRUCTION DRAWINGS HAVE BEEN REVIEWED BY DOUGLAS COUNTY FOR STREET AND DRAINAGE IMPROVEMENTS ONLY.

ENGINEERING DIVISION ACCEPTANCE BLOCK