



2114 MIDPOINT DRIVE, SUITE 1
FORT COLLINS, CO 80525

ESTIMATED QUANTITIES

MOBILIZATION:	1 L.S.
SITE PREPARATION (TOP SOIL):	1 L.S.
EXCAVATION:	
DEEPEMED DITCH (1,769 C.Y. CUT)	INCIDENTAL
EXCAVATE FISH KETTLE (1,864 C.Y. CUT)	INCIDENTAL
CULVERT DITCH (257 C.Y. CUT)	INCIDENTAL
CONSTRUCTED TOPOGRAPHY:	
REGRADE AUDUBON ENDANGERED FISH POND	2,756 C.Y.-P**
SIDE SLOPES (1,367 C.Y. CUT - INCIDENTAL)	
REGRADE WEST ISLAND (44 C.Y. CUT - INCIDENTAL)	1,960 C.Y.-P**
REGRADE EAST PENINSULA (130 C.Y. CUT - INCIDENTAL)	781 C.Y.-P**
BUILD-UP UNDER WALKING PATH	222 C.Y.-P**
WATER CONTROL STRUCTURES - SUPPLY & INSTALL:	
6' WIDE x 7.2' TALL RUBICON FLUME GATE	1 EA.
24" FRESNO SERIES 6600 MODEL 101C SCREW GATE	2 EA.
CAST-IN-PLACE REINFORCED CONCRETE:	
REINFORCED CONCRETE HEADGATE CHANNEL	1 EA.
REINFORCED CONCRETE KETTLE CHECK	1 EA.
CULVERTS & PIPE - SUPPLY & INSTALL:	
3'x3' x 5'-0" TALL SQUARE MANHOLE	1 EA.
24"Ø 16 GAUGE CORRUGATED METAL PIPE	80 L.F.-A
24"Ø DUAL WALL HDPE (STOP LOG STORAGE CONTAINERS)	14 L.F.-A
2'x3' PRE-CAST CONCRETE BOX CULVERT	38 L.F.-A
2'x3' PRE-CAST CONCRETE BOX CULVERT 90° ELBOW	2 EA.
ROCK RIPRAP - SUPPLY & PLACE:	
DU CLASS II ROCK RIPRAP W/ FILTER FABRIC	98 C.Y.-P
1/4" MINUS GRAVEL W/ FILTER FABRIC (WALKING PATH)	80 C.Y.-P
1/2" MINUS GRAVEL W/ FILTER FABRIC (ACCESS ROAD)	150 C.Y.-P
1/2" MINUS GRAVEL (FISH KETTLE & ACCESS RAMP)	38 C.Y.-P
2" DRAIN ROCK BEDDING	24 C.Y.-P
6" THICK GEOCELLS	2,020 S.F.-A
REMOVAL OF EXISTING CULVERTS AND STRUCTURES	
REMOVE EX. WALKING BRIDGE	1 EA.
MISCELLANEOUS	
2"Ø 18 GAUGE LOCKABLE ROAD GATE	1 EA.
L.F.-A - PAYMENT WILL BE BASED ON ACTUAL QUANTITY SUPPLIED AND INSTALLED	
S.F.-A - PAYMENT WILL BE BASED ON ACTUAL QUANTITY SUPPLIED AND INSTALLED	
C.Y.-P - PAYMENT WILL BE BASED ON THE PLAN QUANTITY LISTED ABOVE.	
** INCLUDES 20% FOR SHRINKAGE.	

SPECIFICATIONS

101	GENERAL CONDITIONS
102	SUPPLEMENTAL CONDITIONS
201	MOBILIZATION
202	SITE PREPARATION
203	EXCAVATION
206	CONSTRUCTED TOPOGRAPHY
301	WATER CONTROL STRUCTURES
304	CAST-IN-PLACE REINFORCED CONCRETE
305	RIPRAP, REVETMENT & AGGREGATE PLACEMENT
307	SHEET PILING
309	STRUCTURAL STEEL
311	REMOVAL OF EXISTING CULVERTS AND STRUCTURES
316	DIKE AND ACCESS ROAD SURFACING
319	DECKING AND RAILINGS
401	SOIL EROSION AND POLLUTION CONTROL

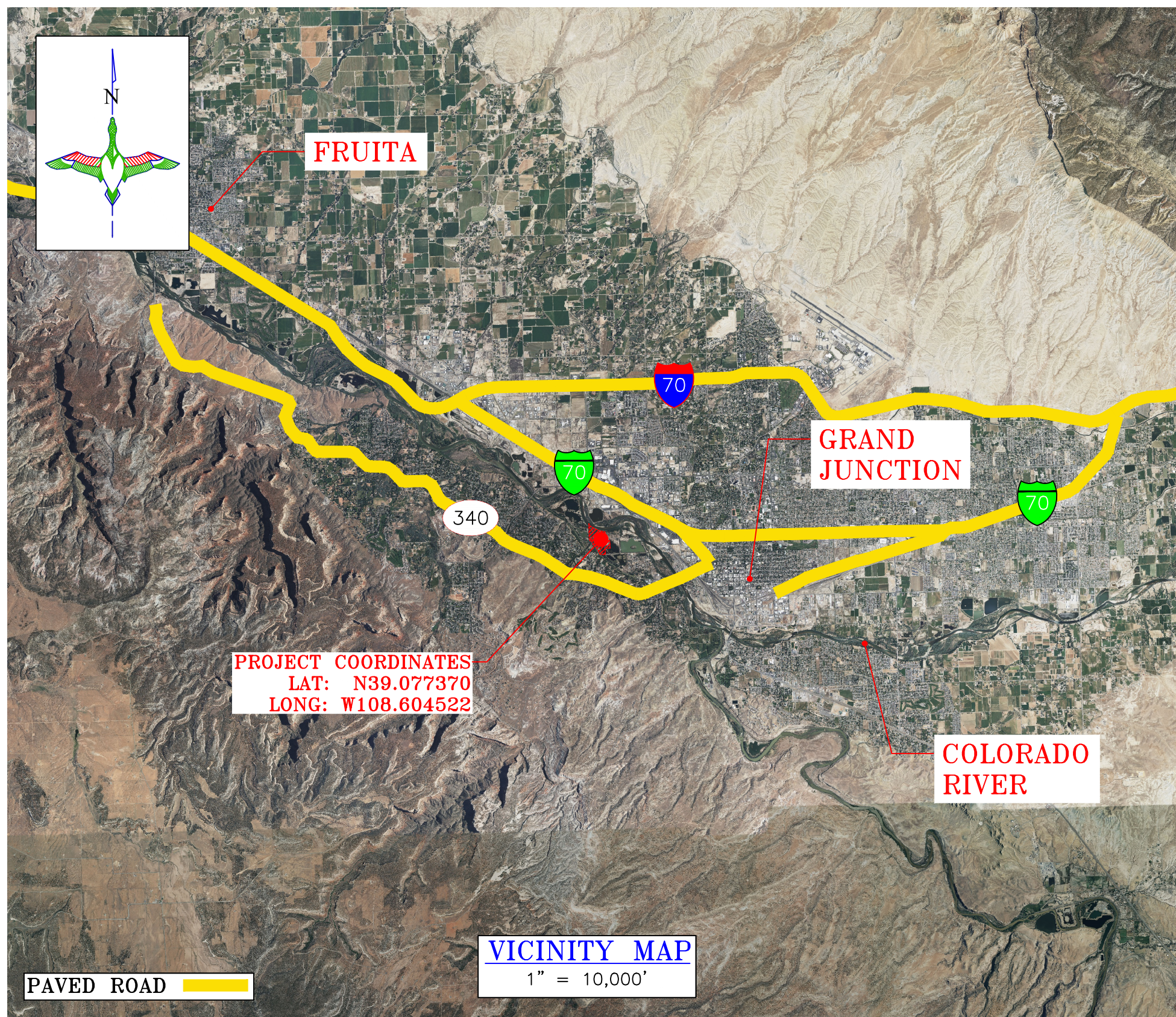
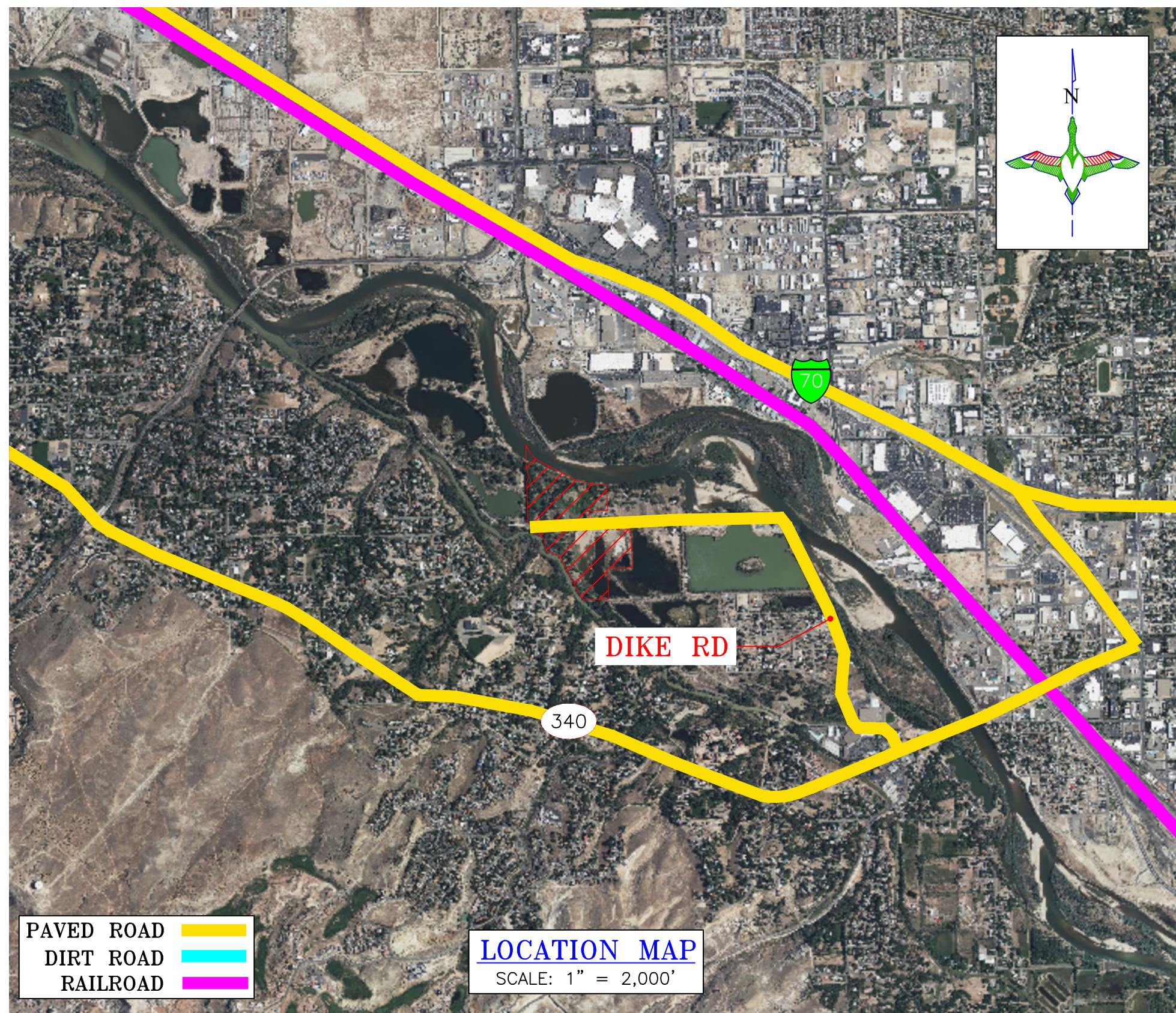
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DUCKS UNLIMITED

PROJECT

GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS
CO-306-4

LOCATED IN SECTION 16
TOWNSHIP (1S), RANGE (1W),
6TH P.M., MESA COUNTY,
COLORADO



PLAN INDEX

- 1 TITLE PAGE & LOCATION MAP
- 2 OVERALL PLAN & CONTROL
- 3 CONCRETE MANHOLE W/ FISH SCREEN
- 4 CONCRETE HEADGATE CHANNEL W/ FISH KETTLE & KETTLE CHECK STRUCTURE
- 5 CONCRETE HEADGATE CHANNEL W/ FISH KETTLE & KETTLE CHECK STRUCTURE DETAILS
- 5A SCREW GATES W/ BOX CULVERT
- 6 FISH KETTLE & FISH KETTLE ACCESS RAMP
- 7 DEEPEMED DITCH
- 7A CULVERT
- 7B CULVERT DITCH
- 8 REGRADE AUDUBON ENDANGERED FISH POND SIDE SLOPES
- 9 REGRADE WEST ISLAND & EAST PENINSULA & CONSTRUCT WALKING PATH & ACCESS ROAD
- 10 PERMANENT & TEMPORARY BEST MANAGEMENT PRACTICES PLAN
- 11 SWMP NOTES



DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:
APPROVED BY:

REVISION:	DATE:	BY:
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS
SHEET TITLE: TITLE PAGE & LOCATION MAP

DATE: 04/17/2025

SHEET TITLE: TITLE PAGE & LOCATION MAP

SCALES ARE ACCURATE ON 24"x36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 1
SHEET 1 OF 11

"BEFORE YOU DIG"

BEFORE THE START OF CONSTRUCTION. THE OWNER OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR/CONTRACTOR IS RESPONSIBLE FOR GIVING THIS NOTICE BY CALLING "ONE CALL OF COLORADO" AT 811. A 72 HOUR NOTIFICATION AND FULL DESCRIPTION OF LOCATION IS REQUIRED.

DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



DIRT BALANCE		
	CUT (CY)	FILL (CY)**
DEEPEINED DITCH	1769	0
FISH KETTLE	1864	0
REGRADE POND SIDE SLOPES	1367	2756
REGRADE WEST ISLAND	44	1960
REGRADE EAST PENINSULA	130	781
WALKING PATH BUILD-UP	0	222
CULVERT DITCH	257	0
NET	5431	5719

**FILL INCLUDES 20% SHRINKAGE FACTOR

LEGEND

SUPPLY WATER PIPELINE

CMP CULVERT

WATER CONTROL STRUCTURE

FISH KETTLE

KETTLE CHECK STRUCTURE

EARTHWORK

DEEPEINED DITCH

ACCESS ROAD

WALKING PATH

MANHOLE W/ FISH SCREEN

BORROW NOTES:

1. STRIP AND STOCKPILE APPROX. 4"-6" OF TOPSOIL FROM PROPOSED BORROW AREA. 4"-6" OF TOPSOIL SHALL BE RESPREAD OVER THE ENTIRE BORROW AREA INCLUDING SIDE SLOPES. COST OF TOPSOIL WORK SHALL BE CONSIDERED INCIDENTAL TO BID ITEM "SITE PREPARATION".

2. SUITABLE MATERIAL FOR ALL FILLS SHALL BE OBTAINED FROM THE DESIGNATED BORROW AREA SHOWN ON THIS SHEET AS APPROVED BY THE DU FIELD ENGINEER. CARE SHALL BE TAKEN NOT TO OPEN UP ANY SAND LENSES THAT WILL INCREASE SEEPAGE FROM ANY EXCAVATION AREAS.

3. BORROW AREAS ARE TO LOOK NATURAL UPON COMPLETION, MAINTAINING VISUAL APPEALING SLOPES. IDEALLY THESE SLOPES SHALL BE 6:1 OR FLATTER. IN ADDITION BORROW AREAS SHALL MAINTAIN HISTORIC DRAINAGE PATHS AND SHALL DRAIN DURING RUNOFF.

4. BORROW AREAS ARE DEFINED AND THE CONTRACTOR NEEDS APPROVAL FROM THE DU ENGINEER TO BORROW OUTSIDE OF THE DEFINED LIMIT.

ABBREVIATIONS LIST

C.L. = CENTER LINE
CMP = CORRUGATED METAL PIPE ROUND
CMPA = CORRUGATED METAL PIPE ARCH
CONC. = CONCRETE
DIA. = DIAMETER
ELEV. = ELEVATION
EMB. = EMBANKMENT
EX. = EXISTING
FES = FLARED END SECTION
FSL = FULL SERVICE LEVEL
GA. = GAUGE
INV. = INVERT
LAT = LATITUDE (WGS84)
LONG = LONGITUDE (WGS84)
L.F. = LINEAR FEET
MISC = MISCELLANEOUS
NFES = NON-FLARED END SECTION

O.C. = ON CENTER
O.C.E.W. = ON CENTER EACH WAY
PLS = PURE LIVE SEED
RCP = REINFORCED CONCRETE PIPE
RD = ROAD
REQ. = REQUIRED
R.O.W. = RIGHT OF WAY
S = SOUTH
SED. = SEDIMENT
TBM = TEMPORARY BENCHMARK
UG = UNDERGROUND
VEG = VEGETATION
W/ = WITH
WCS = WATER CONTROL STRUCTURE
WL = WATER LEVEL
WS = WATER SHOT

*NOTE: NOT ALL ABBREVIATIONS IN THIS LIST APPEAR ON THIS SHEET

EXAMPLE OF DUCKS UNLIMITED CONTROL POINT SURVEY CAP

HORIZONTAL AND VERTICAL CONTROL OPUS SOLUTION - COORDINATES ARE UTM ZONE 12 GRID COORDINATES IN US FEET [NAD83]. THEY WERE ESTABLISHED FROM THE WGS84 ELLIPSOID WITH INFORMATION FROM A TRIMBLE R10 SURVEY GRADE GPS RECEIVER ON AUGUST 02, 2018 AT DUCKS UNLIMITED CONTROL POINT DU-541-18 AND CALIBRATED TO AN OPUS POSITION OCCUPIED FOR 53 MINUTE(S) AND SENT TO NGS FOR SOLUTION. THE VERTICAL CONTROL CAME FROM THE SAME SOLUTION USING GEOID 12A CONUS IN THE NAVD88. THE FULL OPUS SOLUTION REPORT IS ON FILE AT THE DUCKS UNLIMITED ENGINEERING DEPARTMENT IN FORT COLLINS, COLORADO.

PROJECT: GRAND VALLEY AUDUBON CENTER ENDANGERED FISH PONDS

SHEET TITLE: OVERALL PLAN & CONTROL

DATE: 04/17/2025

SCALE: ARE ACCURATE ON 24"x36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 2

SHEET 2 OF 11

DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:

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DU CONSTRUCTION ENGINEER:
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LEGEND

SUPPLY WATER PIPELINE

WATER CONTROL STRUCTURE

FISH KETTLE

KETTLE CHECK STRUCTURE

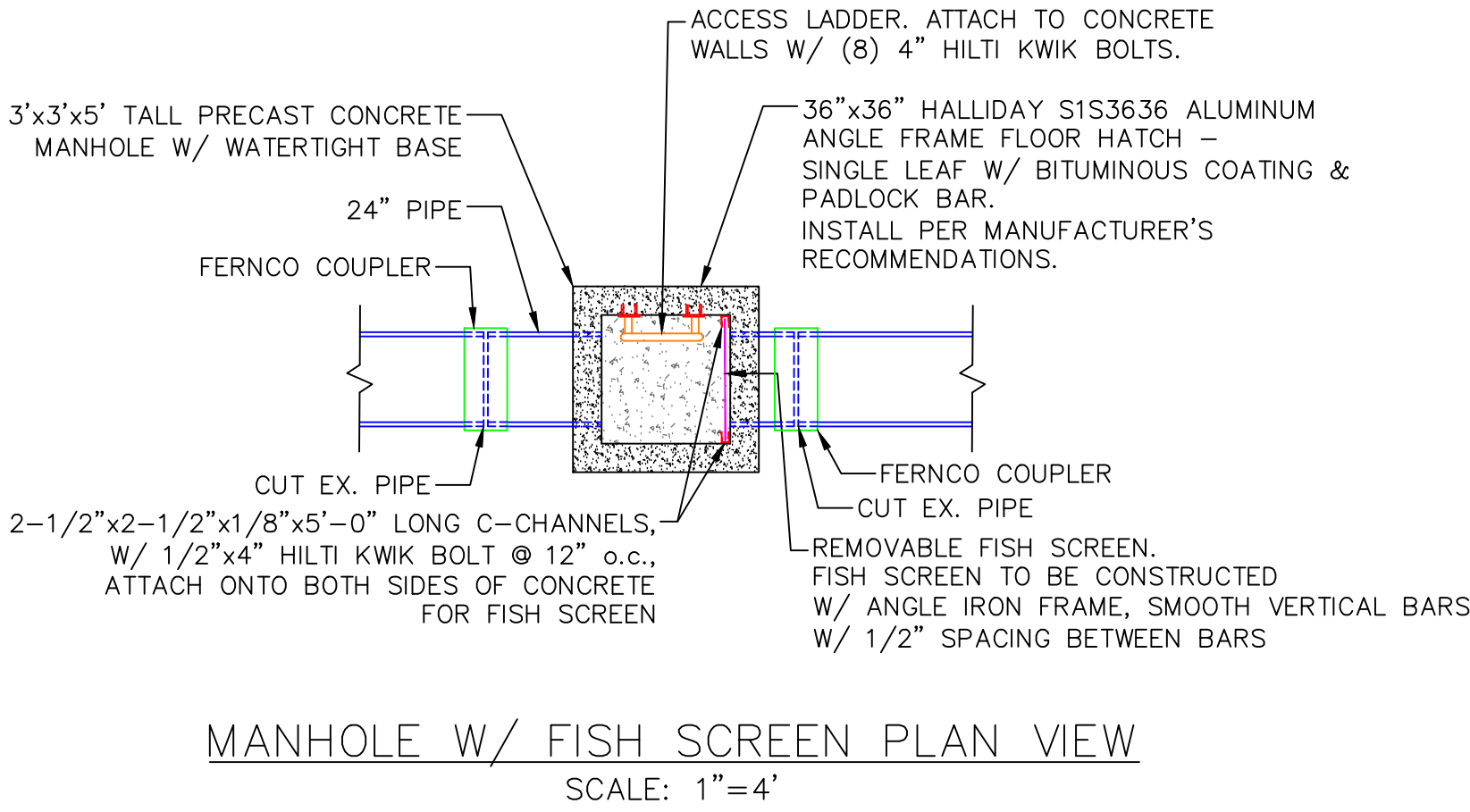
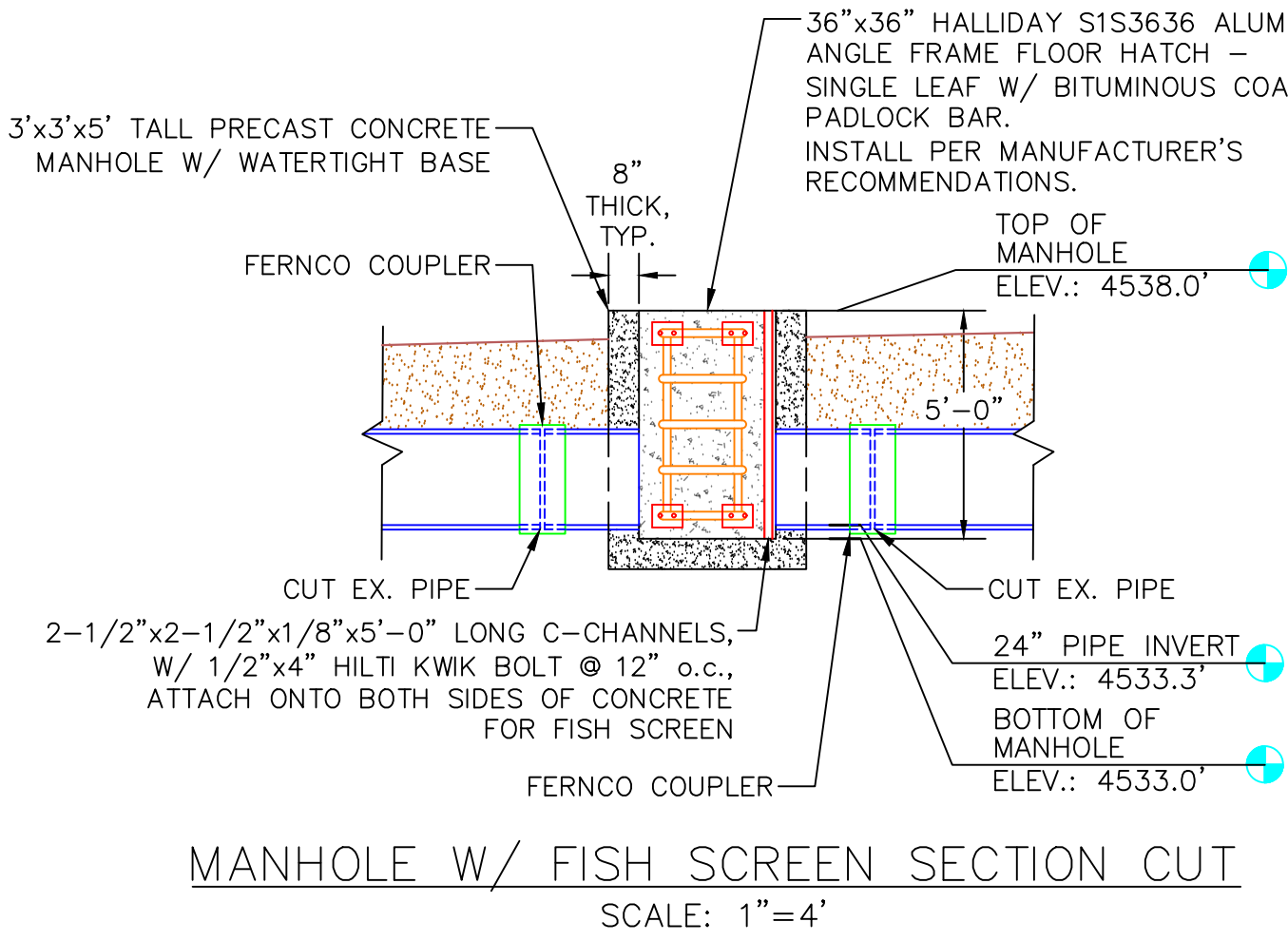
EARTHWORK

DEEPENED DITCH

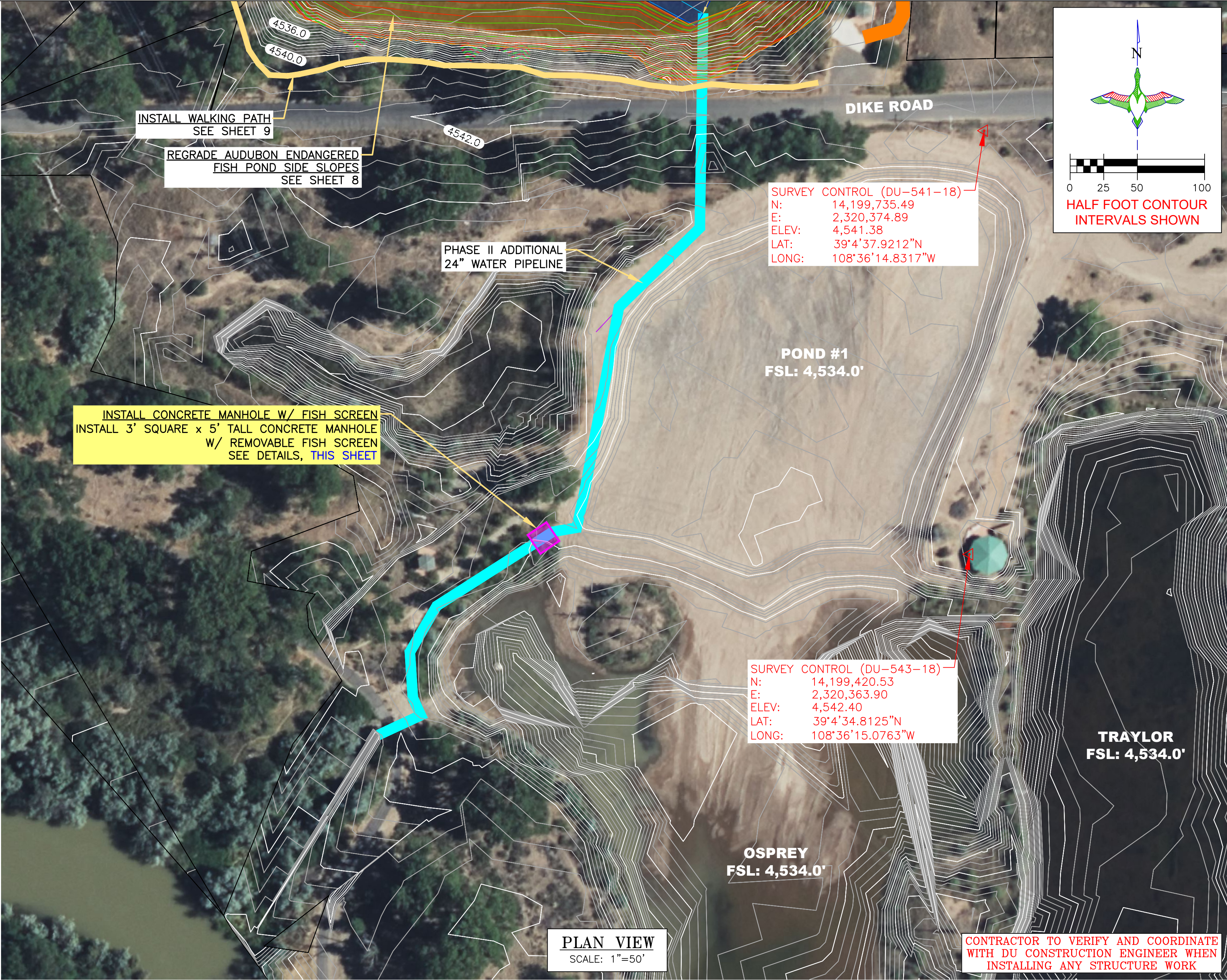
ACCESS ROAD

WALKING PATH

MANHOLE W/ FISH SCREEN




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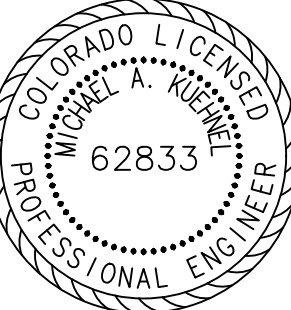
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DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW

DRAWN BY: MAK/JJW

SURVEYED BY: MAK

CHECKED BY:

APPROVED BY:

REVISION:	DATE:	BY:
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PROJECT:

GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE:

CONCRETE MANHOLE W/ FISH SCREEN

DATE:

04/17/2025

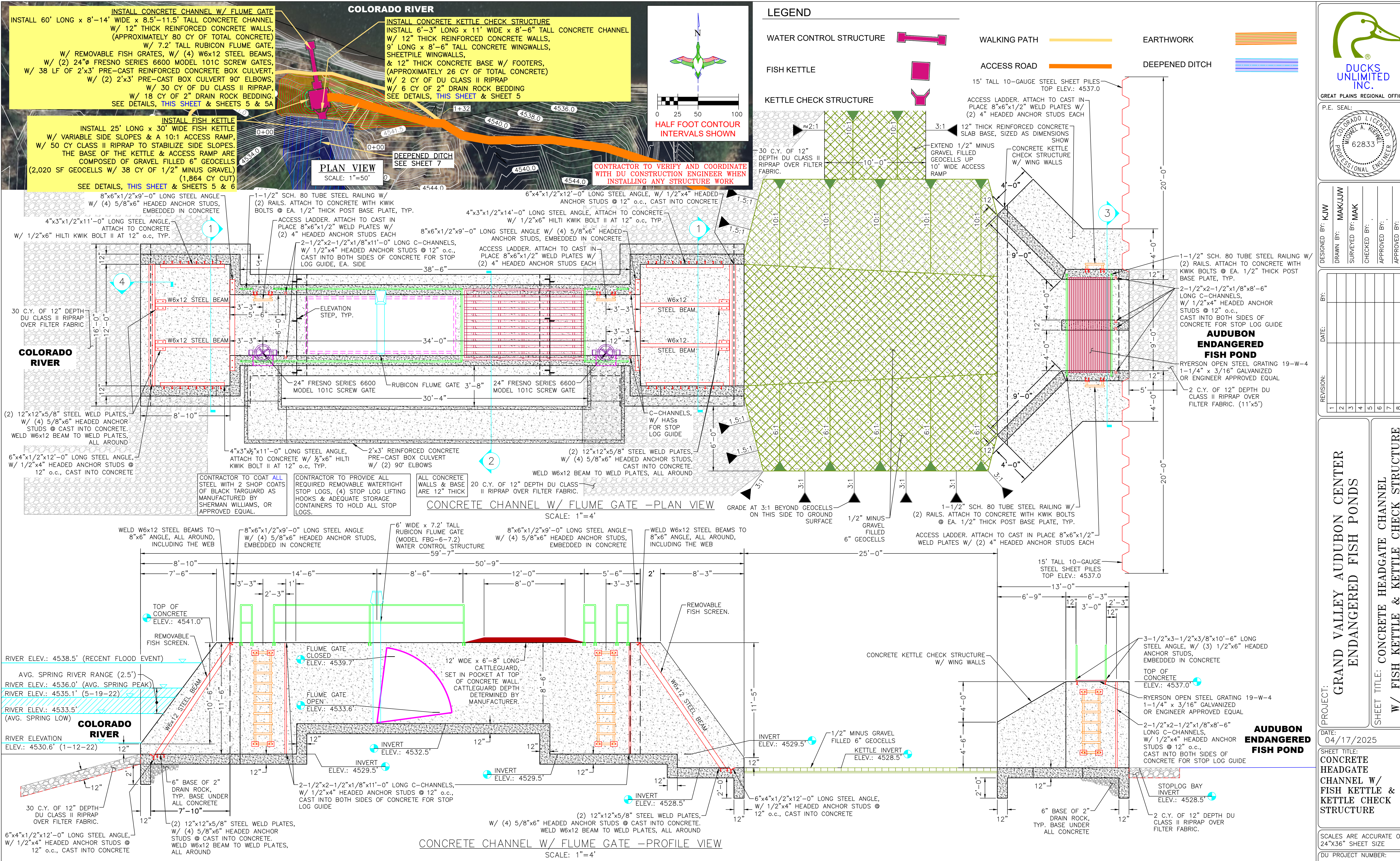
SHEET TITLE:

CONCRETE MANHOLE W/ FISHSCREEN

SCALES ARE ACCURATE ON
24"x36" SHEET SIZE

DU PROJECT NUMBER:
CO-306-4

SHEET NUMBER:
3
SHEET 3 OF 11



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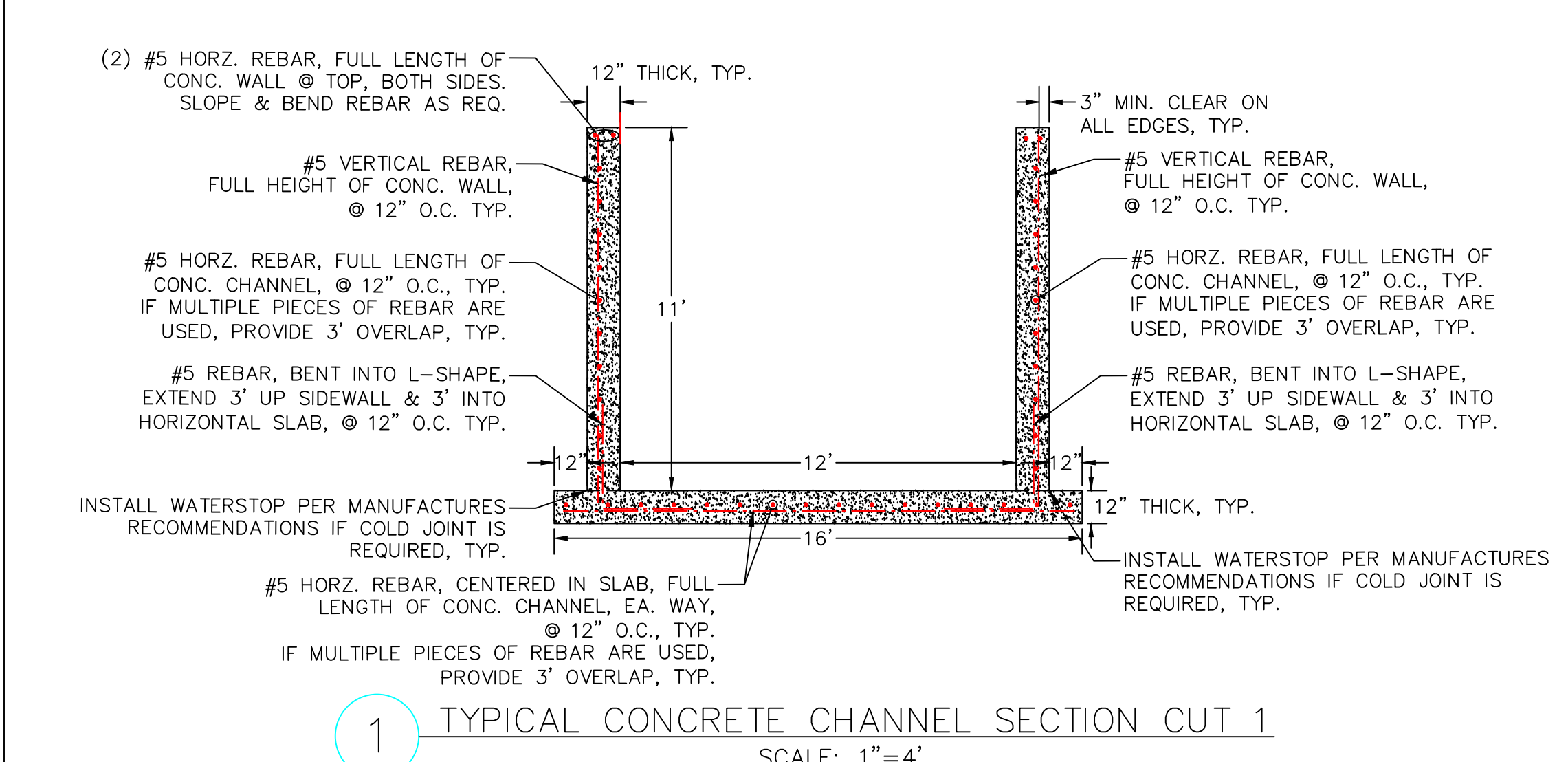
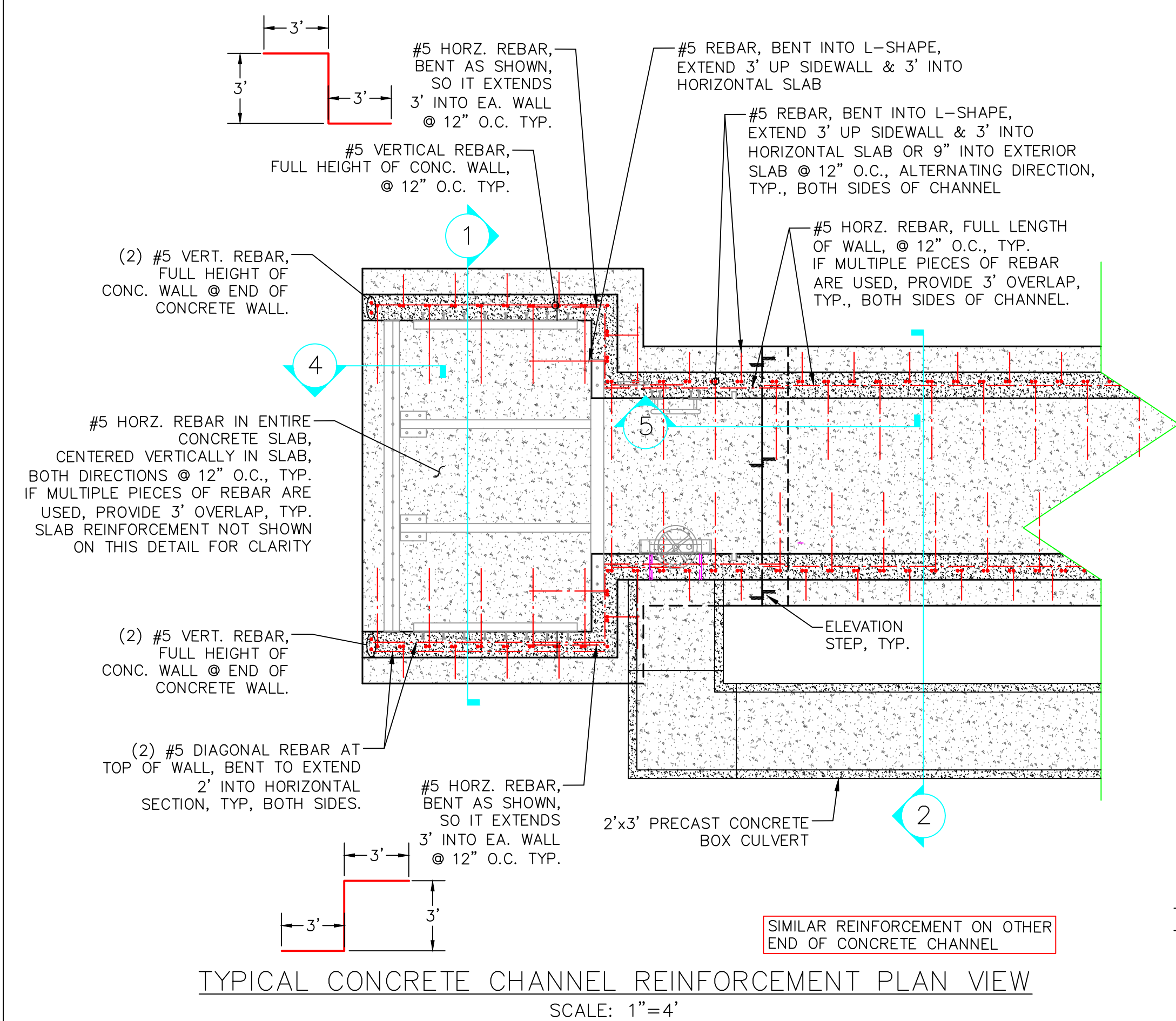
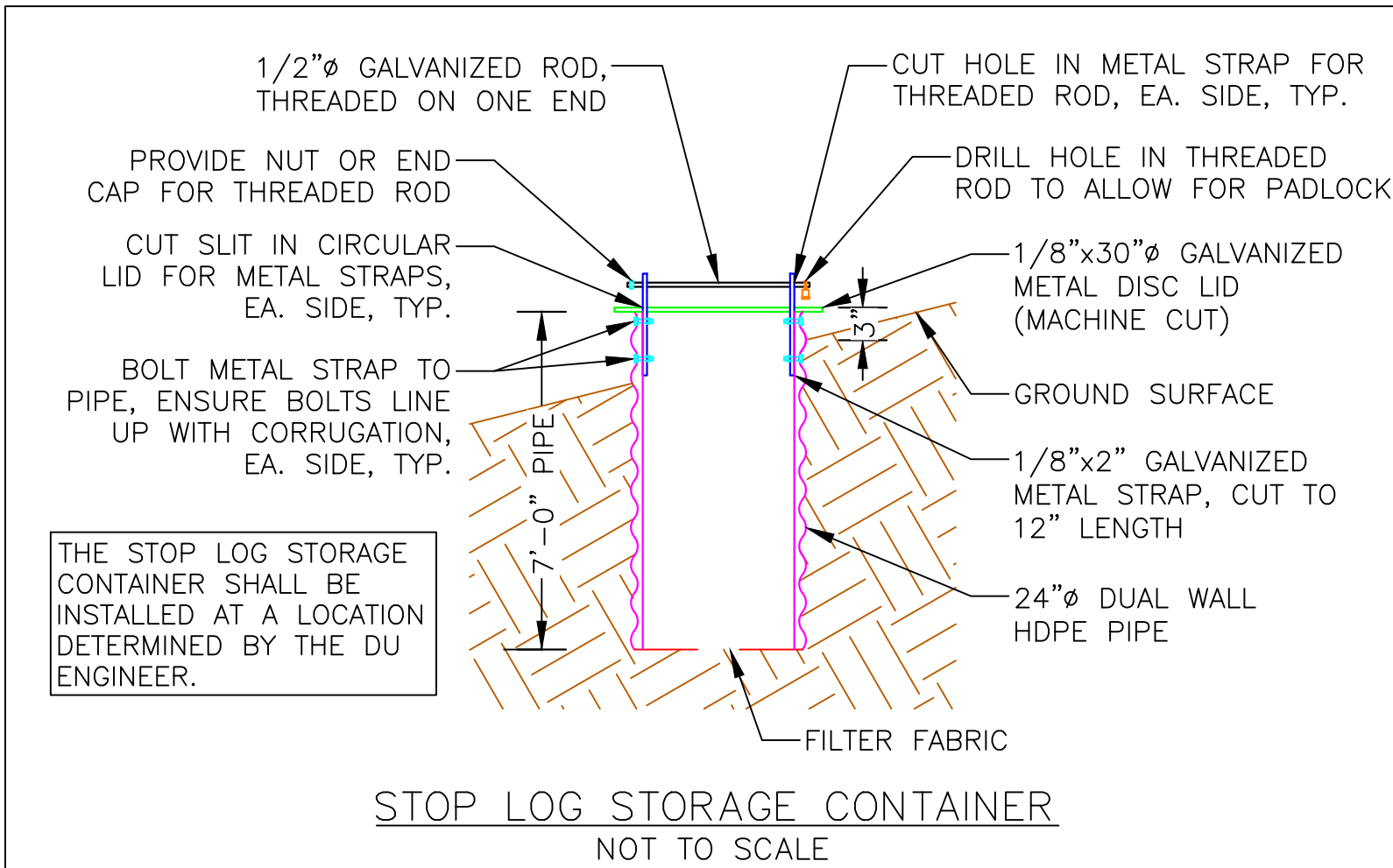
DESIGNED BY: KAW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:

REVISION:	DATE:	BY:
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS
SHEET TITLE: CONCRETE HEADGATE CHANNEL
W/ FISH KETTLE & KETTLE CHECK STRUCTURE

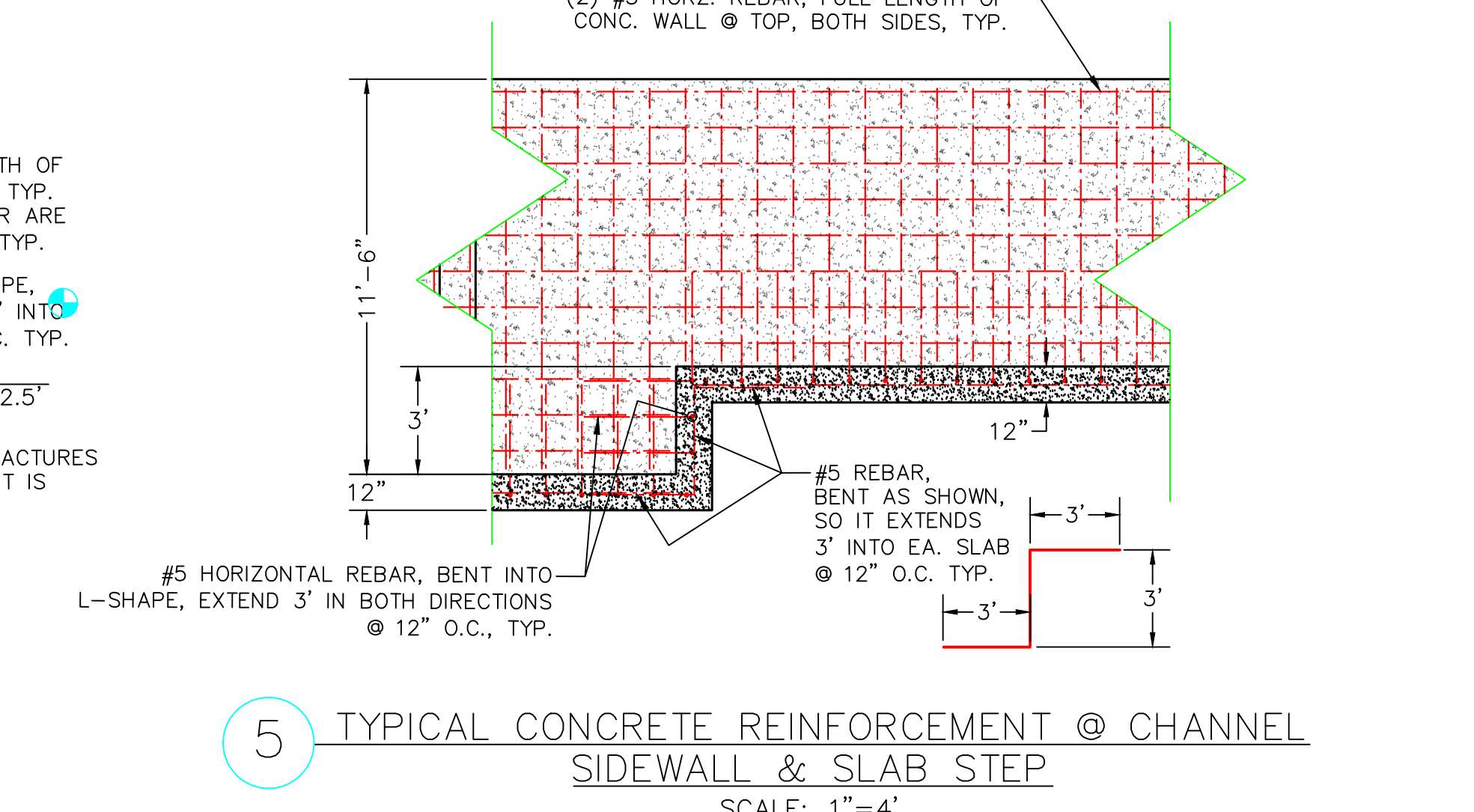
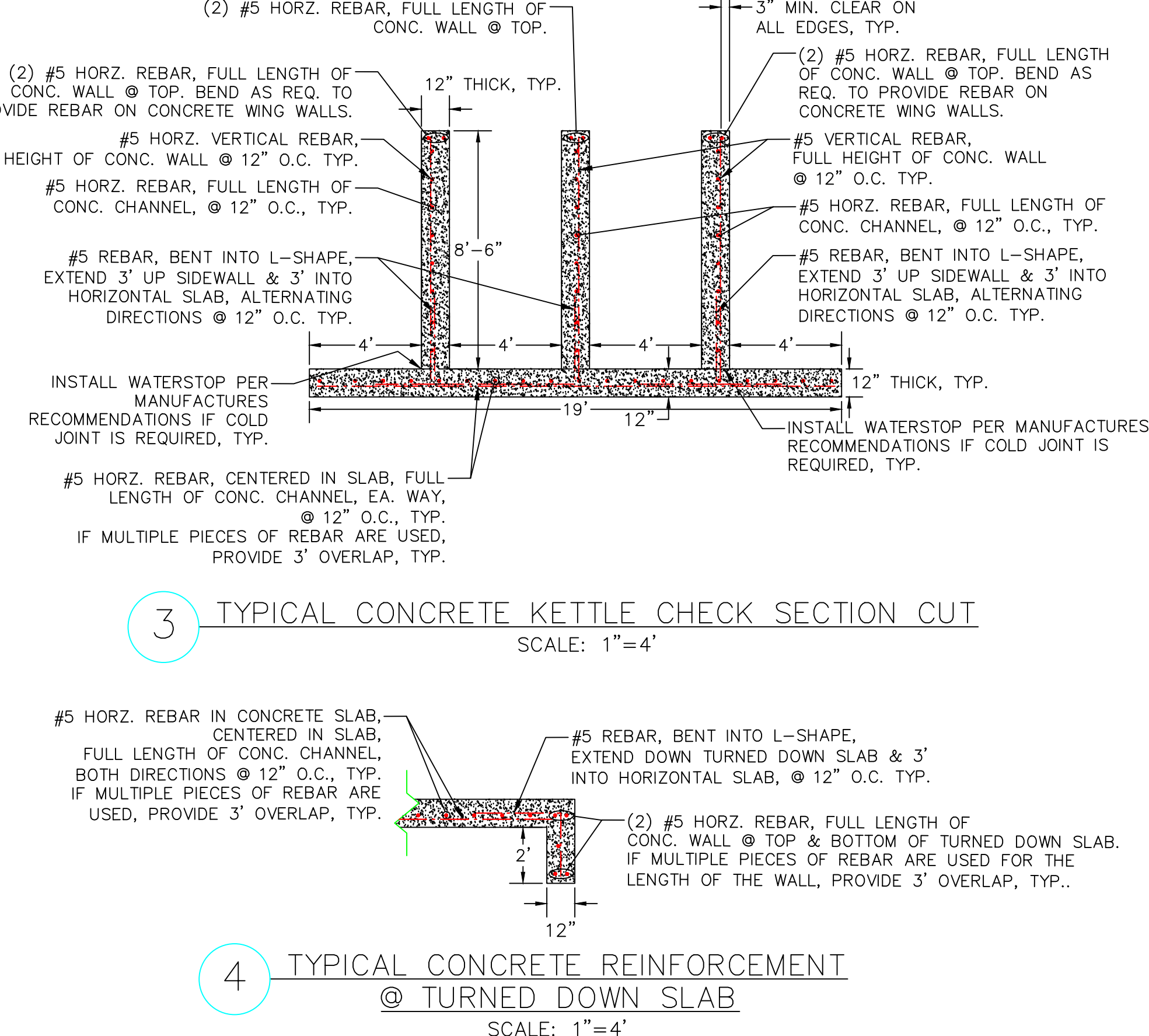
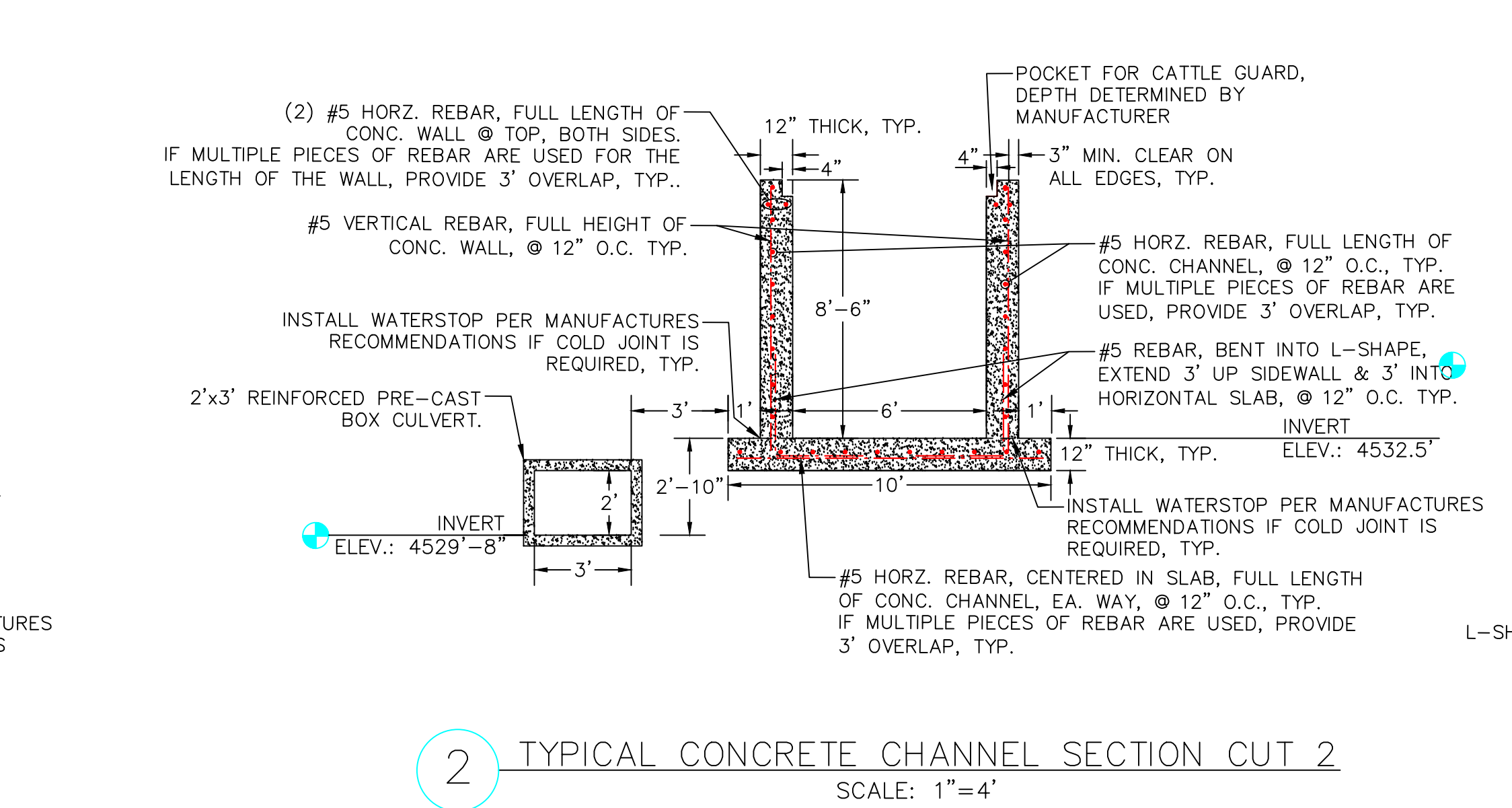
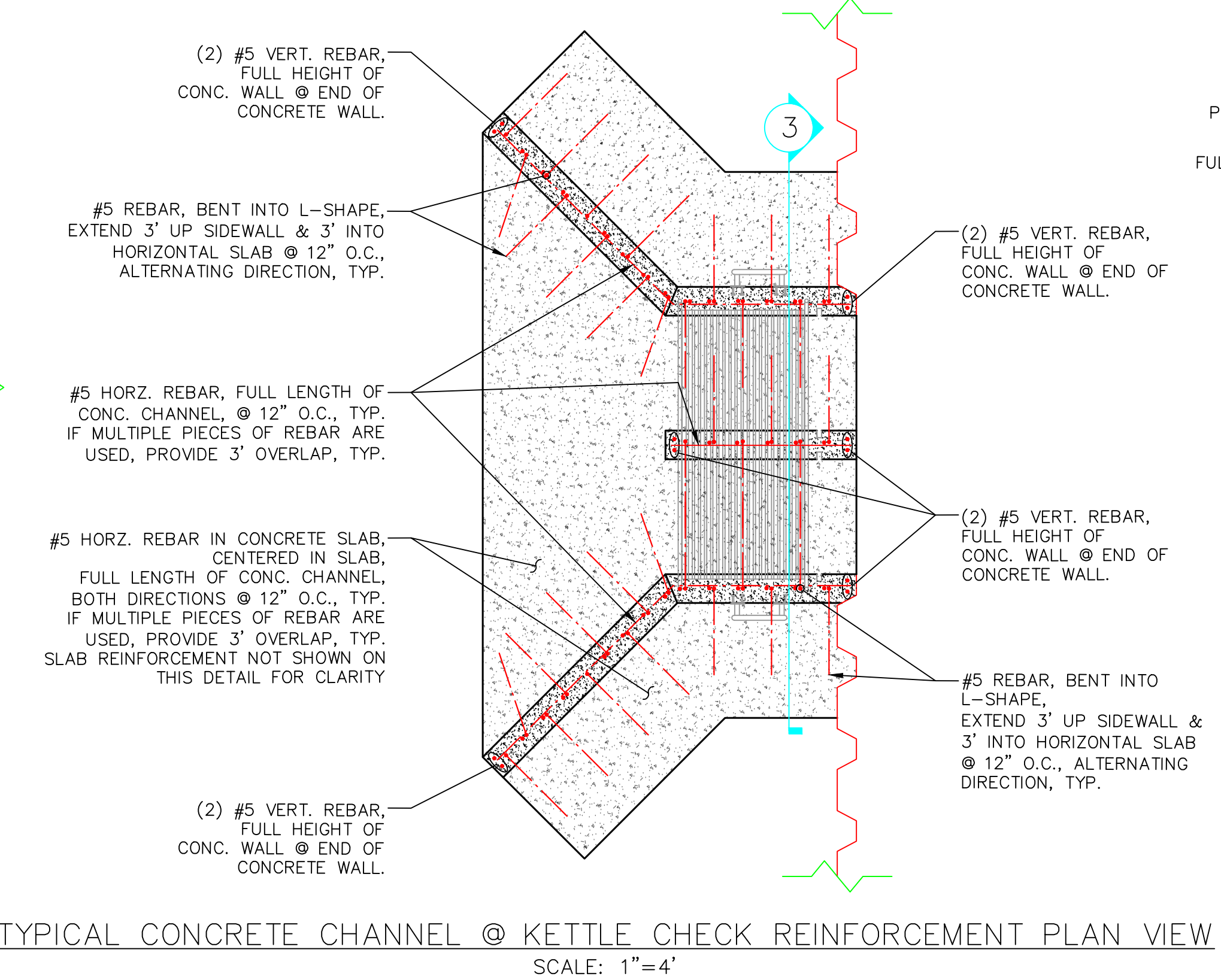
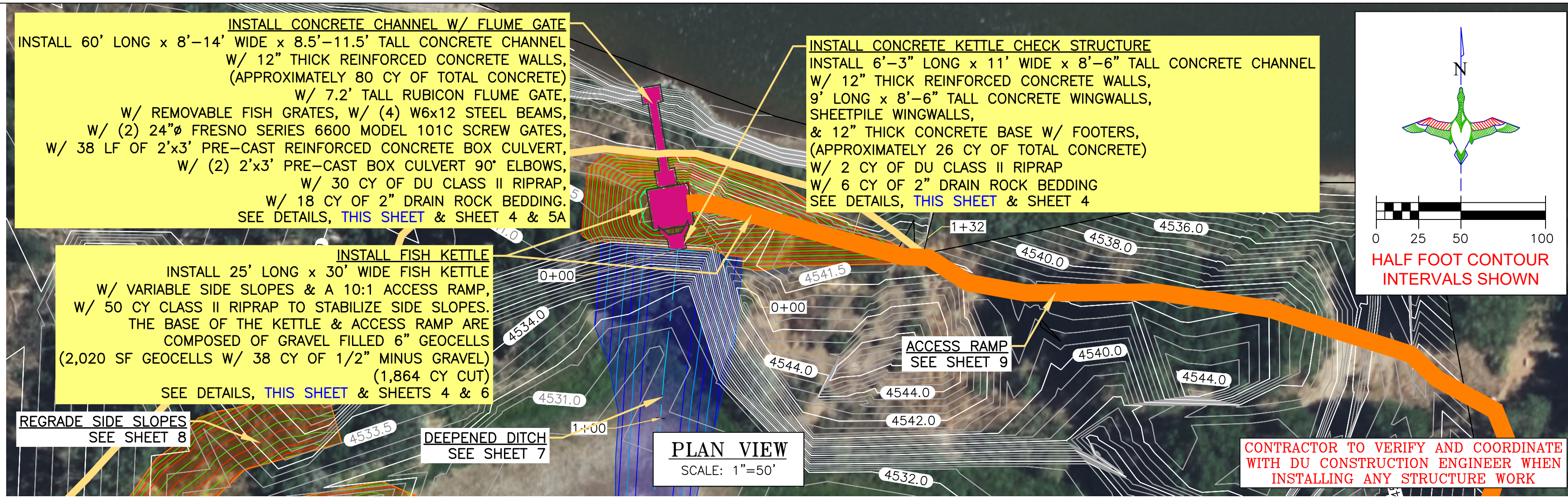
DATE: 04/17/2025
SHEET TITLE: CONCRETE HEADGATE CHANNEL W/ FISH KETTLE & KETTLE CHECK STRUCTURE

SCALES ARE ACCURATE ON 24"x36" SHEET SIZE
DU PROJECT NUMBER: CO-306-4
SHEET NUMBER: 4
SHEET 4 OF 11



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- LEGEND**
- WATER CONTROL STRUCTURE
 - KETTLE
 - KETTLE CHECK STRUCTURE
 - WALKING PATH
 - ACCESS ROAD
 - EARTHWORK
 - DEEPEND DITCH



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DU CONSTRUCTION ENGINEER:
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GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:
MICHAEL A. KUEHNEL
62833
PROFESSIONAL ENGINEER

DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:

PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: CONCRETE HEADGATE CHANNEL W/ FISH KETTLE & KETTLE CHECK STRUCTURE DETAILS

DATE: 04/17/2025

SHEET TITLE: CONCRETE HEADGATE CHANNEL W/ FISH KETTLE & KETTLE CHECK STRUCTURE DETAILS

SCALES ARE ACCURATE ON 24"x36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 5

SHEET 5 OF 11

LEGEND

WATER CONTROL STRUCTURE

KETTLE

KETTLE CHECK STRUCTURE

WALKING PATH

ACCESS ROAD

EARTHWORK

DEEPEINED DITCH

INSTALL CONCRETE CHANNEL W/ FLUME GATE
INSTALL 60' LONG x 8'-14' WIDE x 8.5'-11.5' TALL CONCRETE CHANNEL
W/ 12" THICK REINFORCED CONCRETE WALLS,
(APPROXIMATELY 80 CY OF TOTAL CONCRETE)
W/ 7.2' TALL RUBICON FLUME GATE,
W/ REMOVABLE FISH GRATES, W/ (4) W6x12 STEEL BEAMS,
W/ (2) 24" FRESNO SERIES 6600 MODEL 101C SCREW GATES,
W/ 38 LF OF 2'x3' PRE-CAST REINFORCED CONCRETE BOX CULVERT,
W/ (2) 2'x3' PRE-CAST BOX CULVERT 90° ELBOWS,
W/ 30 CY OF DU CLASS II RIPRAP,
W/ 18 CY OF 2" DRAIN ROCK BEDDING.
SEE DETAILS, **THIS SHEET** & SHEETS 4 & 5

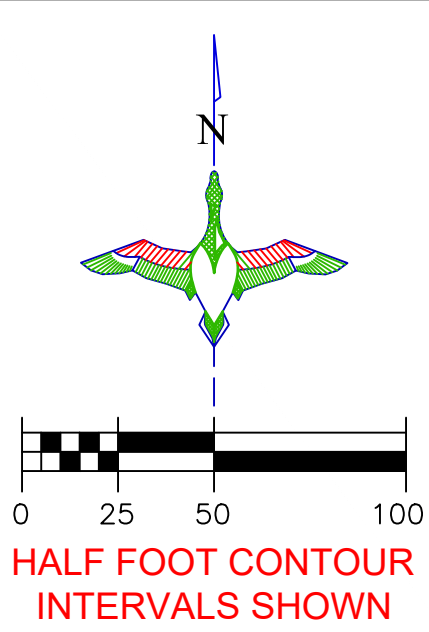
INSTALL FISH KETTLE
SEE SHEETS 4, 5 & 6

REGRADE SIDE SLOPES
SEE SHEET 8

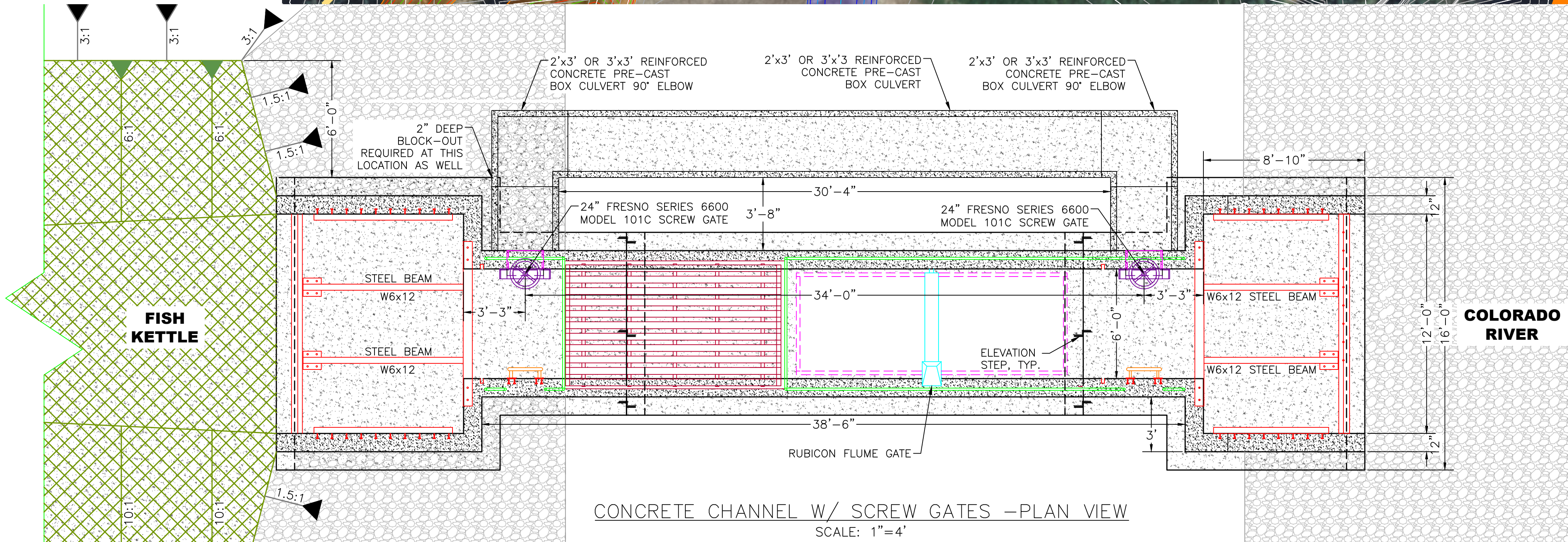
DEEPEINED DITCH
SEE SHEET 7

PLAN VIEW
SCALE: 1"=50'

COLORADO RIVER

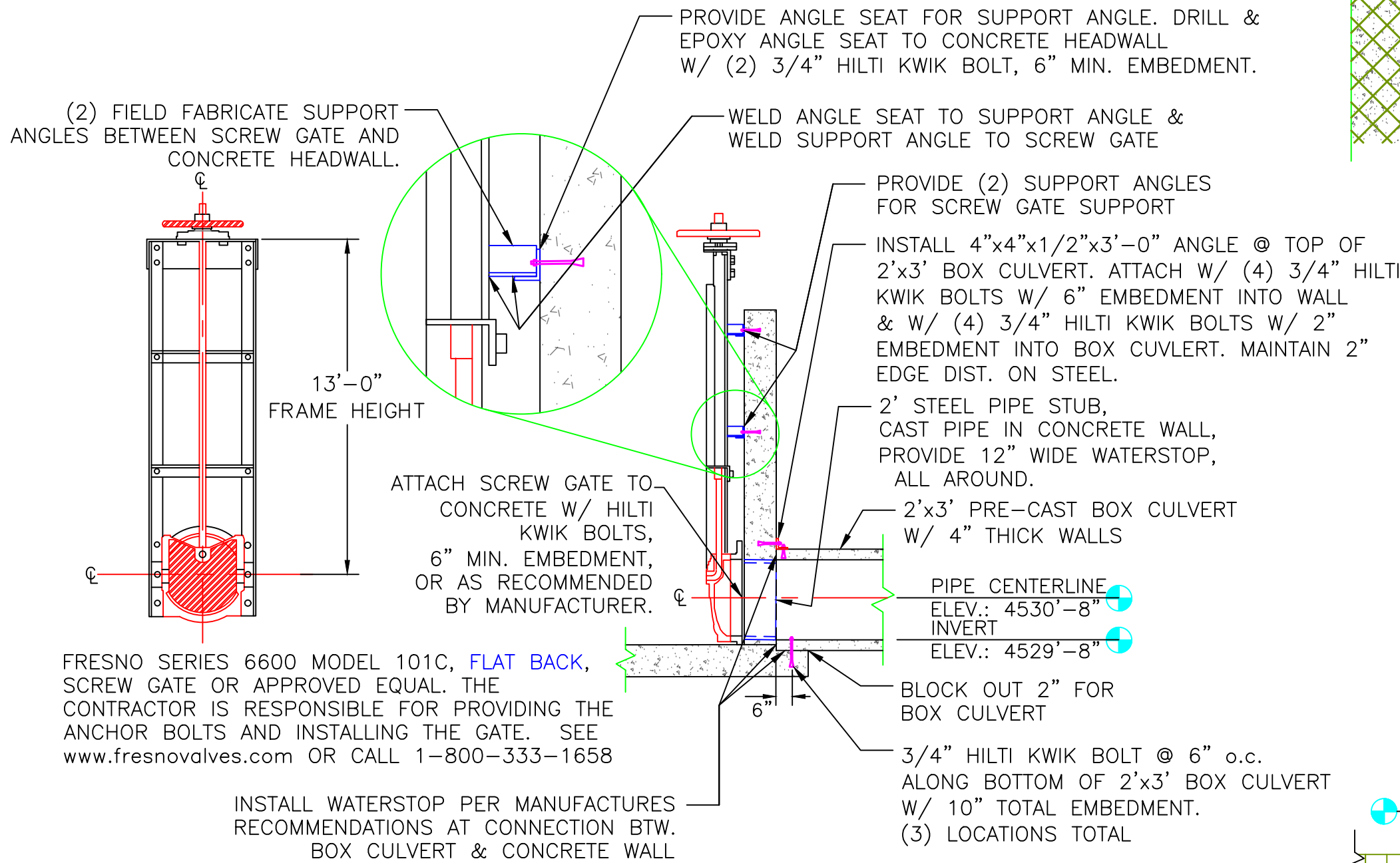


CONTRACTOR TO VERIFY AND COORDINATE
WITH DU CONSTRUCTION ENGINEER WHEN
INSTALLING ANY STRUCTURE WORK

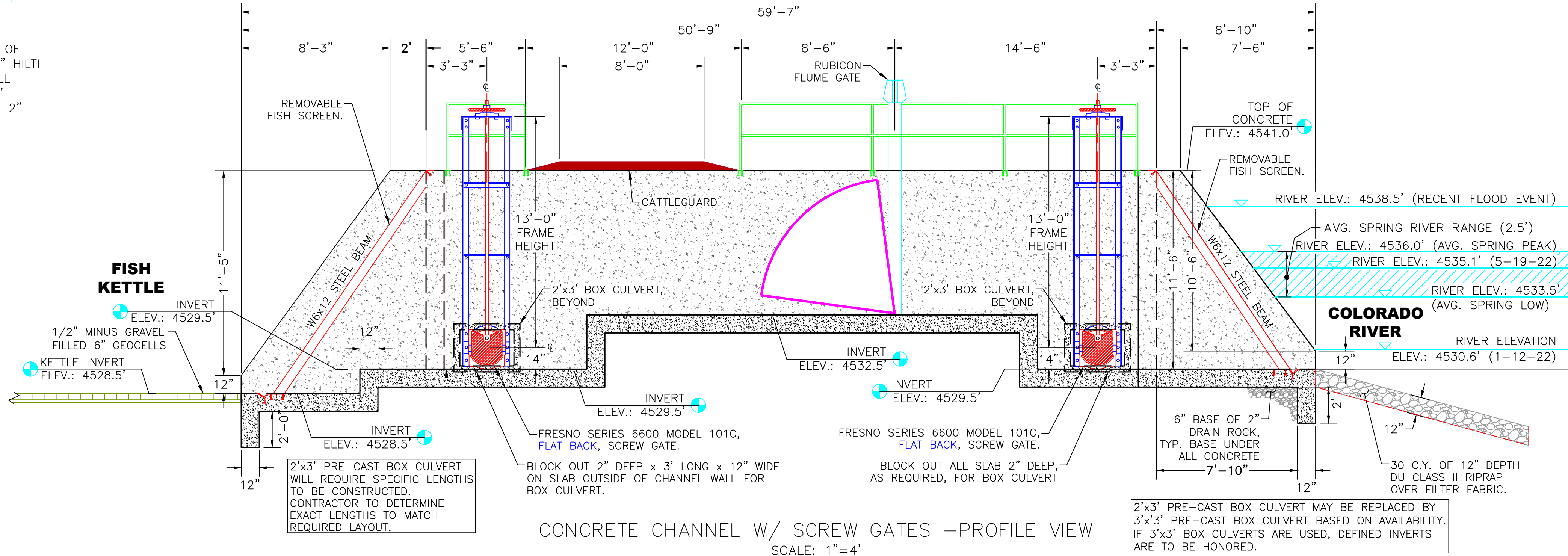


24" SCREWGATE NOTES:

1. COST OF STRUCTURE INSTALLATION SHALL BE PAID AS BID ITEM "WATER CONTROL STRUCTURES-SUPPLY & INSTALL"
2. ALL WELDS TO BE 1/4" FILLET WELDS.
3. ALL WELDED SEAMS SHALL BE CONTINUOUS AND WATERTIGHT, UNLESS OTHERWISE STATED.
4. ALL STEEL SHALL BE GIVEN 2 SHOP COATS OF BLACK TARGUARD AS MANUFACTURED BY SHERMAN WILLIAMS, OR APPROVED EQUAL. PAINT ALL STEEL SURFACES PER MANUFACTURER'S RECOMMENDATIONS, EXCEPT GALVANIZED SHEET PILE.



24" SCREW GATE DETAIL
NOT TO SCALE



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"BEFORE YOU DIG"
BEFORE THE START OF CONSTRUCTION. THE OWNER OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR/CONTRACTOR IS RESPONSIBLE FOR GIVING THIS NOTICE BY CALLING **"ONE CALL OF COLORADO"** AT **811**. A **72 HOUR** NOTIFICATION AND FULL DESCRIPTION OF LOCATION IS REQUIRED.

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DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:
APPROVED BY:

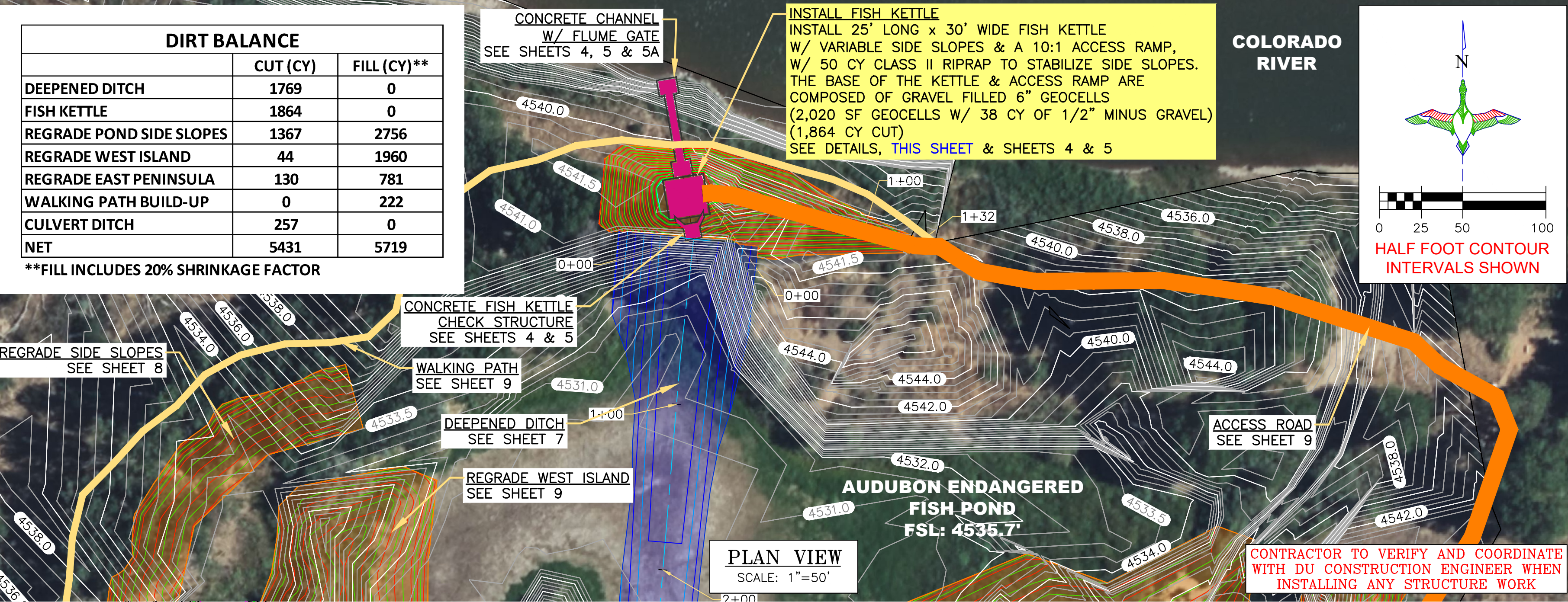
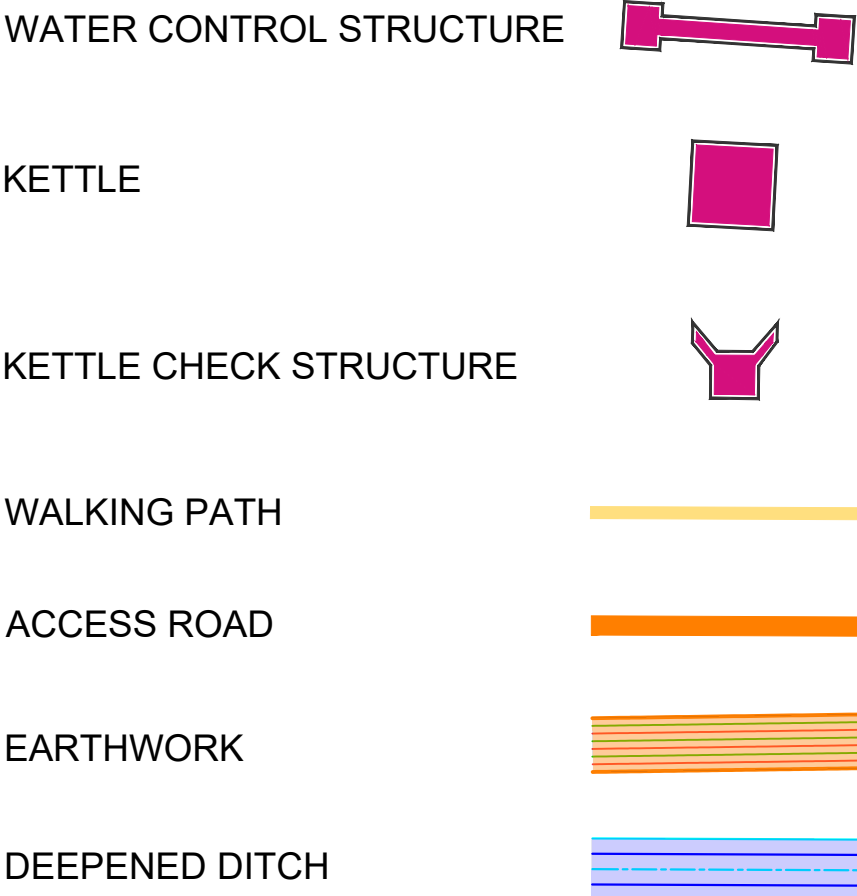
REVISION:	DATE:	BY:
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS
SHEET TITLE: SCREW GATES W/ BOX CULVERT

DATE: 04/17/2025
SHEET TITLE: SCREW GATES
W/ BOX CULVERT

SCALES ARE ACCURATE ON
24"X36" SHEET SIZE
DU PROJECT NUMBER:
CO-306-4
SHEET NUMBER:
5A
SHEET 5A OF 11

LEGEND



DUCKS UNLIMITED INC.

GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:

DESIGNED BY: KJW

DRAWN BY: MAKUJW

SURVEYED BY: MAK

CHECKED BY:

APPROVED BY:

APPROVED BY:

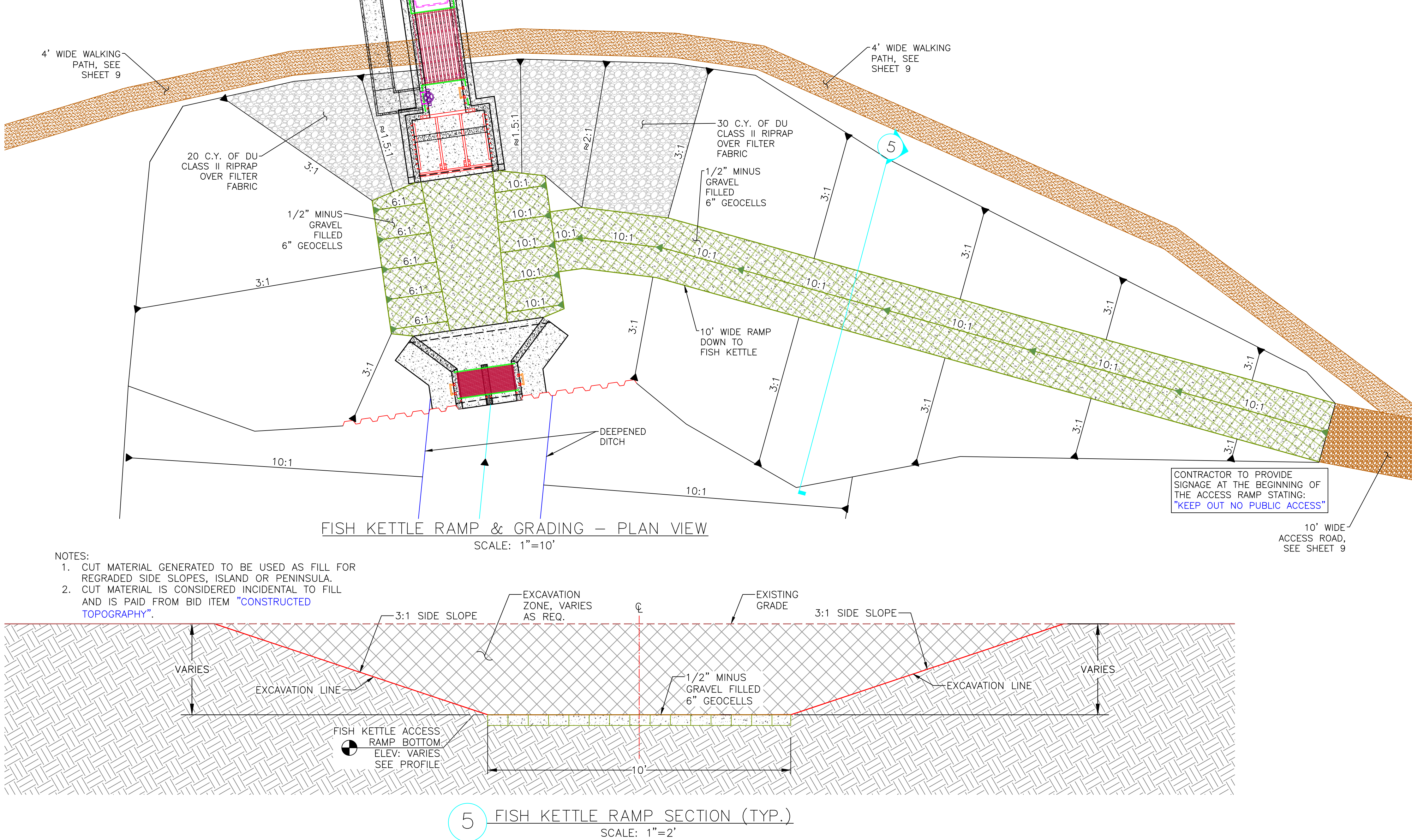
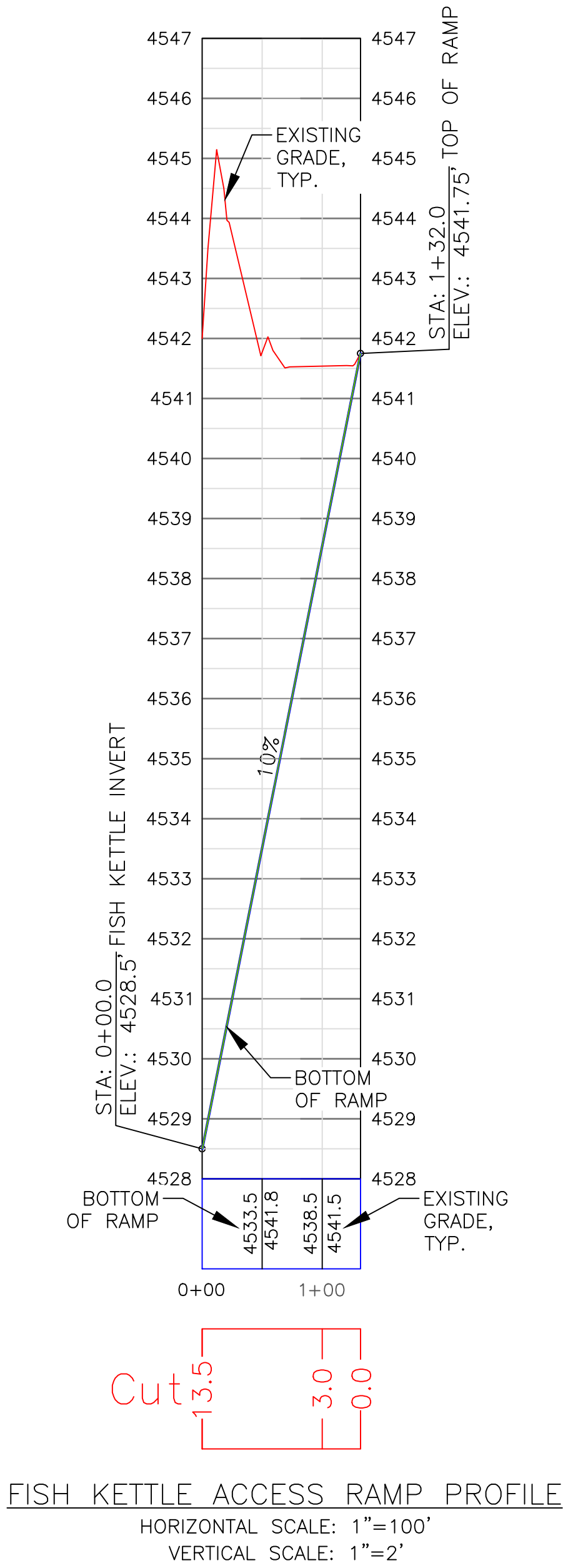
PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: FISH KETTLE & FISH KETTLE ACCESS RAMP

DATE: 04/17/2025

SHEET NUMBER: 6

SHEET 6 OF 11



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"BEFORE YOU DIG"

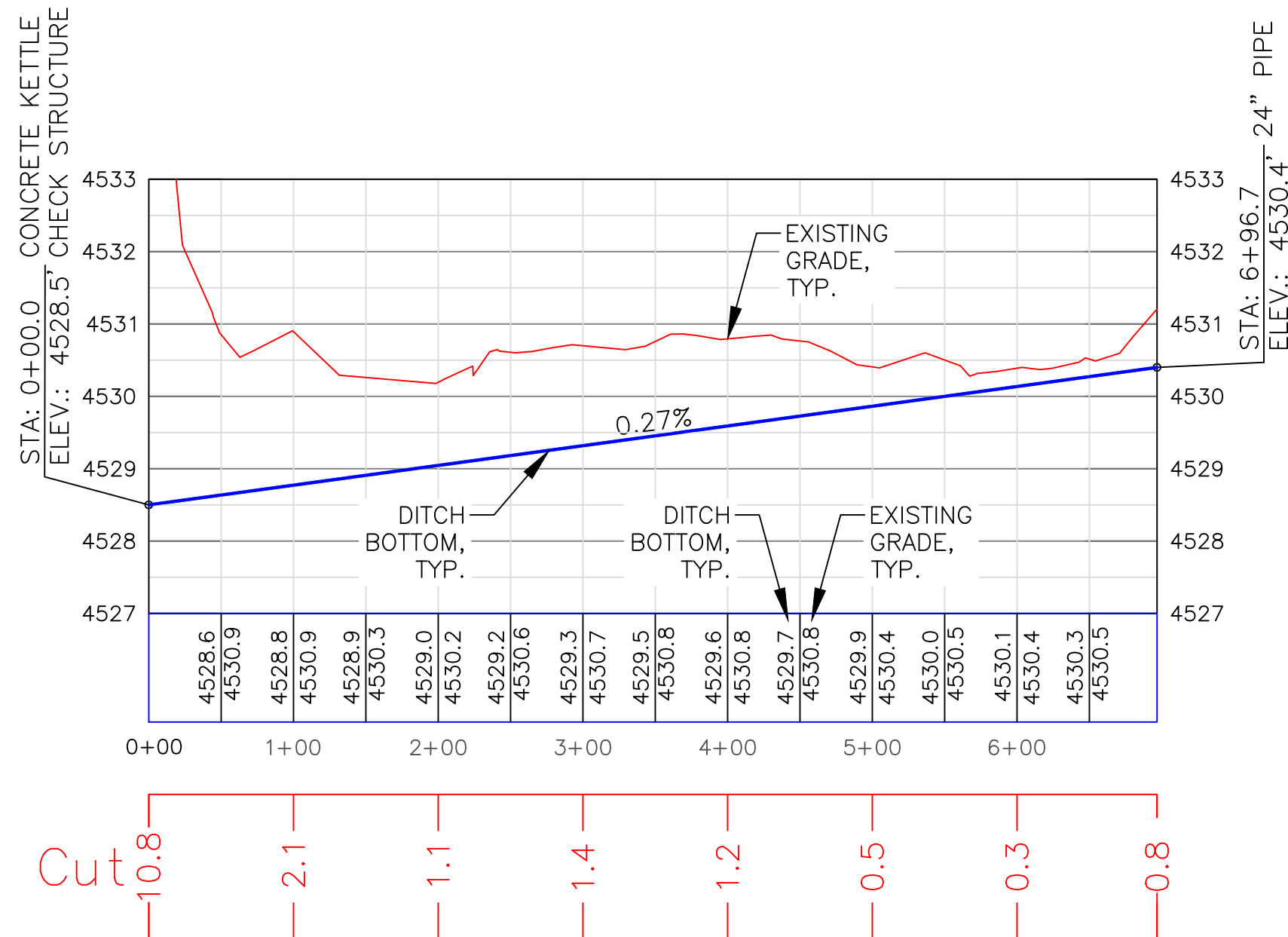
BEFORE THE START OF CONSTRUCTION. THE OWNER OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR/CONTRACTOR IS RESPONSIBLE FOR GIVING THIS NOTICE BY CALLING "ONE CALL OF COLORADO" AT 811. A 72 HOUR NOTIFICATION AND FULL DESCRIPTION OF LOCATION IS REQUIRED.

DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009

LEGEND

- SUPPLY WATER PIPELINE
- CMP CULVERT
- WATER CONTROL STRUCTURE
- KETTLE
- KETTLE CHECK STRUCTURE
- WALKING PATH
- ACCESS ROAD
- EARTHWORK
- DEEPENED DITCH



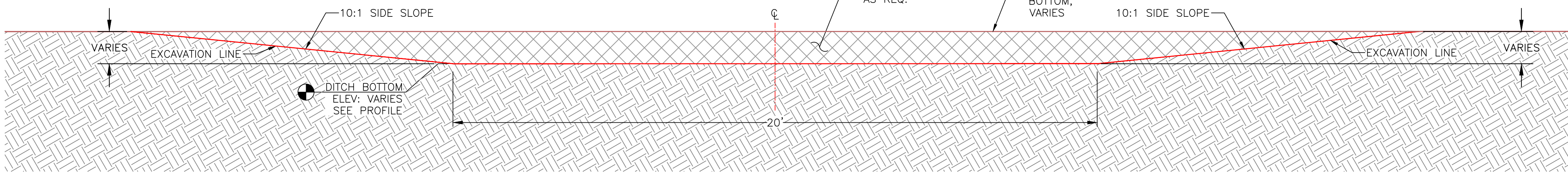
DEEPENED DITCH PROFILE

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=2'

DIRT BALANCE		
	CUT (CY)	FILL (CY)**
DEEPENED DITCH	1769	0
FISH KETTLE	1864	0
REGRADE POND SIDE SLOPES	1367	2756
REGRADE WEST ISLAND	44	1960
REGRADE EAST PENINSULA	130	781
WALKING PATH BUILD-UP	0	222
CULVERT DITCH	257	0
NET	5431	5719

**FILL INCLUDES 20% SHRINKAGE FACTOR

- NOTES:
- CUT MATERIAL GENERATED TO BE USED AS FILL FOR REGRADED SIDE SLOPES, ISLAND OR PENINSULA.
 - CUT MATERIAL IS CONSIDERED INCIDENTAL TO FILL AND IS PAID FROM BID ITEM "CONSTRUCTED TOPOGRAPHY".



DEEPENED DITCH SECTION (TYP.)

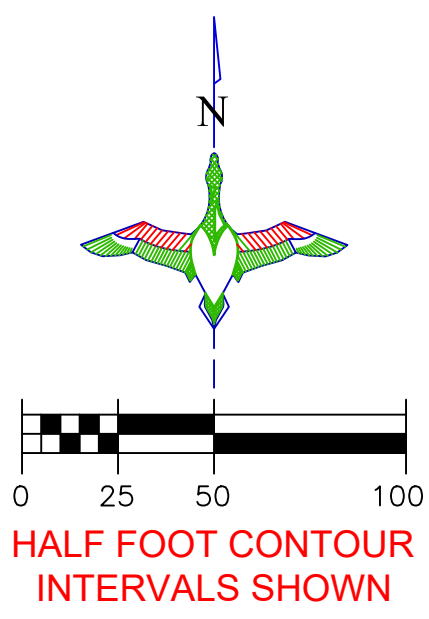
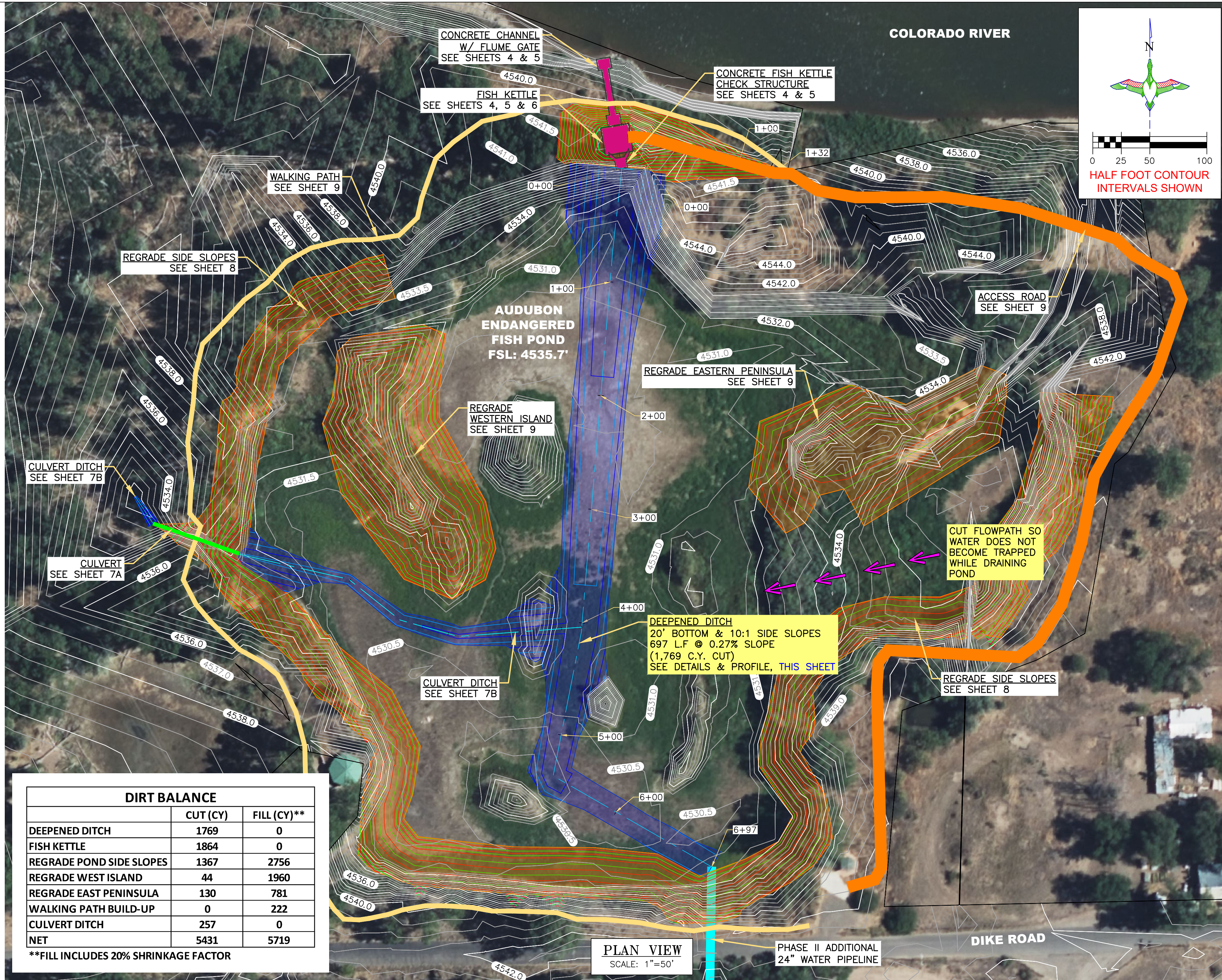
SCALE: 1"=2'

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DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW

DRAWN BY: MAK/JJW

SURVEYED BY: MAK

CHECKED BY:

APPROVED BY:

APPROVED BY:

BY:

DATE:

REVISION:

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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE:

DATE:

04/17/2025

SHEET NUMBER:

DEEPENED
DITCH

SCALES ARE ACCURATE ON
24"X36" SHEET SIZE

DU PROJECT NUMBER:

CO-306-4

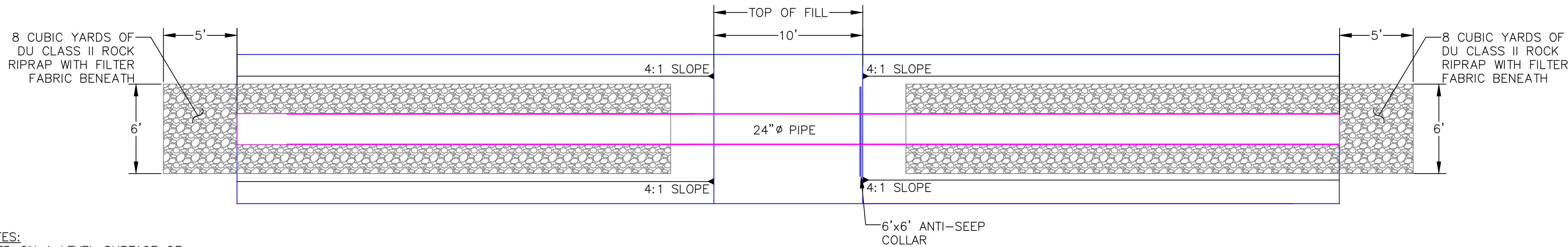
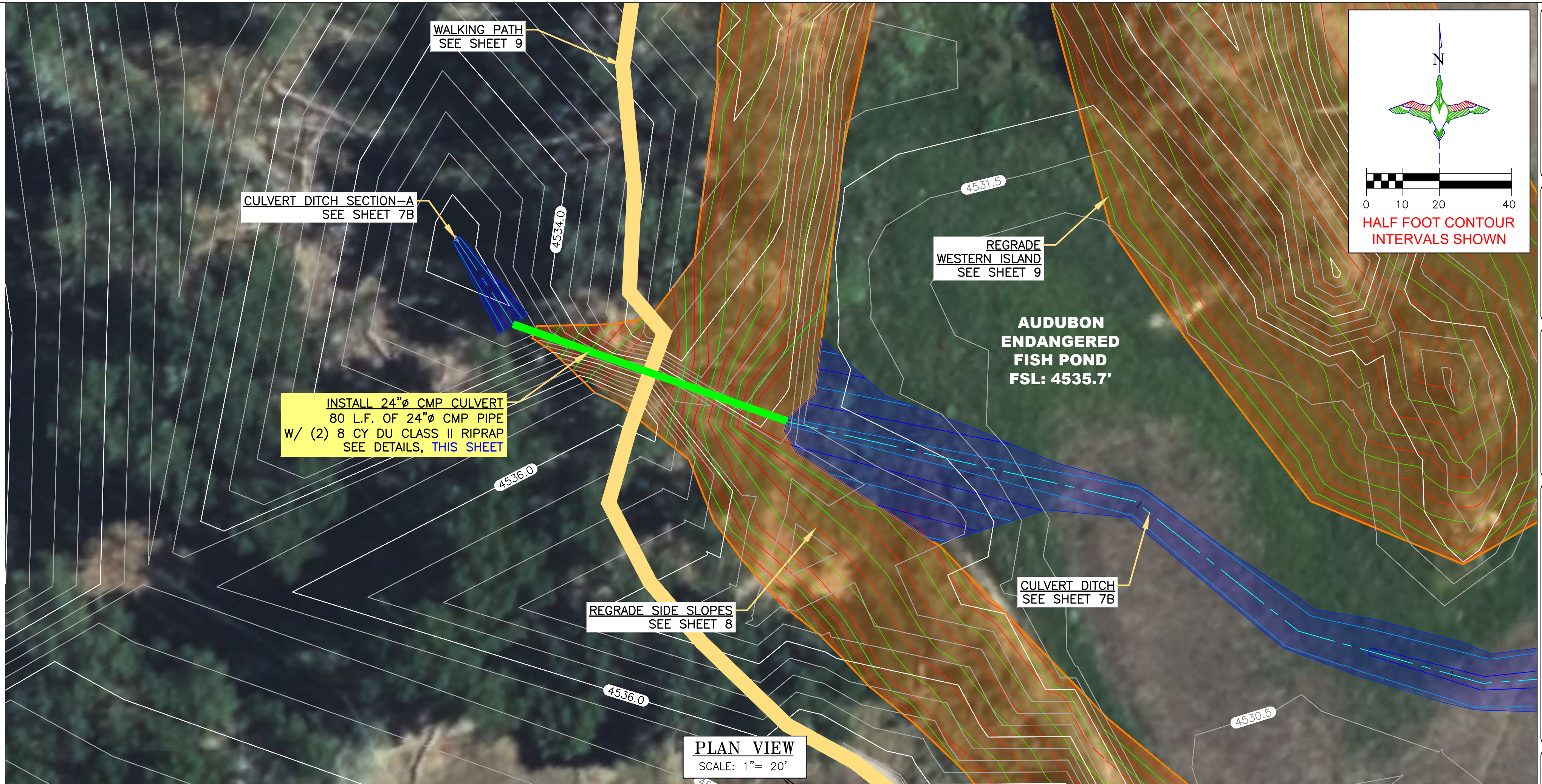
SHEET NUMBER:

7

SHEET 7 OF 11

LEGEND

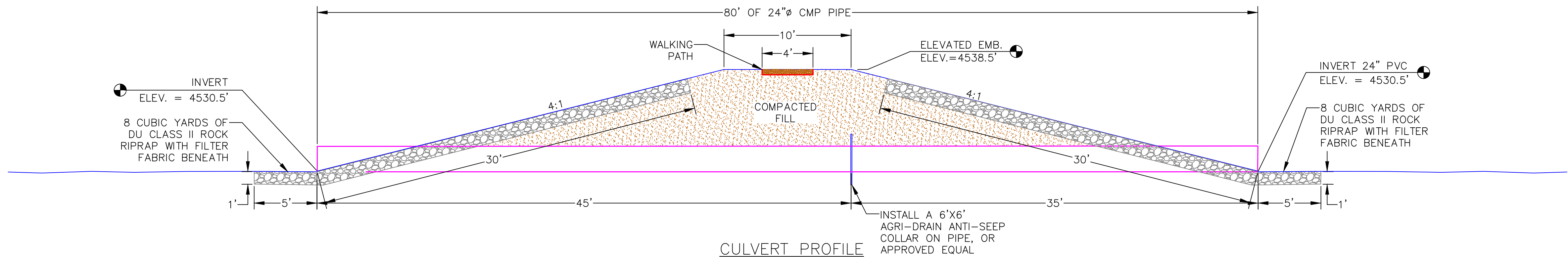
- SUPPLY WATER PIPELINE
- CMP CULVERT
- WATER CONTROL STRUCTURE
- KETTLE
- KETTLE CHECK STRUCTURE
- WALKING PATH
- ACCESS ROAD
- EARTHWORK
- DEEPENED DITCH



CULVERT INSTALLATION NOTES:

- PIPE SHALL BE PLACED ON A LEVEL SURFACE OF COMPACTED SOIL.
- ANTI-SEEP COLLARS WILL BE CONSIDERED INCIDENTAL TO BID ITEMS UNDER "CULVERTS & PIPE – SUPPLY & INSTALL".

CULVERT PLAN
SCALE 1"=5'



CULVERT PROFILE
SCALE 1"=5'

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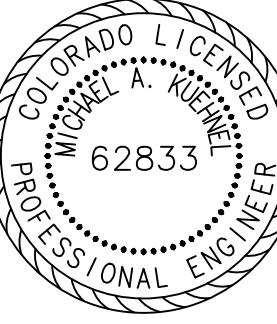
DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:
APPROVED BY:

REVISION:	DATE:	BY:
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: CULVERT

DATE: 04/17/2025

SHEET TITLE: CULVERT

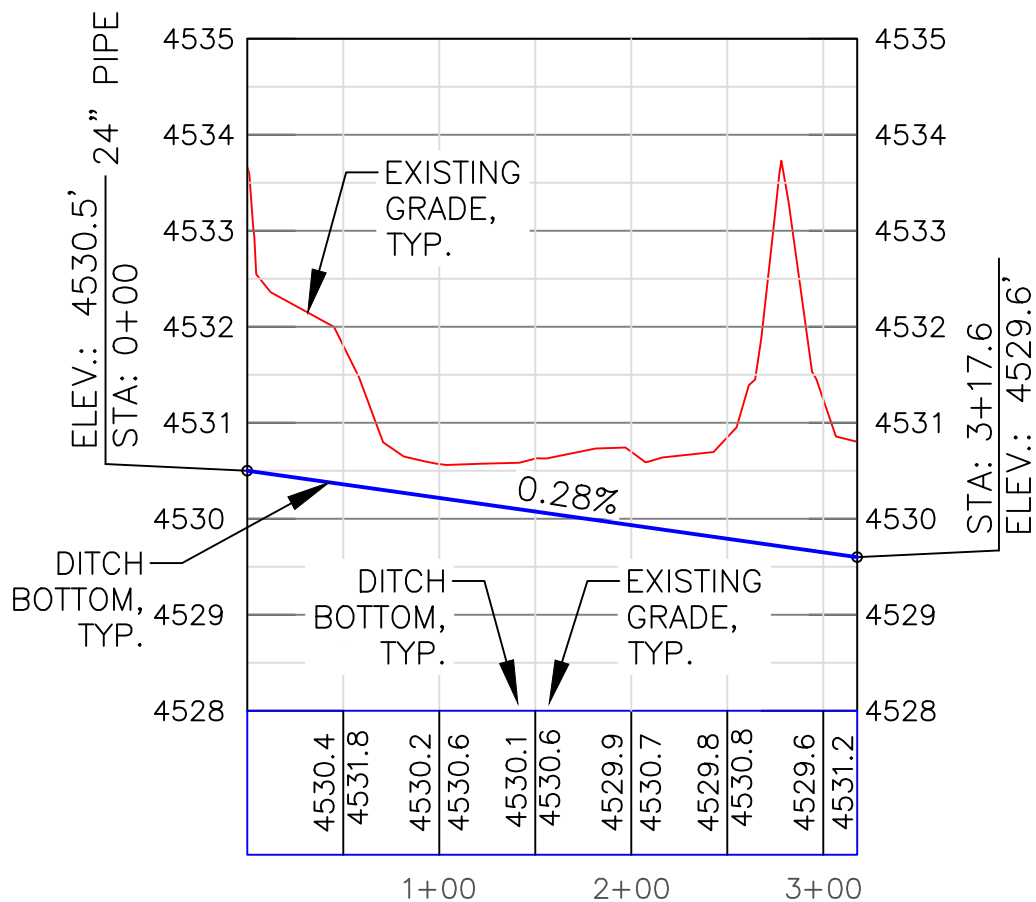
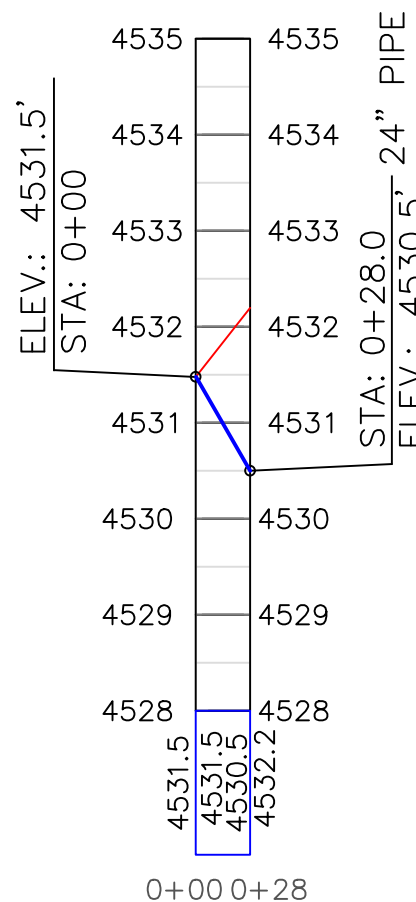
SCALES ARE ACCURATE ON 24"x36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 7A
SHEET 7A OF 11

LEGEND

- SUPPLY WATER PIPELINE
- CMP CULVERT
- WATER CONTROL STRUCTURE
- KETTLE
- KETTLE CHECK STRUCTURE
- WALKING PATH
- ACCESS ROAD
- EARTHWORK
- DEEPEINED DITCH



CULVERT DITCH PROFILE-A

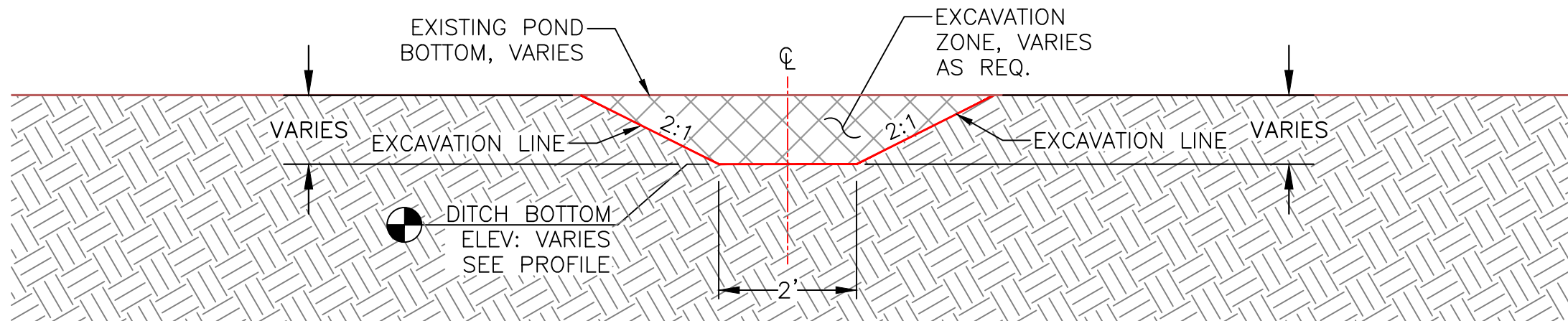
HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=2'

CULVERT DITCH PROFILE

HORIZONTAL SCALE: 1"=100'
VERTICAL SCALE: 1"=2'

NOTES:

1. CUT MATERIAL GENERATED TO BE USED AS FILL FOR REGRADED SIDE SLOPES, ISLAND OR PENINSULA.
2. CUT MATERIAL IS CONSIDERED INCIDENTAL TO FILL AND IS PAID FROM BID ITEM "CONSTRUCTED TOPOGRAPHY".

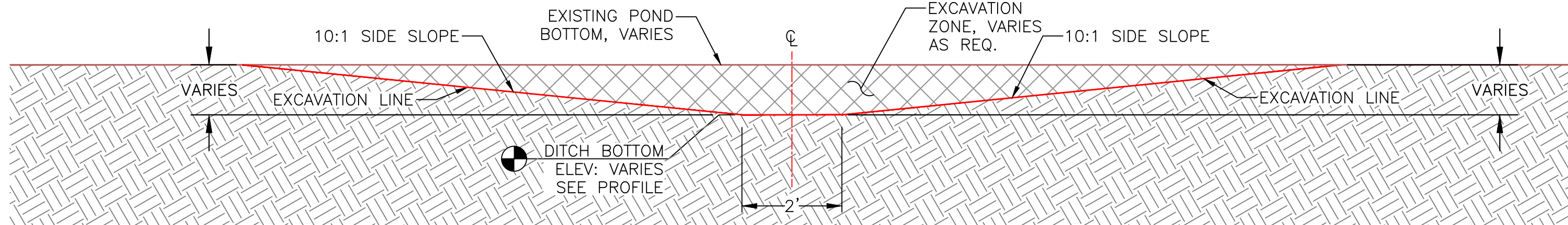


CULVERT DITCH SECTION-A (TYP.)

SCALE: 1"=2'

NOTES:

1. CUT MATERIAL GENERATED TO BE USED AS FILL FOR REGRADED SIDE SLOPES, ISLAND OR PENINSULA.
2. CUT MATERIAL IS CONSIDERED INCIDENTAL TO FILL AND IS PAID FROM BID ITEM "CONSTRUCTED TOPOGRAPHY".



CULVERT DITCH SECTION (TYP.)

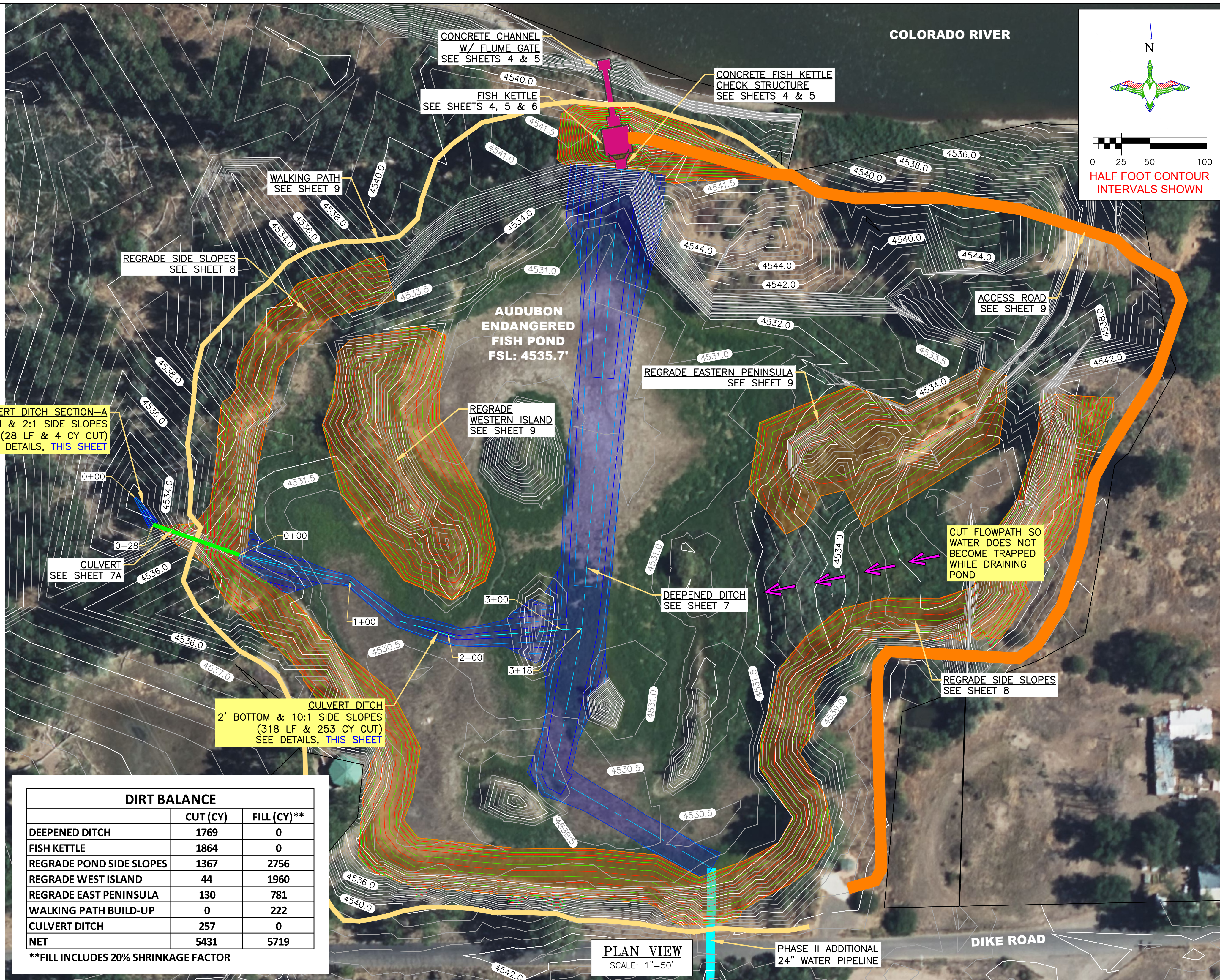
SCALE: 1"=2'

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DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



PLAN VIEW

SCALE: 1"=50'

PHASE II ADDITIONAL
24" WATER PIPELINE



GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW

DRAWN BY: MAK/JJW

SURVEYED BY: MAK

CHECKED BY:

APPROVED BY:

BY:

DATE:

REVISION:

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PROJECT:

GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE:

CULVERT DITCH

DATE:

04/17/2025

SHEET TITLE:

CULVERT
DITCH

SCALES ARE ACCURATE ON
24"X36" SHEET SIZE

DU PROJECT NUMBER:

CO-306-4

SHEET NUMBER:

7B

SHEET 7B OF 11

LEGEND

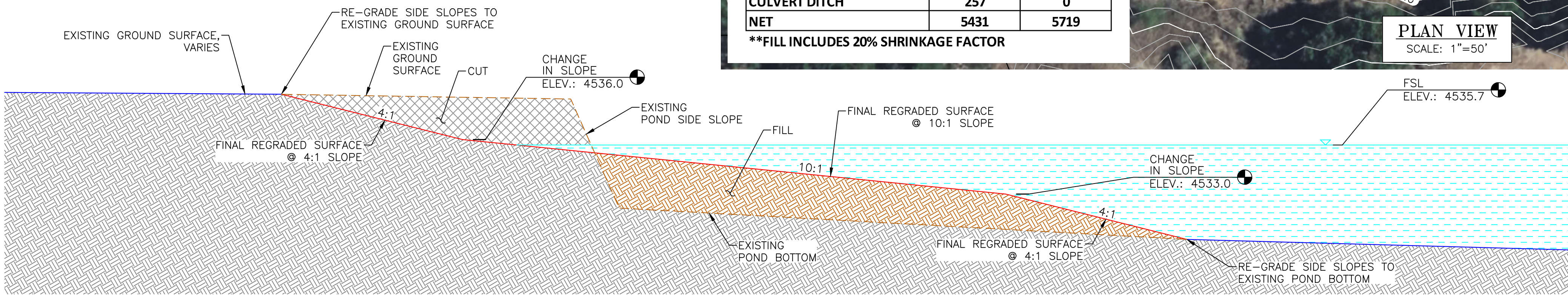
- SUPPLY WATER PIPELINE
- CMP CULVERT
- WATER CONTROL STRUCTURE
- KETTLE
- KETTLE CHECK STRUCTURE
- WALKING PATH
- ACCESS ROAD
- EARTHWORK
- DEEPENED DITCH



DIRT BALANCE		
	CUT (CY)	FILL (CY)**
DEEPENED DITCH	1769	0
FISH KETTLE	1864	0
REGRADE POND SIDE SLOPES	1367	2756
REGRADE WEST ISLAND	44	1960
REGRADE EAST PENINSULA	130	781
WALKING PATH BUILD-UP	0	222
CULVERT DITCH	257	0
NET	5431	5719

**FILL INCLUDES 20% SHRINKAGE FACTOR

- NOTES:
- CUT MATERIAL GENERATED FROM DEEPENED DITCH & FISH KETTLE REGRADING TO BE USED AS FILL FOR REGRADED SIDE SLOPES.
 - CUT MATERIAL IS CONSIDERED INCIDENTAL TO FILL AND IS PAID FROM BID ITEM "CONSTRUCTED TOPOGRAPHY".



TYPICAL REGRADED SIDE SLOPE -SECTION CUT
SCALE: 1"=4'

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DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

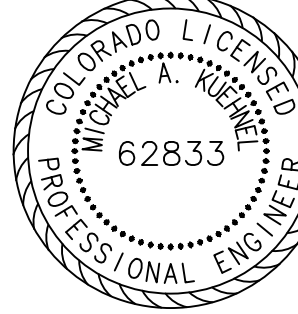
DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



DUCKS
UNLIMITED
INC.

GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KJW

DRAWN BY: MAK/JJW

SURVEYED BY: MAK

CHECKED BY:

APPROVED BY:

APPROVED BY:

BY:

DATE:

REVISION:

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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: REGRADE AUDUBON ENDANGERED
FISH POND SIDE SLOPES

DATE:

04/17/2025

SHEET TITLE:

REGRADE
AUDUBON
ENDANGERED
FISH POND
SIDE SLOPES

SCALES ARE ACCURATE ON
24"X36" SHEET SIZE

DU PROJECT NUMBER:

CO-306-4

SHEET NUMBER:

8

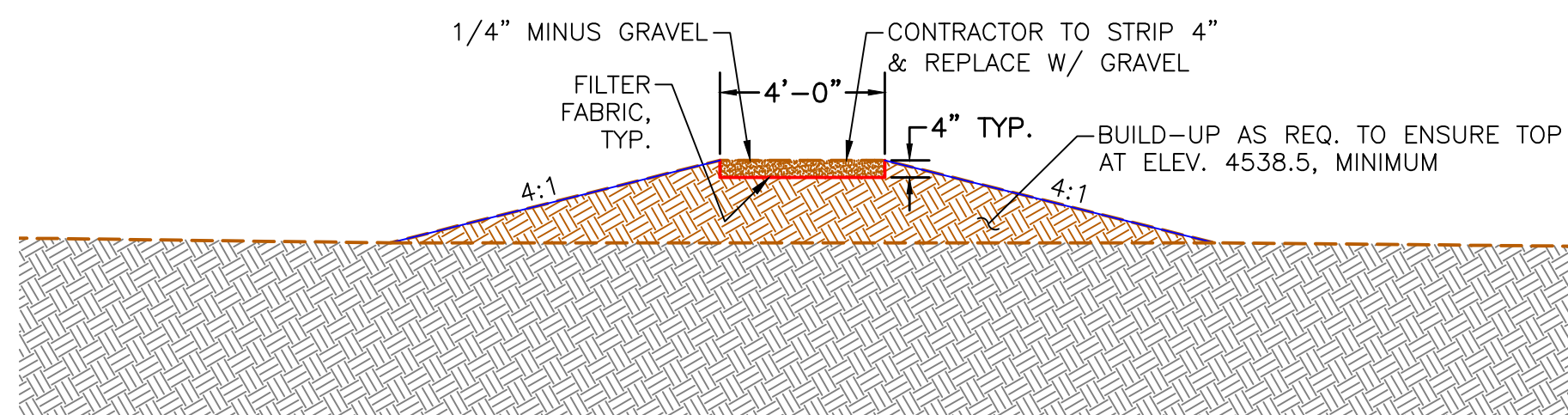
SHEET 8 OF 11

LEGEND

SUPPLY WATER PIPELINE	
CMP CULVERT	
WATER CONTROL STRUCTURE	
KETTLE	
KETTLE CHECK STRUCTURE	
WALKING PATH	
ACCESS ROAD	
EARTHWORK	
DEEPENED DITCH	

NOTES:

- ALL VEGETATION SHOULD BE STRIPPED OFF EXISTING GROUND PRIOR TO PLACE FILTER FABRIC. THIS TASK IS CONSIDERED PART OF BID ITEM "SITE PREPARATION".
- WELL GRADED 1/4" MINUS GRAVEL SHALL BE PLACED ON TOP OF FILTER FABRIC AND COMPACTED IN PLACE.
- BUILD-UP BASE UNDER WALKING TRAIL TO ENSURE TOP IS AT A MINIMUM ELEV. OF 4538.5

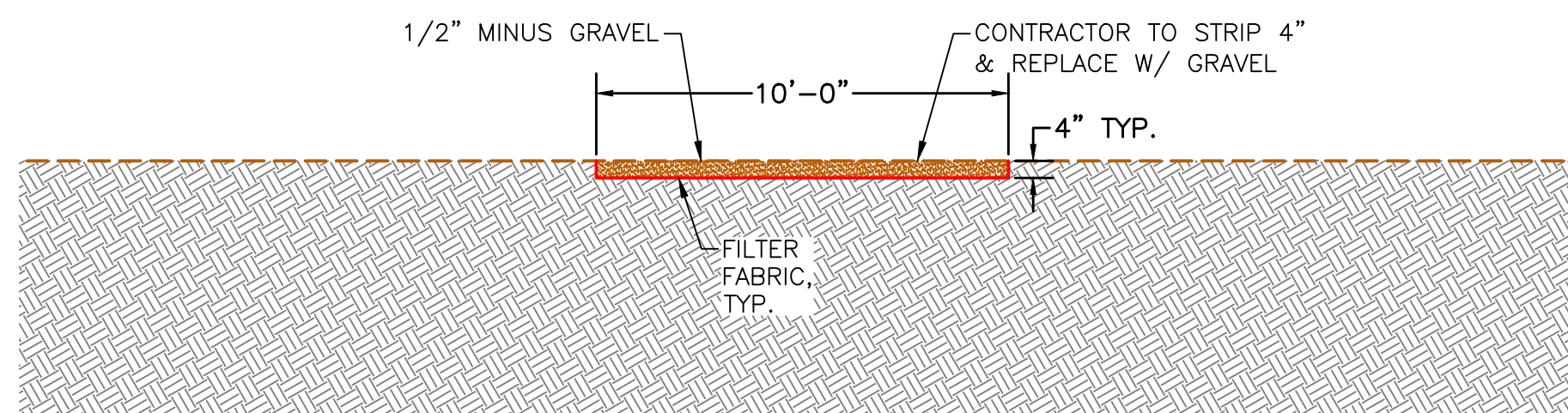


WALKING PATH SECTION (TYP.)

SCALE: 1"=4'

NOTES:

- ALL VEGETATION SHOULD BE STRIPPED OFF EXISTING GROUND PRIOR TO PLACE FILTER FABRIC. THIS TASK IS CONSIDERED PART OF BID ITEM "SITE PREPARATION".
- WELL GRADED 1/2" MINUS GRAVEL SHALL BE PLACED ON TOP OF FILTER FABRIC AND COMPACTED IN PLACE.

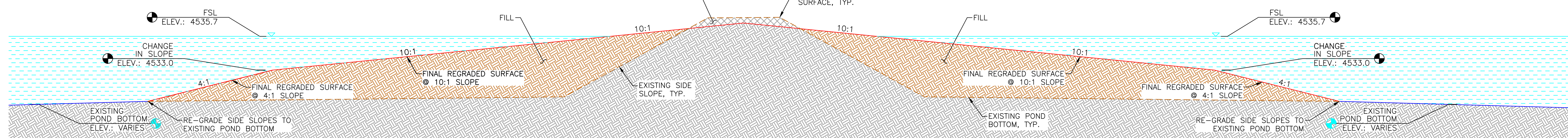


ACCESS ROAD SECTION (TYP.)

SCALE: 1"=4'

NOTES:

- CUT MATERIAL GENERATED FROM DEEPENED DITCH & FISH KETTLE REGRADING TO BE USED AS FILL FOR ISLAND & PENINSULA CONSTRUCTION.
- CUT MATERIAL IS CONSIDERED INCIDENTAL TO FILL AND IS PAID FROM BID ITEM "CONSTRUCTED TOPOGRAPHY".



TYPICAL ISLAND/PENINSULA -SECTION CUT

SCALE: 1"=4'

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DU DESIGN ENGINEER:
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(970) 590-1545

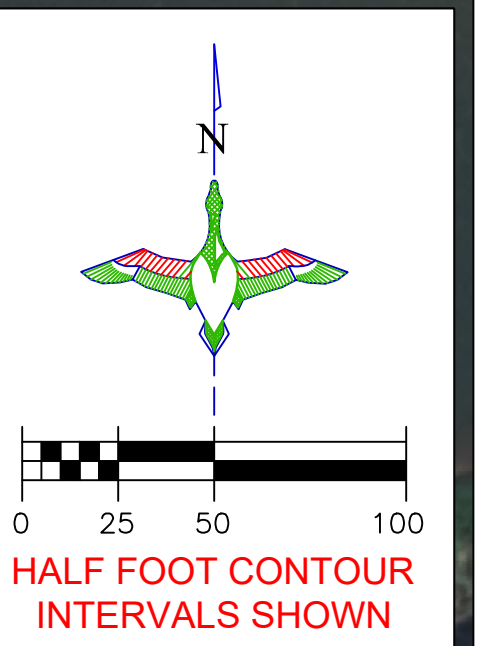
DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009



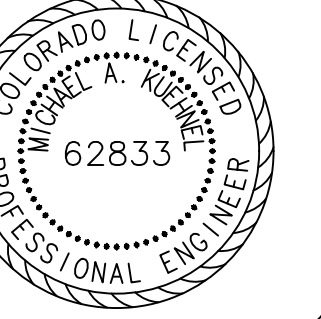
PLAN VIEW

SCALE: 1"=50'

COLORADO RIVER



P.E. SEAL:



DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:
APPROVED BY:

REVISION:	DATE:	BY:
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS
SHEET TITLE: REGRADE WEST ISLAND & EAST PENINSULA & CONSTRUCT WALKING PATH & ACCESS ROAD

DATE: 04/17/2025

SHEET TITLE: REGRADE WESTERN ISLAND & EASTERN PENINSULA & CONSTRUCT WALKING PATH & ACCESS ROAD

SCALES ARE ACCURATE ON 24"X36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 9
SHEET 9 OF 11



LEGEND

- SUPPLY WATER PIPELINE
- CMP CULVERT
- WATER CONTROL STRUCTURE
- FISH KETTLE
- KETTLE CHECK STRUCTURE
- EARTHWORK
- DEEPEINED DITCH
- ACCESS ROAD
- WALKING PATH
- MANHOLE W/ FISH SCREEN
- ROCK RIPRAP
- 50' VEGETATION BUFFER
- STAGING AREA

BORROW NOTES:

1. STRIP AND STOCKPILE APPROX. 4"-6" OF TOPSOIL FROM PROPOSED BORROW AREA. 4"-6" OF TOPSOIL SHALL BE RESPREAD OVER THE ENTIRE BORROW AREA INCLUDING SIDE SLOPES. COST OF TOPSOIL WORK SHALL BE CONSIDERED INCIDENTAL TO BID ITEM "SITE PREPARATION".
2. SUITABLE MATERIAL FOR ALL FILLS SHALL BE OBTAINED FROM THE DESIGNATED BORROW AREA SHOWN ON THIS SHEET AS APPROVED BY THE DU FIELD ENGINEER. CARE SHALL BE TAKEN NOT TO OPEN UP ANY SAND LENSES THAT WILL INCREASE SEEPAGE FROM ANY EXCAVATION AREAS.
3. BORROW AREAS ARE TO LOOK NATURAL UPON COMPLETION, MAINTAINING VISUAL APPEALING SLOPES. IDEALLY THESE SLOPES SHALL BE 6:1 OR FLATTER. IN ADDITION BORROW AREAS SHALL MAINTAIN HISTORIC DRAINAGE PATHS AND SHALL DRAIN DURING RUNOFF.
4. BORROW AREAS ARE DEFINED AND THE CONTRACTOR NEEDS APPROVAL FROM THE DU ENGINEER TO BORROW OUTSIDE OF THE DEFINED LIMIT.

ABBREVIATIONS LIST

C.L. = CENTER LINE
CMP = CORRUGATED METAL PIPE ROUND
CMPA = CORRUGATED METAL PIPE ARCH
CONC. = CONCRETE
DIA. = DIAMETER
ELEV. = ELEVATION
EMB. = EMBANKMENT
EX. = EXISTING
FES = FLARED END SECTION
FSL = FULL SERVICE LEVEL
GA. = GAUGE
INV = INVERT
LAT = LATITUDE (WGS84)
LONG = LONGITUDE (WGS84)
L.F. = LINEAR FEET
MISC = MISCELLANEOUS
NFES = NON-FLARED END SECTION

O.C. = ON CENTER
O.C.E.W. = ON CENTER EACH WAY
PLS = PURE LIVE SEED
RCP = REINFORCED CONCRETE PIPE
REQ. = REQUIRED
R.O.W. = RIGHT OF WAY
S = SOUTH
SED. = SEDIMENT
TBM = TEMPORARY BENCHMARK
UG = UNDERGROUND
VEG = VEGETATION
W/ = WITH
WCS = WATER CONTROL STRUCTURE
WL = WATER LEVEL
WS = WATER SHOT

*NOTE: NOT ALL ABBREVIATIONS IN THIS LIST APPEAR ON THIS SHEET

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"BEFORE YOU DIG"
BEFORE THE START OF CONSTRUCTION. THE OWNER OF ANY UTILITIES INVOLVED MUST BE NOTIFIED. THE EXCAVATOR/CONTRACTOR IS RESPONSIBLE FOR GIVING THIS NOTICE BY CALLING **"ONE CALL OF COLORADO"** AT **811**. A **72 HOUR** NOTIFICATION AND FULL DESCRIPTION OF LOCATION IS REQUIRED.

DU DESIGN ENGINEER:
KEVIN WARNER, P.E.
(970) 590-1545

DU CONSTRUCTION ENGINEER:
MICHAEL KUEHNEL, P.E.
(970) 218-7009

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:
MICHAEL A. KUEHNEL
62833
PROFESSIONAL ENGINEER

DESIGNED BY: KJW
DRAWN BY: MAK/JJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:

REVISION:	DATE:	BY:
1		
2		
3		
4		
5		
6		
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8		

PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: PERMANENT & TEMPORARY
BEST MANAGEMENT PRACTICES PLAN

DATE: 04/17/2025

SHEET TITLE: PERMANENT & TEMPORARY BEST
MANAGEMENT PLAN

SCALE: 1" = 60'

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 10
SHEET 10 OF 11

STORM WATER POLLUTION PREVENTION PLAN
The Colorado General Permit Authorization to Discharge Stormwater Associated with Construction Activity
(Permit # _____)
issued on ____/____/____ shall apply for this project.

ABBREVIATIONS
CDPHE: Colorado Department of Public Health and Environment
CDNR: Colorado Department of Natural Resources
USFWS: United States Fish and Wildlife Service
SWMP: Storm Water Management Plan

LOCATION/NARRATIVE
Location: See Sheet 1 for the location of this project.
Project Limits: See Sheet 2 of this plan for the project limits. These sheets cover the earthwork for the two ponds and the water control structure.

PROJECT CONTACTS
SWMP Administrator:
Michael Kuehnel, El
Regional Engineer I
Ducks Unlimited
Cell: 970-218-7009
Email: mkuehnel@ducks.org

The Contractor is responsible for implementation of the SWMP and installation, inspection and maintenance of the erosion prevention and sediment control BMP's before and during construction.

Contractor Name:_____
Company:_____
Telephone Number:_____
Email:_____

SPILL NOTIFICATION
In the event of a spill, the contractor's site superintendent will make the appropriate notificiaton(s), consistent with the following procedures:
1. A reportable spill is a quantity of more than 5 gallons of petroleum which must be reported immediately to the CDPHE.
2. Any spill of oil or hazardous substance to waters of the state must be reported immediately by telephone to the CDPHE.
3. Colorado Environment Release and Reporting Line: 24 Hour (877) 518-5608

POTENTIAL POLLUTION SOURCES
Heavy machinery will be operated on the project site requiring the use of fuel trucks. Contamination due to fuel spills and oil leaks is possible due to the large volume of work being performed. Day to day cleaning and maintenance of equipment has the potential to impact stormwater quality. Delivery of site materials also has potential for impacting runoff quality. Another potential pollution source is sediment transport from earthwork.

POLLUTION PREVENTION MANAGEMENT MEASURES
• Solid Wastes (None anticipated):
Collected sediment, asphalt, and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with the CDPHE disposal requirements.
• Hazardous Materials (None anticipated):
Oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with CDPHE regulations.
• Vehicle Washing:
External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff must be contained and waste properly disposed of. No engine degreasing is allowed on site.
• Concrete Washout Onsite (No concrete anticipated):
All liquid and solid wastes generated by concrete washout operation must be contained in a leak-proof containment facility or impermeable liner. A compacted clay liner that does not allow washout liquids to enter ground water is considered an impermeable liner. The liquid and solid wastes must not contact the ground, and there must not be runoff from the concrete washout operation or areas. Liquid and solid wastes must be disposed of properly and in compliance with CDPHE regulations. A sign must be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.

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EROSION AND SEDIMENT CONTROLS
(Check all that apply)
• Stabilization Practices
• _____ Temporary or Permanent Seeding
• _____ Sod Placement
• _____ Planting
• _____ Mulching (Straw or Cellulose Fiber)
• _____ Erosion Control Blankets or Mats
• _____ Vegetation Buffer Strips
• ☒ _____ Roughened Surface (e.g. tracking)
• _____ Gabions-Gabion Mattress
• ☒ _____ Other: Rip Rap

Structural Temporary Erosion and Sediment Controls
• _____ Silt Fence
• _____ Temporary Berm
• _____ Temporary Slope Drain
• _____ Straw Wattles or Rolls
• _____ Diversion Channels/Swales
• _____ Channel Liners (TRM)
• _____ Stone Rip Rap Sheet
• _____ Rock Check Dams
• _____ Sediment Traps/Basins
• _____ Inlet Protection
• _____ Outlet Protection
• _____ Surface Inlet Protection
• _____ Curb Inlet Protection
• _____ Stabilized Construction Entrances
• ☒ _____ Other (Vegetation Buffer)

Wetland Avoidance:
Will construction and/or erosion and sediment controls impinge on regulated wetlands?
☒ Yes _____ No

If yes, the project and erosion and sediment control impacts have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.

Storm Water Management: Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period.

SITE DESCRIPTION
EXISTING CONDITIONS: The portion of the Audubon Nature Preserve that the work will be performed is considered a wildlife nature preserve.
PROJECT DESCRIPTION: The purpose of the project is to install a water control structure and fish kettle to isolate endangered fish. The project will consist of strategic earth-moving to enhance the Audubon Endangered Fish Pond and the installation of a water control and fish kettle structures to allow filling of the Audubon Endangered Fish Pond and isolate endangered fish species.

DESCRIPTION OF CONSTRUCTION ACTIVITIES
The proposed construction activities will provide water level management to the site. Through this management more desirable wetlands will be created.

Major Soil Disturbing Activities (check all that apply):
• ☒ Clearing & Grubbing
• ☒ Grading & Shaping
• ☒ Cutting & Filling
• _____ Other (describe):

Discharges to Special Or Impaired Waters: The project does not have a discharge point within 1 mile of a special water or a water that is impaired for sediment or a sediment related parameter of the permit.

Discharges to Calcareous Fen: The project does not have a discharge to a Calcareous fen.

Endangered or Threatened Species: The project area has not been identified for endangered or threatened species.

Historic Places or Archeological Sites: Historical places or archeological sites have been addressed by the USFWS.

Quantities Tabulation for All BMPs: See estimated quantities and construction notes in plans.

ORDER OF CONSTRUCTION ACTIVITIES
(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.)
• Install initial erosion and sediment control measures.
• Proceed with site grading and construction activities.
• Stabilize areas disturbed by construction activities with temporary erosion and sediment control measures.
• Complete final grading.
• Complete permanent erosion and sediment control measures.

ESTIMATED PROJECT AREA QUANTITIES
Total Project Area: 31 Acres
Total Area to Be Disturbed: 3.5 Acres
Existing Impervious Area: 0.0 Acres
Proposed Impervious Area: 0.0 Acres

EXISTING GROUND COVER
Currently the site is a wildlife nature preserve with three ponds on-site.

NON-STORMWATER DISCHARGE
None.

RECEIVING WATER
Runoff from the site is retained by the existing pond system. during a flooding event, water from the project area would ultimately drain into the Colorado River.

STREAM CROSSINGS LOCATED WITHIN THE CONSTRUCTION SITE BOUNDARY
None.


SITE MAP
See Sheet 1 (Cover Sheet) for vicinity and location maps. See Sheet 2 for overall site map.

LOCATION OF SWMP REQUIREMENTS IN PROJECT PLAN
See the Erosion and Sediment Control notes and details on sheets 10 & 11.

FINAL STABILIZATION AND LONGTERM STORMWATER MANAGEMENT
Following site construction, the goal is to achieve a stabilized cover condition to provide long-term stormwater protection. Stabilization is quantified by achieving uniform cover equal to 70% of the pre-disturbance condition. The post-construction condition of the site shall be that the majority of the disturbed area will be compacted soil and seeded. Once the seeding takes, this shall virtually eliminate erosion from the site. Permanent seeding with mulching is installed as needed. Drainage ditches, pans, and culverts shall be cleaned of debris and sediment. Repair eroded sloped or drainage paths by backfilling. Remove all silt fences following establishment of permanent stable vegetation.

CONSTRUCTION CHANGES
When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Management Plan (SWMP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SWMP will be retained in a designated place for review over the course of the project.

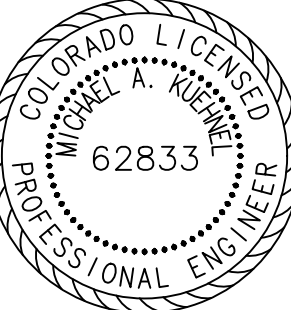
MAINTENANCE AND INSPECTION
Maintenance and Inspection Practices
• Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
• All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report or as soon as field conditions allow access.
• Where work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs at the site or prior to resuming construction, whichever comes first.
• Where parts of the construction site have undergone final stabilization, but work remains on other parts of the site, inspections of the stabilized areas may be reduced to once per month.
• Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely anchored. Sediment buildup will be removed from the silt fence when it reaches ½ of the height of the silt fence. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches ½ of the height of the fence.
• Sediment basins and traps will be checked. Sediment will be removed when the depth reaches approximately 50 percent of the structure's capacity.
• Check dams will be inspected for stability. Sediment will be removed when the depth reaches ½ the height of the dam.
• All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
• Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion.
• Construction site vehicle exit locations must be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment must be removed from all off-site paved surfaces within 24 hours of discovery.
• Disturbed areas will be checked for stabilization. Stabilization measures shall be initiated as soon as construction activity in that portion of the site has temporarily or permanently ceased.
• The normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, must be stabilized within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connection to a surface water.
• Stabilization of the remaining portions of any temporary or permanent ditches or swales must be completed within 14 days after connecting to a surface water and construction in that portion of the ditch has temporarily or permanently ceased.
• Temporary or permanent ditches or swales that are being used as a sediment containment system (with properly designed rock ditch checks, bio rolls, silt dikes, etc.) do not need to be stabilized. These areas must be stabilized within 24 hours after no longer being used as a sediment containment system.
• Pipe outlets must be provided with temporary or permanent energy dissipation within 24 hours after connection to a surface water.
• Discharge procedures for water control and dewatering operations will be inspected. If the water cannot be discharged to a sedimentation basin prior to entering the surface water, it must be treated with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners.
• Inspection and maintenance reports will be completed for each site inspection, this form will also be used to document changes to the SWMP. The report shall include the date and amount of precipitation or snowmelt events that cause surface erosion. A copy of the completed inspection form will be filed with the SWMP documents.
• The Contractor's site superintendent is responsible for inspection. Maintenance and repair activities are the responsibility of the Contractor.



DUCKS UNLIMITED INC.

GREAT PLAINS REGIONAL OFFICE

P.E. SEAL:



DESIGNED BY: KAW
DRAWN BY: MAK/UJW
SURVEYED BY: MAK
CHECKED BY:
APPROVED BY:
APPROVED BY:

REVISION:	DATE:	BY:
1		
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PROJECT: GRAND VALLEY AUDUBON CENTER
ENDANGERED FISH PONDS

SHEET TITLE: SWMP NOTES

DATE: 04/17/2025

SHEET TITLE: SWMP NOTES

SCALES ARE ACCURATE ON 24"x36" SHEET SIZE

DU PROJECT NUMBER: CO-306-4

SHEET NUMBER: 11
SHEET 11 OF 11