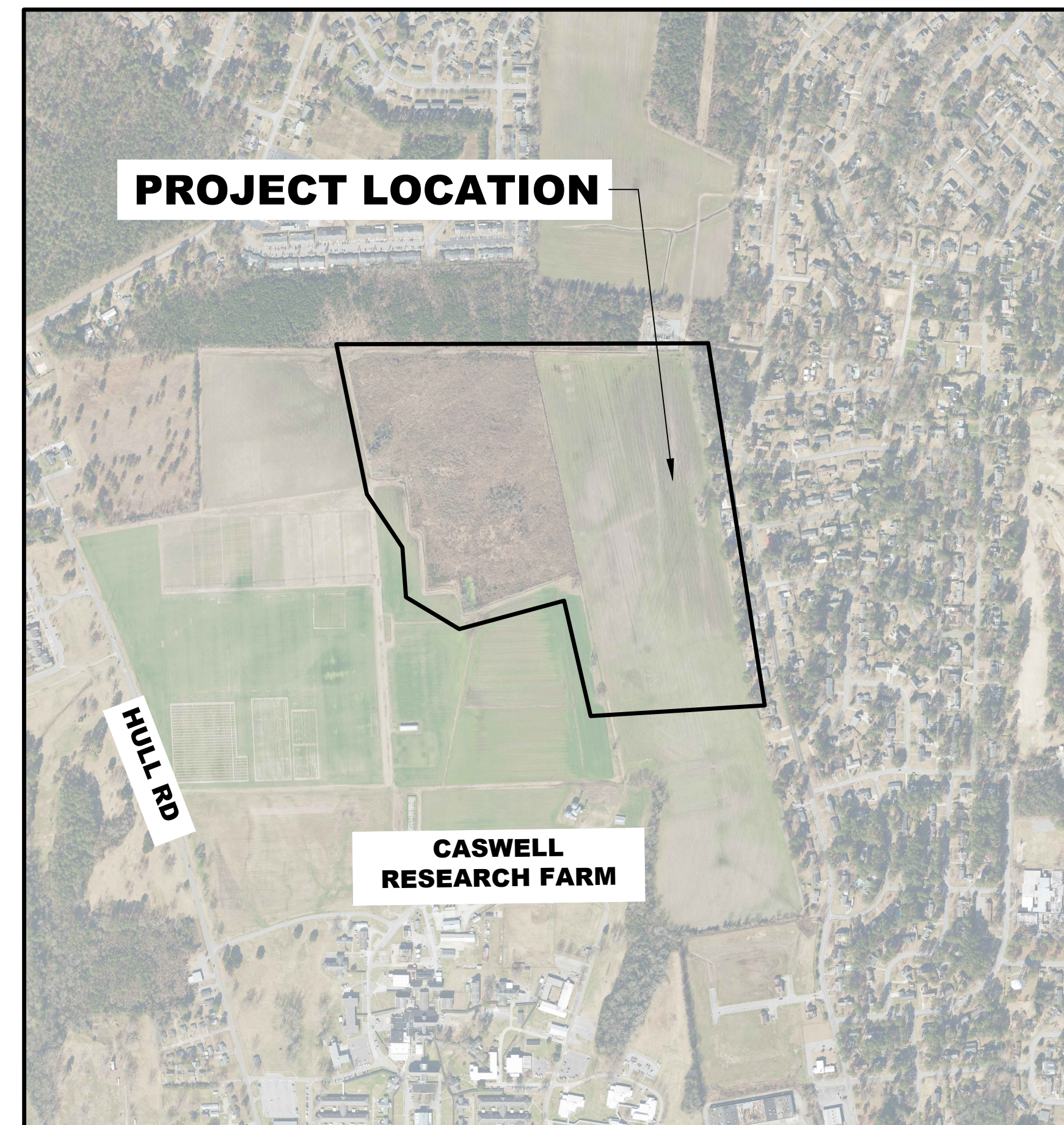


CASWELL RESEARCH FARM WATER FARMING DEMONSTRATION PROJECT

2415 W. VERNON AVE KINSTON, NC 28504



VICINITY MAP

PROJECT CONTACTS	



SHEET INDEX	
SHEET #	SHEET DESCRIPTION
1.1	TITLE SHEET
2.1	PROJECT OVERVIEW
3.1	EXISTING CONDITION
4.1	GRADING PLAN
5.1	DRAINAGE DITCH MODIFICATIONS
5.2	DRAINAGE
5.3	DIMENSIONS
6.1	SEDIMENT AND EROSION CONTROL
7.1	SECTION VIEWS 1
7.2	SECTION VIEWS 2
8.1	DETAILS
8.2	S & EC DETAILS
9.1	QUANTITIES AND NOTES

WATER FARMING DEMO
CASWELL RESEARCH FARM
LENIOR COUNTY, NC
TITLE SHEET
1.1

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3100 FAUCETTE DRIVE
RALEIGH, NC 27696

PROJECT: CASWELL WATER FARMING

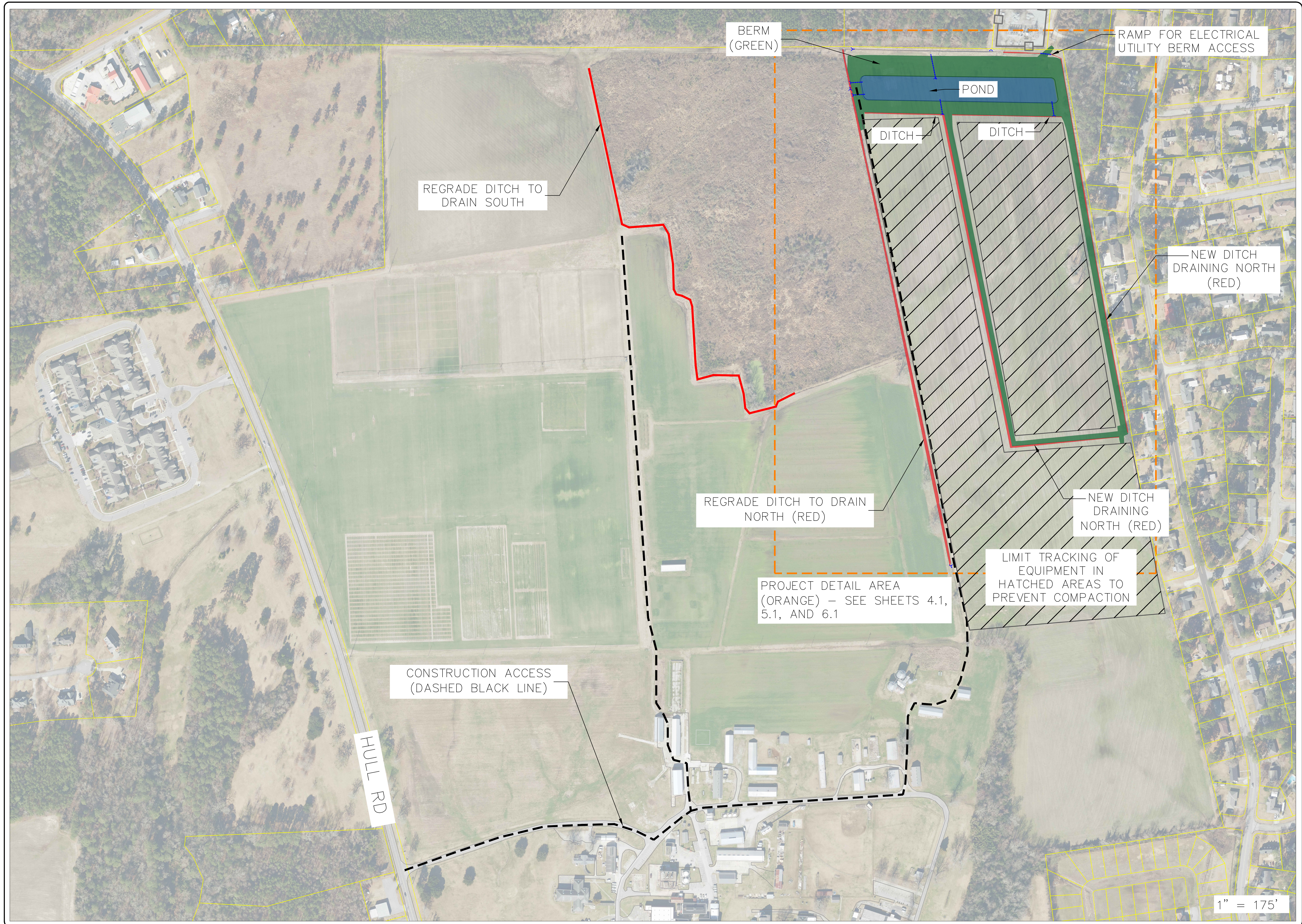
NAME: AS NOTED

SCALE: AS NOTED

DATE: NOVEMBER 1, 2023

PROJECT # _____

PHASE # _____



BERM
(GREEN)

RAMP FOR ELECTRICAL
UTILITY BERM ACCESS

POND

DITCH

DITCH

REGRADE DITCH TO
DRAIN SOUTH

NEW DITCH
DRAINING NORTH
(RED)

REGRADE DITCH TO DRAIN
NORTH (RED)

NEW DITCH
DRAINING
NORTH (RED)

PROJECT DETAIL AREA
(ORANGE) - SEE SHEETS 4.1,
5.1, AND 6.1

LIMIT TRACKING OF
EQUIPMENT IN
HATCHED AREAS TO
PREVENT COMPACTION

CONSTRUCTION ACCESS
(DASHED BLACK LINE)

HULL RD

1" = 175'



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RALEIGH, NC 27695



DRAWN BY:	JWE	PROJECT:	CASWELL WATER FARMING
DESIGN:	JWE, BAD, HY, CP	NAME:	WATER FARMING
CHECK:	BAD	SCALE:	AS NOTED
APPROVED:	BAD	DATE:	NOVEMBER 1, 2023

PROJECT # _____
PHASE # _____



WATER FARMING DEMO
CASWELL RESEARCH FARM
LENIOR COUNTY, NC



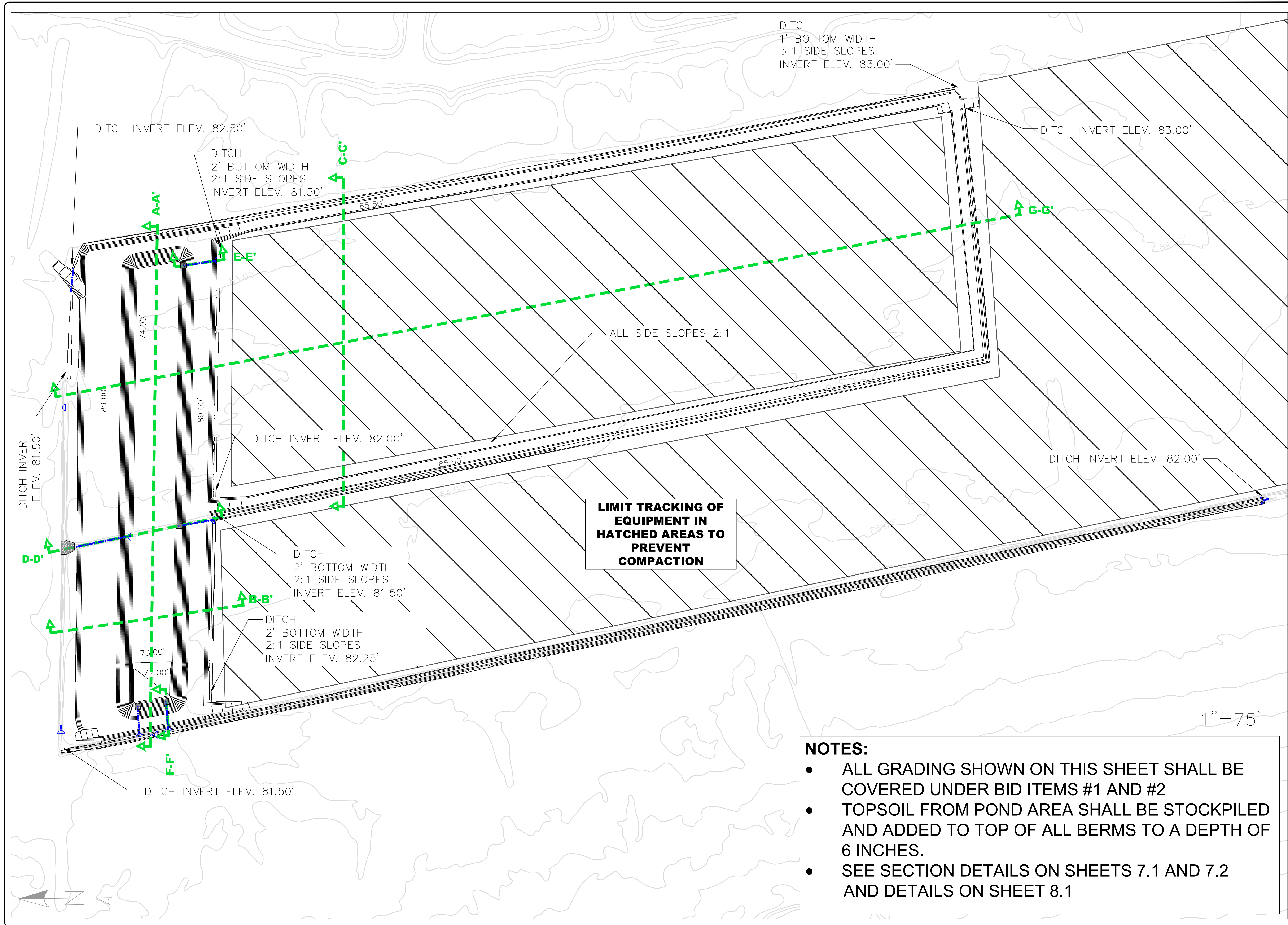
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3100 FAUCETTIE DRIVE
RALEIGH, NC 27695



DRAWN:	JWE	PROJECT:	CASWELL WATER FARMING
DESIGN:	JWE	NAME:	WATER FARMING
CHECK:	BAJ	SCALE:	AS NOTED
APPROVED:	BAJ	DATE:	NOVEMBER 1, 2023

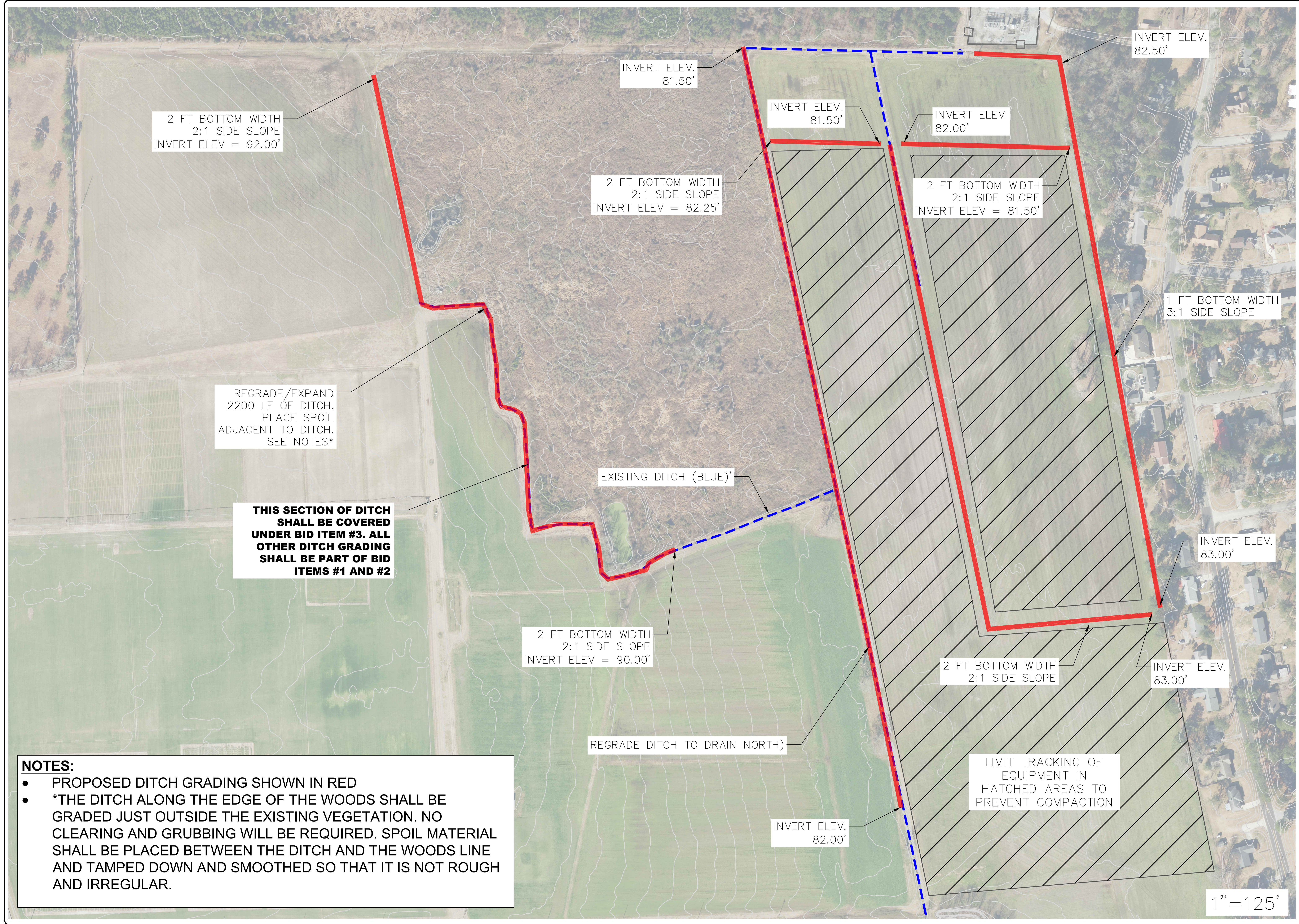
PROJECT # _____
PHASE # _____

EXISTING CONDITION 3.1



- NOTES:**
- ALL GRADING SHOWN ON THIS SHEET SHALL BE COVERED UNDER BID ITEMS #1 AND #2
 - TOPSOIL FROM POND AREA SHALL BE STOCKPILED AND ADDED TO TOP OF ALL BERMS TO A DEPTH OF 6 INCHES.
 - SEE SECTION DETAILS ON SHEETS 7.1 AND 7.2 AND DETAILS ON SHEET 8.1

WATER FARMING DEMO CASWELL RESEARCH FARM LENIOR COUNTY, NC		GRADING PLAN 4.1
NCSU BAE WEAVER ADMIN. BLD. 3100 FAUCETTIE DRIVE RALEIGH, NC 27695		
DRAWN: JFE DESIGN: JFE CHECK: JFE APPROVED: JFE	PROJECT: CASWELL WATER FARMING NAME: WATER FARMING SCALE: AS NOTED DATE: NOVEMBER 1, 2023	PROJECT # _____ PHASE # _____



2 FT BOTTOM WIDTH
2:1 SIDE SLOPE
INVERT ELEV = 92.00'

INVERT ELEV.
81.50'

INVERT ELEV.
81.50'

INVERT ELEV.
82.00'

INVERT ELEV.
82.50'

2 FT BOTTOM WIDTH
2:1 SIDE SLOPE
INVERT ELEV = 82.25'

2 FT BOTTOM WIDTH
2:1 SIDE SLOPE
INVERT ELEV = 81.50'

REGRADE/EXPAND
2200 LF OF DITCH.
PLACE SPOIL
ADJACENT TO DITCH.
SEE NOTES*

1 FT BOTTOM WIDTH
3:1 SIDE SLOPE

**THIS SECTION OF DITCH
SHALL BE COVERED
UNDER BID ITEM #3. ALL
OTHER DITCH GRADING
SHALL BE PART OF BID
ITEMS #1 AND #2**

EXISTING DITCH (BLUE)'

INVERT ELEV.
83.00'

2 FT BOTTOM WIDTH
2:1 SIDE SLOPE
INVERT ELEV = 90.00'

2 FT BOTTOM WIDTH
2:1 SIDE SLOPE

INVERT ELEV.
83.00'

REGRADE DITCH TO DRAIN NORTH)

LIMIT TRACKING OF
EQUIPMENT IN
HATCHED AREAS TO
PREVENT COMPACTION

INVERT ELEV.
82.00'

NOTES:

- PROPOSED DITCH GRADING SHOWN IN RED
- *THE DITCH ALONG THE EDGE OF THE WOODS SHALL BE GRADED JUST OUTSIDE THE EXISTING VEGETATION. NO CLEARING AND GRUBBING WILL BE REQUIRED. SPOIL MATERIAL SHALL BE PLACED BETWEEN THE DITCH AND THE WOODS LINE AND TAMPED DOWN AND SMOOTHED SO THAT IT IS NOT ROUGH AND IRREGULAR.

1"=125'

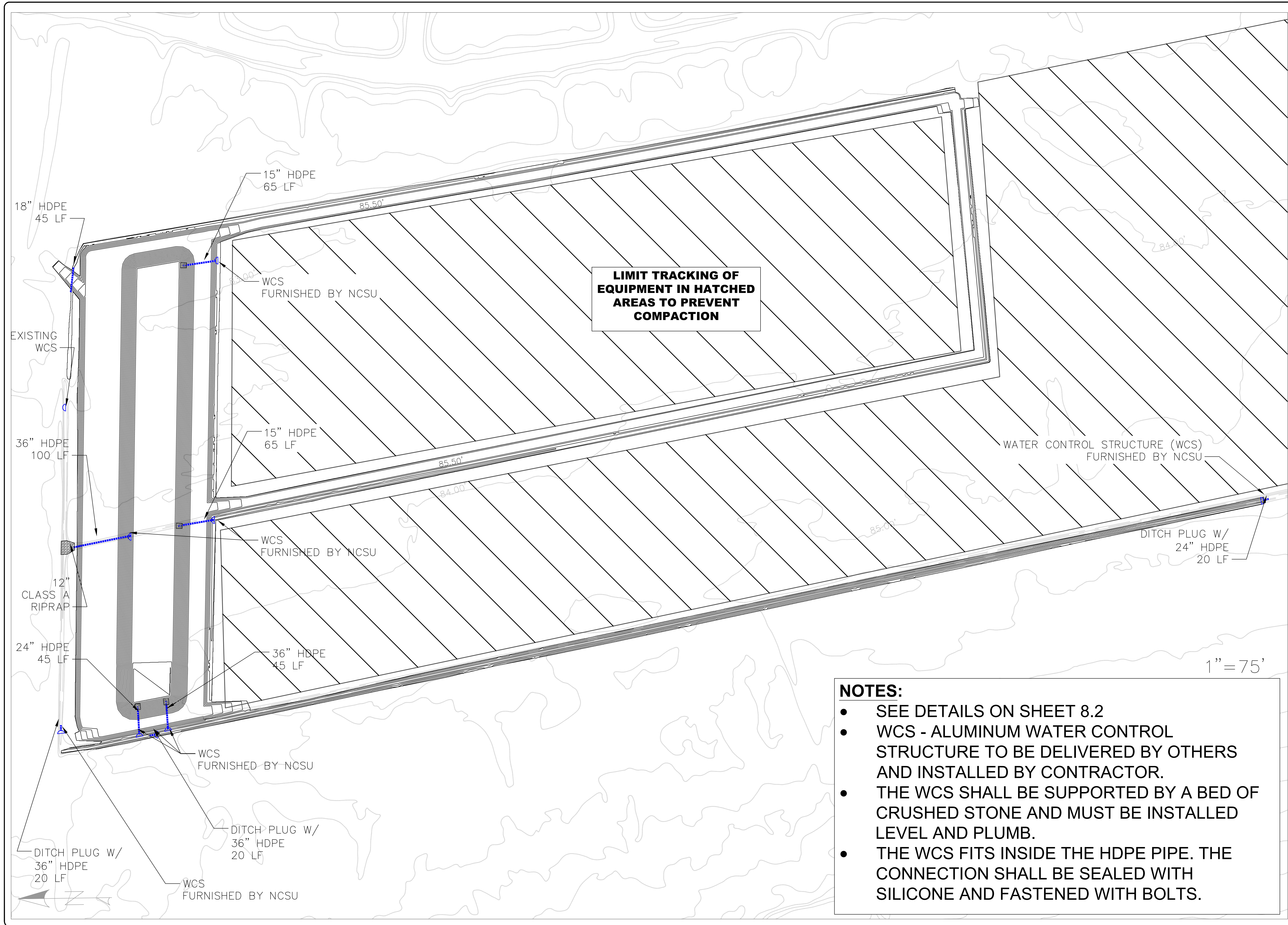


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DRAWN:	PROJECT:	CASWELL WATERS
DESIGN:	NAME:	WATER FARMING
CHECK:	SCALE:	AS NOTED
APPROVED:	DATE:	NOVEMBER 1, 2023

PROJECT # _____
PHASE # _____



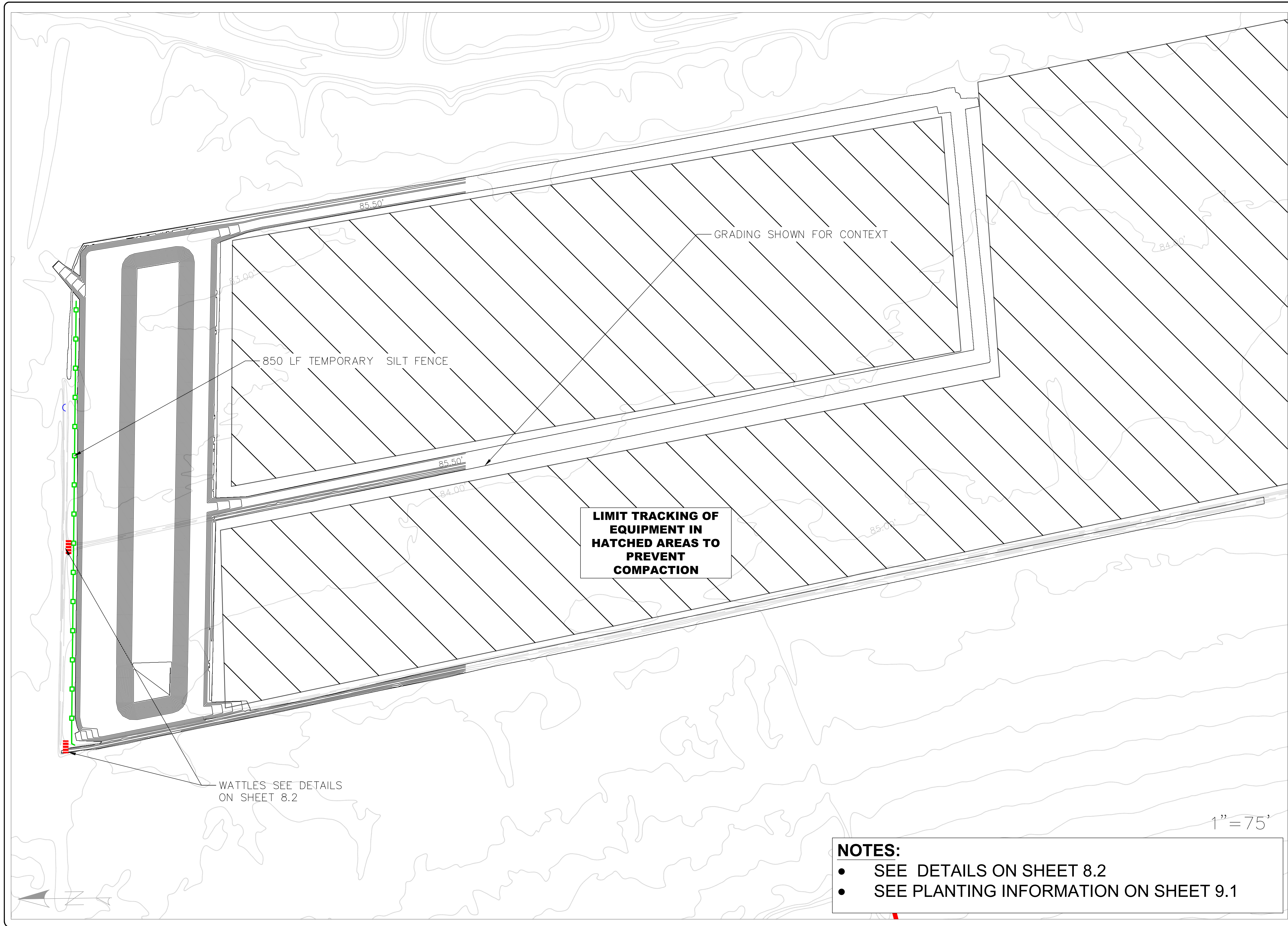
- NOTES:**
- SEE DETAILS ON SHEET 8.2
 - WCS - ALUMINUM WATER CONTROL STRUCTURE TO BE DELIVERED BY OTHERS AND INSTALLED BY CONTRACTOR.
 - THE WCS SHALL BE SUPPORTED BY A BED OF CRUSHED STONE AND MUST BE INSTALLED LEVEL AND PLUMB.
 - THE WCS FITS INSIDE THE HDPE PIPE. THE CONNECTION SHALL BE SEALED WITH SILICONE AND FASTENED WITH BOLTS.



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PROJECT NAME:	CASWELL WATERS FARMING
SCALE:	AS NOTED
DATE:	NOVEMBER 1, 2023
DRAWN BY:	JWE
CHECKED BY:	BAJ
APPROVED BY:	BAJ
PROJECT #	
PHASE #	



850 LF TEMPORARY SILT FENCE

GRADING SHOWN FOR CONTEXT

LIMIT TRACKING OF EQUIPMENT IN HATCHED AREAS TO PREVENT COMPACTION

WATTLES SEE DETAILS ON SHEET 8.2

1" = 75'

NOTES:

- SEE DETAILS ON SHEET 8.2
- SEE PLANTING INFORMATION ON SHEET 9.1

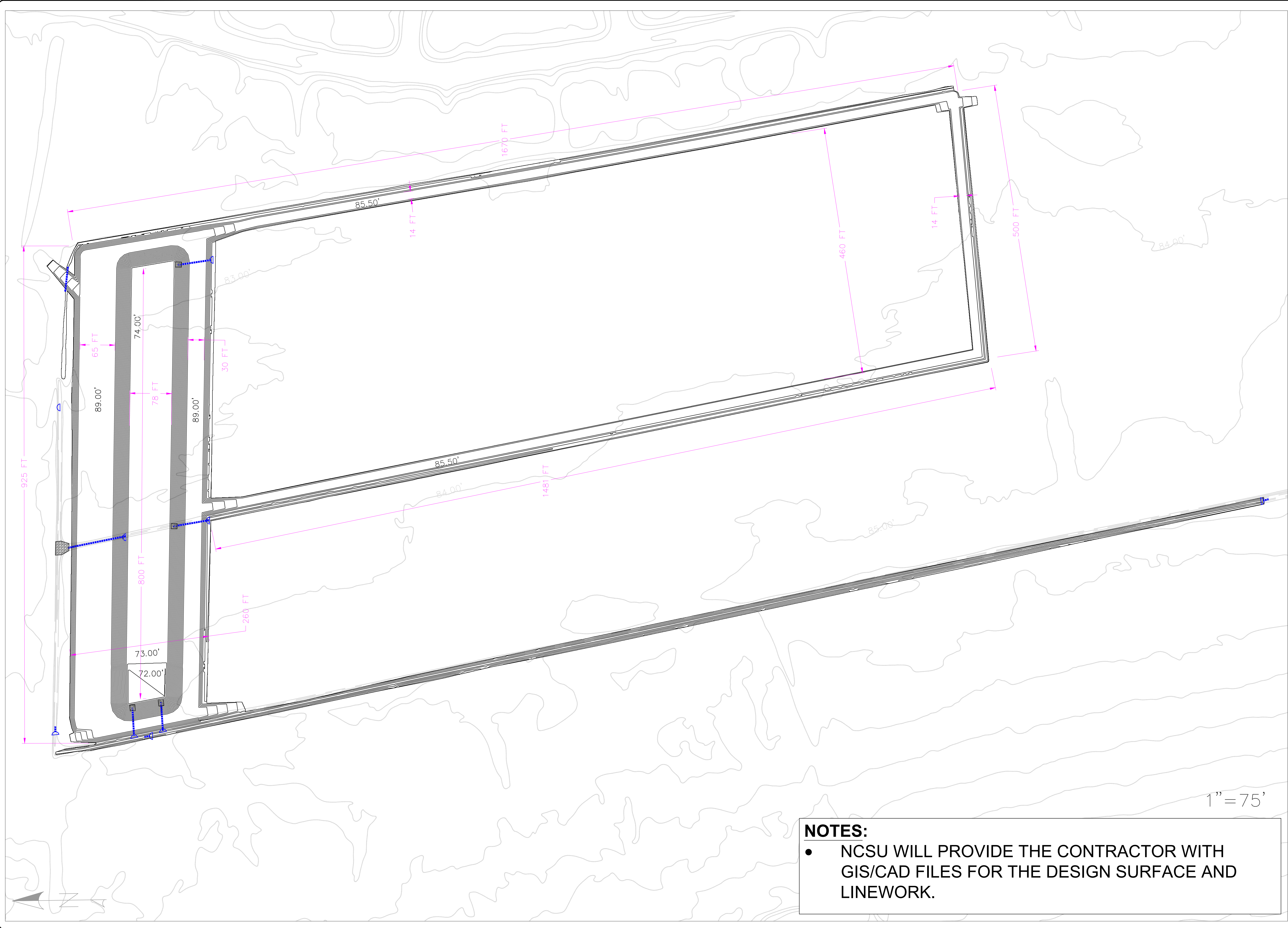


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RALEIGH, NC 27695






PROJECT NAME:	CASWELL WATERS WATER FARMING
SCALE:	AS NOTED
DATE:	NOVEMBER 1, 2023

PROJECT # _____
PHASE # _____



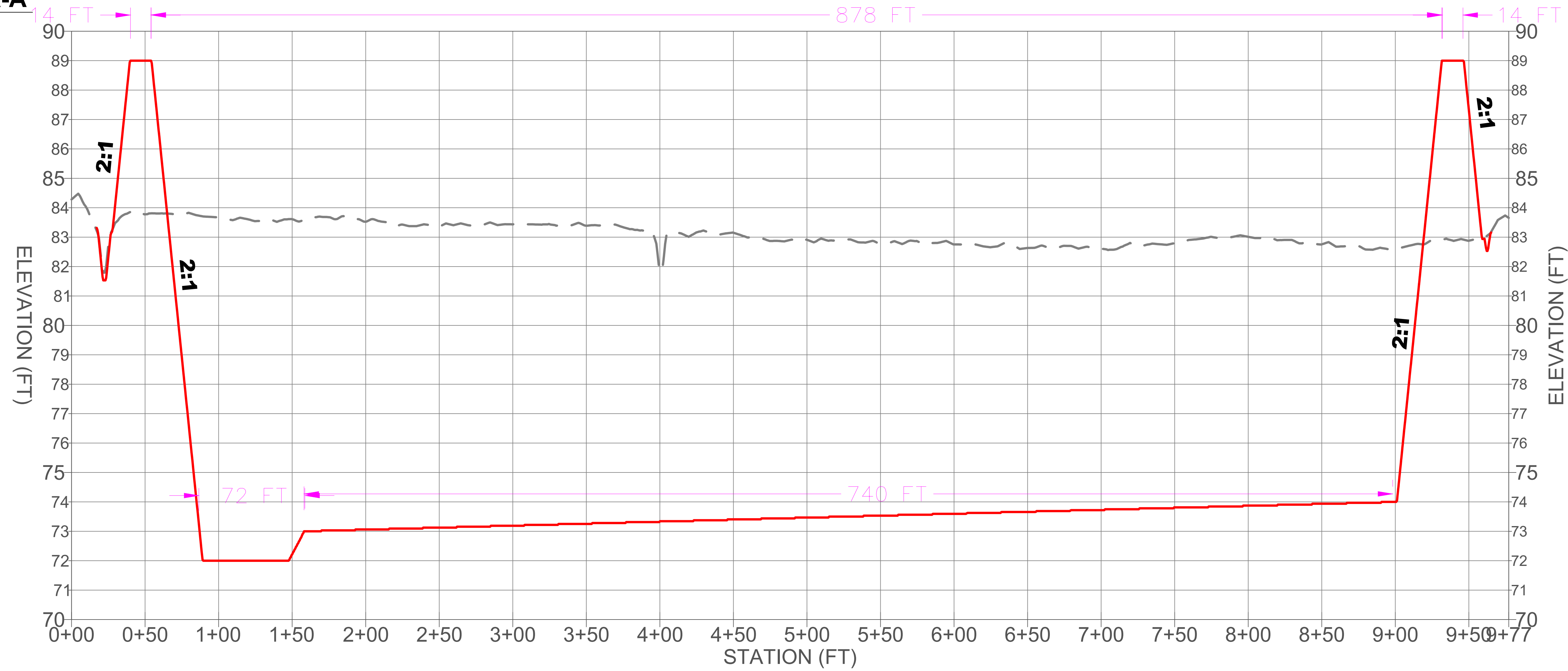
NOTES:

- NCSU WILL PROVIDE THE CONTRACTOR WITH GIS/CAD FILES FOR THE DESIGN SURFACE AND LINEWORK.

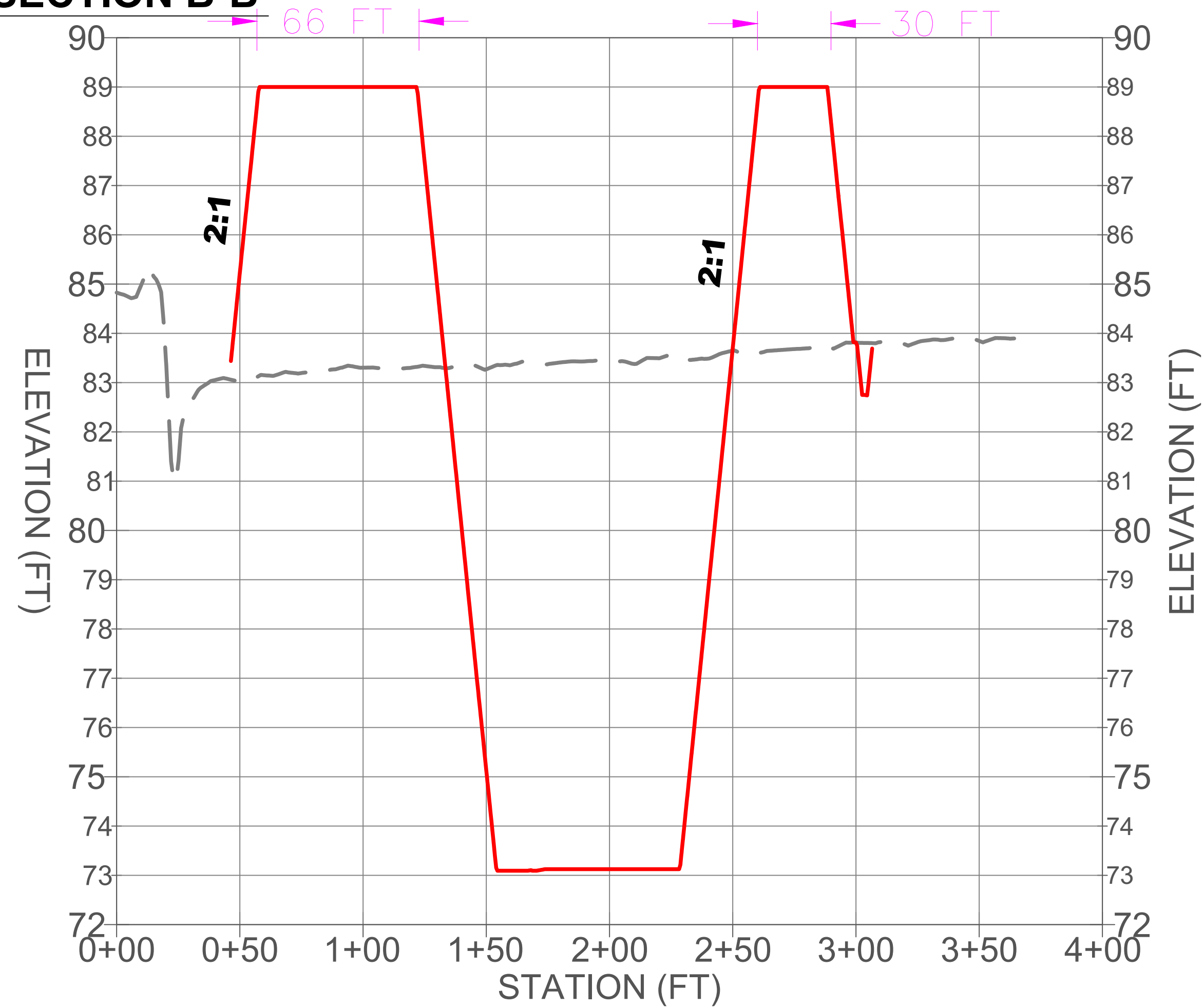
DRAWN: JWE BAD, WY, CP DESIGN: JWE BAD, WY, CP CHECK: BAD APPROVED: BAD		PROJECT: CASWELL WATERS NAME: WATER FARMING SCALE: AS NOTED DATE: NOVEMBER 1, 2023		PROJECT # _____ PHASE # _____	
NCSU BAE WEAVER ADMIN. BLD. 3100 FAUCETTIE DRIVE RALEIGH, NC 27695		  		WATER FARMING DEMO CASWELL RESEARCH FARM LENIOR COUNTY, NC	
				DIMENSIONS 5.3	



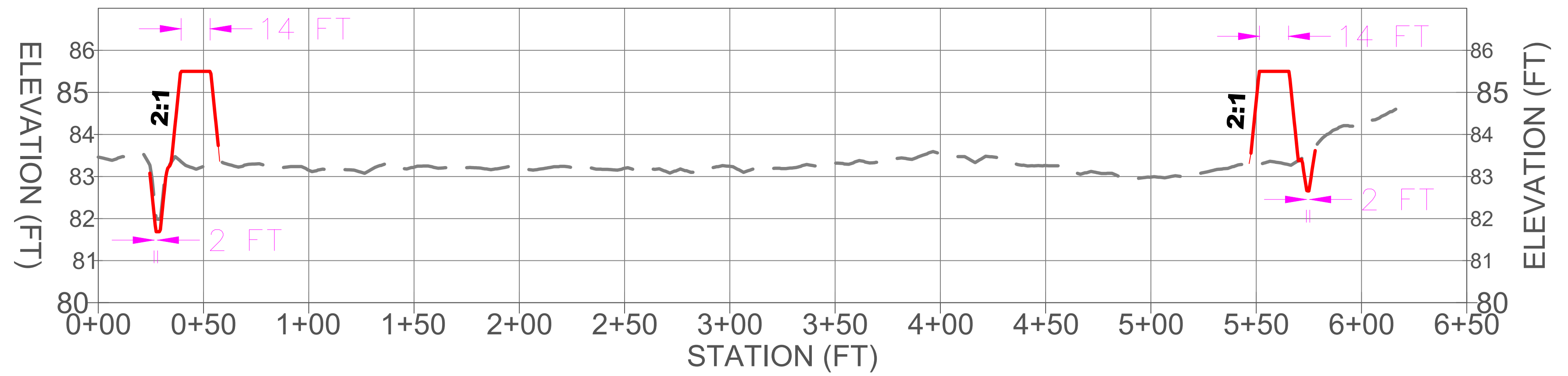
SECTION A-A'



SECTION B-B'



SECTION C-C'



1" = 40'
1:20 VERTICAL EXAGGERATION

WATER FARMING DEMO
CASWELL RESEARCH FARM
LENIOR COUNTY, NC



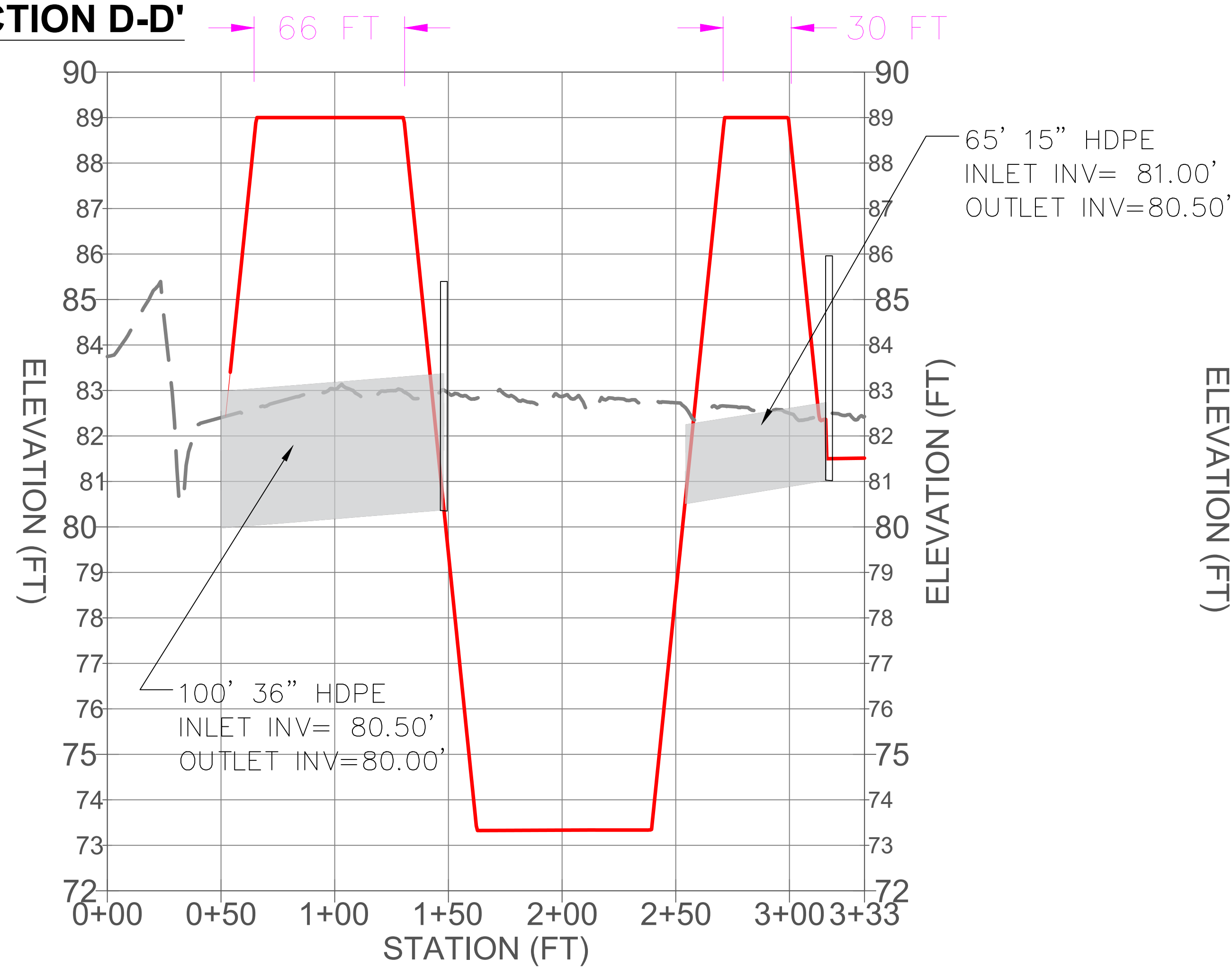
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3100 FAUCETTIE DRIVE
RALEIGH, NC 27695



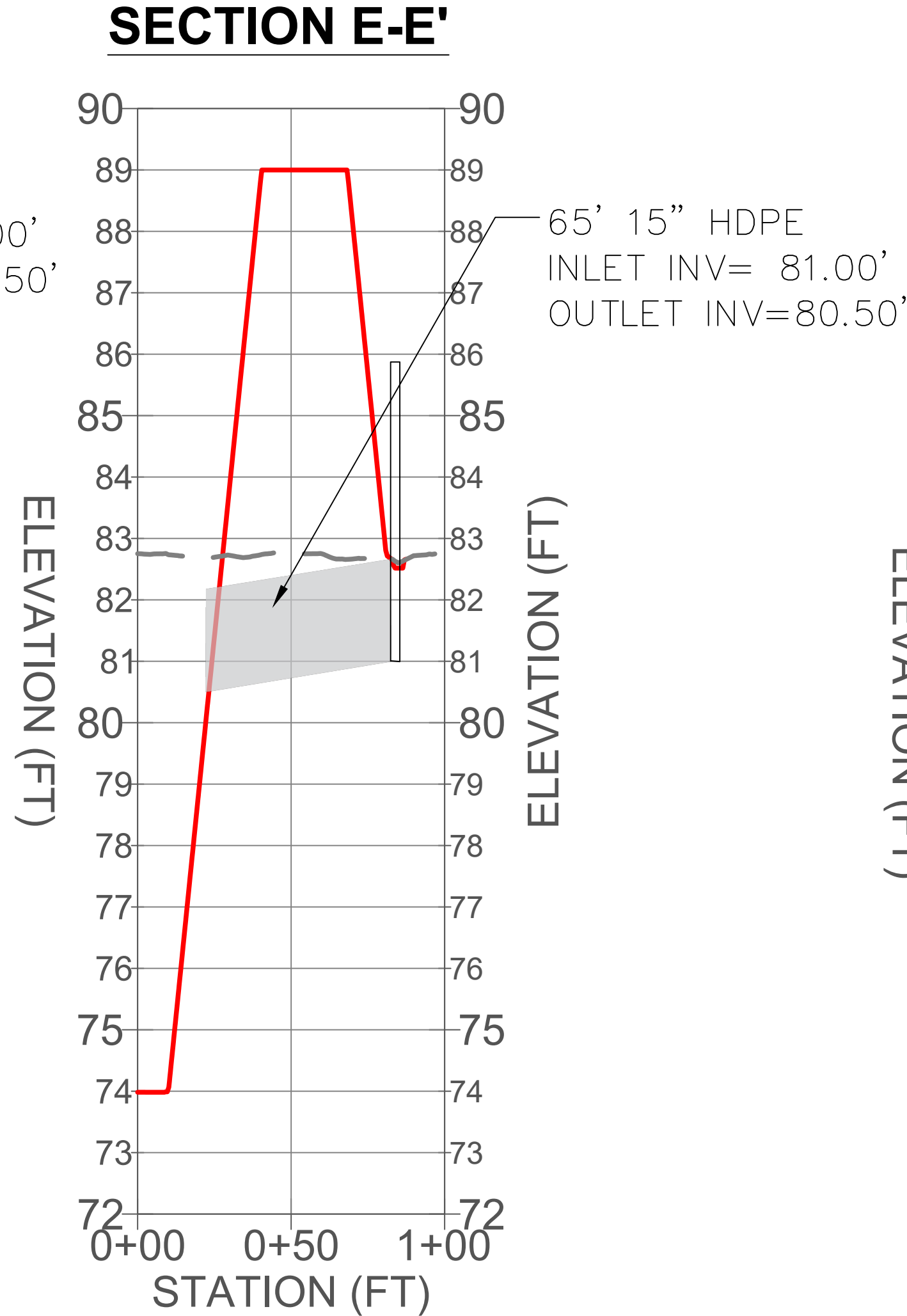
DRAWN:	JWE	PROJECT:	CASWELL WATERS
DESIGN:	JWE	NAME:	WATER FARMING
CHECK:	BAJ	SCALE:	AS NOTED
APPROVED:	BAJ	DATE:	NOVEMBER 1, 2023

PROJECT # _____
PHASE # _____

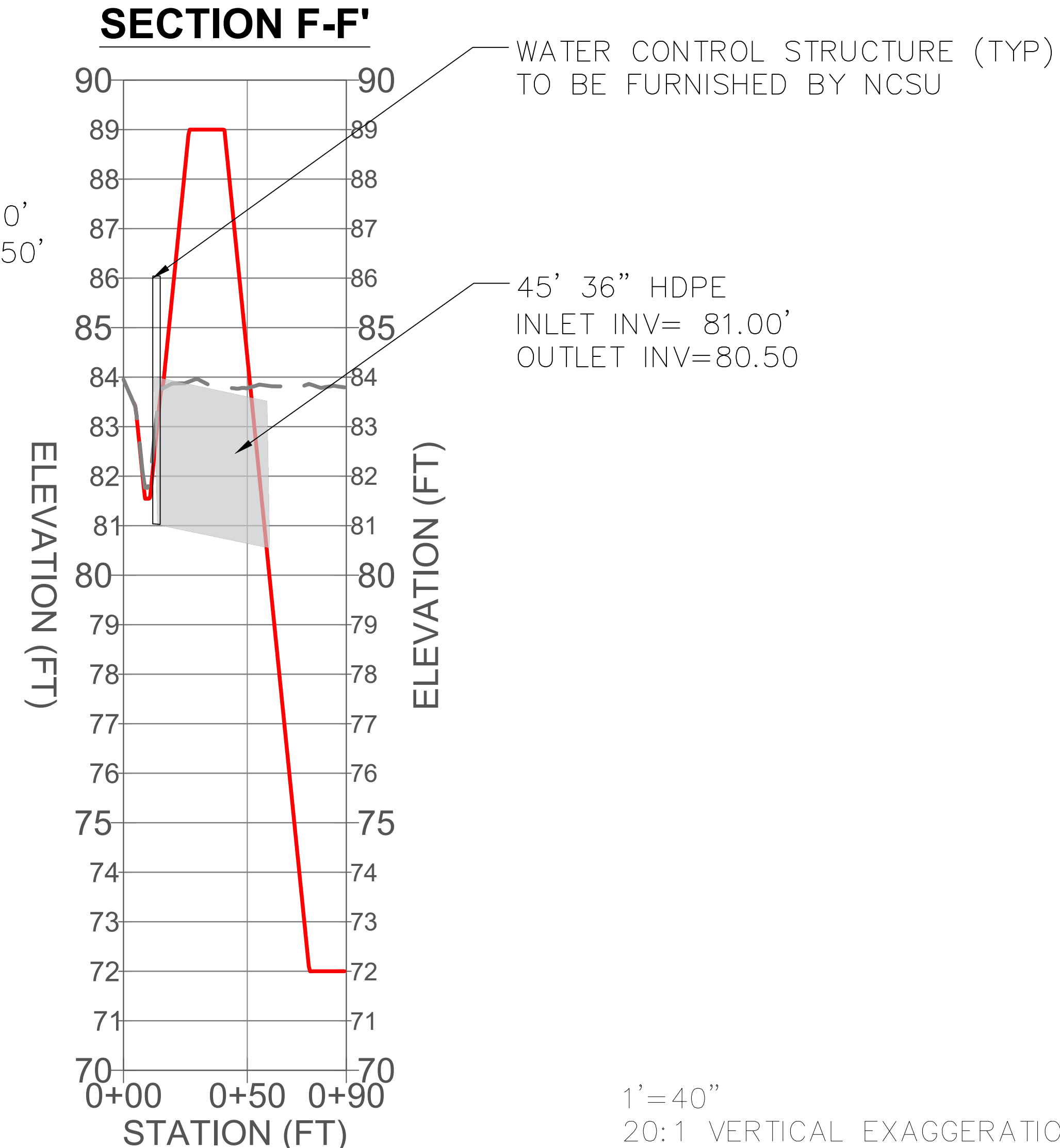
SECTION D-D'



SECTION E-E'

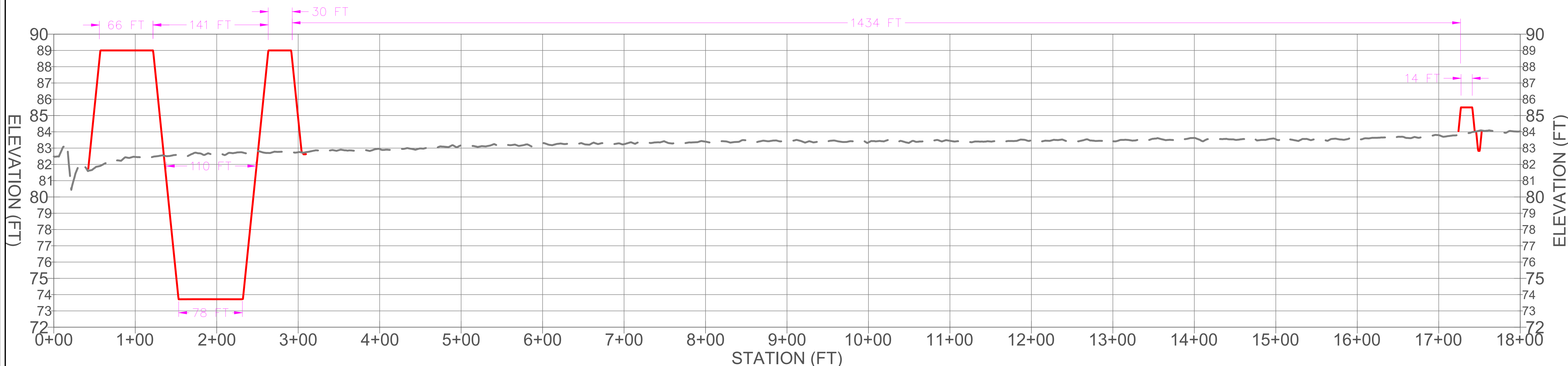


SECTION F-F'



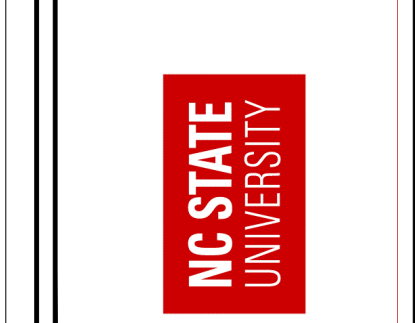
1' = 40"
20:1 VERTICAL EXAGGERATION

SECTION G-G'



1' = 60"
20:1 VERTICAL EXAGGERATION

WATER FARMING DEMO
CASWELL RESEARCH FARM
LENIOR COUNTY, NC



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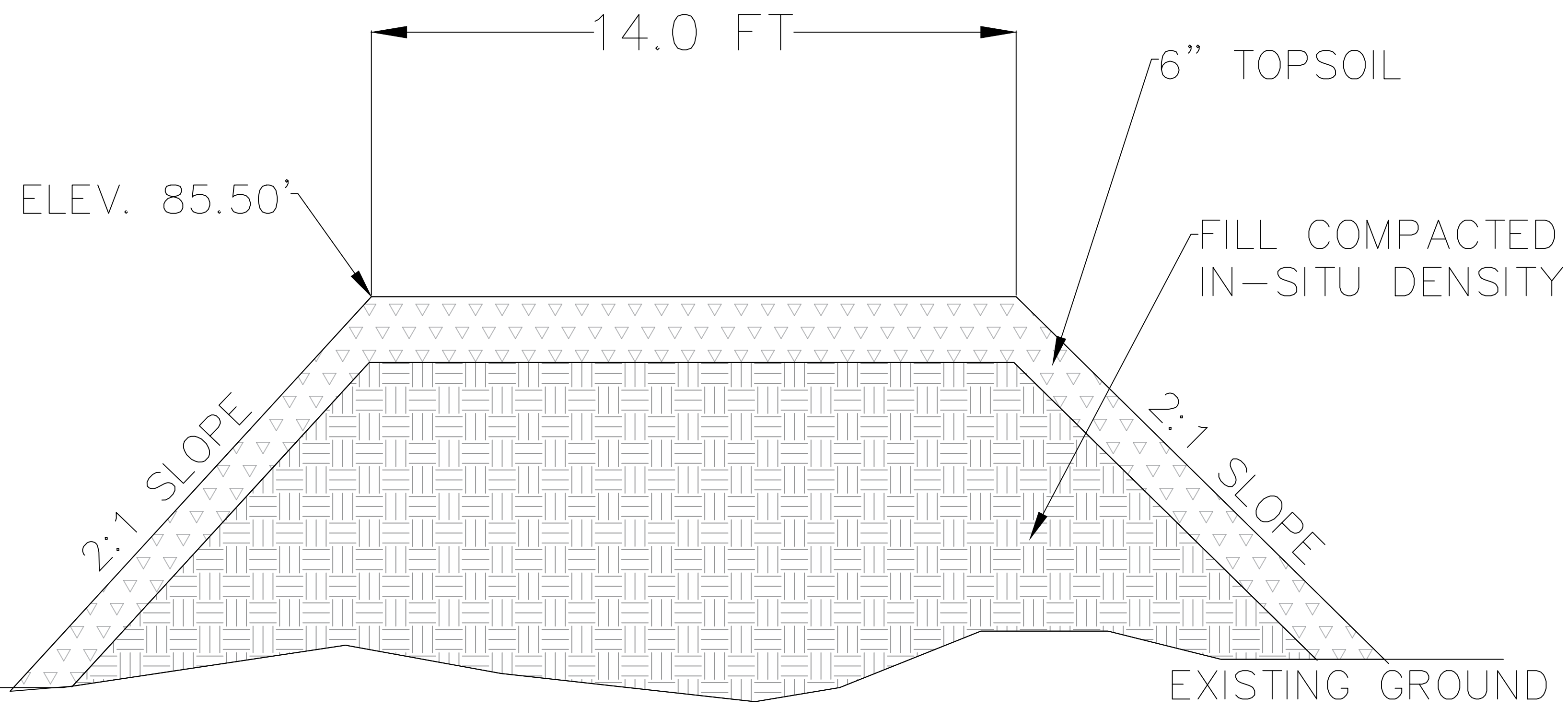


DRAWN:	JWF	PROJECT:	CASWELL WATERS
DESIGN:	JWF, BAD, WY, CP	NAME:	WATER FARMING
CHECK:	BAD	SCALE:	AS NOTED
APPROVED:	BAD	DATE:	NOVEMBER 1, 2023
PROJECT #		PHASE #	

SECTION VIEWS 2

7.2

DETAIL A: TYPICAL WATER FARMING CELL PERIMETER BERM DETAIL

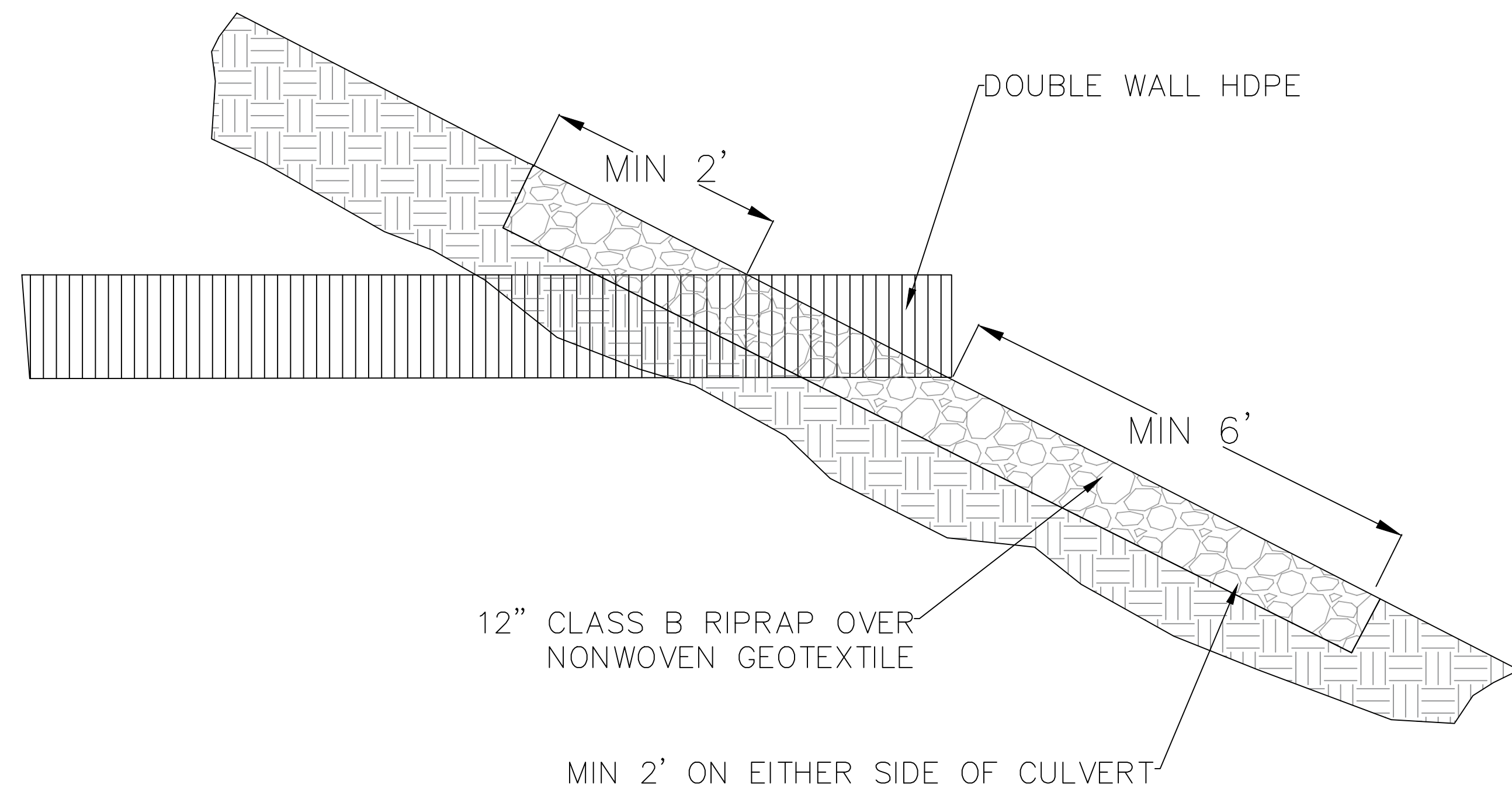


NOT TO SCALE

NOTES

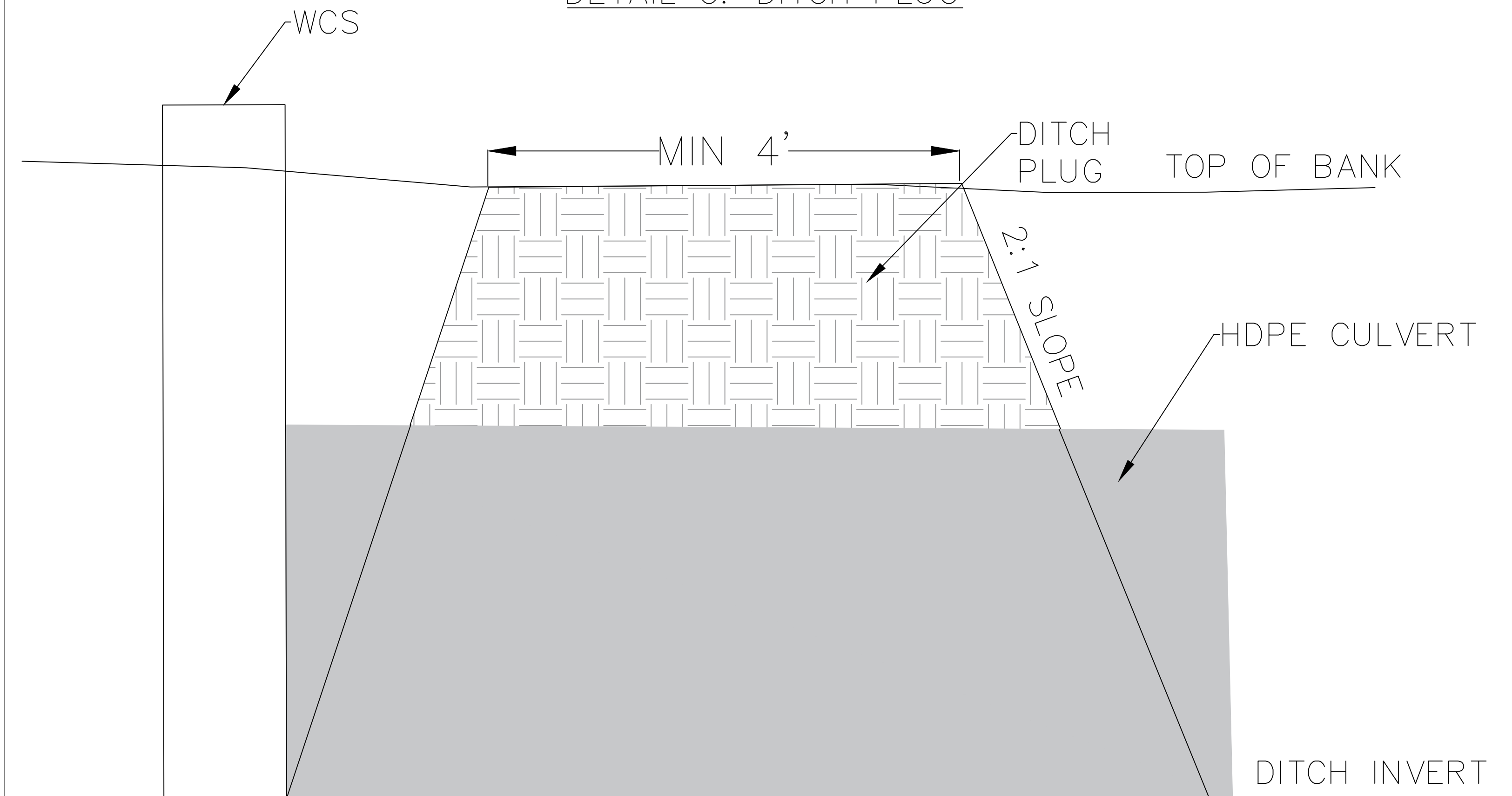
- SEE PLANTING NOTES ON SHEET 9.1 FOR SEEDING OF BERMS.
- TOPSOIL FROM POND AREA SHALL BE STOCKPILED AND ADDED TO TOP OF ALL BERMS TO A DEPTH OF 6'.
- THE SOIL BERMS SHALL BE COMPACTED BY TRACKING EQUIPMENT ACROSS THE BERM AND/OR TAMPING THE SOILS IN PLACE WITH THE EXCAVATOR BUCKET. TOPSOIL SHALL NOT BE COMPACTED.

DETAIL B: PIPE OUTLET PROTECTION – PROFILE VIEW



NOT TO SCALE

DETAIL C: DITCH PLUG



NOT TO SCALE



ITEM	QUANTITY	UNITS	NOTES
TOPSOIL EARTHWORK	6000	CY	TOPSOIL FROM POND AREA SHALL BE STOCKPILED AND ADDED TO ALL BERMS AT A DEPTH OF 6"
POND, BERM, AND DITCH EARTHWORK	24000	CY	CUT AND FILL IS BALANCED - 30,000 CY CUT, 30,000 CY FILL - QUANTITIES ARE IN BANK CY
WOODS PERIMETER DITCH GRADING	2200	LF	SEE SHEET 5.1
SEEDING	6	AC	PERMANENT SEED MIX - SEE 9.1
MATTING	5000	SY	COIR MATTING
15" DPE CULVERT	130	LF	DUAL WALL HDPE
18" HDPE CULVERT	45	LF	DUAL WALL HDPE
24" HDPE CULVERT	45	LF	DUAL WALL HDPE
36" HDPE CULVERT	185	LF	DUAL WALL HDPE
INSTALL WATER CONTROL STRUCTURES	8	EA	SEE SHEET 5.2
RIPRAP	35	TON	NCDOT CLASS B RIPRAP
EROSION CONTROL	1	LS	SEE DETAIL F ON SHEET 8.2
SURVEY	1	LS	MARK PROPERTY LINES AND SET CONTROL POINTS

GENERAL NOTES

- A. THE CONTRACTOR SHALL CALL FOR A UTILITY LOCATE BEFORE BEGINNING ANY EXCAVATION. THE CONTRACTOR SHALL NOT ASSUME THAT UTILITIES ARE LOCATED WHERE SPECIFIED. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES THAT OCCUR DUE TO INTERFERENCE WITH UTILITIES.
- B. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR ALL LEGAL AND SAFETY REQUIREMENTS FOR UTILITIES.
- C. THE CONTRACTOR IS RESPONSIBLE FOR PLACING SEED AND STRAW ON ANY DISTURBED AREAS AND STABILIZING WITH MATTING AS REQUIRED TO PREVENT EROSION.
- D. CONTRACTOR MUST BE WILLING TO WORK WITH AND ACCEPT OVERSIGHT FROM NCSU BIOLOGICAL & AGRICULTURAL ENGINEERING PERSONNEL.
- E. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL SEDIMENT AND EROSION CONTROL MEASURES USED DURING CONSTRUCTION.
- F. CONTRACTOR IS RESPONSIBLE FOR REMOVING REFUSE FROM SITE AND RETURNING IT TO PRE-CONSTRUCTION AESTHETICS.
- G. CONTRACTOR SHALL USE PUMPS AND DIVERSIONS AS NECESSARY TO REMOVE WATER TO ALLOW FOR CONSTRUCTION ACTIVITIES.

PLANTING NOTES

TEMPORARY SEEDING AND MULCHING

1. ALL SEED AND SEED VARIETIES MUST BE FREE OF STATE AND FEDERALLY LISTED NOXIOUS WEED SEED.
2. ALL DISTURBED AREAS WILL BE SEEDED WITH TEMPORARY SEED AND MULCHED WITH WHEAT STRAW. SEEDING WILL BE PERFORMED USING A BROADCAST SPREADER. OTHER METHODS MAY BE USED BUT MUST BE APPROVED BY ENGINEER IN ADVANCE OF INSTALLATION.

PERMANENT SEEDING

3. PERMANENT SEEDING SHALL OCCUR IN CONJUNCTION WITH TEMPORARY SEEDING WHERE APPLICABLE. IDEALLY,

PERMANENT SEEDING SHALL OCCUR DURING THE PLANTING SEASON FOR EACH SEED TYPE. ALL SEED AND SEED VARIETIES MUST BE OF FROM STATE AND FEDERALLY LISTED NOXIOUS WEED SEED. IN ADDITION, NONE OF THE FOLLOWING SEED WILL OCCUR IN THE MIX.

4. SEED SHALL BE SOWN WITH A SPREADER OR A SEEDING MACHINE. SEED IS NOT TO BE BROADCAST OR DROPPED WHEN WIND VELOCITY EXCEEDS 5 MPH. SEED SHALL BE EVENLY DISTRIBUTED BY SOWING IN TWO DIRECTIONS AT RIGHT ANGLES TO EACH

OTHER. WET SEED OR SEED THAT IS MOLDY OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE IS 5. MATTING SHALL BE USED ON STEEP SLOPES OR ON DITCH BANKS

Type	Application Rate (lbs/acre)
Rye Grain	120
Straw Mulch	4000

SPECIES	Common Name	Percent
Dactyylis glomerata	Orchard Grass	50
Schendonorous phoenix	Tall Fescue	50



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3100 FAUCETTIE DRIVE
RALEIGH, NC 27695



PROJECT: CASWELL WATER FARMING
NAME: AS NOTED
SCALE: AS NOTED
DATE: NOVEMBER 1, 2023

DRAWN: JFE
DESIGN: JFE
CHECK: BAO
APPROVED: BAO

PROJECT #
PHASE #