

# TRANSPORTATION IMPROVEMENT PROJECT

ESSEX  
APPLE STREET  
TITLE SHEET & INDEX  
SHEET 1 OF 36

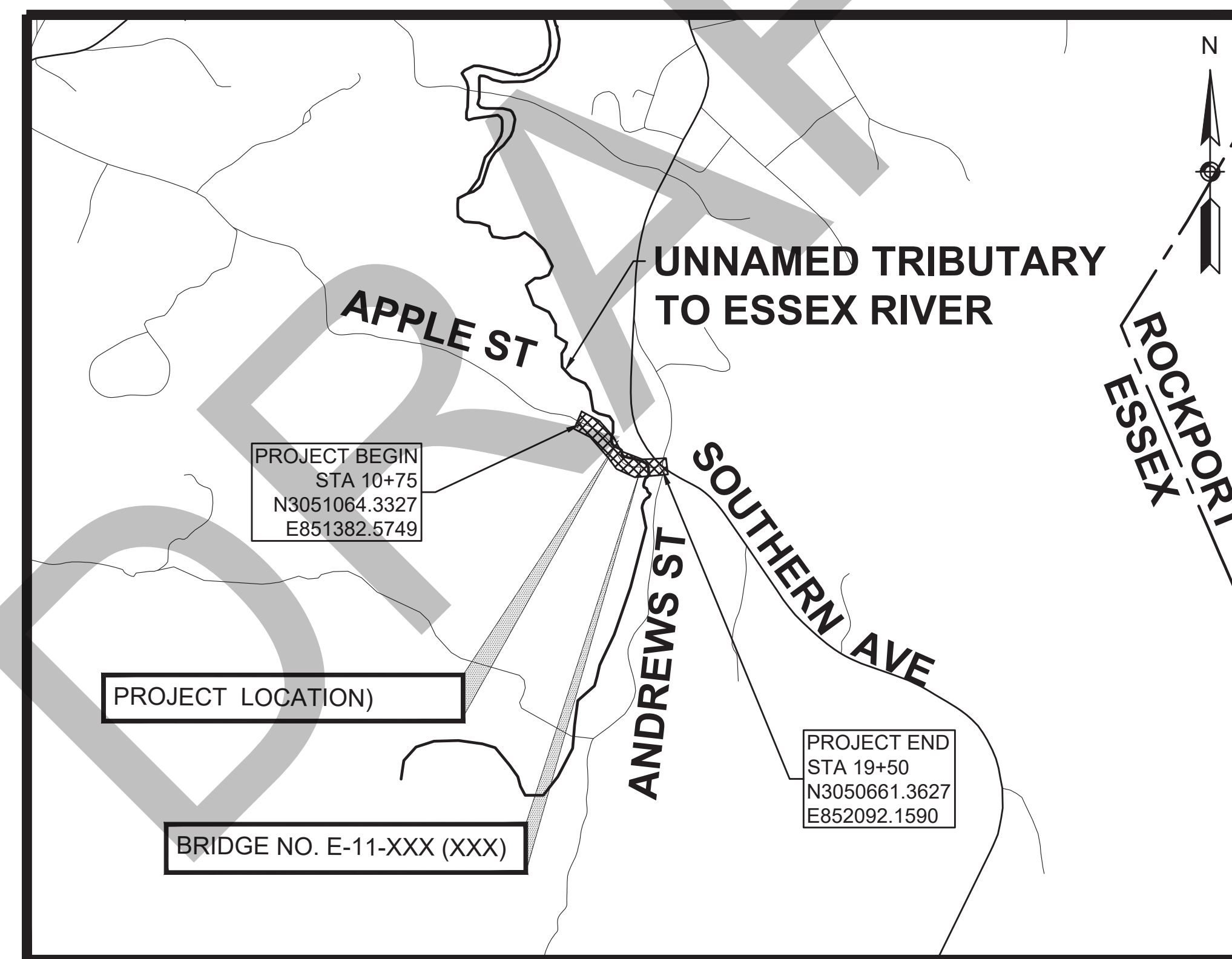
PLAN AND PROFILE OF  
APPLE STREET over UNNAMED TRIBUTARY TO ESSEX RIVER  
(BRIDGE NO. E-11-XXX) (XXX)

IN THE TOWN OF  
ESSEX  
ESSEX COUNTY

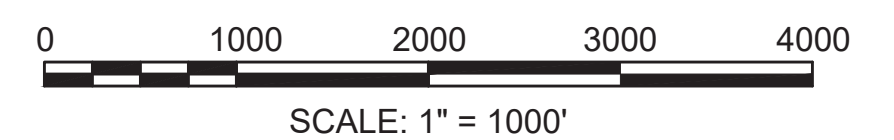
THESE PLANS ARE SUPPLEMENTED BY THE MASSDOT OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE MASSDOT WORKZONE SAFETY TEMPORARY TRAFFIC CONTROL, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO PAVEMENT MARKING DETAILS ONLY), THE MASSDOT 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE MASSDOT 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) WITH MASSACHUSETTS AMENDMENTS AND THE STANDARD MUNICIPAL TRAFFIC CODE, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, THE TOWN OF ESSEX SUBDIVISION RULES AND REGULATIONS, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

## PRELIMINARY DESIGN

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1	TITLE SHEET & INDEX
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DESIGN DESIGNATION (APPLE STREET)	
DESIGN SPEED	20 MPH
FUNCTIONAL CLASSIFICATION	LOCAL



LENGTH OF PROJECT = 875.00 FEET = 0.166 MILES

DATE	DESCRIPTION	REV #

	282 Merrimack St 2nd Floor Lawrence, MA 01843 978-794-1792	311 Main Street 2nd Floor Worcester, MA 01608 508-868-5104	169 Ocean Blvd, Unit 3 PO Box 249 Hampton, NH 03842 603-601-8154
	www.TheEngineeringCorp.com		

**GENERAL SYMBOLS**

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W / 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		GUARD RAIL - DOUBLE FACE - STEEL POSTS
		GUARD RAIL - DOUBLE FACE - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		SEDIMENT CONTROL BARRIER
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

**PAVEMENT MARKINGS SYMBOLS**

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND "ONLY" - WHITE
		STOP LINE
		CROSSWALK
		SOLID WHITE LINE
		SOLID YELLOW LINE
		BROKEN WHITE LINE
		BROKEN YELLOW LINE
		DOTTED WHITE LINE
		DOTTED YELLOW LINE
		DOTTED WHITE LINE EXTENSION
		DOTTED YELLOW LINE EXTENSION
		DOUBLE WHITE LINE
		DOUBLE YELLOW LINE

**ABBREVIATIONS**

GENERAL	DESCRIPTION
AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FDP	FULL DEPTH PAVEMENT
FES	FLARED END SECTION
FLDSTN	FIELDSTONE
FP	FLAGPOLE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
GSW	GRANITE SLAB WALL
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OHW	OVERHEAD WIRES
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY

**ABBREVIATIONS (cont.)**

GENERAL	DESCRIPTION
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&D	REMOVE AND DISCARD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLDR	SHOULDER
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION





CONSTRUCTION NOTES:

1. EXISTING CONDITIONS INFORMATION IS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY MERIDIAN ASSOCIATES, INC. OF BEVERLY, MA IN APRIL 2020 AND SUPPLEMENTED IN NOVEMBER 2020.
2. THE HORIZONTAL DATUM FOR THIS SURVEY IS THE MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE.  
THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS OBSERVATIONS.
3. THE LIMITS OF BORDERING VEGETATED WETLANDS SHOWN IN THE PLANS WERE DELINEATED BY DEROSA ENVIRONMENTAL CONSULTANTS, INC. ON FEBRUARY 7, 2020 AND FLAGS WERE LOCATED VIA FIELD SURVEY BY MERIDIAN ASSOCIATES, INC.
4. EXISTING COUNTY LAYOUT LINES WERE COMPILED FROM RECORD INFORMATION, AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
5. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL CONTACT DIGSAFE (1-888-DIGSAFE) A MINIMUM OF 72 HOURS PRIOR TO ANY CONSTRUCTION TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
6. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
7. ALL MUNICIPALLY OWNED UTILITY STRUCTURES (CATCH BASINS, DRAIN, ETC.) SHALL BE ADJUSTED BY THE CONTRACTOR TO FINISHED GRADE UNLESS DIRECTED OTHERWISE.
8. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R), AS APPROVED BY THE ENGINEER.
9. THE TERM "MEET EXIST" MEANS TO MEET BOTH THE EXISTING ALIGNMENT AND ELEVATION.
10. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
11. ALL DISTURBED AREAS OUTSIDE THE PROPOSED EDGE OF PAVEMENT SHALL BE STABILIZED WITH 4" LOAM AND SEED, UNLESS OTHERWISE NOTED.
12. ALL EXISTING TREES WITHIN THE PROJECT LIMITS SHALL BE RETAINED AND PROTECTED WITH TREE PROTECTION UNLESS INDICATED OTHERWISE ON THE PLANS. ALL PROVIDED DIMENSIONS REFER TO THE DIAMETER AT BREAST HEIGHT.
13. CLEARING AND GRUBBING SHALL EXTEND FIVE FEET BEYOND THE LIMIT OF GRADING; EXCEPT FOR WHEN THE FIVE FOOT EXTENSION ENCROACHES FURTHER INTO WETLANDS.
14. CONTRACTOR TO COORDINATE TREE TRIMMING WITH UTILITY COMPANIES PRIOR TO RELOCATION OF UTILITY POLES.
15. CONTRACTOR TO TAKE CARE TO ENSURE PROPOSED GUARDRAIL POSTS DO NOT CONFLICT WITH UNDERGROUND UTILITIES (E.G. PROPOSED DRAINAGE STRUCTURES AND PIPES).
16. PROPOSED SLOPES STEEPER THAN 3:1 SHALL BE COVERED WITH BIODEGRADABLE EROSION BLANKETS, OR MATTING.
17. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
18. ALL PAVEMENT MARKINGS WITHIN THE LIMITS OF WORK SHALL BE THERMOPLASTIC MATERIALS.
19. THE MINIMUM MOUNTING HEIGHT OF POST MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE CURB OR EDGE OF PAVEMENT SHALL BE 7 FEET.

DRAFT



7 9 10 15

PROJECT BEGIN  
 STA 10+75  
 N3051064.3327  
 E851382.5749

PC +94.35

APPLE STREET

8 9 11 16

SOUTHERN AVENUE

PC +79.61

PT +16.52

PI +24.47

PI +26.96

PI +55.35

B-1

B-2






PT +08.83

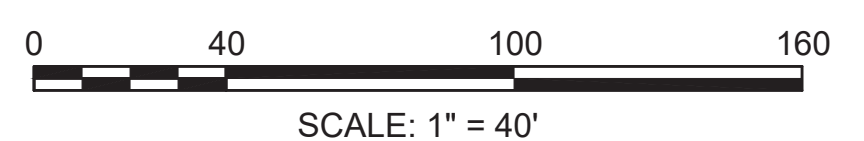
PI +09.11

PI +17.42

PI +21.01

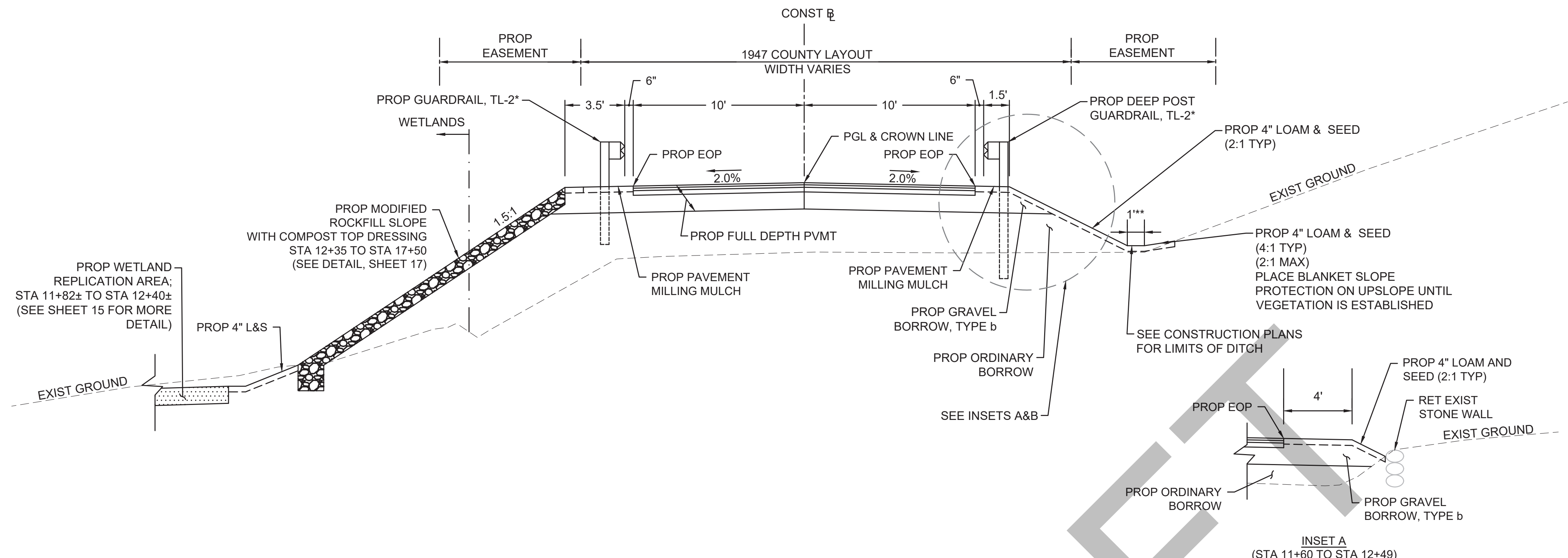
PROJECT END  
 STA 19+50  
 N3050661.3627  
 E852092.1590

- LEGEND:
-  = CONSTRUCTION PLAN
  -  = PROFILES
  -  = CURB TIE AND GRADING PLAN
  -  = WETLAND REPLICATION PLAN
  -  = BORING LOCATION

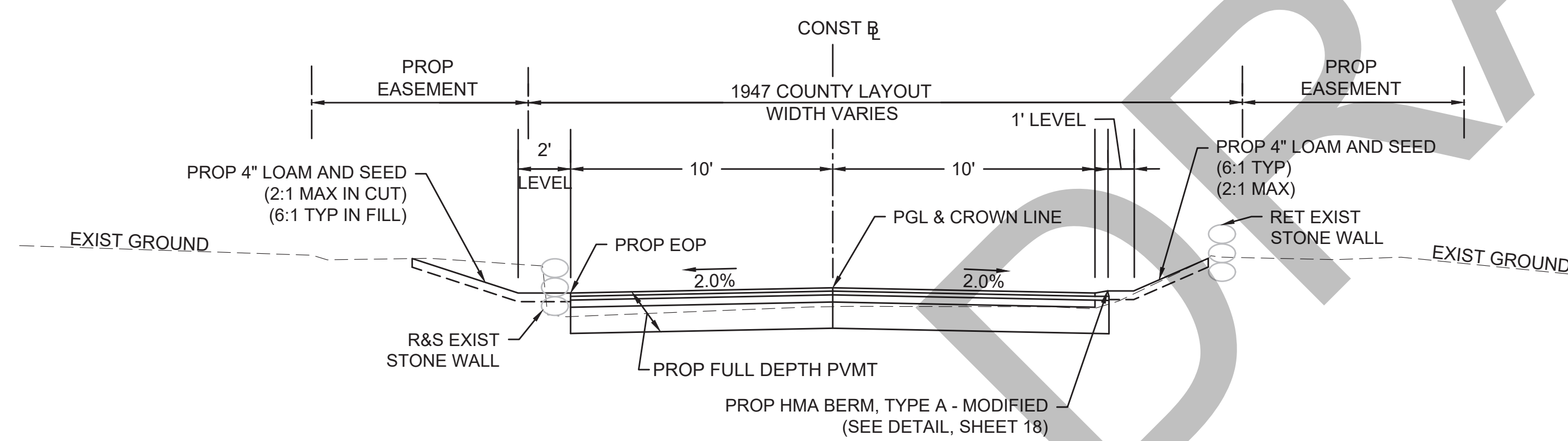


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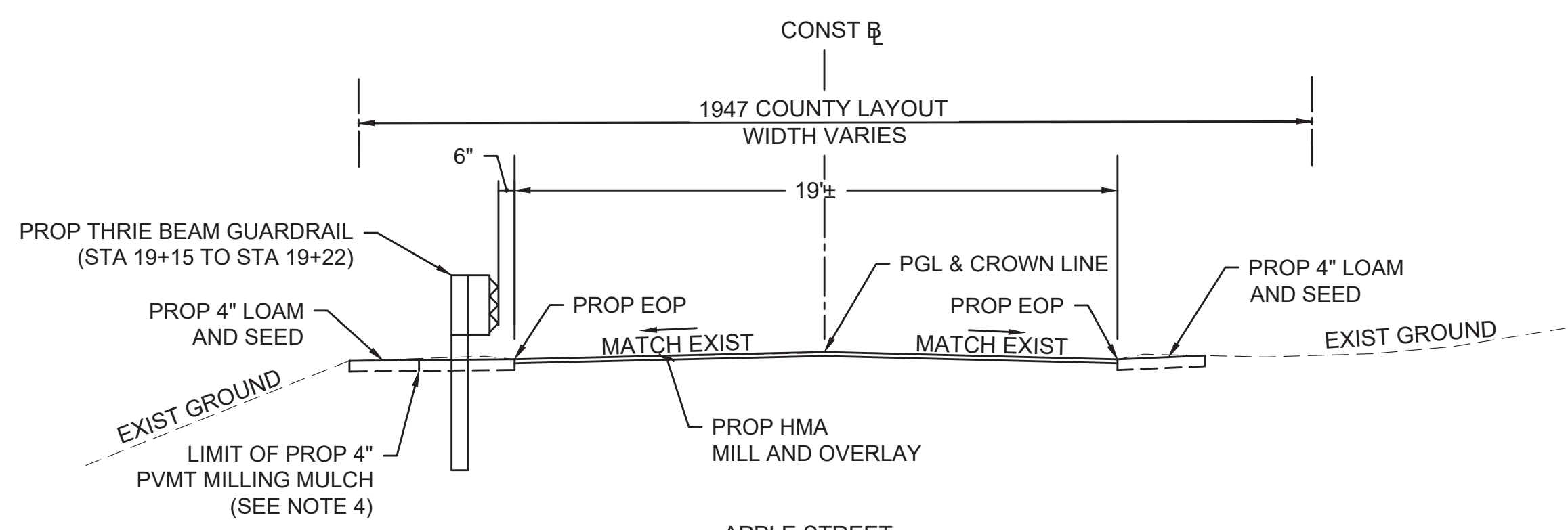




APPLE STREET  
TYPICAL SECTION  
STA. 11+60± TO STA 17+50±  
\*SEE CONSTRUCTION PLANS FOR  
STATIONING OF GUARDRAIL  
\*\*DITCH BOTTOM WIDTH = 1.5' FROM  
STA 16+00 TO STA 17+50



APPLE STREET  
TYPICAL SECTION  
STA. 11+00± TO STA 11+60±



APPLE STREET  
TYPICAL SECTION  
STA 10+75± TO STA 10+85±  
STA 19+15± TO STA 19+25±

PAVEMENT NOTES

PROPOSED MILL AND OVERLAY

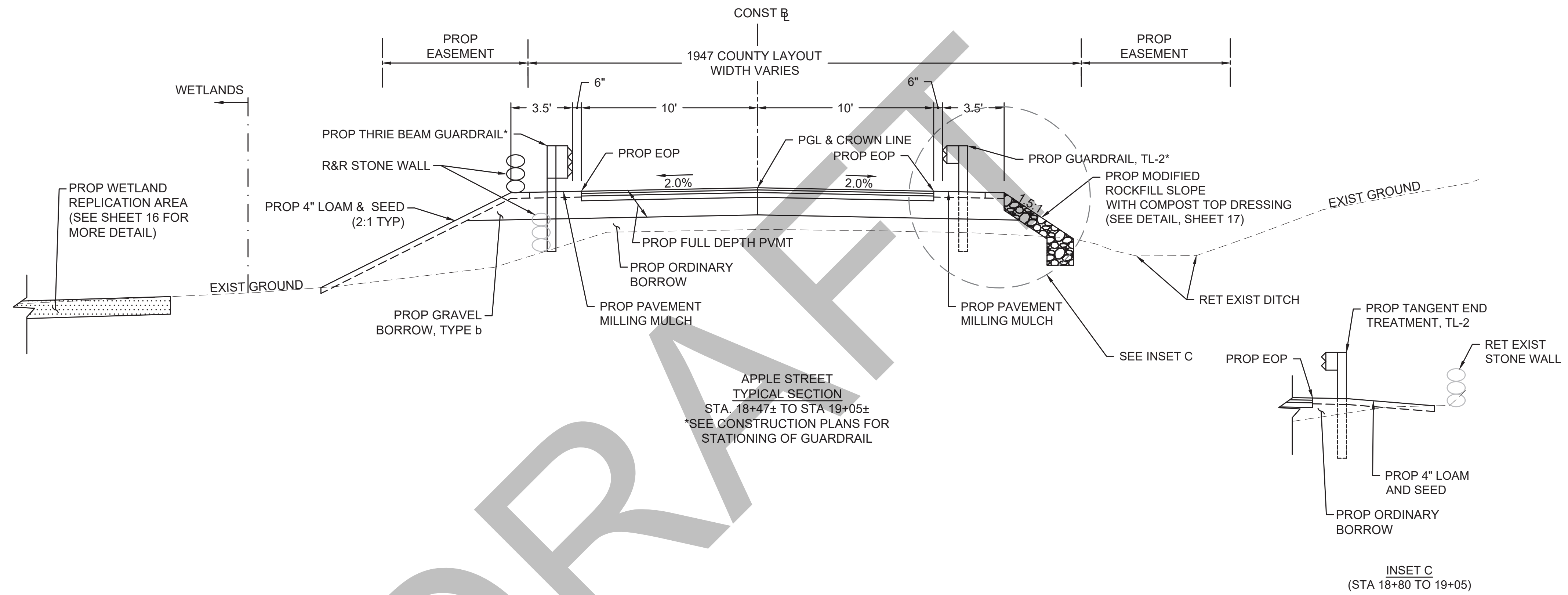
SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
1½" PAVEMENT MICRO MILLING

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 1½" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5) OVER  
1¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC - 12.5) OVER  
BASE: ¾" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER  
SUBBASE: 12" GRAVEL BORROW, TYPE b

GENERAL PAVEMENT NOTES:

1. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN ALL ASPHALT SURFACES AND SAWCUT JOINTS BEFORE PAVING. HMA JOINT ADHESIVE SHALL BE APPLIED TO ALL COLD JOINTS (LONGITUDINAL AND TRANSVERSE) BEFORE PAVING SURFACE COURSE. ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED AT A RATE CONSISTENT WITH MASSDOT STANDARD SPECIFICATION 460.43G2. ALL SURFACES SHALL BE CLEAN OF ALL ORGANICS, DEBRIS, AND SAND PRIOR TO PAVING.
2. ALL HMA SHALL BE IN ACCORDANCE WITH SECTION 460.
3. ASPHALT EMULSION FOR TACK COAT SHALL BE RS-1H TO RESIST TRACKING OF TACK BY HAUL VEHICLES.
4. PAVEMENT MILLING MULCH SHALL BE PLACED IN BETWEEN PROPOSED GUARDRAIL AND THE PROPOSED EDGE OF ROADWAY IN ALL LOCATIONS WHERE GUARDRAIL IS PROPOSED. PAVEMENT MILLING MULCH SHALL EXTEND ONE FOOT BEHIND PROPOSED GUARDRAIL POSTS EXCEPT IN AREAS OF DEEP POST GUARDRAIL.



DRAFT



GUARDRAIL DETAILS

STA 11+36 LT TO STA 11+61 LT TANGENT END TREATMENT, TL-2  
STA 11+61 LT TO STA 17+71 LT GUARDRAIL, TL-2 (CONTINUED ON NEXT SHEET)  
(HALF POST SPACING FROM STA 11+61 LT TO STA 14+61 LT & 16+25 LT TO STA 17+71 LT)

STA 12+49 RT TO STA 12+74 RT TANGENT END TREATMENT, TL-2  
STA 12+74 RT TO STA 17+81 RT GUARDRAIL, TL-2 (DEEP STEEL POSTS FROM STA 12+74 TO STA 16+50)  
(CONTINUED ON NEXT SHEET)  
(HALF POST SPACING FROM STA 16+25 RT TO STA 17+81 RT)

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

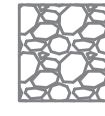
NONE

DRAINAGE DETAILS

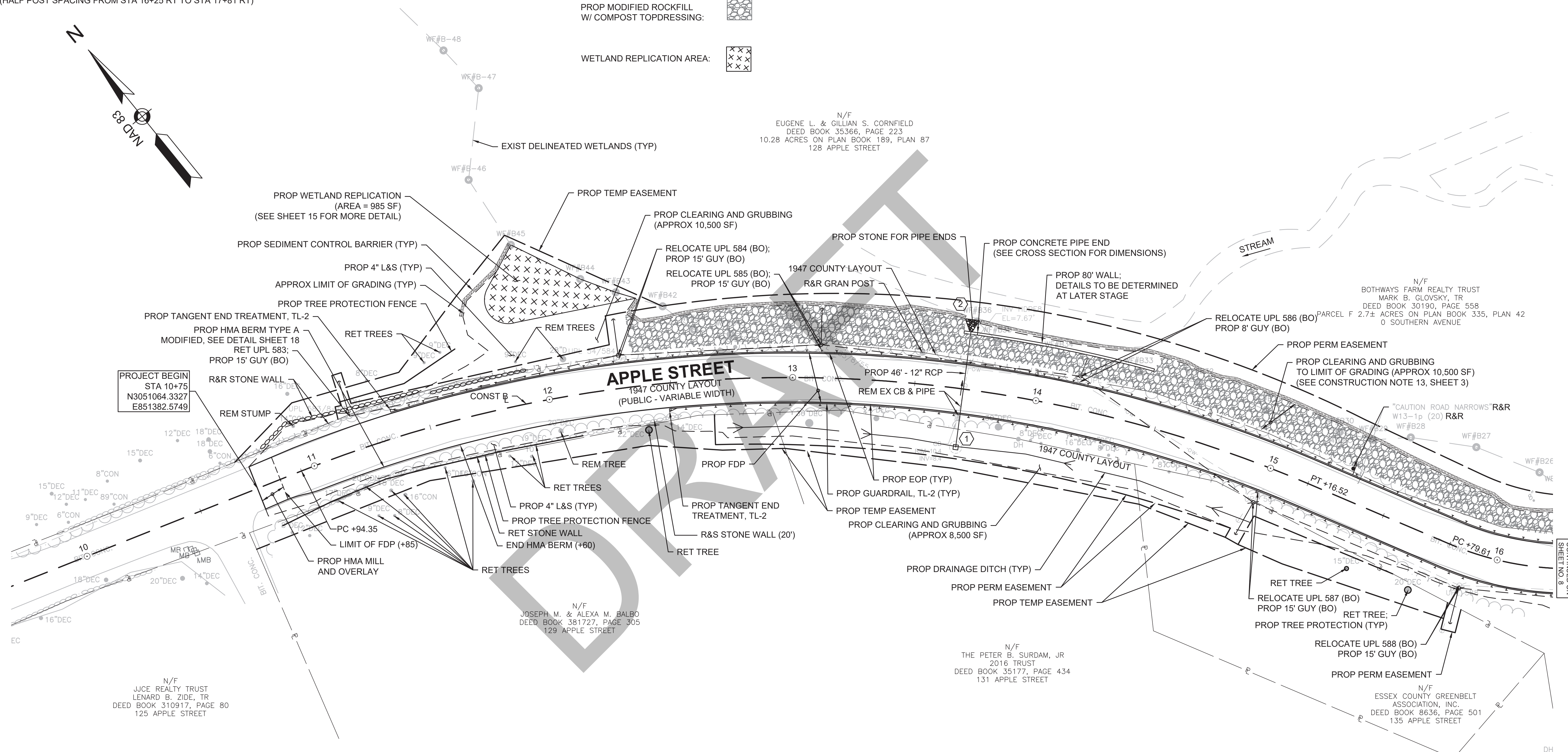
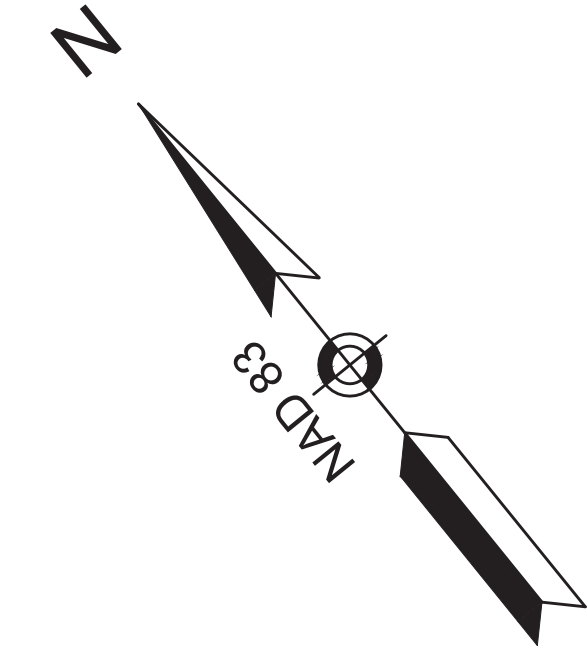
SEE BELOW

LEGEND:

PROP MODIFIED ROCKFILL  
W/ COMPOST TOPDRESSING:



WETLAND REPLICATION AREA:



PROJECT BEGIN  
STA 10+75  
N3051064.3327  
E851382.5749

N/F  
JJCE REALTY TRUST  
LENARD B. ZIDE, TR  
DEED BOOK 310917, PAGE 80  
125 APPLE STREET

N/F  
JOSEPH M. & ALEXA M. BALBO  
DEED BOOK 381727, PAGE 305  
129 APPLE STREET

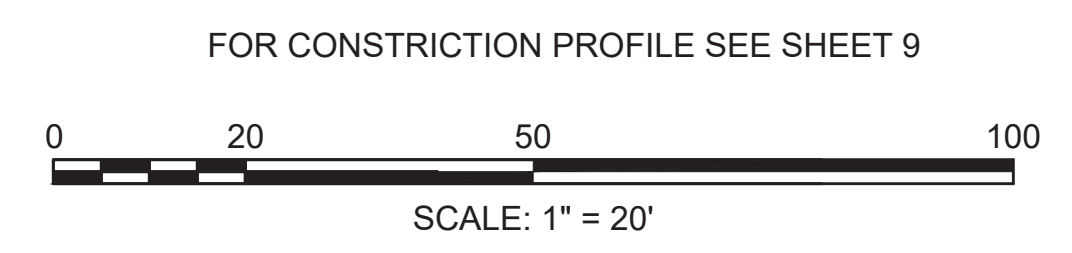
N/F  
EUGENE L. & GILLIAN S. CORNFIELD  
DEED BOOK 35366, PAGE 223  
10.28 ACRES ON PLAN BOOK 189, PLAN 87  
128 APPLE STREET

N/F  
BOTHWAYS FARM REALTY TRUST  
MARK B. GLOVSKY, TR  
DEED BOOK 30190, PAGE 558  
PARCEL F 2.7± ACRES ON PLAN BOOK 335, PLAN 42  
0 SOUTHERN AVENUE

N/F  
THE PETER B. SURDAM, JR  
2016 TRUST  
DEED BOOK 35177, PAGE 434  
131 APPLE STREET

N/F  
ESSEX COUNTY GREENBELT  
ASSOCIATION, INC.  
DEED BOOK 8636, PAGE 501  
135 APPLE STREET

PROPOSED DRAINAGE STRUCTURE DATA							
NO.	TYPE	STATION	OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
①	PROP DI; TYPE DF	13+70.00	23.5' RT	10.22		6.72 (TO 2)	
②	CEM CONC HEADWALL	13+70.00	23.6' RT	-	-	6.19	SEE MASSDOT STANDARD DETAIL E 206.4.0



CONTINUED ON  
SHEET NO. 8



**GUARDRAIL DETAILS**

STA 11+61 LT TO STA 17+71 LT GUARDRAIL, TL-2 (CONTINUED FROM PREVIOUS SHEET)  
 (HALF POST SPACING FROM STA 11+55 LT TO STA 14+61 LT & 16+25 LT TO STA 17+71 LT)  
 STA 17+71 LT TO STA 17+76 LT THRIE BEAM TRANSITION PANEL  
 STA 17+76 LT TO STA 18+41 LT DOUBLE NESTED STEEL THRIE BEAM  
 STA 18+41 LT TO STA 19+10 LT THRIE BEAM PANELS (HALF POST SPACING)  
 STA 19+10 LT TO STA 19+20 LT THRIE BEAM PANEL (CURVED; L=12.5', R=16')  
 STA 19+20 LT TO STA 19+22 LT THRIE BEAM TERMINAL END UNIT

STA 12+74 RT TO STA 17+81 RT GUARDRAIL, TL-2 (DEEP STEEL POSTS FROM STA 12+74 TO STA 16+50)  
 (CONTINUED FROM PREVIOUS SHEET) (HALF POST SPACING FROM STA 16+25 RT TO STA 17+81 RT)  
 STA 17+81 RT TO STA 17+87 RT THRIE BEAM TRANSITION PANEL  
 STA 17+87 RT TO STA 18+24 RT DOUBLE NESTED STEEL THRIE BEAM  
 STA 18+24 RT TO STA 18+30 RT THRIE BEAM TRANSITION PANEL  
 STA 18+30 RT TO STA 18+80 RT GUARDRAIL, TL-2  
 STA 18+80 RT TO STA 19+05 RT TANGENT END TREATMENT, TL-2

**TRAFFIC SIGNAL CONDUIT**

NONE

**WATER SUPPLY ALTERATIONS**

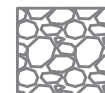


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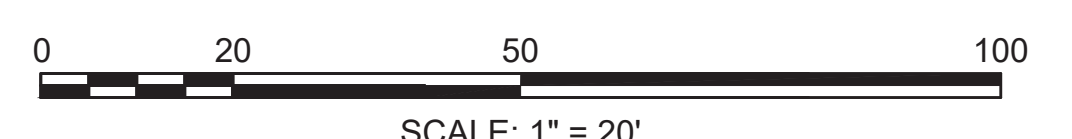
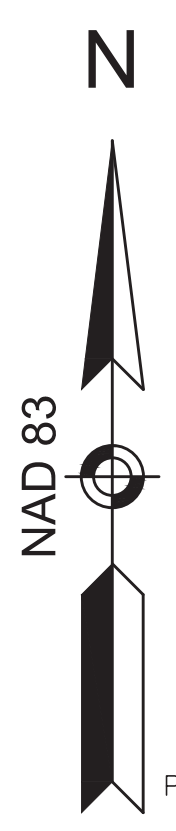
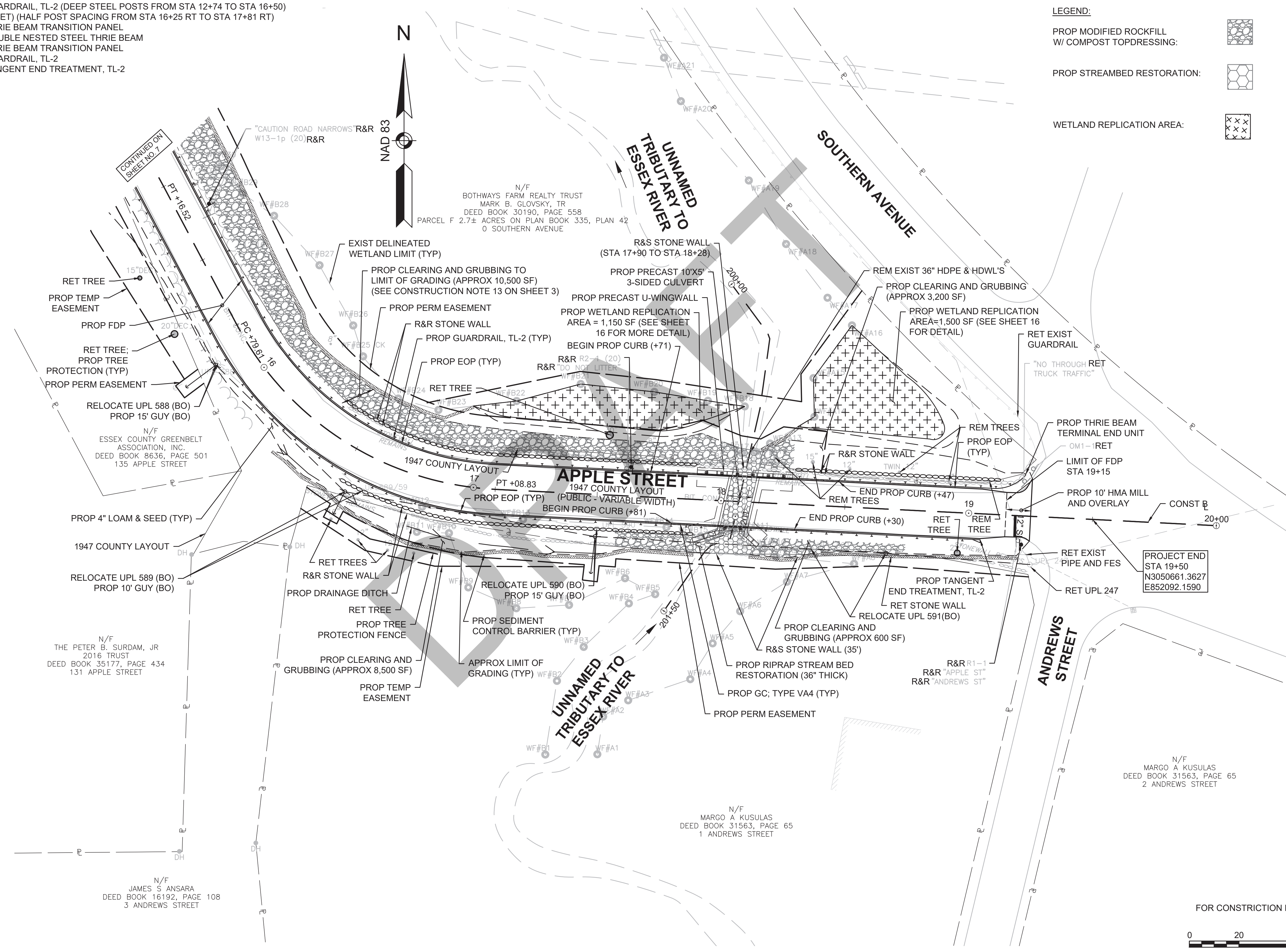
**DRAINAGE DETAILS**

SEE BELOW

**ESSEX  
 APPLE STREET  
 CONSTRUCTION PLANS - 2 OF 2  
 SHEET 8 OF 36**

**LEGEND:**

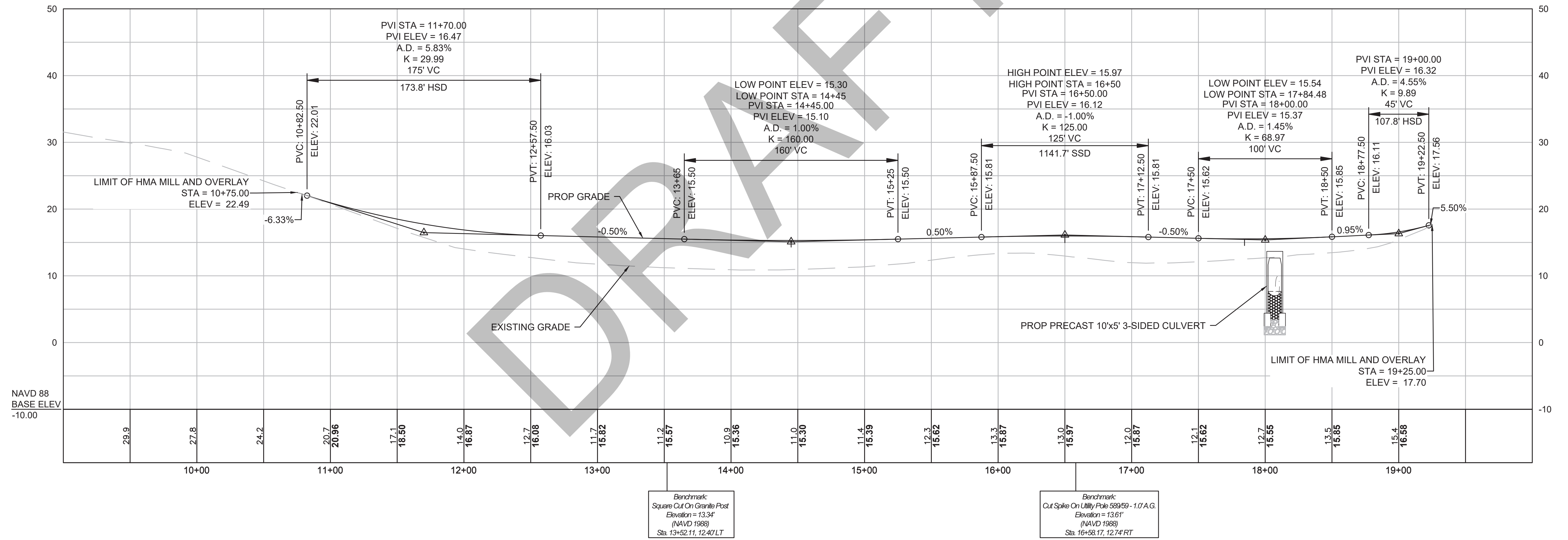
- PROP MODIFIED ROCKFILL  
W/ COMPOST TOPDRESSING: 
- PROP STREAMBED RESTORATION: 
- WETLAND REPLICATION AREA: 



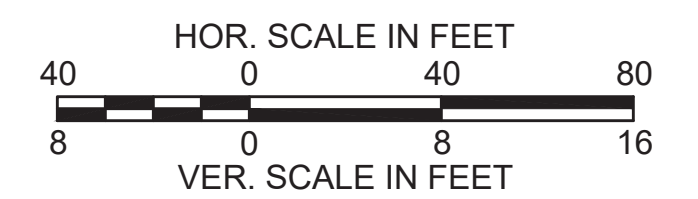
FOR CONSTRUCTION PROFILE SEE SHEET 9



APPLE STREET



FOR CONSTRUCTION PLAN SEE SHEETS 7 - 8

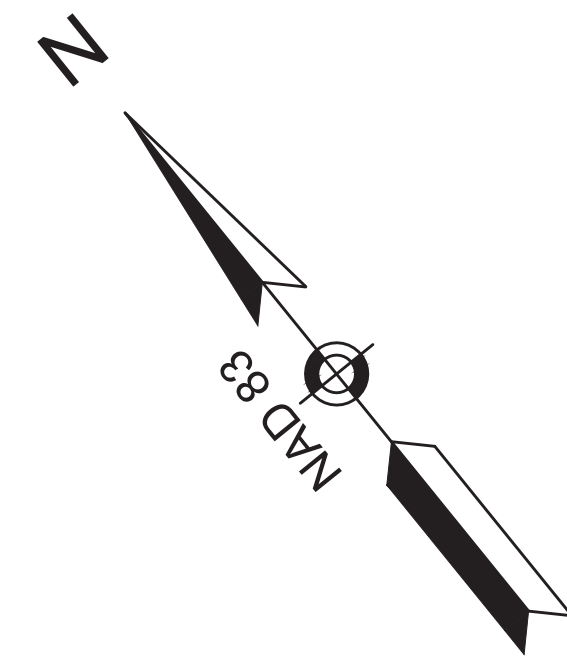
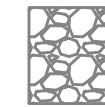




Survey Traverse Point Table						
Point #	Northing	Easting	Elevation	Raw Description	Station	Offset
503	3050682.0716	851776.0672	13.685	MTRV M/W SET 560/42	16+38.69	17.00' RT
504	3050948.0065	851615.0806	11.060	MTRV S/T SET AKA 703 560/42	13+34.36	11.77' LT
511	3051090.8254	851344.9577	26.162	MTRV S/T 560/61	10+31.20	14.09' LT

LEGEND:

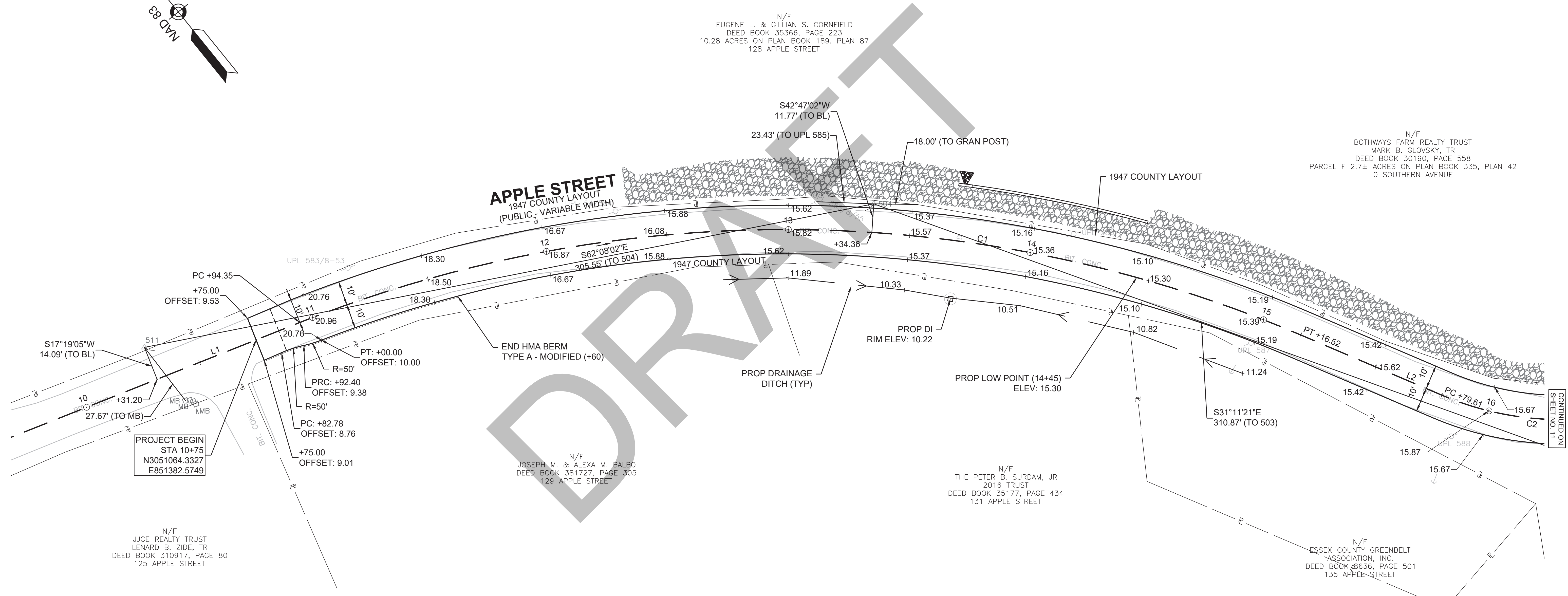
PROP MODIFIED ROCKFILL  
W/ COMPOST TOP DRESSING:



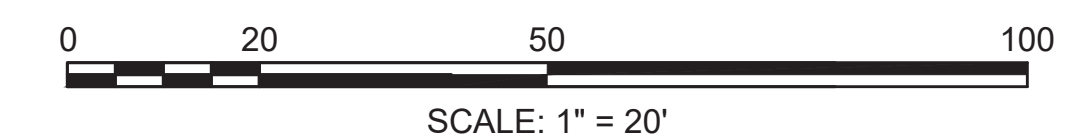
N/F  
EUGENE L. & GILLIAN S. CORNFIELD  
DEED BOOK 35366, PAGE 223  
10.28 ACRES ON PLAN BOOK 189, PLAN 87  
128 APPLE STREET

N/F  
BOTHWAYS FARM REALTY TRUST  
MARK B. GLOVSKY, TR  
DEED BOOK 30190, PAGE 558  
PARCEL F 2.7± ACRES ON PLAN BOOK 335, PLAN 42  
0 SOUTHERN AVENUE

APPLE STREET  
1947 COUNTY LAYOUT  
(PUBLIC - VARIABLE WIDTH)



APPLE STREET CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	9+00.00	3051116.4257	851215.5081		S72°40'55"E 194.35'	10+94.35	3051058.5737	851401.0446
C1	10+94.35	3051058.5737	851401.0446	R=540.00' Δ=44°47'37" L=422.17' T=222.54'		15+16.52	3050795.6397	851717.5846
L2	15+16.52	3050795.6397	851717.5846		S27°53'19"E 63.10'	15+79.61	3050739.8706	851747.0985
C2	15+79.61	3050739.8706	851747.0985	R=125.00' Δ=59°13'38" L=129.21' T=71.05'		17+08.83	3050673.4981	851851.2912



CONTINUED ON SHEET NO. 11



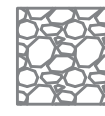

APPLE STREET CONSTRUCTION BASELINE DATA

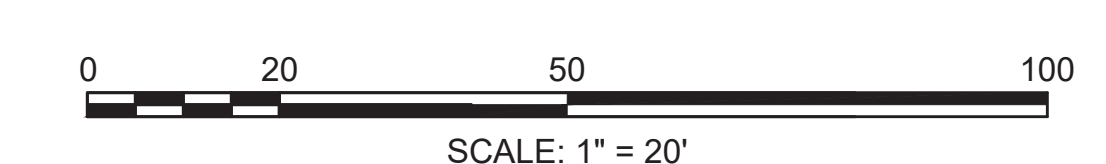
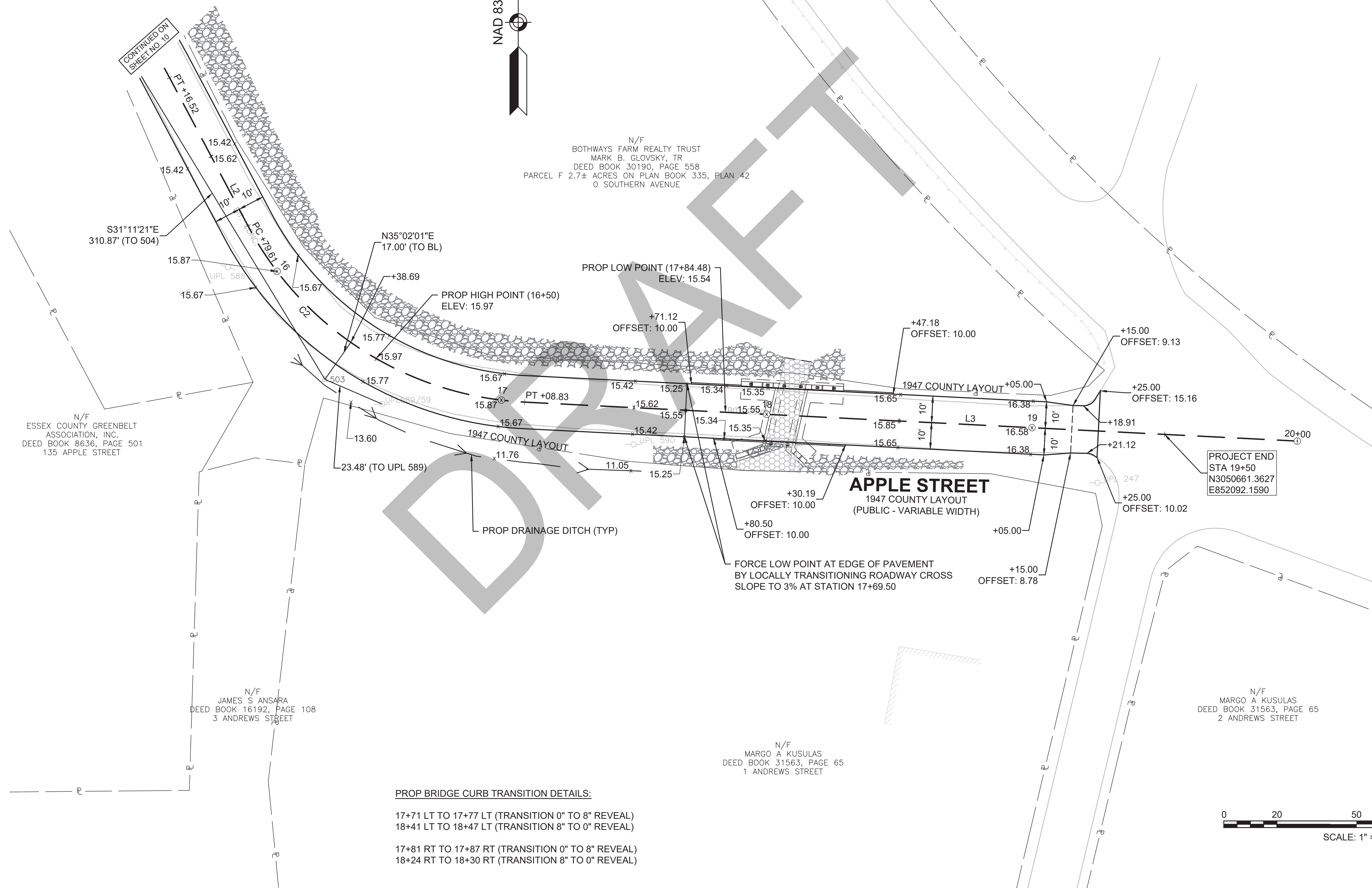
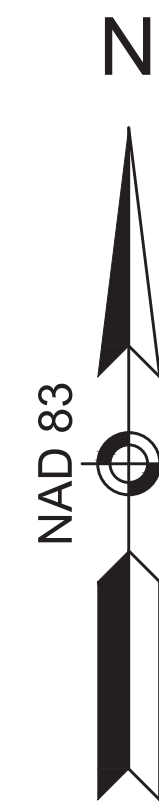
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C2	15+79.61	3050739.8706	851747.0985	R=125.00' Δ=59°13'38" L=129.21' T=71.05'		17+08.83	3050673.4981	851851.2912
L2	15+16.52	3050795.6397	851717.5846		S27°53'19"E 63.10'	15+79.61	3050739.8706	851747.0985
L3	17+08.83	3050673.4981	851851.2912		S87°06'57"E 291.17'	20+00.00	3050658.8468	852142.0956

Survey Traverse Point Table

Point #	Northing	Easting	Elevation	Raw Description	Station	Offset
503	3050682.0716	851776.0672	13.685	MTRV M/W SET 560/42	16+38.69	17.00' RT
504	3050948.0065	851615.0806	11.060	MTRV S/T SET AKA 703 560/42	13+34.36	11.77' LT
511	3051090.8254	851344.9577	26.162	MTRV S/T 560/61	10+31.20	14.09' LT

LEGEND:

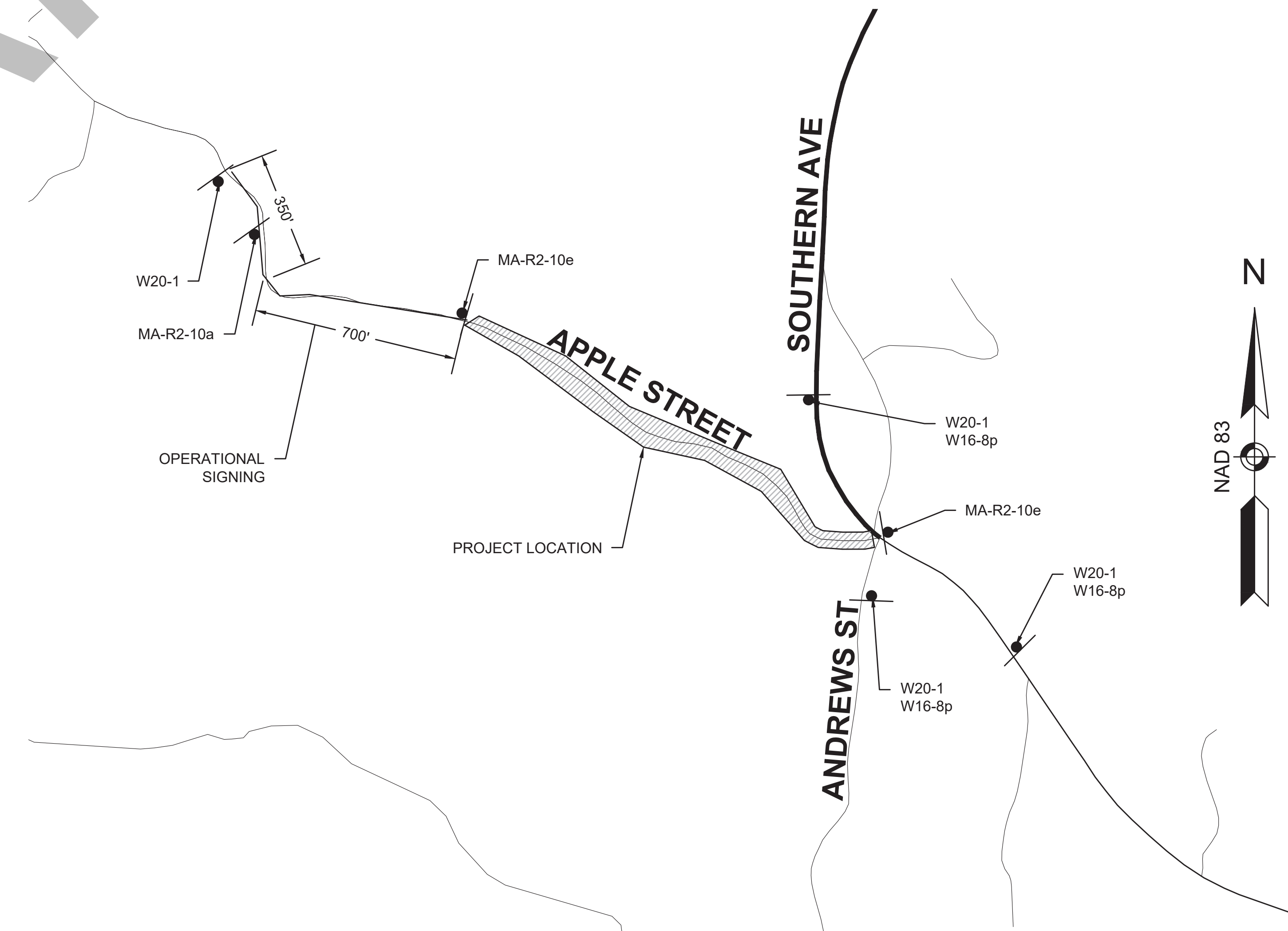
- PROP MODIFIED ROCKFILL  
W/ COMPOST TOPDRESSING: 
- PROP STREAMBED RESTORATION: 





TEMPORARY TRAFFIC CONTROL SIGN SUMMARY												
IDENTIFICATION NUMBER	SIZE OF SIGN (IN)		LEGEND	TEXT DIMENSIONS (IN)			NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACKGROUND	LEGEND	BORDER		
MA-R2-10a	48	36		MASSDOT STANDARD SIGN			1	FL. ORANGE/WHITE	BLACK	BLACK	12.00	12.00
MA-R2-10e	36	48		MASSDOT STANDARD SIGN			2	FL. ORANGE/WHITE	BLACK	BLACK	12.00	24.00
R11-2a	48	30		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			2	WHITE	BLACK	BLACK	10.00	20.00
R11-3a (2000)	60	30					1	WHITE	BLACK	BLACK	12.50	12.50
R11-3b(1 MILE)	60	30					1	WHITE	BLACK	BLACK	12.50	12.50
R11-4	60	30					2	WHITE	BLACK	BLACK	12.50	25.00
M4-8	24	12					22	FL. ORANGE	BLACK	BLACK	2.00	44.00
M4-8a	24	18					2	FL. ORANGE	BLACK	BLACK	3.00	6.00
M5-1L	21	15					2	FL. ORANGE	BLACK	BLACK	2.19	4.38
M5-1R	21	15					1	FL. ORANGE	BLACK	BLACK	2.19	2.19
M5-2L	21	15					1	FL. ORANGE	BLACK	BLACK	2.19	2.19
M5-2R	21	15					1	FL. ORANGE	BLACK	BLACK	2.19	2.19
M6-1L	21	15					4	FL. ORANGE	BLACK	BLACK	2.19	8.75
M6-1R	21	15					2	FL. ORANGE	BLACK	BLACK	2.19	4.38
M6-2L	21	15					1	FL. ORANGE	BLACK	BLACK	2.19	2.19
M6-2R	21	15					3	FL. ORANGE	BLACK	BLACK	2.19	6.56
M6-3	21	15					7	FL. ORANGE	BLACK	BLACK	2.19	15.31
W5-1	36	36					1	FL. ORANGE	BLACK	BLACK	9.00	9.00
W13-1p	24	24					2	FL. ORANGE	BLACK	BLACK	4.00	8.00

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)												
IDENTIFICATION NUMBER	SIZE OF SIGN (IN)		LEGEND	TEXT DIMENSIONS (IN)			NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA (SF)	TOTAL AREA (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACKGROUND	LEGEND	BORDER		
W16-8p	18	8		4B	2/2	N/A	22	FL. ORANGE	BLACK	BLACK	1.00	22.00
W20-1	36	36		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			4	FL. ORANGE	BLACK	BLACK	9.00	36.00
W20-4	36	36					2	FL. ORANGE	BLACK	BLACK	9.00	18.00
W20-7	36	36					2	FL. ORANGE	BLACK	BLACK	9.00	18.00
MA-W20-7b	36	36		MASSDOT STANDARD SIGN			2	FL. ORANGE	BLACK	BLACK	9.00	18.00
W21-5a	36	36		SEE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS			1	FL. ORANGE	BLACK	BLACK	9.00	9.00



NOTE:  
ADVANCED WARNING SCHEMATIC ONLY APPLICABLE WHEN BRIDGE IS OPEN. REFER TO DETOUR SIGNING FOR ADDITIONAL SIGNS.

ADVANCED WARNING SCHEMATIC



**NOTES:**

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING WARNING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 10 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. NO WORK THAT IMPACTS THE TRAVELED WAY SHALL BE PERMITTED DURING PEAK HOUR TRAFFIC. PEAK HOUR IS DEFINED AS WEEKDAYS FROM 7-9 AM & 3-6 PM.

**LEGEND:**

- REFLECTORIZED PLASTIC DRUM OR 36" CONE
- ▨ WORK ZONE
- 🚚 WORK VEHICLE
- P/F POLICE/FLAGGER DETAIL
- ➡ DIRECTION OF TRAFFIC
- 🚛 TRUCK MOUNTED ATTENUATOR
- ▨ TYPE III BARRICADE
- 🚧 IMPACT ATTENUATOR
- ➡ TRAFFIC OR PEDESTRIAN SIGNAL
- 📄 CHANGEABLE MESSAGE SIGN
- 🚧 MEDIAN BARRIER
- ➡ SIGN
- ➡ ARROW BOARD
- 🚧 MEDIAN BARRIER WITH WARNING LIGHTS

**SUGGESTED WORK ZONE WARNING SIGN SPACING**

ROAD TYPE	DISTANCE BETWEEN SIGNS (FEET)		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS	350	350	350
MOST OTHER ROADWAYS	500	500	500
FREEWAYS AND EXPRESSWAYS	1,000	1,500	2,640

**TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES**

TYPE OF TAPER	TAPER LENGTH (L)
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN. 100 FT MAX.
DOWNSTREAM TAPER	50 FT MIN. 100 FT MAX. PER LANE

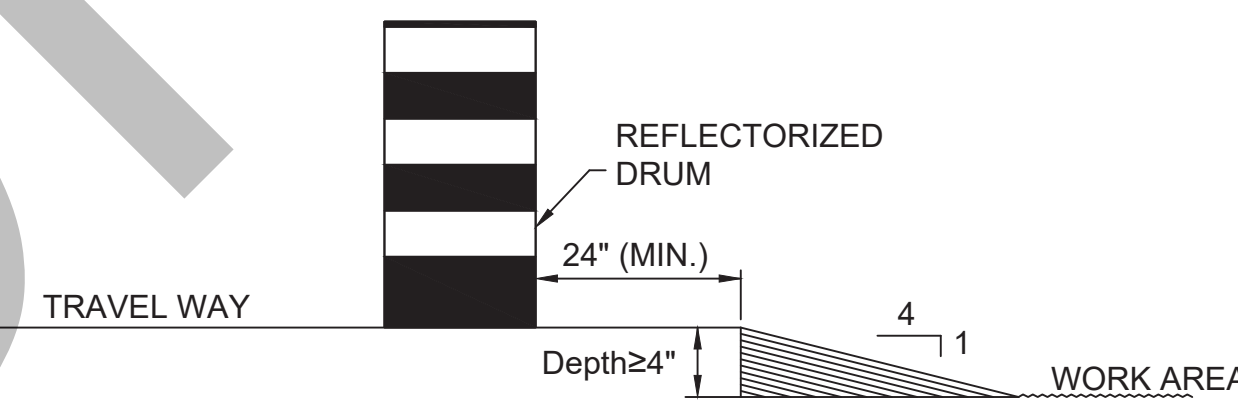
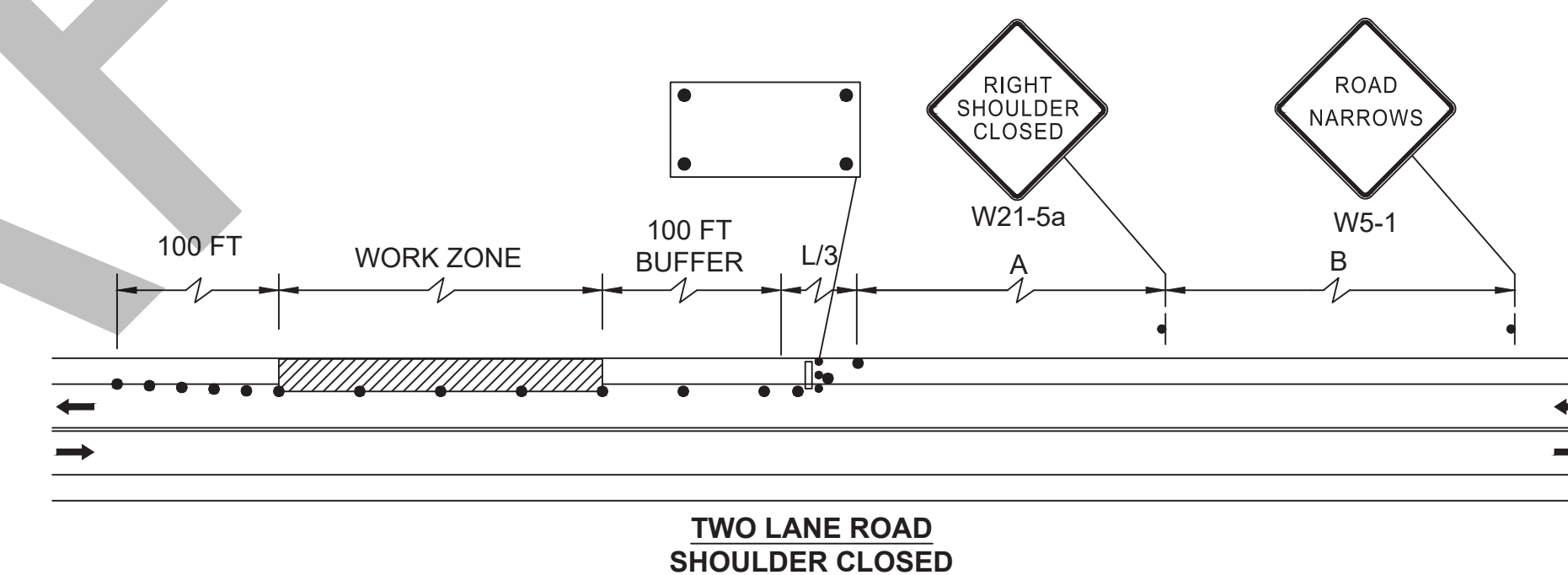
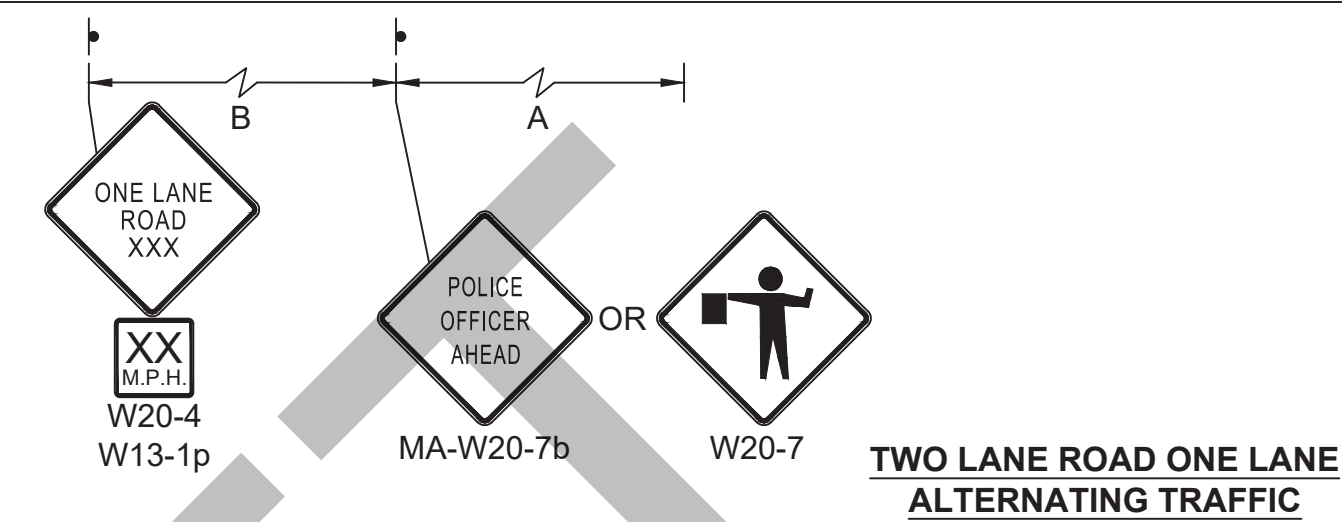
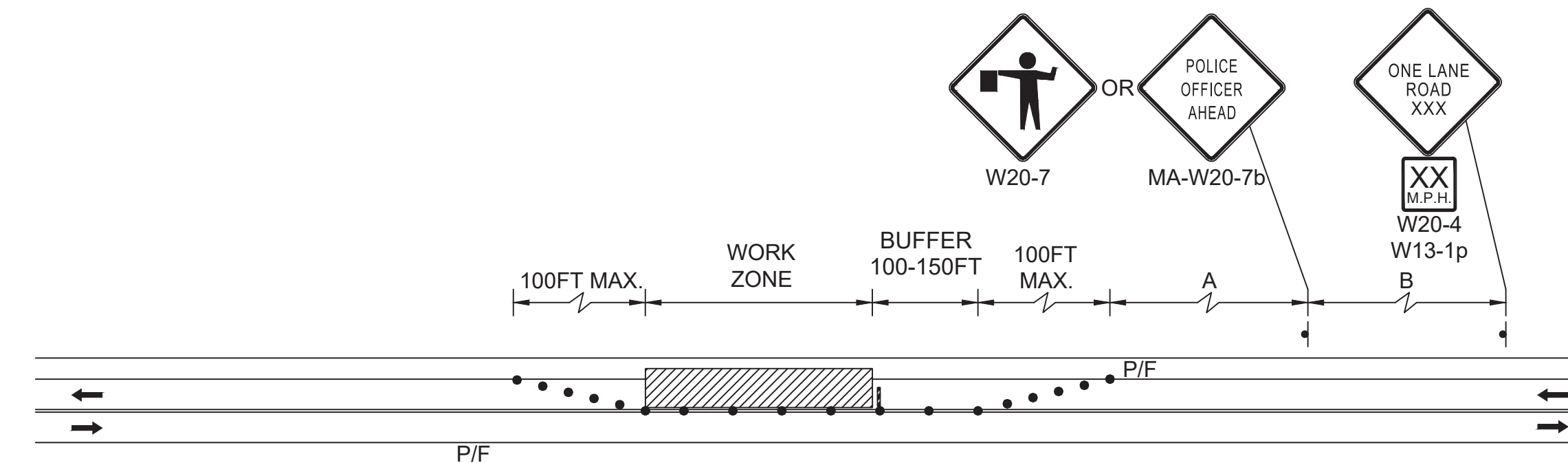
**FORMULAS FOR DETERMINING TAPER LENGTHS**

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

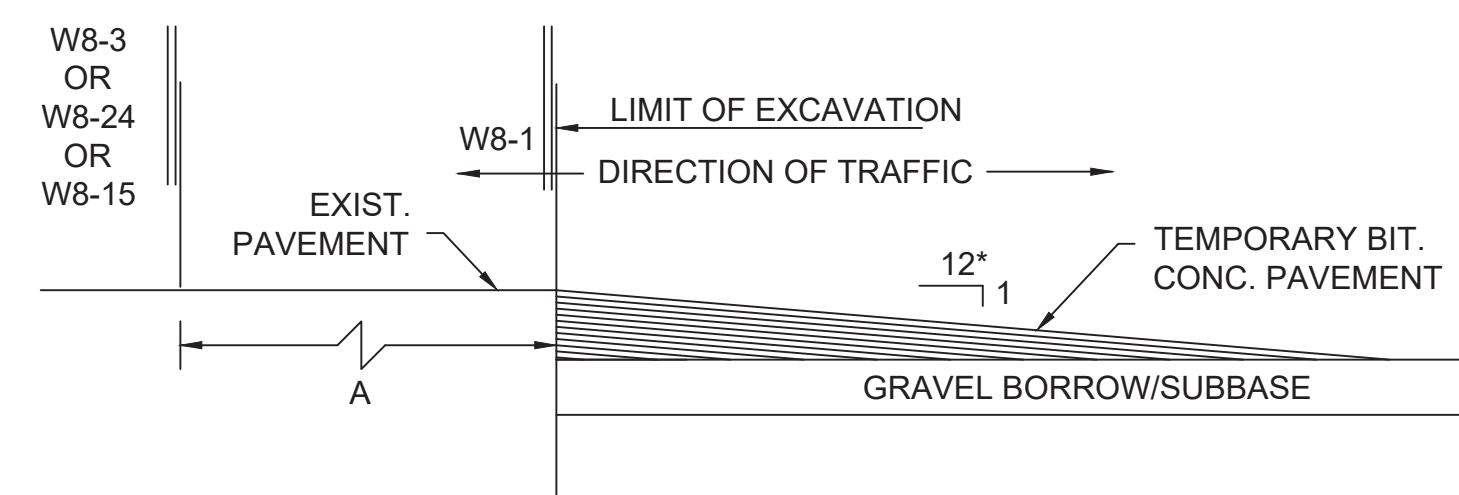
WHERE: L = TAPER LENGTH IN FEET

W = WIDTH OF OFFSET IN FEET

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH



**LATERAL DROP-OFF DETAIL**  
NOT TO SCALE



**LONGITUDINAL DROP-OFF DETAIL**  
NOT TO SCALE

\* - INCREASE SLOPE RATIO FOR HIGHER SPEEDS



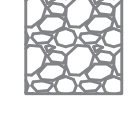
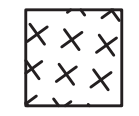


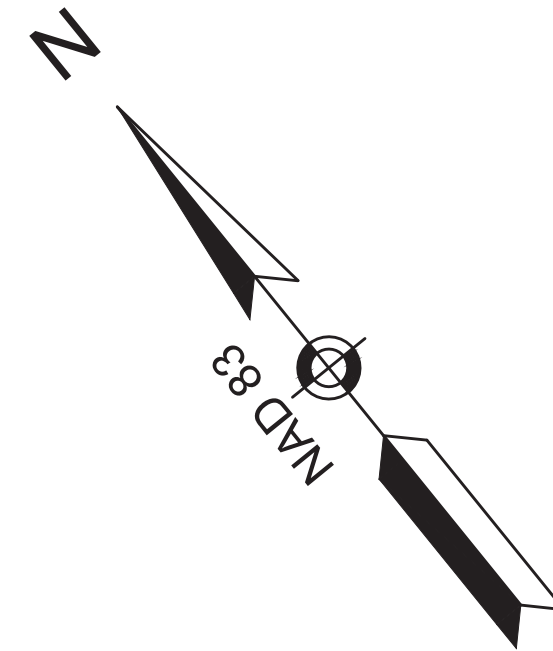


IMPACTS:

PERMANENT VEGETATED WETLAND (VW) IMPACT: 3,607 SF  
 TEMPORARY VEGETATED WETLAND (VW) IMPACT: 620 SF  
 TEMPORARY BANK IMPACT: 24 LF

LEGEND:

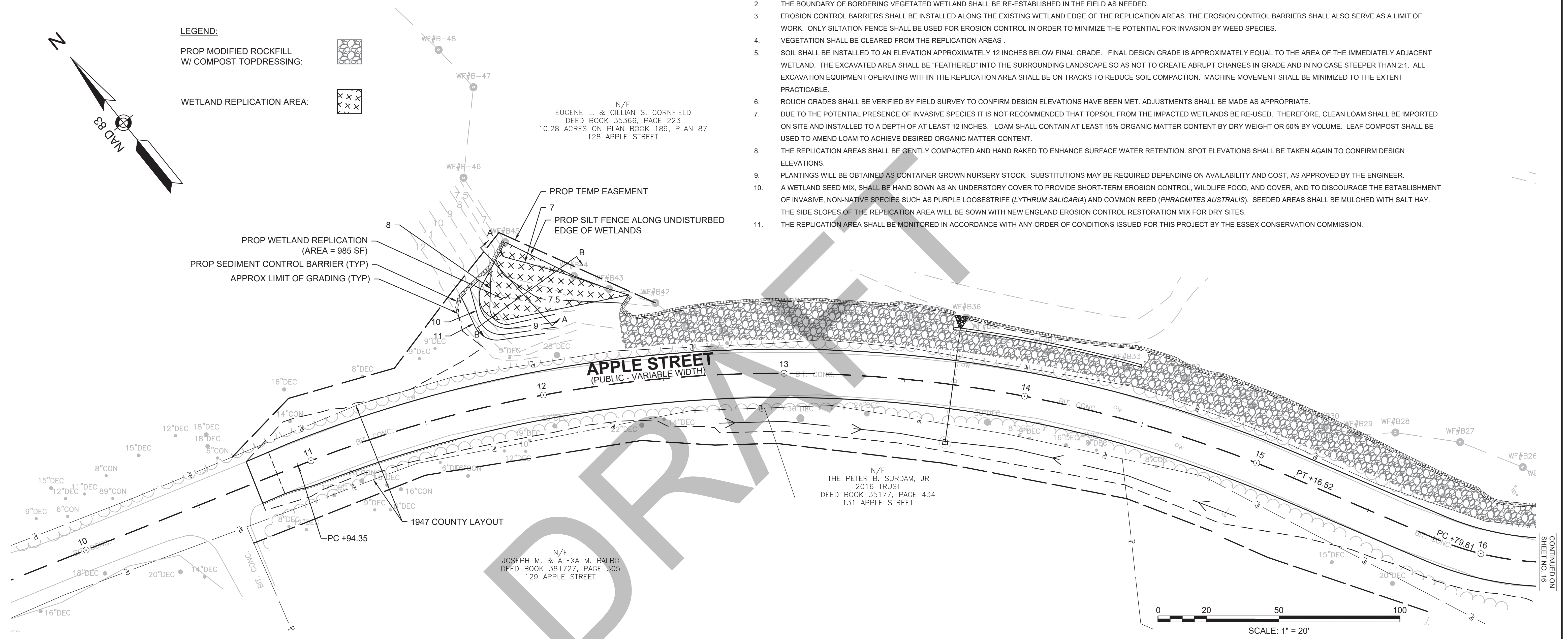
PROP MODIFIED ROCKFILL  
W/ COMPOST TOPDRESSING:   
 WETLAND REPLICATION AREA: 



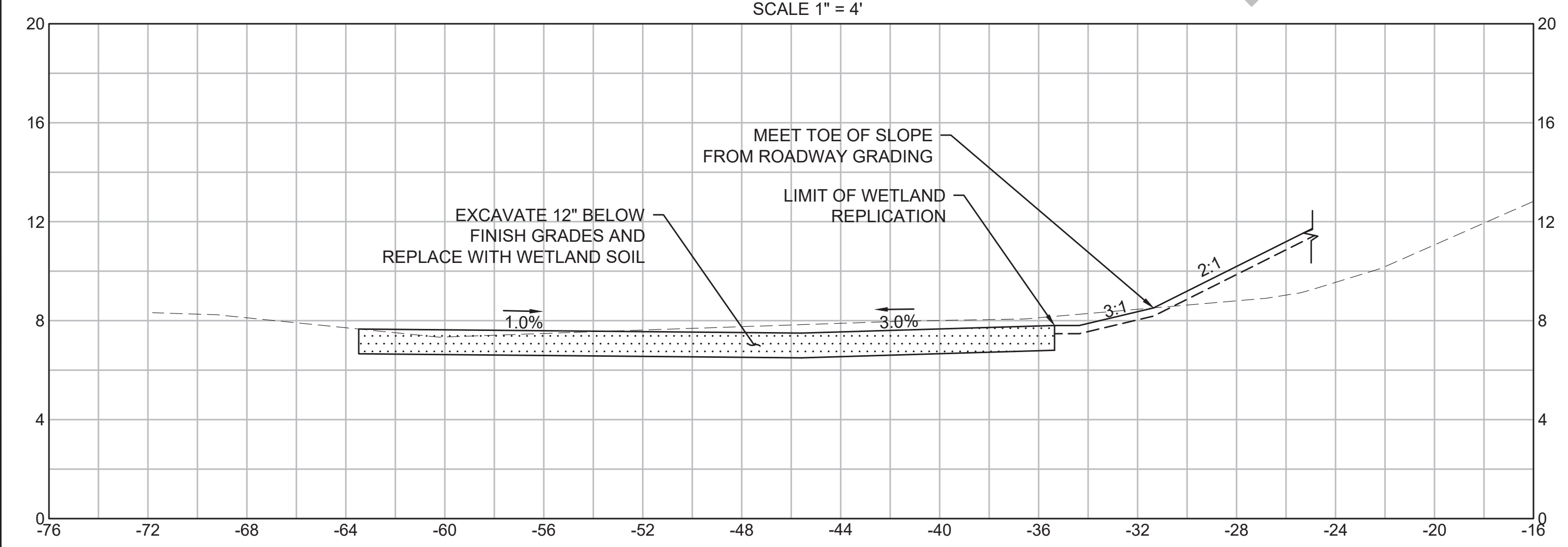
REPLICATION AREA CONSTRUCTION SEQUENCING

THE FOLLOWING IS A PROPOSED SEQUENCE OF CONSTRUCTION FOR THE COMPLETION OF THE WETLAND REPLICATION:

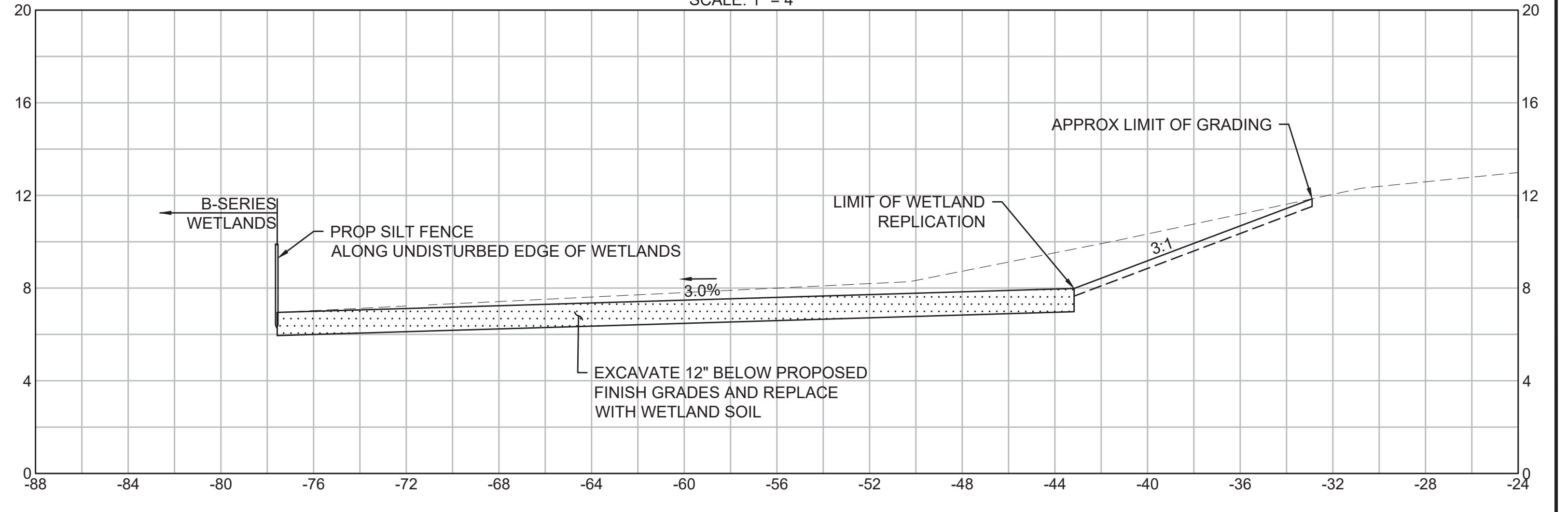
1. A PRE-CONSTRUCTION CONFERENCE WITH THE CONTRACTOR AND A QUALIFIED WETLAND SPECIALIST SHALL BE CONDUCTED TO ENSURE ALL ASPECTS OF THE PROJECT, AS WELL AS ANY ORDER OF CONDITIONS ARE UNDERSTOOD. EQUIPMENT NEEDS AND ACCESS ROUTES TO THE PROPOSED REPLICATION AREA SHALL BE FIRMLY ESTABLISHED.
2. THE BOUNDARY OF BORDERING VEGETATED WETLAND SHALL BE RE-ESTABLISHED IN THE FIELD AS NEEDED.
3. EROSION CONTROL BARRIERS SHALL BE INSTALLED ALONG THE EXISTING WETLAND EDGE OF THE REPLICATION AREAS. THE EROSION CONTROL BARRIERS SHALL ALSO SERVE AS A LIMIT OF WORK. ONLY SILTATION FENCE SHALL BE USED FOR EROSION CONTROL IN ORDER TO MINIMIZE THE POTENTIAL FOR INVASION BY WEED SPECIES.
4. VEGETATION SHALL BE CLEARED FROM THE REPLICATION AREAS.
5. SOIL SHALL BE INSTALLED TO AN ELEVATION APPROXIMATELY 12 INCHES BELOW FINAL GRADE. FINAL DESIGN GRADE IS APPROXIMATELY EQUAL TO THE AREA OF THE IMMEDIATELY ADJACENT WETLAND. THE EXCAVATED AREA SHALL BE "FEATHERED" INTO THE SURROUNDING LANDSCAPE SO AS NOT TO CREATE ABRUPT CHANGES IN GRADE AND IN NO CASE STEEPER THAN 2:1. ALL EXCAVATION EQUIPMENT OPERATING WITHIN THE REPLICATION AREA SHALL BE ON TRACKS TO REDUCE SOIL COMPACTION. MACHINE MOVEMENT SHALL BE MINIMIZED TO THE EXTENT PRACTICABLE.
6. ROUGH GRADES SHALL BE VERIFIED BY FIELD SURVEY TO CONFIRM DESIGN ELEVATIONS HAVE BEEN MET. ADJUSTMENTS SHALL BE MADE AS APPROPRIATE.
7. DUE TO THE POTENTIAL PRESENCE OF INVASIVE SPECIES IT IS NOT RECOMMENDED THAT TOPSOIL FROM THE IMPACTED WETLANDS BE RE-USED. THEREFORE, CLEAN LOAM SHALL BE IMPORTED ON SITE AND INSTALLED TO A DEPTH OF AT LEAST 12 INCHES. LOAM SHALL CONTAIN AT LEAST 15% ORGANIC MATTER CONTENT BY DRY WEIGHT OR 50% BY VOLUME. LEAF COMPOST SHALL BE USED TO AMEND LOAM TO ACHIEVE DESIRED ORGANIC MATTER CONTENT.
8. THE REPLICATION AREAS SHALL BE GENTLY COMPACTED AND HAND RAKED TO ENHANCE SURFACE WATER RETENTION. SPOT ELEVATIONS SHALL BE TAKEN AGAIN TO CONFIRM DESIGN ELEVATIONS.
9. PLANTINGS WILL BE OBTAINED AS CONTAINER GROWN NURSERY STOCK. SUBSTITUTIONS MAY BE REQUIRED DEPENDING ON AVAILABILITY AND COST, AS APPROVED BY THE ENGINEER.
10. A WETLAND SEED MIX, SHALL BE HAND SOWN AS AN UNDERSTORY COVER TO PROVIDE SHORT-TERM EROSION CONTROL, WILDLIFE FOOD, AND COVER, AND TO DISCOURAGE THE ESTABLISHMENT OF INVASIVE, NON-NATIVE SPECIES SUCH AS PURPLE LOOSESTRIPE (*LYTHRUM SALICARIA*) AND COMMON REED (*PHRAGMITES AUSTRALIS*). SEEDED AREAS SHALL BE MULCHED WITH SALT HAY. THE SIDE SLOPES OF THE REPLICATION AREA WILL BE SOWN WITH NEW ENGLAND EROSION CONTROL RESTORATION MIX FOR DRY SITES.
11. THE REPLICATION AREA SHALL BE MONITORED IN ACCORDANCE WITH ANY ORDER OF CONDITIONS ISSUED FOR THIS PROJECT BY THE ESSEX CONSERVATION COMMISSION.



SECTION A-A  
SCALE 1" = 4'



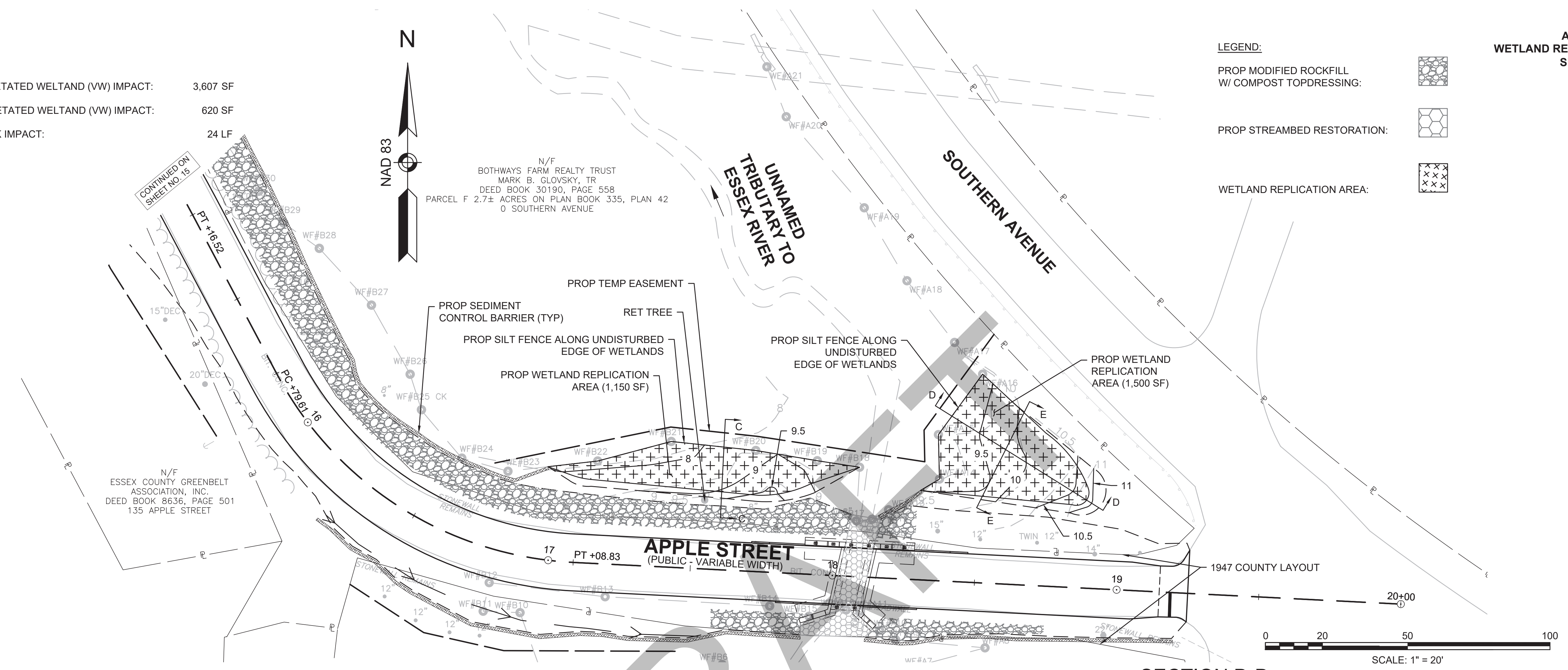
SECTION B-B  
SCALE 1" = 4'



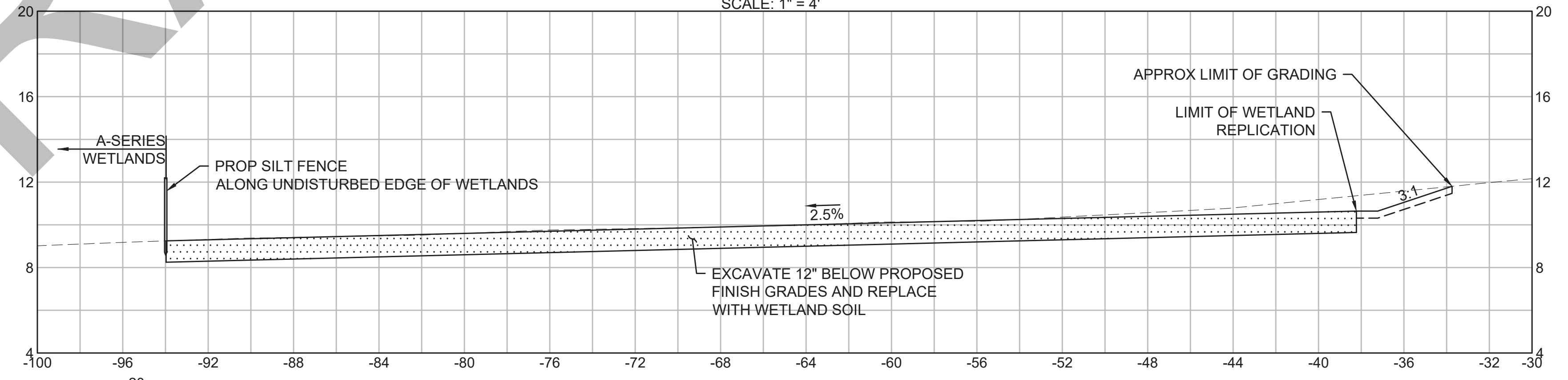


**IMPACTS:**  
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 TEMPORARY VEGETATED WELTAND (VW) IMPACT: 620 SF  
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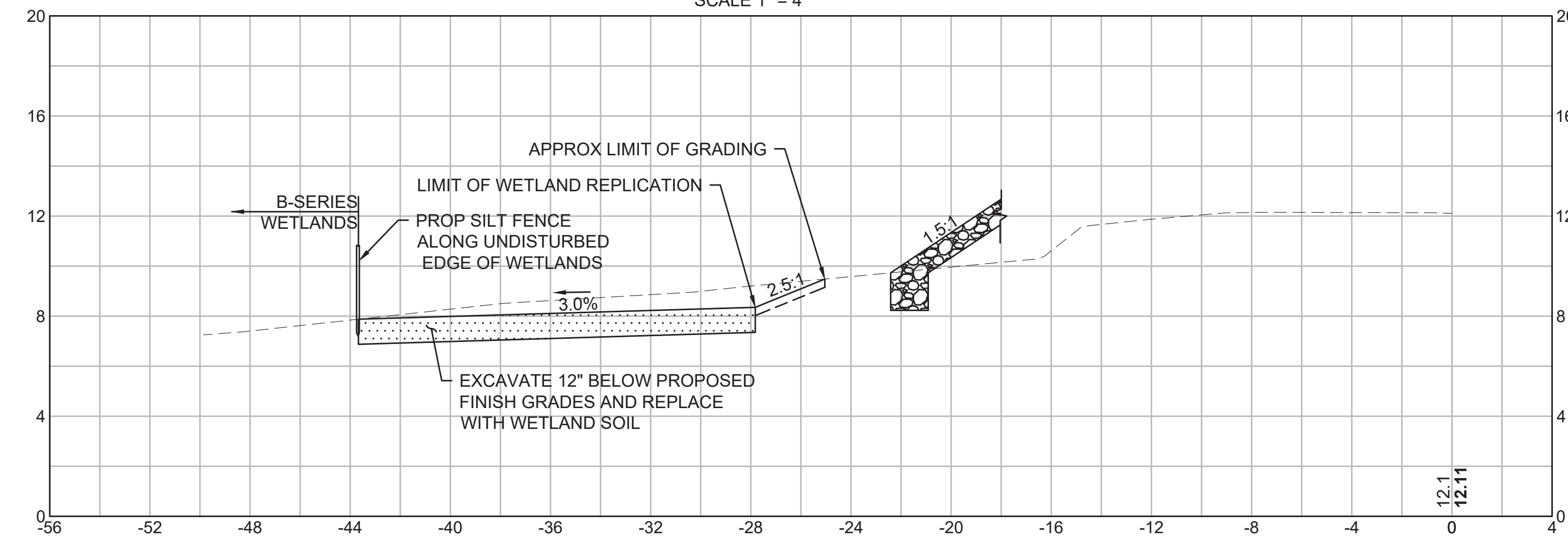
**LEGEND:**  
 PROP MODIFIED ROCKFILL  
 W/ COMPOST TOPDRESSING: [Pattern]  
 PROP STREAMBED RESTORATION: [Pattern]  
 WETLAND REPLICATION AREA: [Pattern]



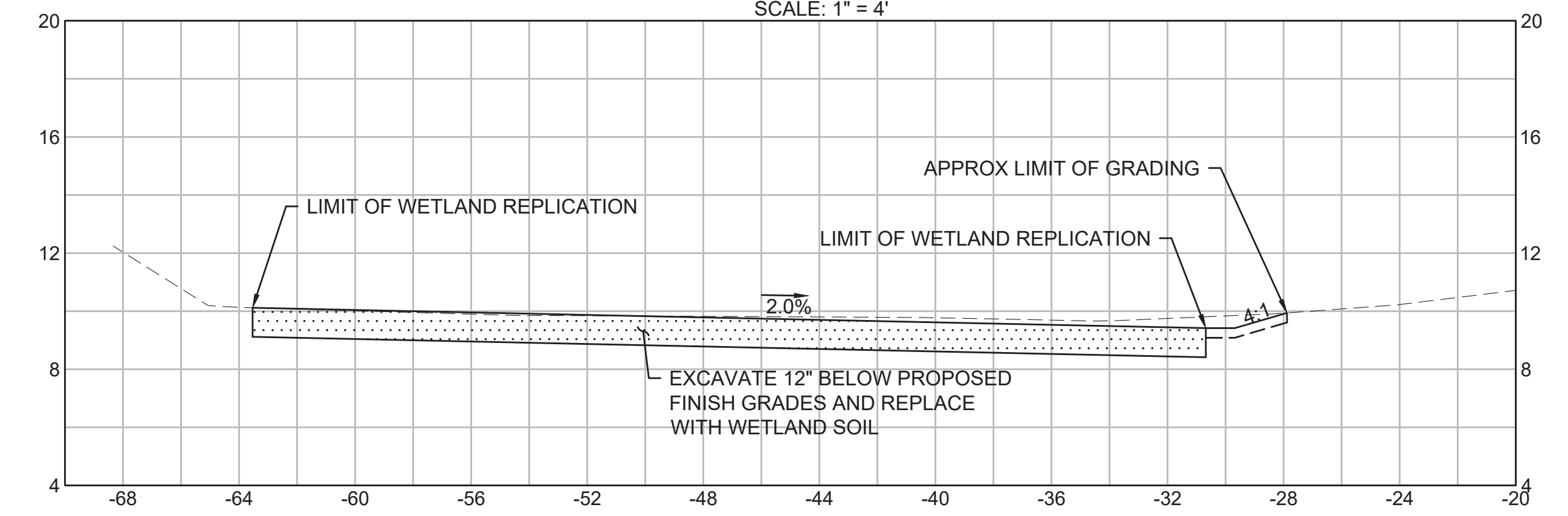
**SECTION D-D**  
SCALE: 1" = 4'



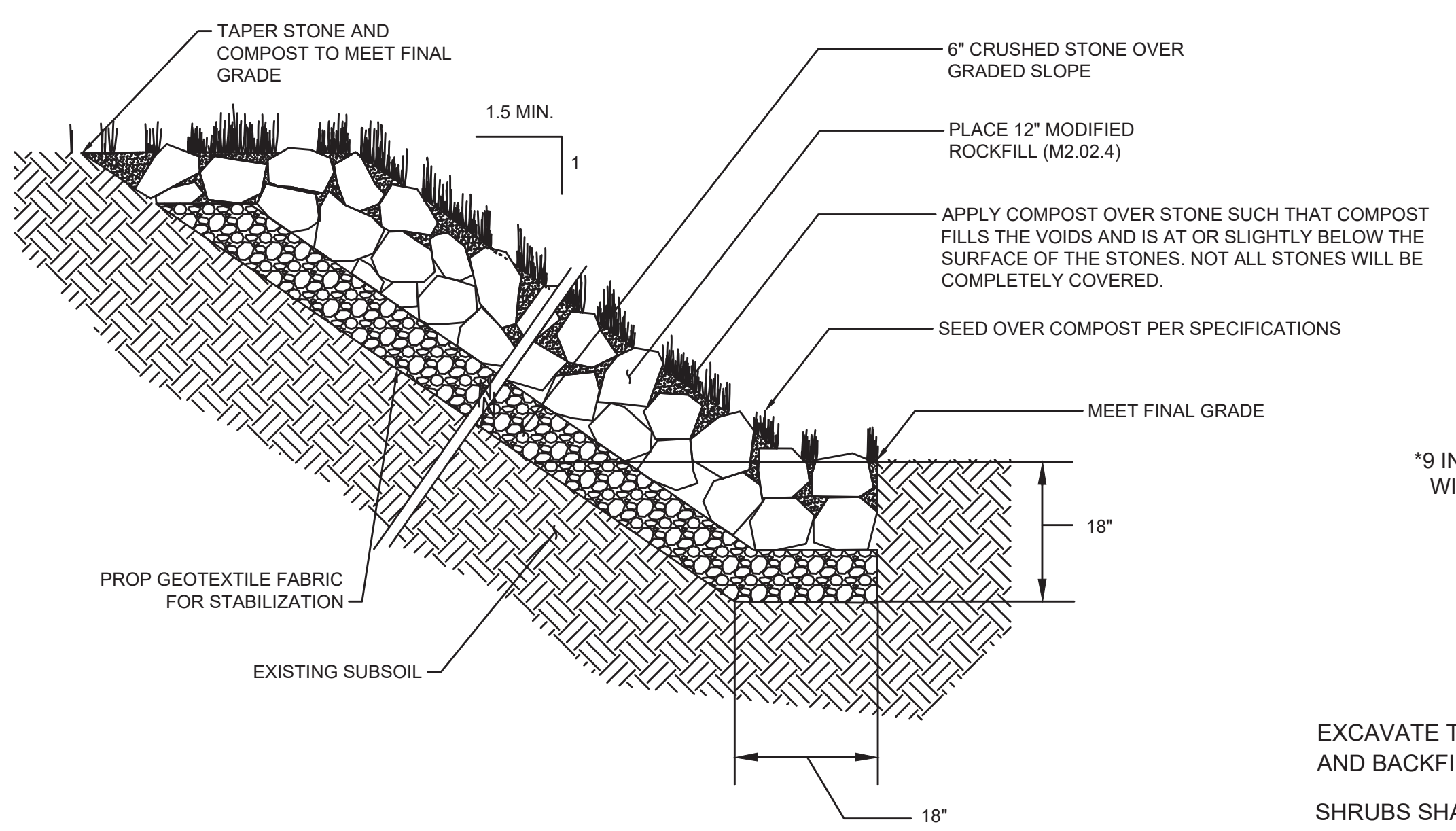
**SECTION C-C**  
SCALE: 1" = 4'



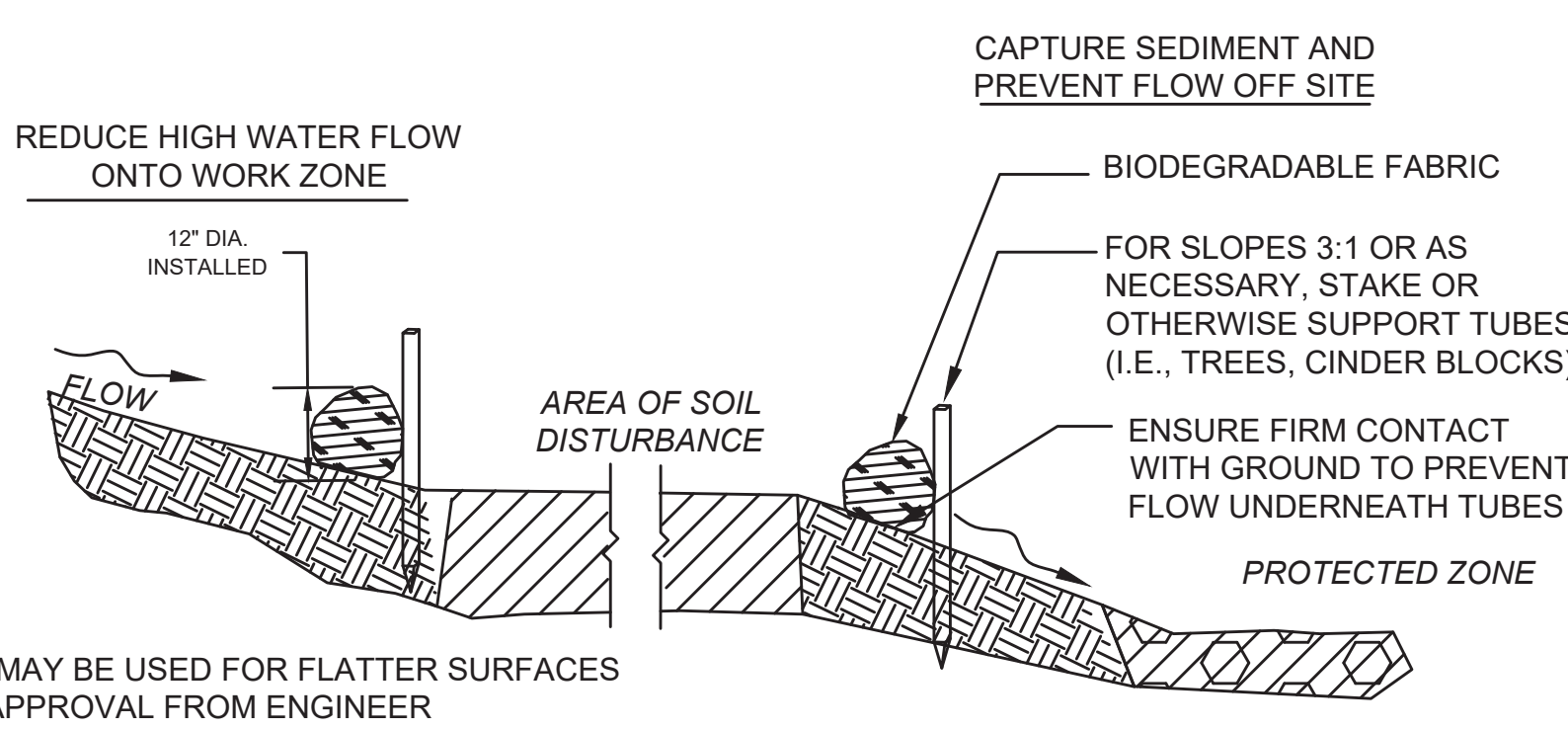
**SECTION E-E**  
SCALE: 1" = 4'







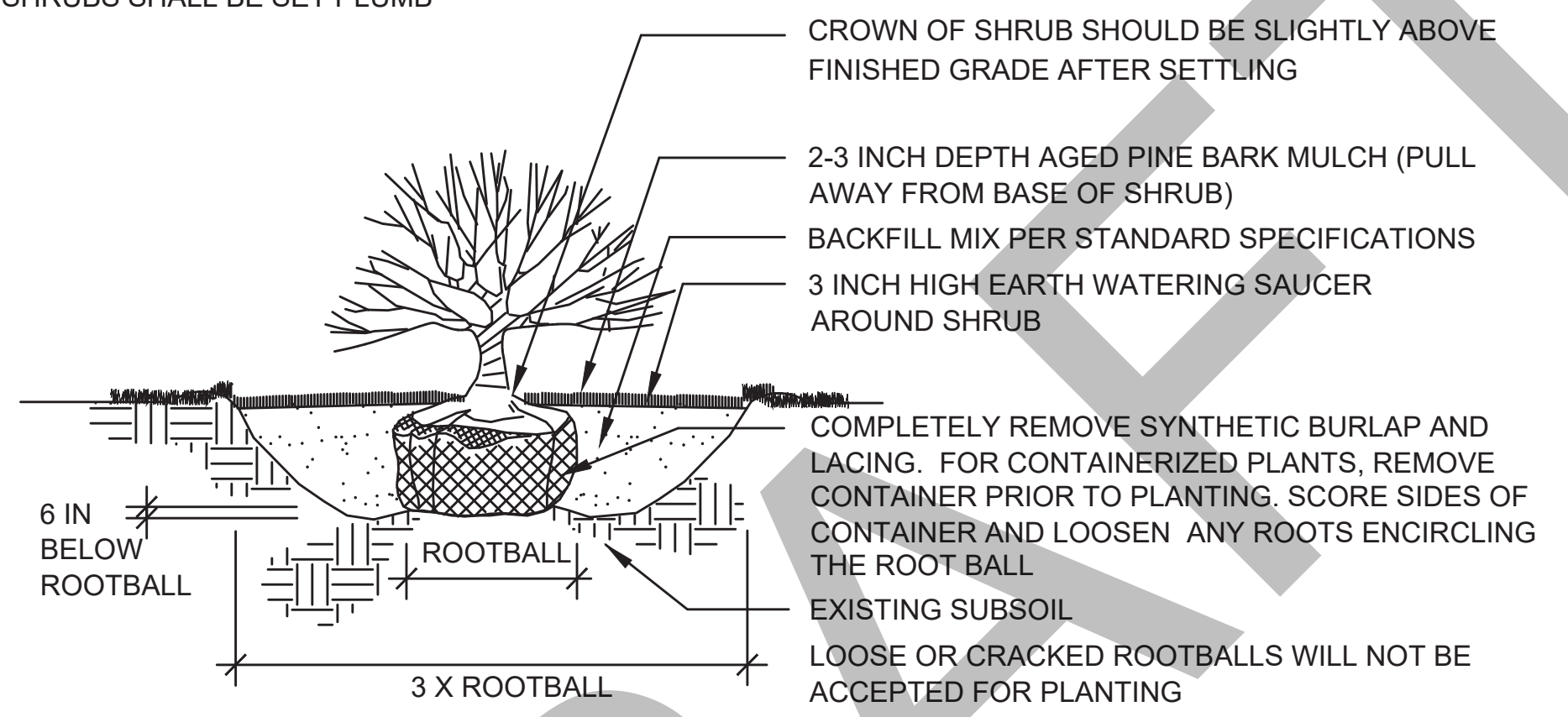
COMPOST AND SEED OVER MODIFIED ROCKFILL (NON-WATERWAY)  
N.T.S.



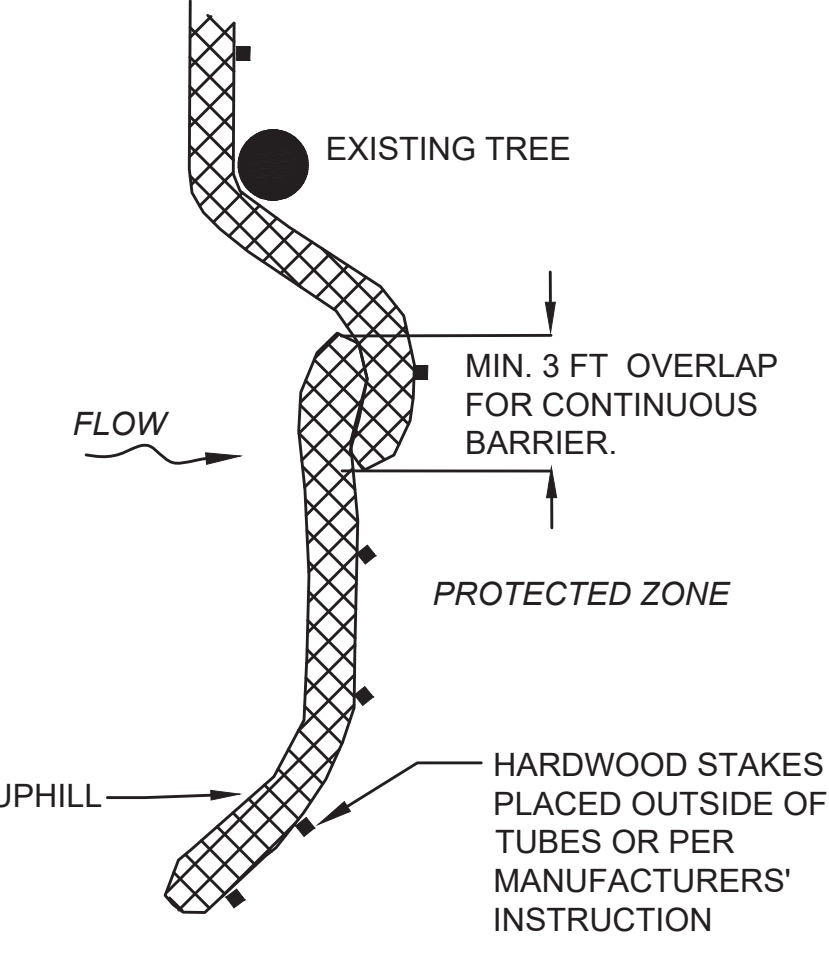
SECTION  
SEDIMENT BARRIER - COMPOST FILTER TUBES  
N.T.S.

EXCAVATE TO REQUIRED DEPTH AND BACKFILL WITH PLANTING MIX  
SHRUBS SHALL BE SET PLUMB

WATER BY FLOODING TWICE IN FIRST TWO HOURS AFTER PLANTING. WATER & MAINTAIN AS PER STANDARD SPECIFICATIONS

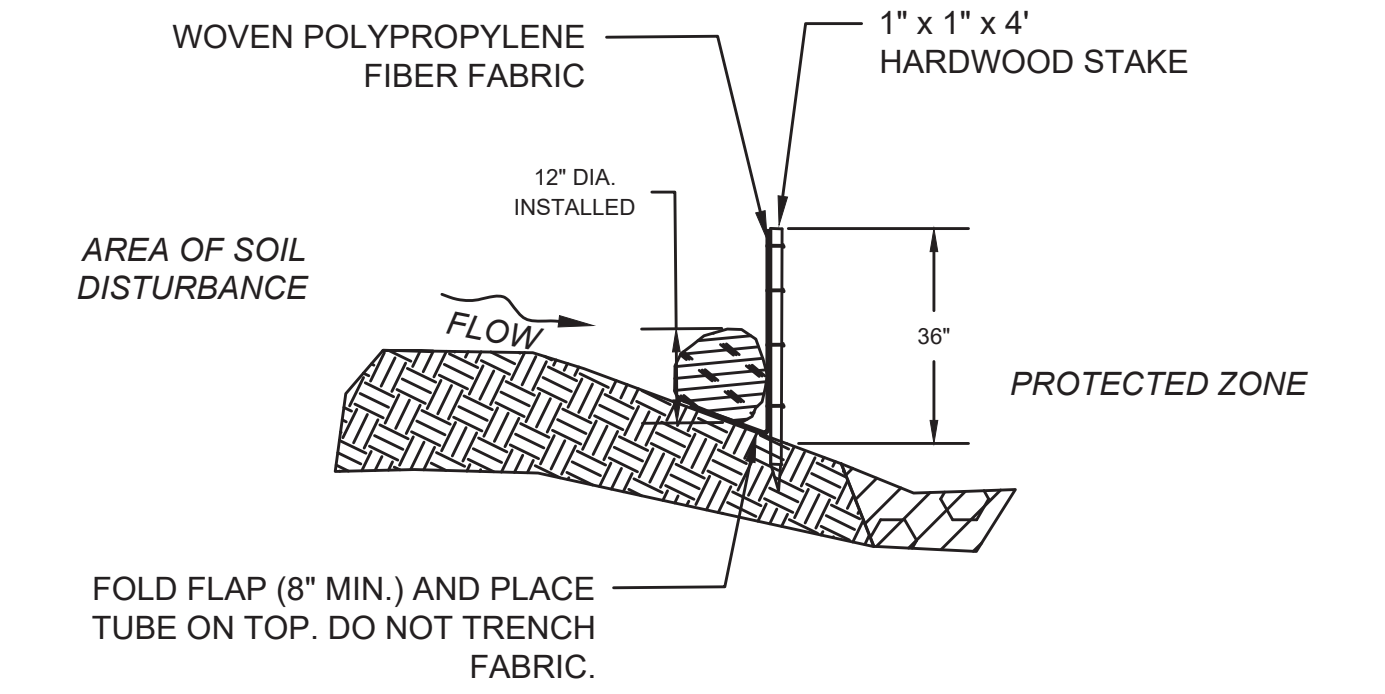


SHRUB PLANTING  
N.T.S.

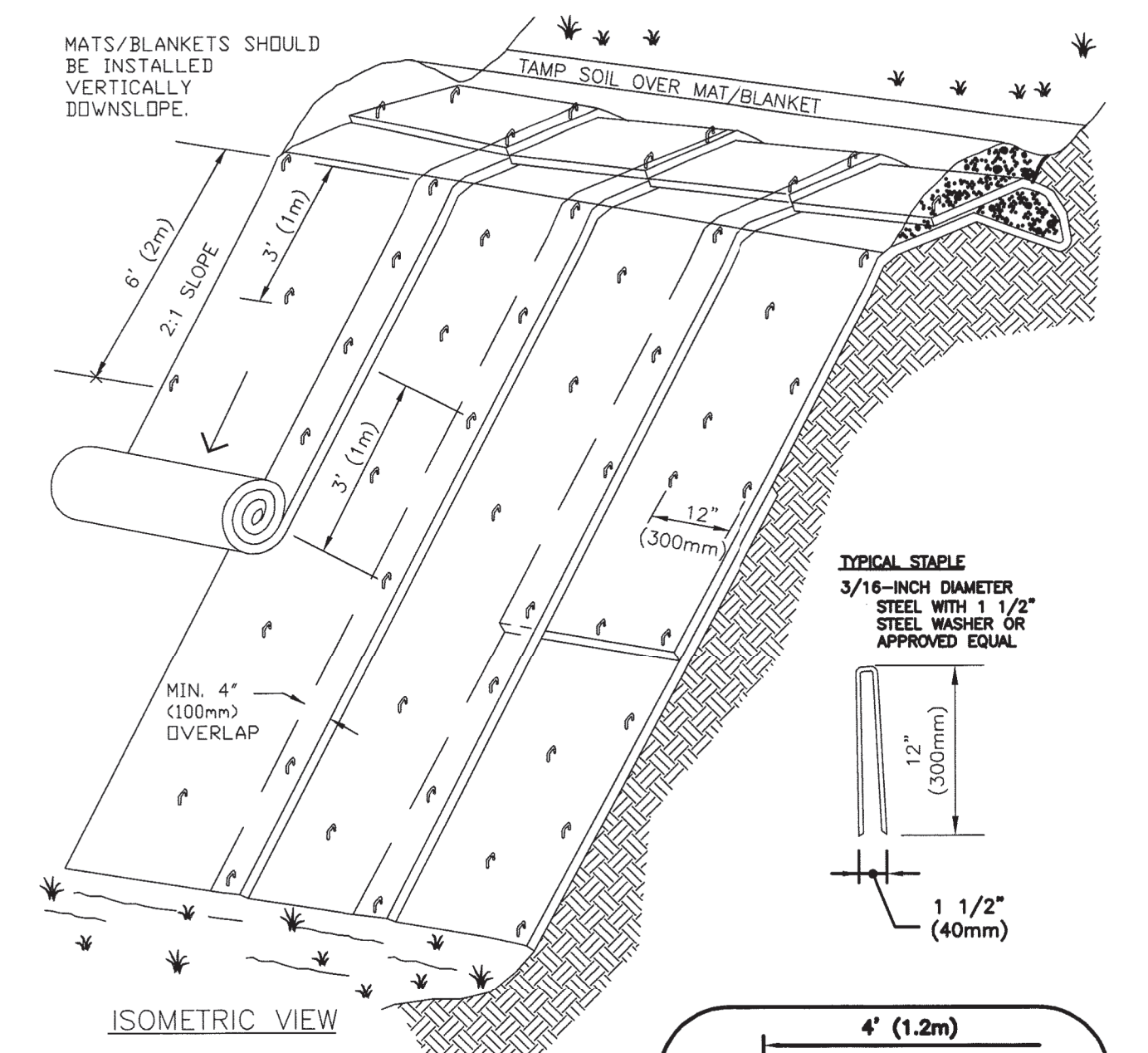


PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.  
PLACE AS CLOSE TO LIMIT OF SOIL DISTURBANCE AS POSSIBLE  
ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.  
PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

PLAN VIEW  
COMPOST FILTER TUBES  
N.T.S.



SECTION  
SEDIMENT BARRIER - COMPOST FILTER TUBE & SILT FENCE  
N.T.S.

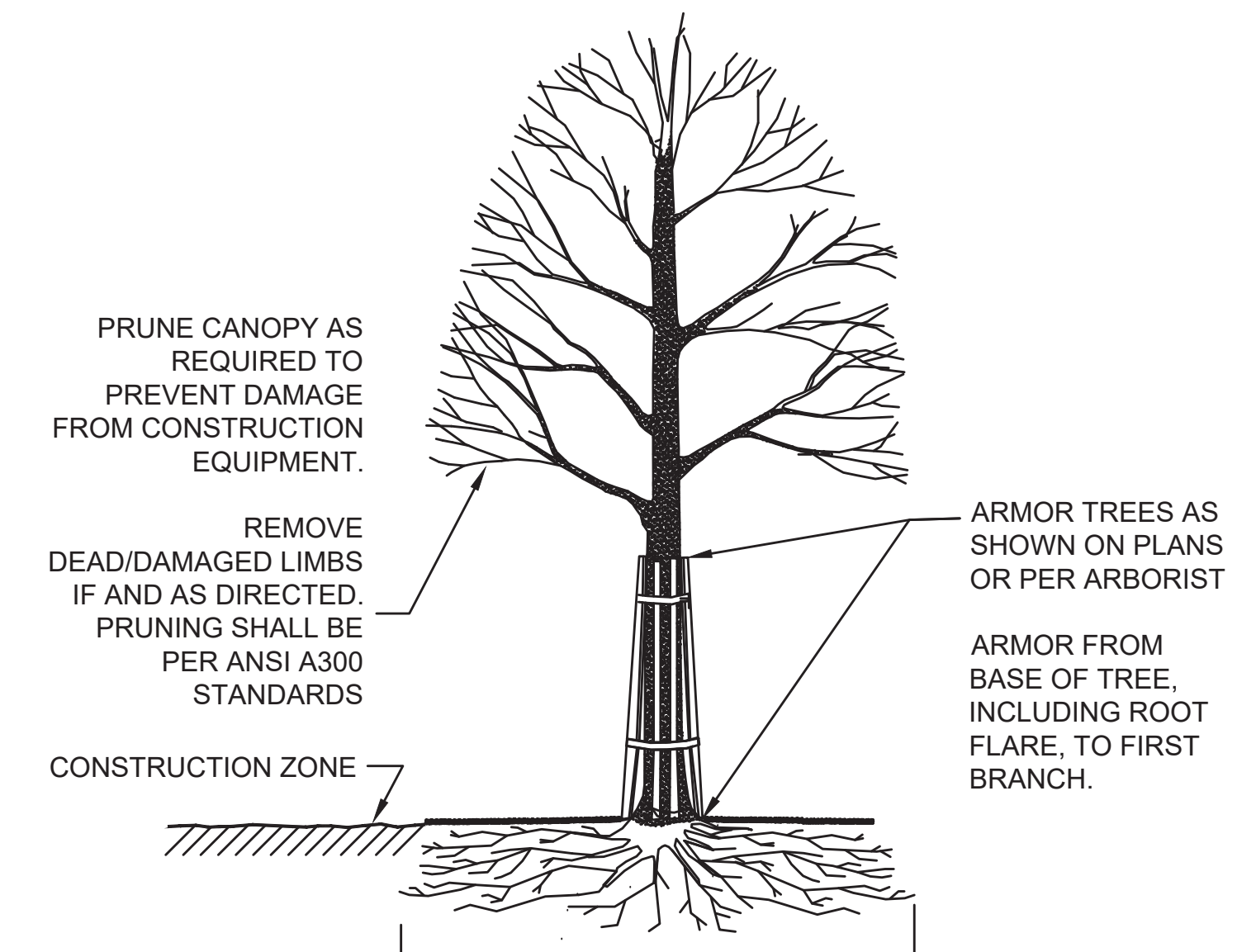


ISOMETRIC VIEW  
TYPICAL INSTALLATION OF EROSION CONTROL BLANKETS FOR SLOPES  
NOT TO SCALE

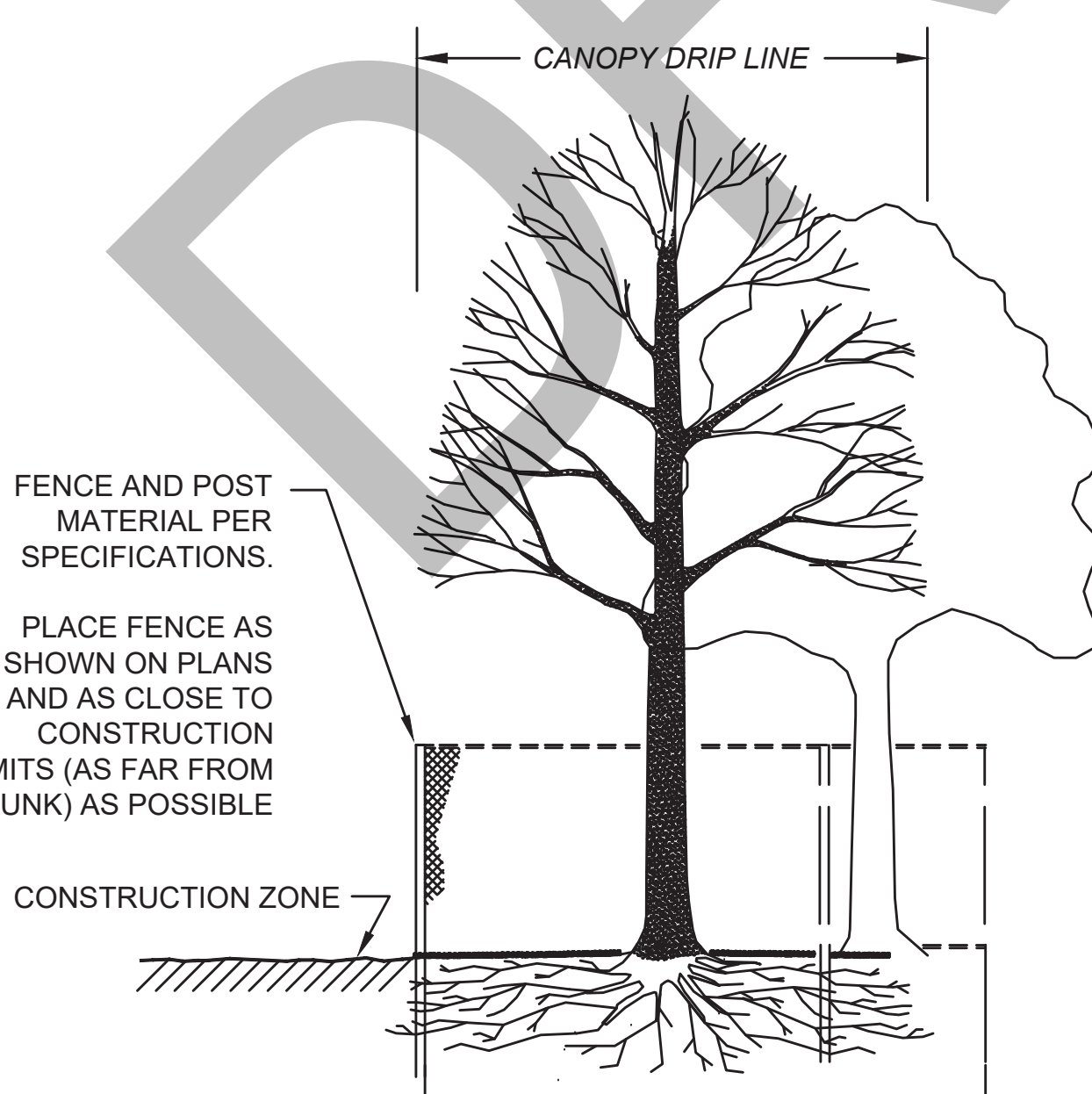
- NOTES:
- BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
  - ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW. LAY BLANKETS LOOSELY & MAINTAIN DIRECT CONTACT WITH SOIL - DO NOT STRETCH.
  - THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
  - WHEN BLANKETS MUST BE SPICED DOWN THE SWALE, PLACE BLANKET END OVER END WITH 6 INCH (MIN.) OVERLAP AND ANCHOR DOWN SLOPE BLANKET IN A 6 INCH DEEP TRENCH.
  - BLANKETS SHALL BE STAPLED ENOUGH TO ANCHOR BLANKET WHILE MAINTAINING CONTACT WITH SOIL. STAPLES SHALL BE PLACED DOWN THE CENTER & STAGGERED WITH THE STAPLES PLACED ALONG EDGES. PATTERN & AMOUNT OF STAPLES VARIES BY MANUFACTURER. FOLLOW MANUFACTURER'S RECOMMENDATIONS, AS REQUIRED.

- MAINTENANCE & MATS
- BLANKETS SHALL BE INSPECTED WEEKLY DURING CONSTRUCTION & AFTER A RAINFALL IN EXCESS OF 1/2" IN A 24-HOUR PERIOD.
  - FAILURES SHALL BE REPAIRED IMMEDIATELY. IF ANY OF THE FOLLOWING OCCUR THE AFFECTED AREA SHALL BE REPAIRED AND RESEEDED & MAT SHALL BE REPLACED OR REINSTALLED: SLOPE WASHOUT, MAT DISPLACEMENT, DAMAGE TO MAT.

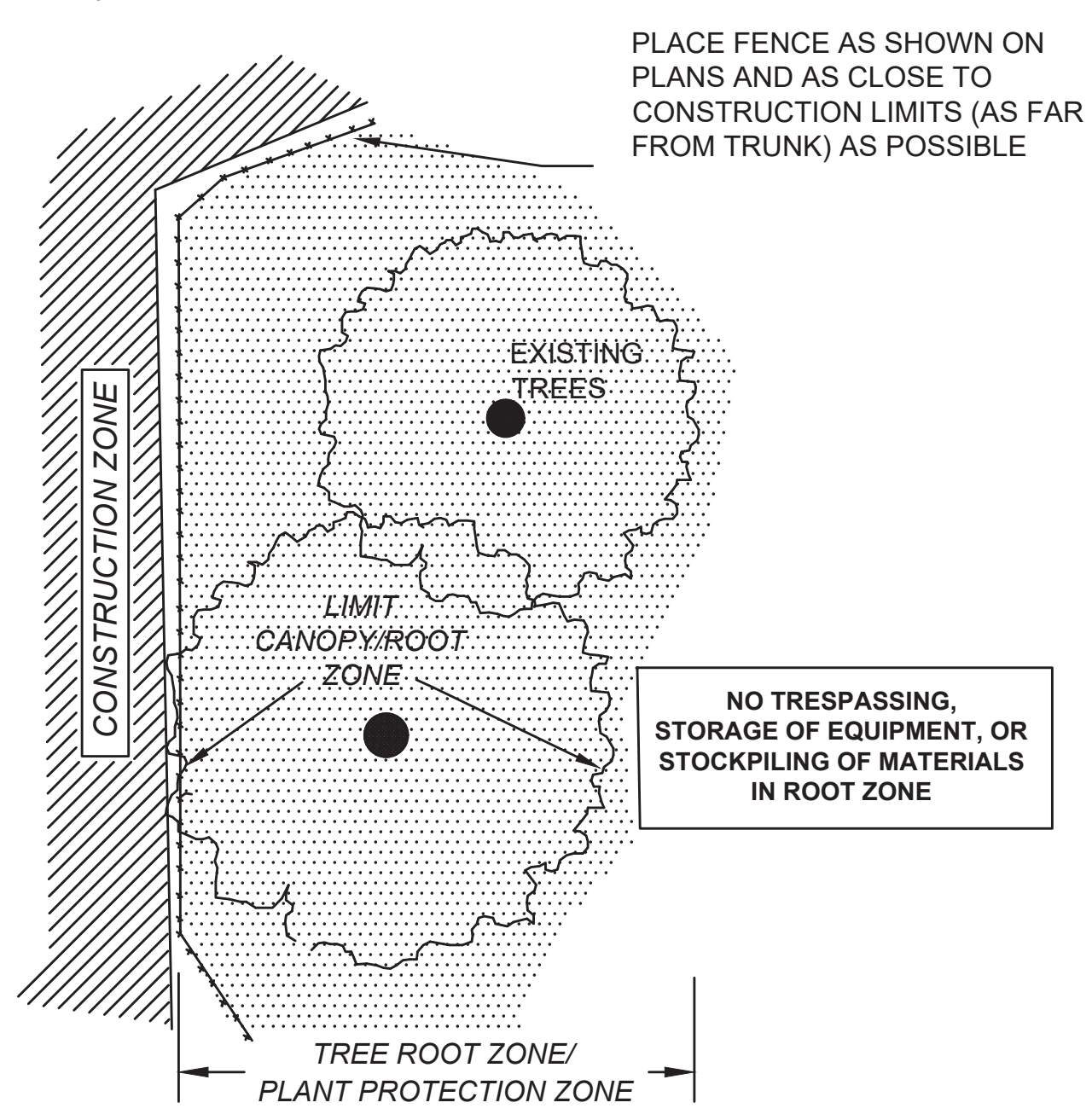
BLANKET SLOPE PROTECTION FOR EROSION CONTROL  
N.T.S.



SECTION - TRUNK ARMORING & PRUNING  
TREE PROTECTION - TRUNK  
N.T.S.



SECTION - FENCE PROTECTION OF ROOT ZONE  
TREE PROTECTION - ROOT ZONE  
N.T.S.

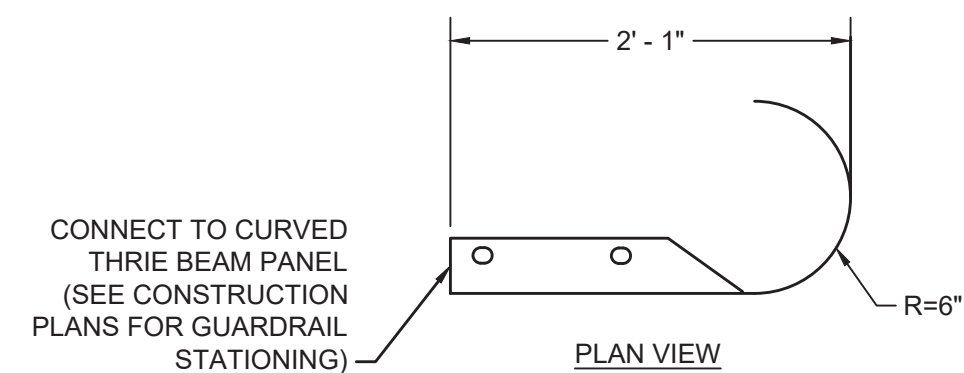


PLAN VIEW - FENCE PROTECTION OF ROOT ZONE  
N.T.S.

PLACE FENCE AS SHOWN ON PLANS AND AS CLOSE TO CONSTRUCTION LIMITS (AS FAR FROM TRUNK) AS POSSIBLE

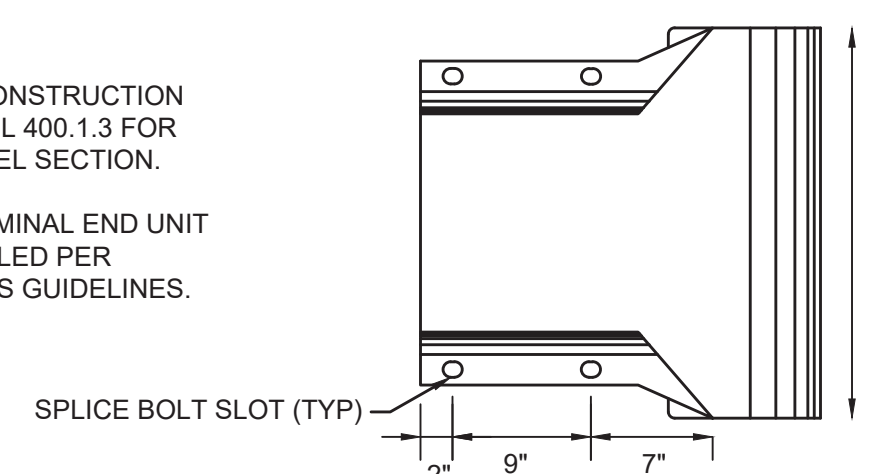
NO TRESPASSING, STORAGE OF EQUIPMENT, OR STOCKPILING OF MATERIALS IN ROOT ZONE



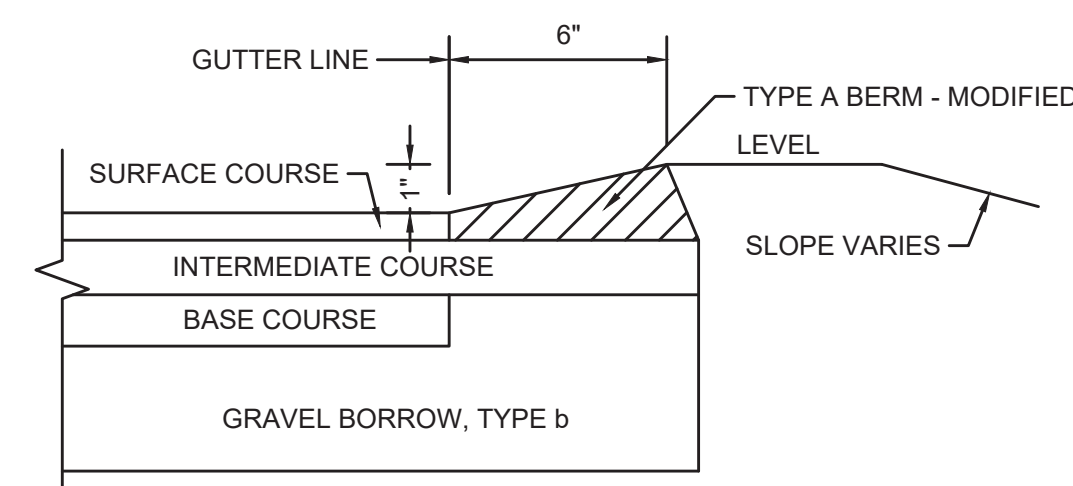
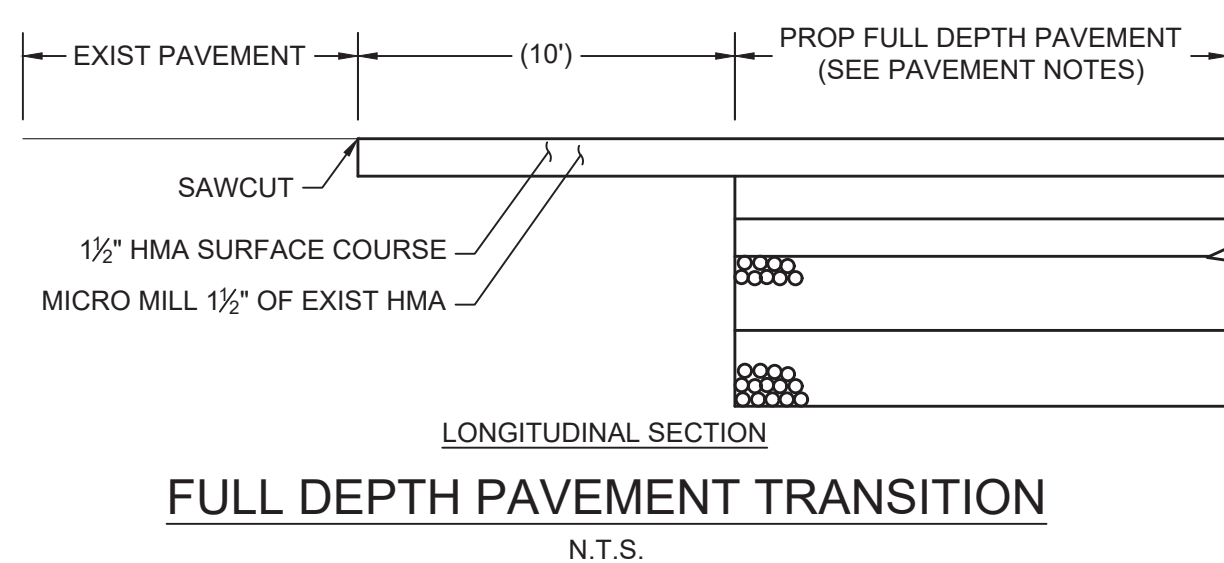


NOTES:

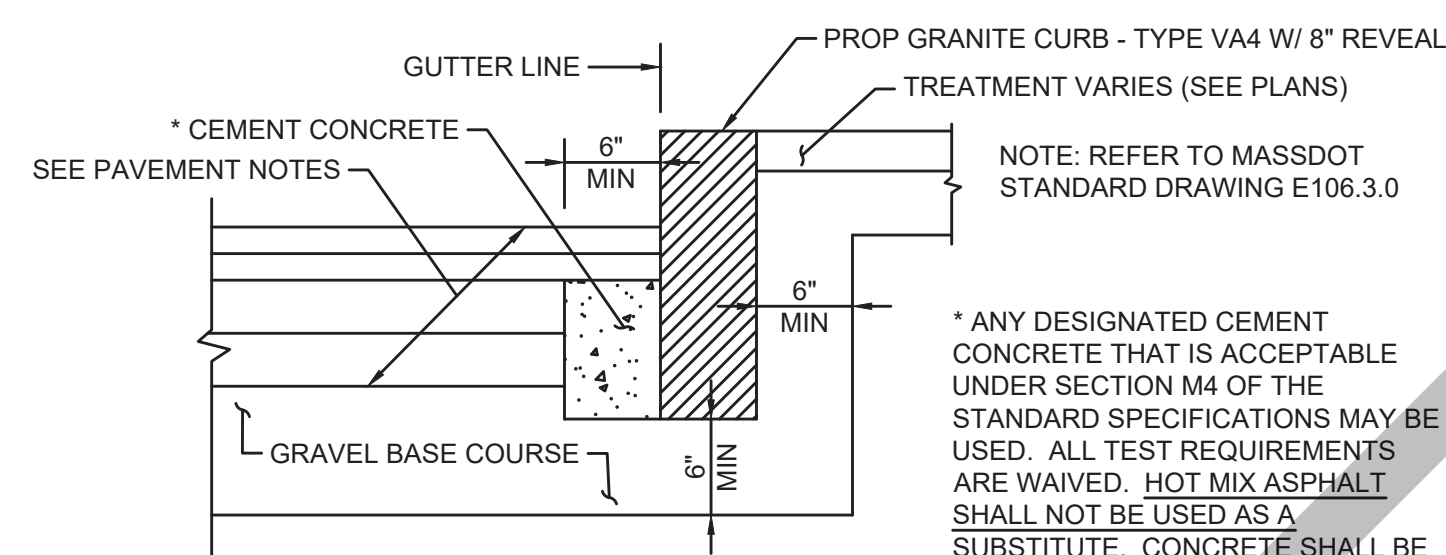
- SEE MASSDOT CONSTRUCTION STANDARD DETAIL 400.1.3 FOR THRIE BEAM PANEL SECTION.
- THRIE BEAM TERMINAL END UNIT SHALL BE INSTALLED PER MANUFACTURER'S GUIDELINES.



THRIE BEAM TERMINAL END UNIT  
N.T.S.

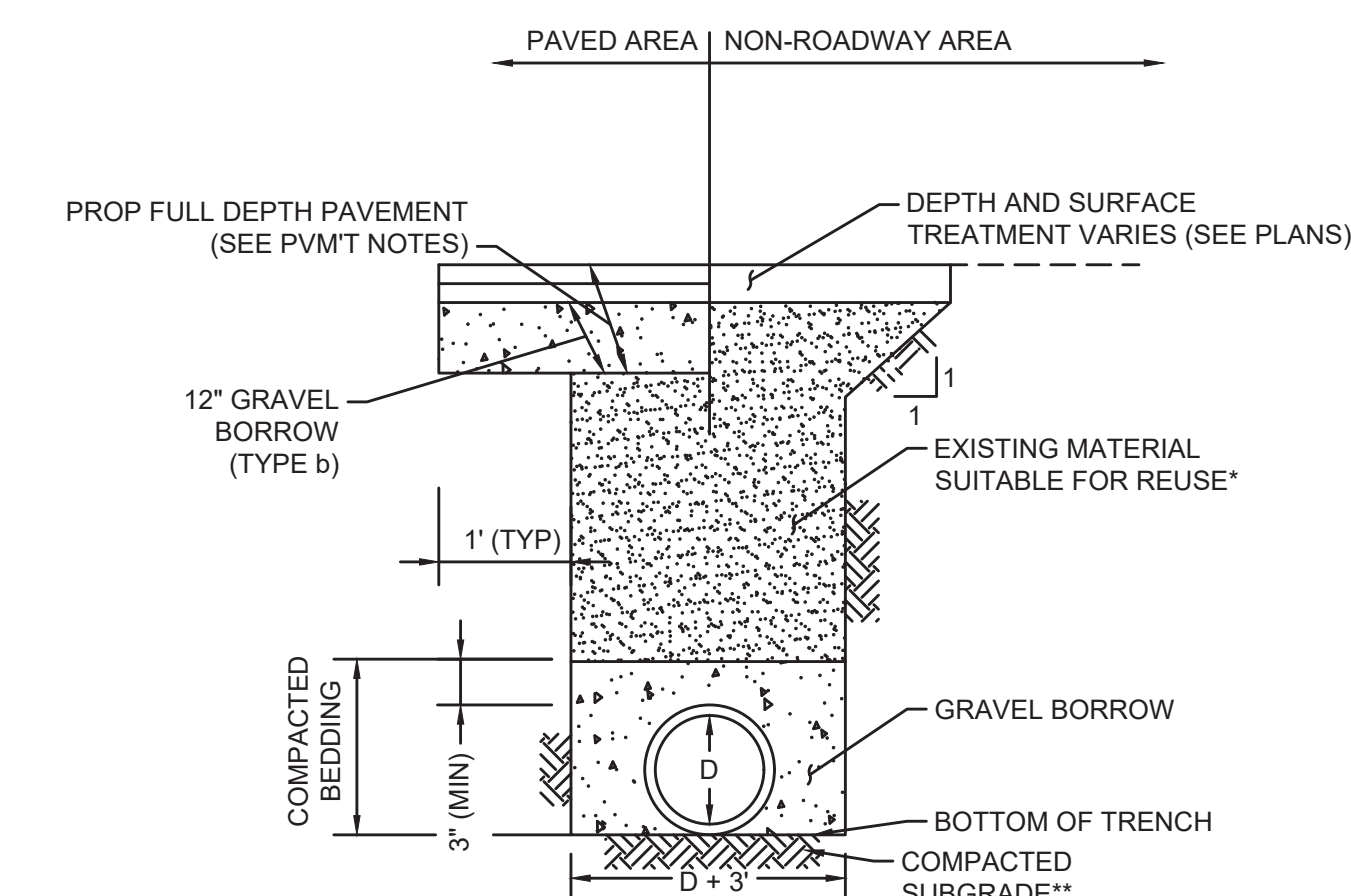


FOR ALL OTHER DIMENSIONS, SEE MASSDOT E 106.1.0  
HOT MIX ASPHALT BERM, TYPE A - MODIFIED  
N.T.S.



\* ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR VARIOUS GRANITE CURB ITEMS FOR 6" OFFSET FROM FACE OF CURB.

GRANITE CURB IN FULL DEPTH PAVEMENT  
N.T.S.

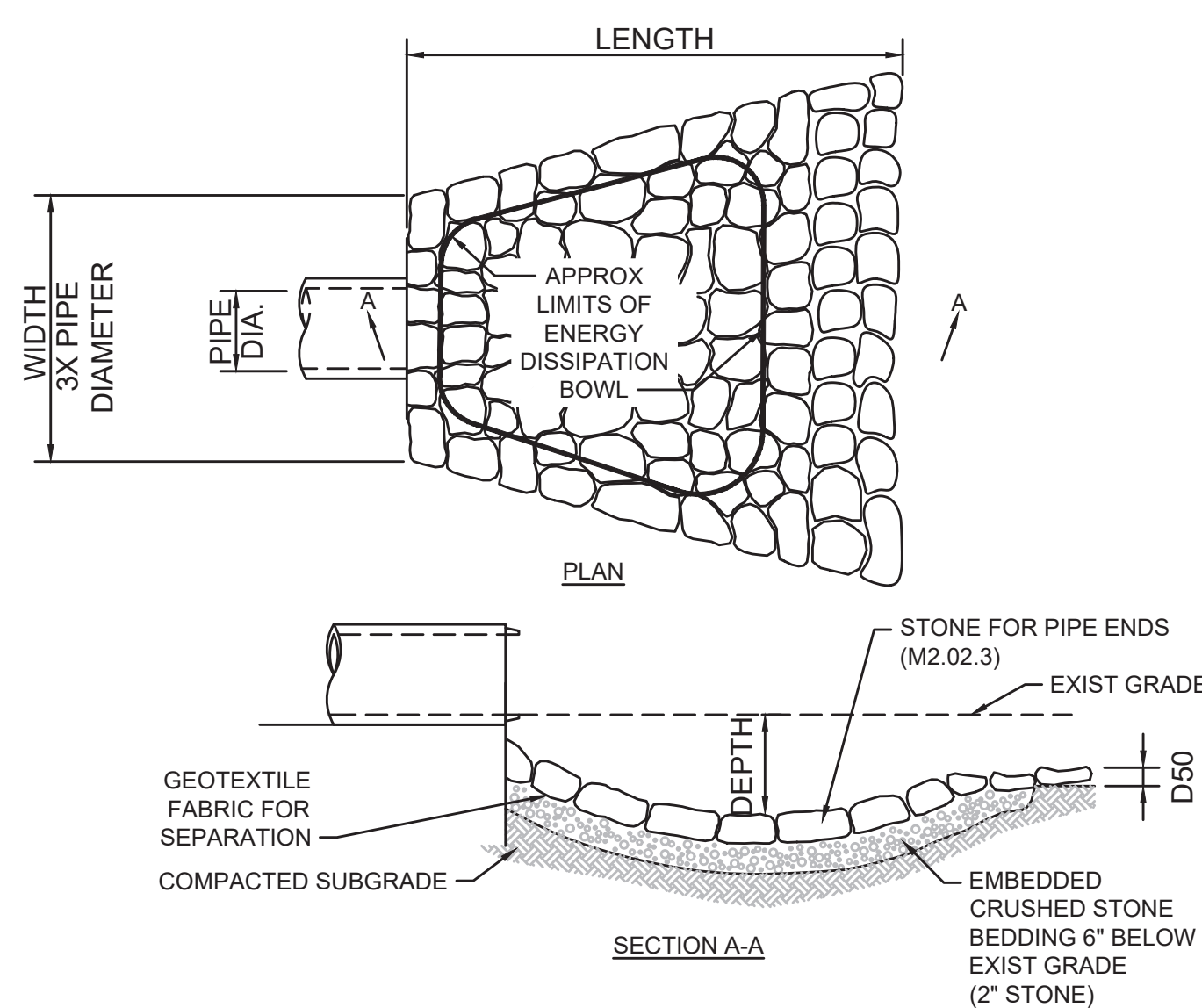


NOTES:

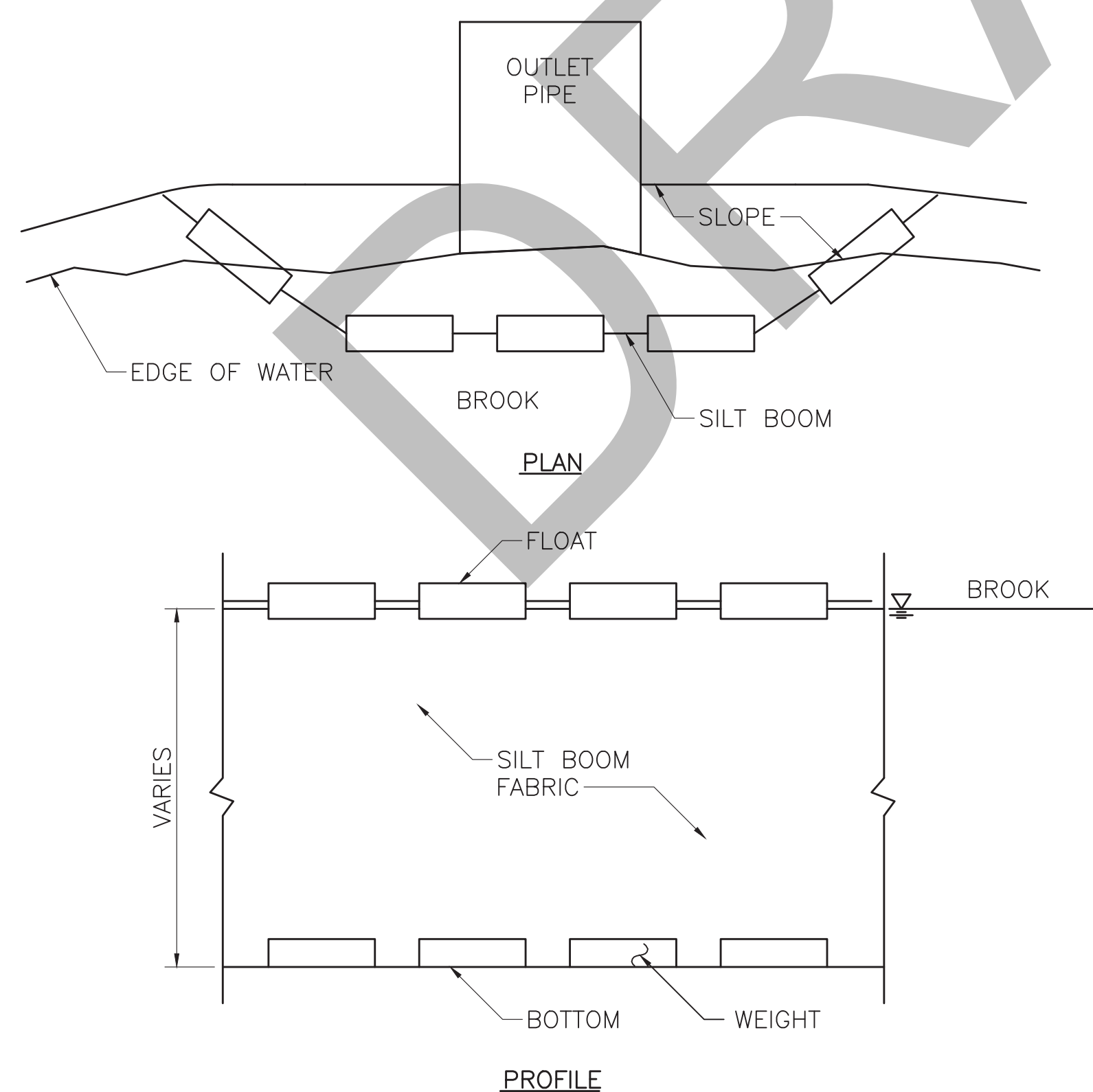
\* MATERIAL USED FOR BACKFILLING TO A POINT 2 FEET OVER THE PIPE SHALL CONTAIN NO STONES LARGER THAN 3 INCHES IN GREATEST DIMENSION, EXCEPT MATERIAL USED TO BACKFILL CORRUGATED PLASTIC PIPE SHALL CONSIST OF GRAVEL BORROW MEETING THE REQUIREMENTS OF M1.03.0: GRAVEL BORROW, TYPE d, TO A DEPTH OF 2 FEET OVER THE TOP OF THE PIPE.

\*\*SOFT OR UNSUITABLE MATERIAL EXISTING BELOW THE REQUIRED BEDDING GRADE SHALL BE REMOVED AS DIRECTED AND REPLACED WITH SAND, GRAVEL, CRUSHED STONE OR OTHER SUITABLE MATERIAL AND THOROUGHLY COMPACTED.

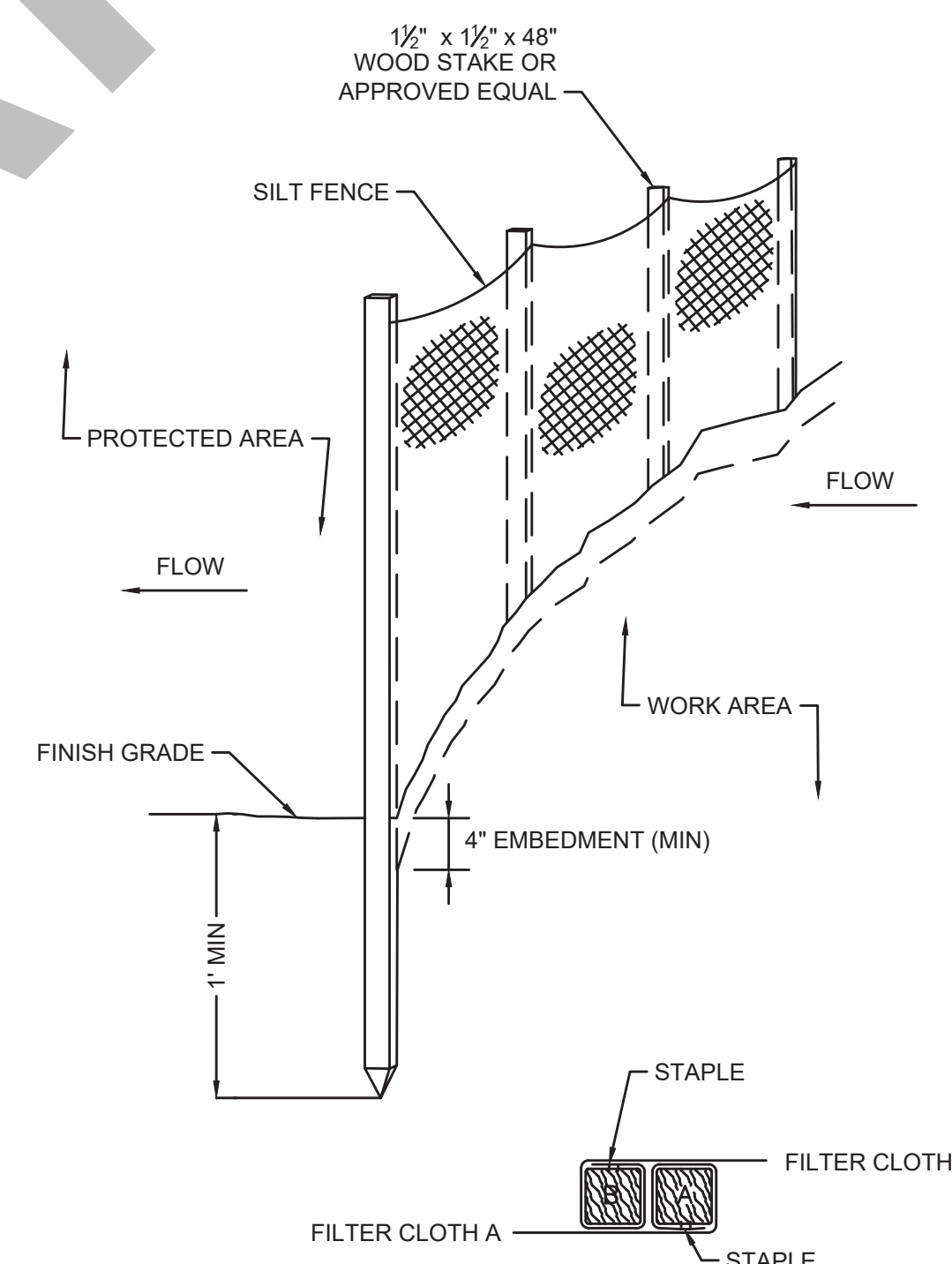
UTILITY TRENCH  
N.T.S.



STONE FOR PIPE ENDS  
N.T.S.



FLOATING SILT FENCE  
N.T.S.

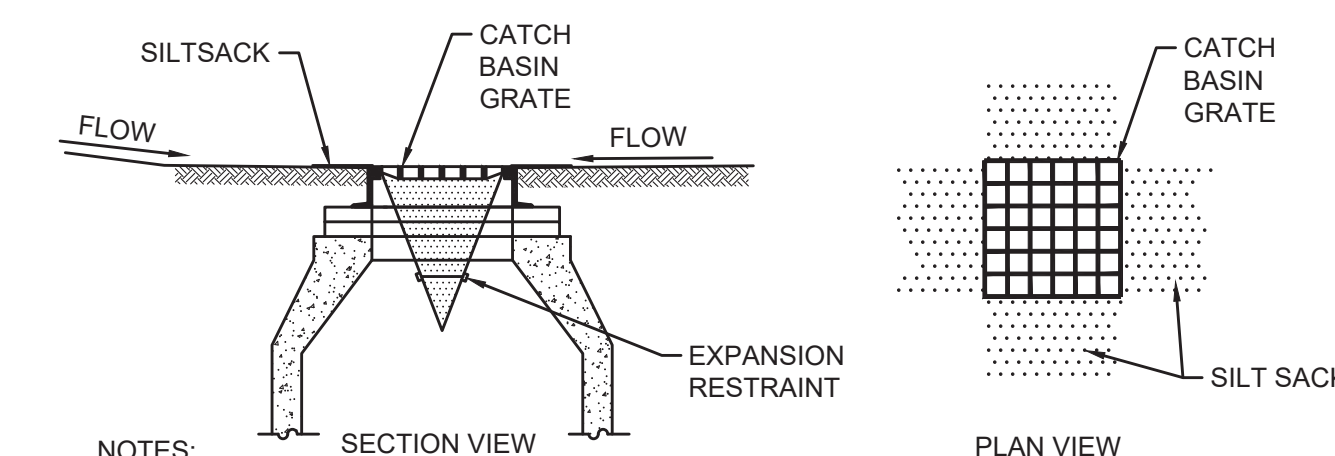


WOOD STAKE JOINT DETAIL  
N.T.S.

NOTES:

- FILTER CLOTH SHALL BE FASTENED SECURELY TO POSTS WITH STAPLES. POSTS SHALL BE SPACED 8'-10' ON CENTER.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
- ENTRENCH SILT FENCE BY 4 INCHES.
- INSPECTIONS SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED, OR WHEN SEDIMENT ACCUMULATES TO HALF THE HEIGHT OF FENCING.

SILT FENCE  
N.T.S.



NOTES:

- INSTALL SILT SACK IN EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL INTERMEDIATE COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
- GRATE TO BE PLACED OVER SILT SACK.
- SILT SACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

INLET PROTECTION SILT SACK IN CATCH BASIN  
N.T.S.

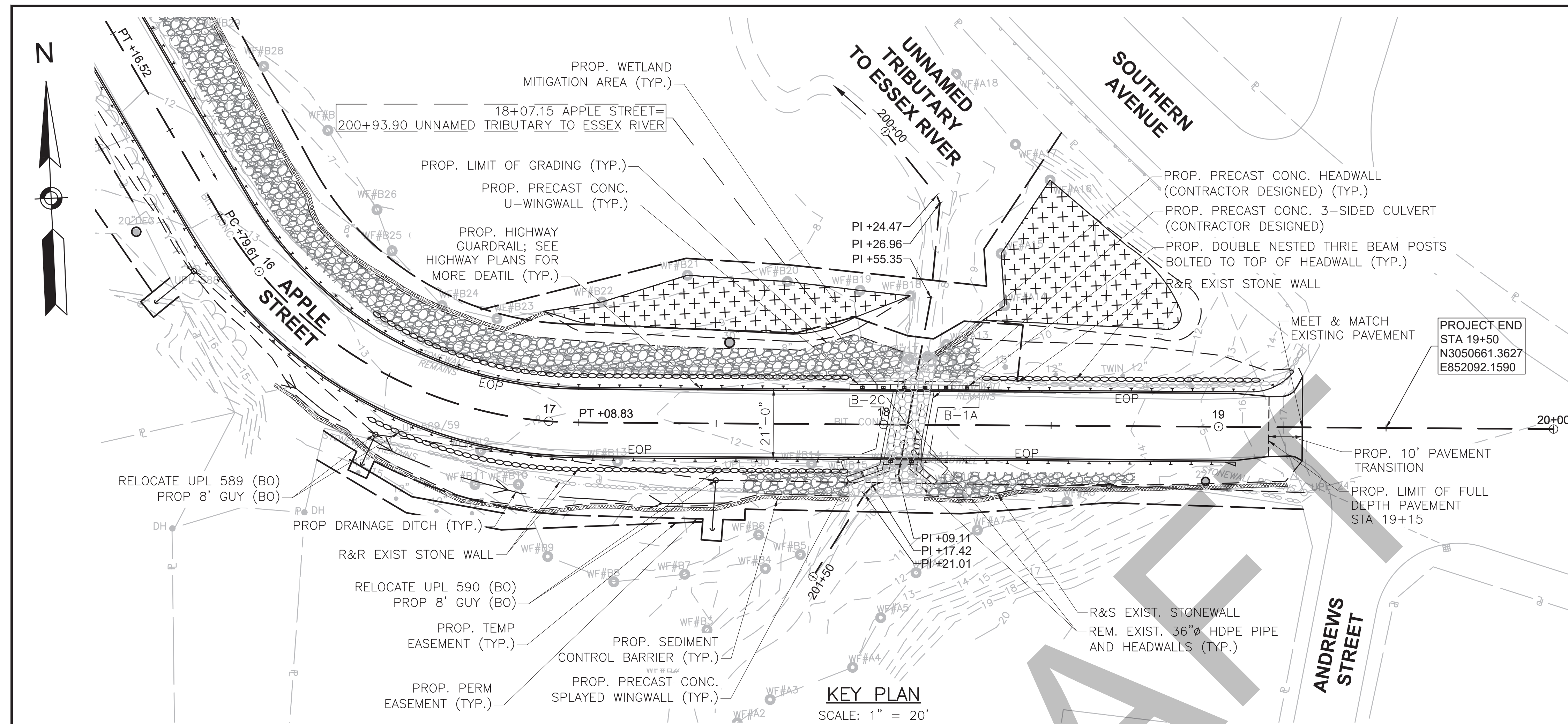
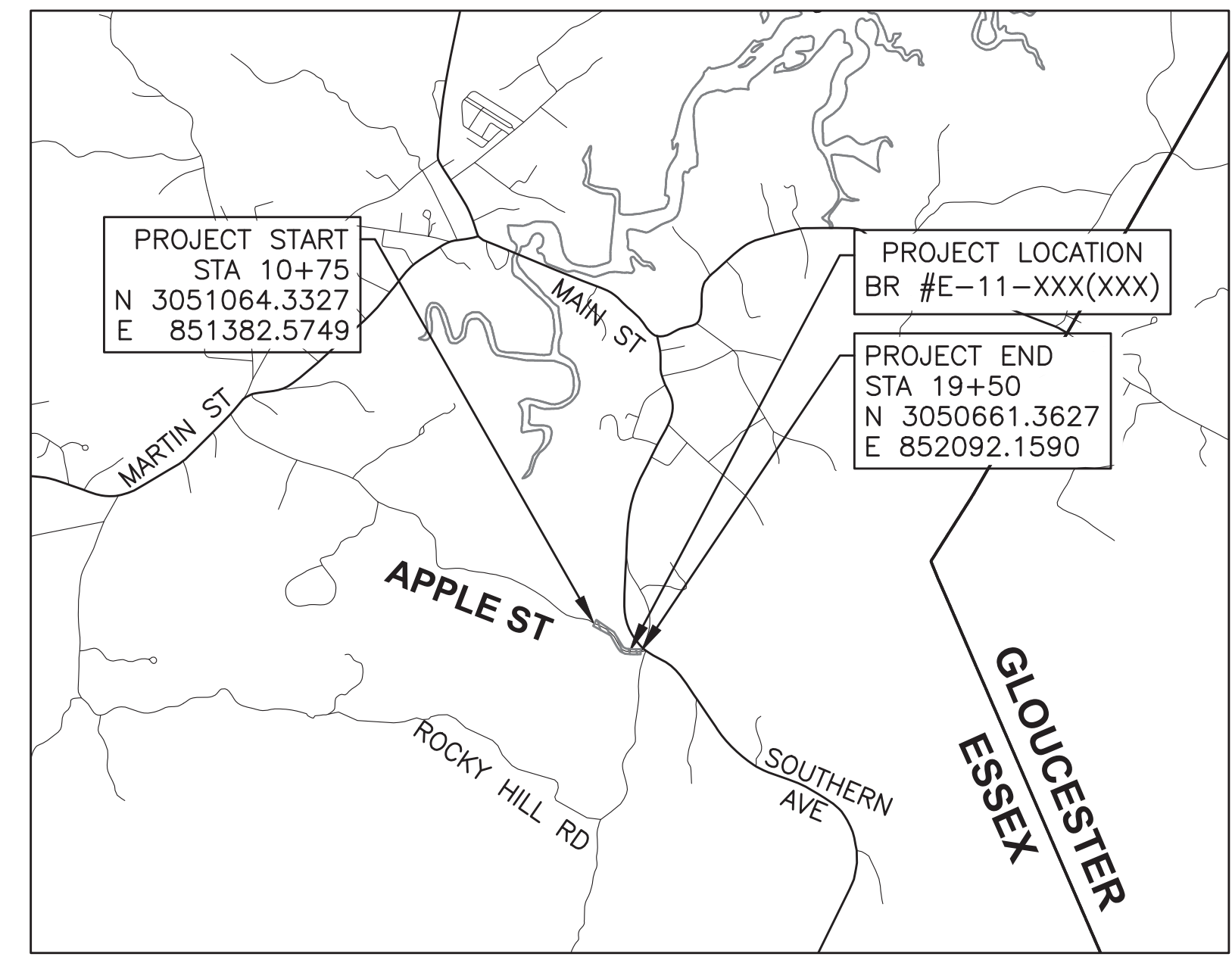


ESSEX  
APPLE ST OVER UNNAMED  
TRIBUTARY TO ESSEX RIVER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		19	36

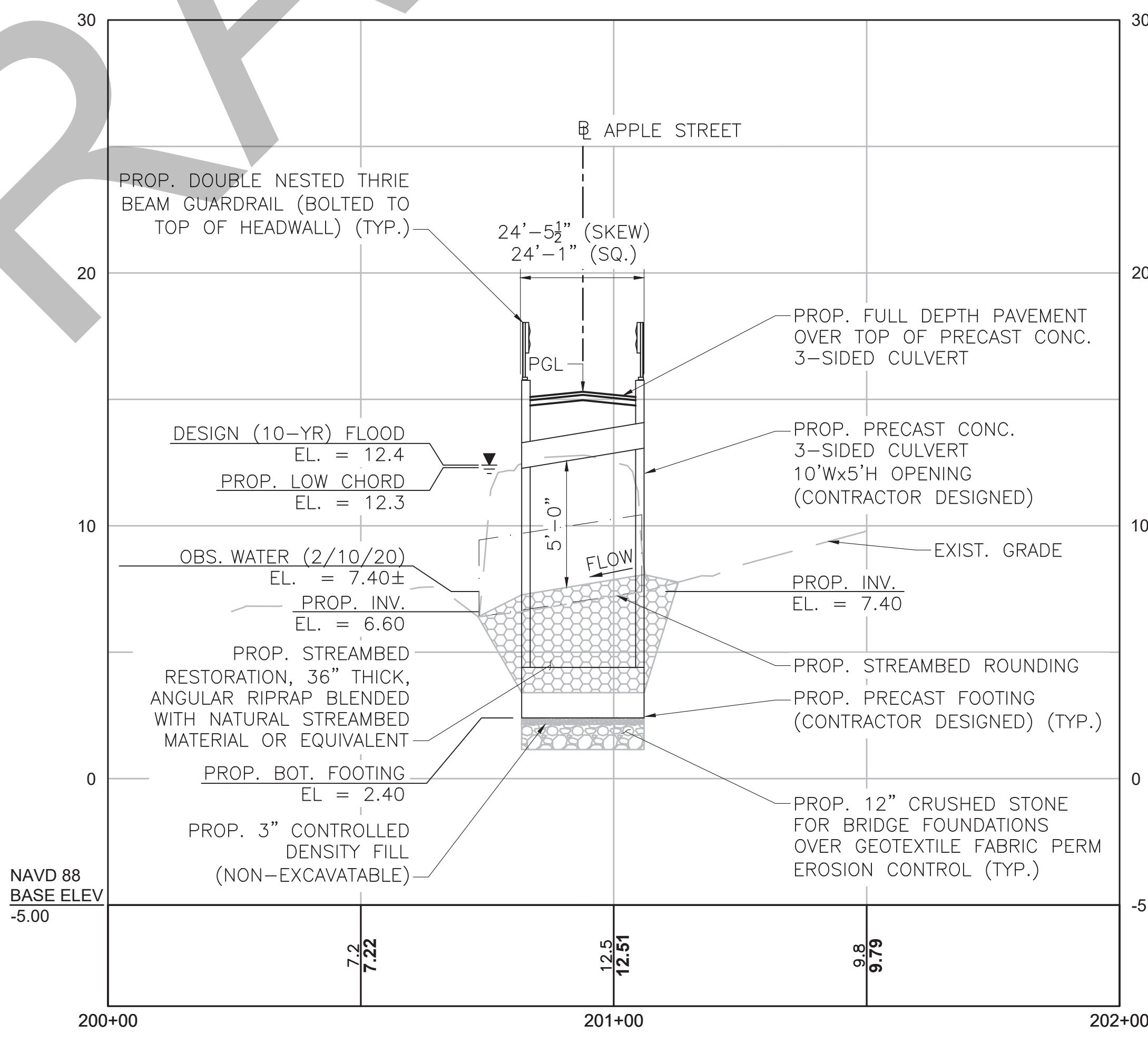
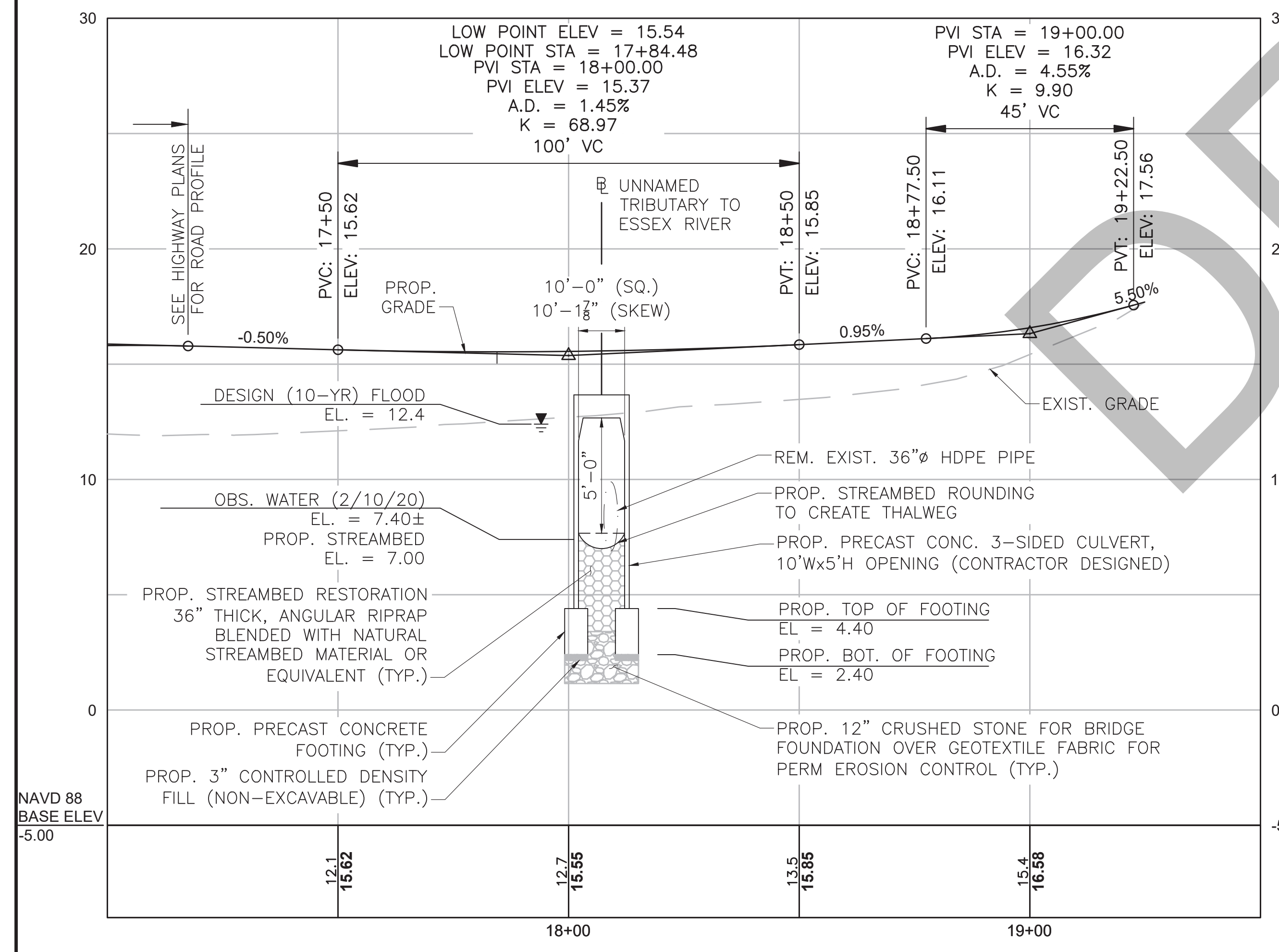
PROJECT FILE NO. T0967.02

KEY PLAN & PROFILES



INDEX

SHEET NO.	DESCRIPTION
1	KEY PLAN & PROFILES
2	GENERAL NOTES
3	BORING LOGS
4	PLAN & ELEVATION
5	SUBSTRUCTURE & FRAME PLAN
6-8	STRUCTURE DETAILS
9	PREFABRICATION TOLERANCES
10	CONTROL OF WATER PLAN



COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING

STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

10/23/22 75% DESIGN

TOWN OF ESSEX  
30 MARTIN STREET  
2nd FLOOR  
ESSEX, MA 01929

PROPOSED BRIDGE  
**ESSEX**  
APPLE STREET OVER UNNAMED  
TRIBUTARY TO ESSEX RIVER

**TEC**  
The Engineering Corp  
282 Merrimack Street,  
2nd Floor  
Lawrence, MA 01843  
169 Ocean Blvd  
Hampton, NH 03842

APPROVAL DATE \_\_\_\_\_ TOWN ADMINISTRATOR \_\_\_\_\_



**GENERAL NOTES**

**DESIGN:**

IN ACCORDANCE WITH THE 2020 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION, WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2021, FOR HL-93 LOADING.

**CHAPTER 85 SECTION 35 REVIEW AND APPROVAL:**

IN ACCORDANCE AND COMPLIANCE WITH THE REQUIREMENTS OF CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS, THE CONTRACTOR SHALL SUBMIT TO THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION ALL CONSTRUCTION DRAWINGS AND DESIGN CALCULATIONS THAT SHALL BE USED TO FABRICATE AND CONSTRUCT THE STRUCTURE DENOTED ON THESE PLANS FOR REVIEW AND APPROVAL. THIS APPROVAL SHALL CONSTITUTE THE FINAL APPROVAL AS STIPULATED BY CHAPTER 85 SECTION 35 OF THE MASSACHUSETTS GENERAL LAWS.

**SURVEY BENCHMARKS:**

T.B.M. #1  
X-CUT HYDRANT FRONT CAP BOLT  
EL: 19.50'

T.B.M. #2  
SQUARE CUT ON GRANITE POST, 3.0' A.G.  
EL: 13.34'

T.B.M. #3  
SET IN UPL #589/59, 1.0' A.G.  
EL: 13.61'

**SURVEY NOTES:**

THE HORIZONTAL DATUM FOR THIS SURVEY IS THE MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE. THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS OBSERVATIONS UTILIZING REALIZATION NAD83(2011) AND GEOID 12A.

THE LIMIT OF BORDERING VEGETATED WETLANDS SHOWN HEREON WAS DELINEATED BY DEROSA ENVIRONMENTAL CONSULTANTS, INC. ON FEBRUARY 7, 2020 AND FLAGS WERE LOCATED VIA FIELD SURVEY BY MERIDIAN ASSOCIATES, INC.

THIS PLAN IS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY MERIDIAN ASSOCIATES, INC. IN APRIL 2020 AND SUPPLEMENTED IN NOVEMBER 2020.

ABUTTING PROPERTY LINES HAVE BEEN COMPILED FROM DEEDS AND PLANS OF RECORD.

**EXISTING CONDITIONS:**

ALL DIMENSIONS AND DETAILS SHOWN FOR THE EXISTING STRUCTURE ARE NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND DETAILS NECESSARY FOR COMPLETION OF ALL WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY AND ACCURACY THEREOF, AND NOT ORDER ANY MATERIAL OR COMMENCE ANY FABRICATION OR WORK UNTIL HE/SHE HAS MADE THE REQUIRED MEASUREMENTS ON THE ACTUAL STRUCTURE AND THE EXTENT OF THE PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.

**DATE:**

TO BE PLACED ON THE OUTSIDE FACE OF BOTH HEADWALLS. A SHEET SHOWING SIZE AND CHARACTER OF NUMBERS SHALL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HEADWALL IS CONSTRUCTED. BOTH HEADWALLS SHALL FEATURE THE SAME DATE.

**SCALES:**

SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY 2 FOR HALF-SIZE PRINTS (A3).

**FOUNDATIONS:**

FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.

**UNSUITABLE MATERIAL:**

ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

**ANCHOR BOLTS:**

ALL ANCHOR BOLTS SHALL BE SET BY TEMPLATE BEFORE THE CONCRETE IS PLACED.

**CONCRETE:**

THE FOLLOWING CONCRETE MIX IS TO BE USED:

5000 PSI, 3/4 IN, 685 HP CEMENT CONCRETE SHALL BE USED FOR PRECAST CULVERT SECTIONS, PRECAST HEADWALL, PRECAST WINGWALLS, AND PRECAST CULVERT FOOTINGS.

**REINFORCEMENT:**

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS	#6 BARS
1. NONE	16"	19"	23"
2. 12" OF CONCRETE BELOW BARS	20"	25"	30"
3. COATED BARS, COVER<3db, OR CLEAR SPACING<6db	23"	29"	34"
4. COATED BARS, ALL OTHER CASES	18"	23"	27"
5. CONDITION 2. AND 3.	26"	32"	39"
6. CONDITION 2. AND 4.	24"	30"	36"

IF THE ABOVE BARS ARE SPACED 6" OR MORE ON CENTER, THE LAP LENGTH SHALL BE 80% OF THE LAP LENGTH GIVEN ABOVE. ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

**TRAFFIC:**

THE BRIDGE WILL BE CLOSED TO VEHICULAR TRAFFIC DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION. VEHICULAR TRAFFIC WILL BE DETOURED AS SHOWN ON THE PLANS.

**UTILITIES:**

DURING CONSTRUCTION, THE CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL UTILITIES THAT ARE TO REMAIN. REFER TO HIGHWAY PLANS FOR UTILITY POLES THAT ARE TO BE RELOCATED BY OTHERS. ANY TEMPORARY UTILITY SUPPORTS OR UTILITY RELOCATIONS REQUIRED & SHOWN ON THE CONSTRUCTION DRAWINGS SHALL BE COORDINATED WITH THE ENGINEER.

**CONTROL OF WATER SYSTEM:**

CONTROL OF WATER SYSTEM SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL, PER ITEM 991.1. APPROXIMATE LIMITS SHOWN ON THIS PLAN ARE CONCEPTUAL AND THE FINAL LOCATION SHALL BE DETERMINED BY THE CONTRACTOR.

**ESTIMATED QUANTITIES  
(NOT GUARANTEED)**

ITEM 140.	BRIDGE EXCAVATION.....	380 CY
ITEM 143.	CHANNEL EXCAVATION.....	90 CY
ITEM 148.01	STOCKPILING OF DREDGED MATERIAL.....	90 CY
ITEM 151.2	GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.....	220 CY
ITEM 153.1	CONTROLLED DENSITY FILL – NON-EXCAVATABLE.....	8 CY
ITEM 156.1	CRUSHED STONE FOR BRIDGE FOUNDATIONS.....	40 TON
ITEM 697.2	FLOATING SILT FENCE.....	25 FT
ITEM 698.4	GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL.....	70 SY
ITEM 983.521	STREAMBED RESTORATION.....	60 CY
ITEM 991.1	CONTROL OF WATER.....	1 LS
ITEM 995.01....	BRIDGE STRUCTURE, BRIDGE NO. E-11-XXX (XXX).....	1 LS

**ESSEX  
APPLE ST OVER UNNAMED  
TRIBUTARY TO ESSEX RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	36
PROJECT FILE NO.		T0967.02	

**GENERAL NOTES**

**SEISMIC DESIGN CRITERIA**

DESIGN RETURN PERIOD:	1000
DESIGN SPECTRA	
As	0.144
SDs	0.275
SD1	0.098
SITE CLASS	D
SEISMIC DESIGN CATEGORY (SDC)	A

**HYDRAULIC DESIGN DATA**

DRAINAGE AREA (SQ. MILES)	0.67
DESIGN FLOOD DISCHARGE (C.F.S.)	247
DESIGN FLOOD FREQUENCY (YEARS)	10
DESIGN FLOOD VELOCITY (F.P.S.)	5.8
DESIGN FLOOD ELEVATION (FEET, NAVD)	12.4
BASE (100-YEAR) FLOOD DATA	
BASE FLOOD DISCHARGE (C.F.S.)	496
BASE FLOOD ELEVATION (FEET, NAVD)	14.9
DESIGN AND CHECK SCOUR DATA	
DESIGN SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	25
DESIGN FLOOD ABUTMENT SCOUR DEPTH (FEET)	7.1
DESIGN FLOOD PIER SCOUR DEPTH (FEET)	N/A
CHECK SCOUR FLOOD EVENT RETURN FREQUENCY (YEARS)	50
CHECK FLOOD ABUTMENT SCOUR DEPTH (FEET)	7.6
CHECK FLOOD PIER SCOUR DEPTH (FEET)	N/A
FLOOD OF RECORD	
DISCHARGE (C.F.S.)	Unknown
FREQUENCY (IF KNOWN, YEARS)	Unknown
MAXIMUM ELEVATION (FEET, NAVD)	Unknown
DATE (MM/YYYY)	Unknown
HISTORY OF ICE FLOES	Unknown
EVIDENCE OF SCOUR AND EROSION	Unknown

**COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING**

STATE BRIDGE ENGINEER

DATE



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	36
PROJECT FILE NO.		T0967.02	

BORING LOGS

BORING LOG B-1A

**GEOSCIENCES TESTING AND RESEARCH, INC.**  
55 Middlesex Street, Suite 225, North Chelmsford, MA.  
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: GTR-1A Contract No: Pg. No.: 1 of 1  
GTR Project Num: 20.113 GTR Rep: John Roth  
Project Name: Apple St - GEO Drilling Company: Carr Dee Corp  
Location: Apple St. Essex, MA 01929

Driller: Steve Desimone Helper(s): Frank Landers  
Start Date: 2/10/2020 End Date: 2/10/2020  
Gnd Surface Elev (ft): +12.8 feet  
Location: See Plan  
Note: DIED RICH D50 w/ Auto-Hammer

Equipment	Casing	Sampler	Core	Groundwater	Depth (ft)
Type	HSA	SS	-	Date	Time
Type	HSA	SS	-	Date	Time
Size I.D.	3-1/4"	1.75"	-	10-Feb	EOD
Hammer Wt.	n/a	140 lb	-		
Hammer Fall	n/a	30"	-		

Depth	Case BPF	No.	Pen/ Revy	Depth (ft)	Blows per 6in	Field Test	Description and Classification	Stratum	Additional Data	Notes
0		S-1	24/10	0.5 - 2.5	9 - 8		moist, m. dense, brown, f-m SAND, some Gravel, trace Silt	ASPHALT		
					10 - 8			6" GRANULAR FILL		
5		S-2	24/14	5 - 7	8 - 13		S-2; wet, m. dense, brown, f-m SAND, some Gravel, little Silt	SAND & GRAVEL		
		S-3A	24/24	7 - 8	33 - 10		S-3A; wet, m. dense, brown, f-m SAND, some Gravel, trace Silt			
		S-3B		8-9	5 - 4		S-3B; stiff, gray, SILT and CLAY, trace fine Sand			
10		S-4	24/19	10 - 12	3 - 4	2.5 tsf	Stiff, gray, SILT and CLAY, trace fine Sand	SILT and CLAY		1
		S-5	24/24	12 - 14	9 - 8		Very stiff, gray, SILT and CLAY			
					9 - 13			14" GLACIAL TILL		2
15		S-6	24/4	15 - 17	24 - 6		Medium dense, gray, f-m SAND and Gravel, trace Silt			
		S-7	0/0	17	50 for 0"		No recovery			3
							Boring terminated at 17.3 feet below ground surface with auger refusal.	17.3'		

**NOTES:**  
1.) Field Test was performed with a Pocket Penetrometer  
2.) Based on drilling action the change in strata is at approximately 14 feet below ground surface.  
3.) Drill rig moved east and performed GTR-1B and GTR-1C. GTR-1B encountered a boulder at approximately 5 feet below grade. GTR-1C encountered auger refusal at 18.5 feet below grade.

Order of Sample Description (Modified Burmister)		PENETRATION RESISTANCE (N) GUIDE	
1. Moisture Content: Dry, Moist, Wet	Cohesionless Soils (Sands)	Very Loose >> 0-4	Very Soft >> Below 2
2. Soil Relative Density or Consistency	Relative Density / Blows per Foot	Loose >> 4-10	Soft >> 2-4
3. Color	Medium Dense >> 10-30	Dense >> 30-50	Medium Stiff >> 4-8
4. Major Component: Should be capitalized	Very Dense >> Over 50	Very Stiff >> 15-30	Stiff >> 8-15
5. Minor Component: "and" - 35% to 50% minor grain size		Hard >> Over 30	Very Stiff >> 15-30
"some" - 20% to 35% minor grain size			Hard >> Over 30
"little" - 10% to 20% minor grain size			
"trace" - < 10% of minor grain size			

EXIST. GROUND SURFACE  
EL=12.8±  
OBSERVED GROUNDWATER  
(2/10/20)  
EL=8.3±

PROP. BOT. OF FOOTING  
EL=2.40

BORING LOG B-2C

**GEOSCIENCES TESTING AND RESEARCH, INC.**  
55 Middlesex Street, Suite 225, North Chelmsford, MA.  
Phone: (978) 251-9395 Fax: (978) 251-9396

Boring No: GTR-2C Contract No: Pg. No.: 1 of 1  
GTR Project Num: 20.113 GTR Rep: John Roth  
Project Name: Apple St - GEO Drilling Company: Carr Dee Corp  
Location: Apple St. Essex, MA 01929

Driller: Steve Desimone Helper(s): Frank Landers  
Start Date: 2/10/2020 End Date: 2/10/2020  
Gnd Surface Elev (ft): +12.8 feet  
Location: See Plan  
Note: DIED RICH D50 w/ Auto-Hammer

Equipment	Casing	Sampler	Core	Groundwater	Depth (ft)
Type	HSA	SS	-	Date	Time
Type	HSA	SS	-	Date	Time
Size I.D.	3-1/4"	1.75"	-	10-Feb	EOD
Hammer Wt.	n/a	140 lb	-		
Hammer Fall	n/a	30"	-		

Depth	Case BPF	No.	Pen/ Revy	Depth (ft)	Blows per 6in	Field Test	Description and Classification	Stratum	Additional Data	Notes
0		S-1	24/4	0.5 - 2.5	12 - 21		moist, m. dense, brown, f-m SAND, some Gravel, trace Silt	ASPHALT		1
					6 - 10			6" GRANULAR FILL		
5		S-2	24/14	5 - 7	9 - 9		wet, m. dense, brown, f-c SAND, some Gravel, little Silt	SAND & GRAVEL		
		S-3	24/24	7 - 9	10 - 16		wet, m. dense, brown, f-c SAND, some Gravel, little Silt			
					10 - 5			9.5' SILT and CLAY		2
10		S-4	24/19	10 - 12	5 - 5	3.0 tsf	Stiff, gray, SILT and CLAY, trace fine Sand			
		S-5	24/24	12 - 14	6 - 6		Very stiff, gray, SILT and CLAY, trace Sand			
					70 - 73			14.5' GLACIAL TILL		
15		S-6	24/4	15 - 17	30 - 15		Medium dense, gray, f-m SAND and Gravel, little Silt			
					7 - 15		Boring terminated at 17.5 feet below ground surface with auger refusal.	17.5'		


**NOTES:**  
1.) GTR-2A and GTR-2B encountered boulders at 2.5 to 4 feet below grade.  
2.) Field Test was performed with a Pocket Penetrometer

Order of Sample Description (Modified Burmister)		PENETRATION RESISTANCE (N) GUIDE	
1. Moisture Content: Dry, Moist, Wet	Cohesionless Soils (Sands)	Very Loose >> 0-4	Very Soft >> Below 2
2. Soil Relative Density or Consistency	Relative Density / Blows per Foot	Loose >> 4-10	Soft >> 2-4
3. Color	Medium Dense >> 10-30	Dense >> 30-50	Medium Stiff >> 4-8
4. Major Component: Should be capitalized	Very Dense >> Over 50	Very Stiff >> 15-30	Stiff >> 8-15
5. Minor Component: "and" - 35% to 50% minor grain size		Hard >> Over 30	Very Stiff >> 15-30
"some" - 20% to 35% minor grain size			Hard >> Over 30
"little" - 10% to 20% minor grain size			
"trace" - < 10% of minor grain size			

EXIST. GROUND SURFACE  
EL=12.8±  
OBSERVED GROUNDWATER  
(2/10/20)  
EL=8.3±

PROP. BOT. OF FOOTING  
EL=2.40

BORING NOTES:

- LOCATION OF BORINGS SHOWN ON THE PLAN THUS: 
- BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
- WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
- FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 4.25 I.D. HOLLOW STEM AUGER 6" USING A 140 POUND WEIGHT FALLING 30".
- ALL BORINGS WERE MADE IN FEBRUARY OF 2020 BY CARR-DEE TEST BORING & CONSTRUCTION OUT OF MEDFORD, MA.
- THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING

STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_





18+07.15 APPLE STREET= 200+93.90 ESSEX RIVER

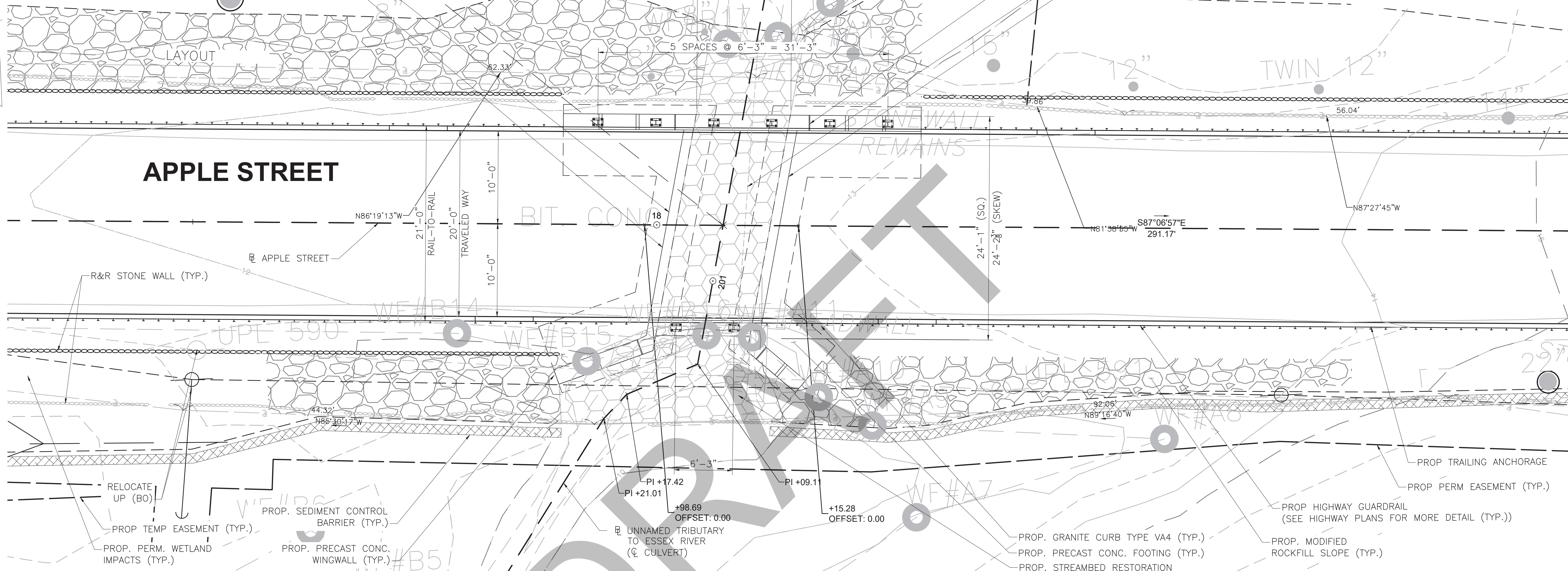
PROP. PRECAST CONC. 3-SIDED CULVERT (CONTRACTOR DESIGNED) (TYP.)  
PROP. PAVEMENT SAWCUT (SEE SHEET 6 FOR DETAILS)

10'-1 1/2" (SKEW)  
10'-0" (SQ.)

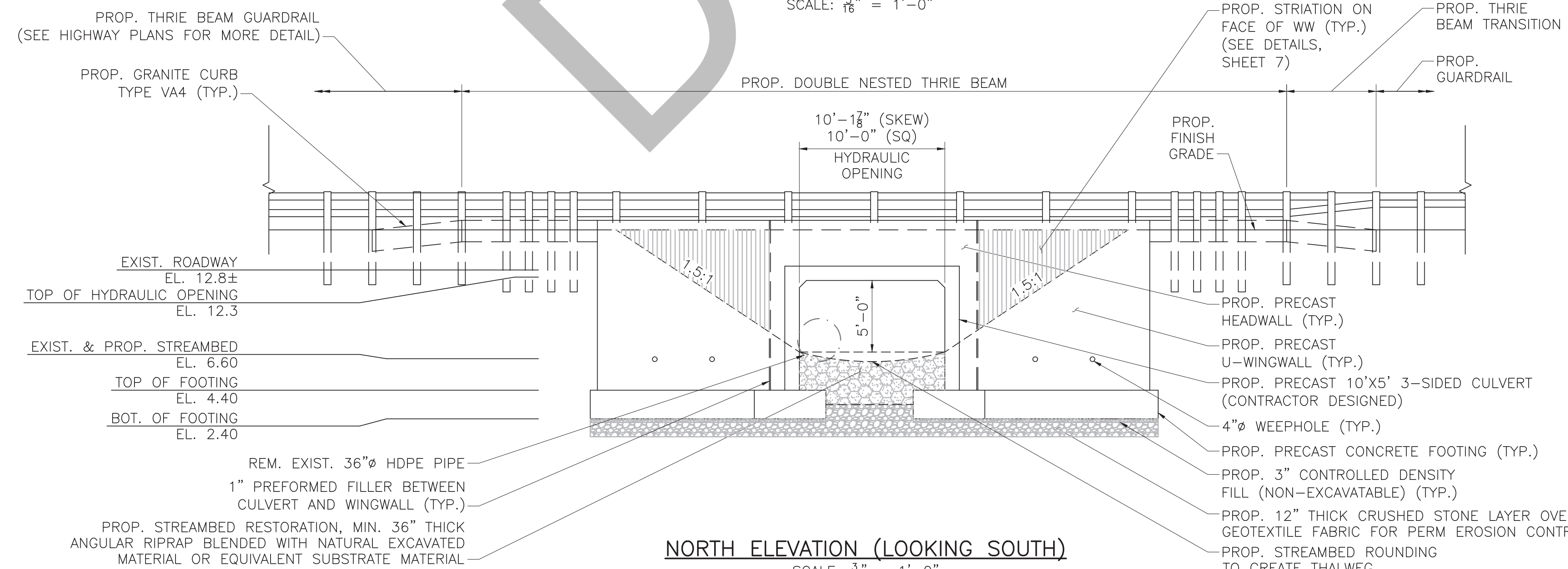
CHANNEL WIDTH/HYDRAULIC-OPENING

PROP. 1" PREFORMED FILLER BETWEEN OPEN-BOTTOMED CULVERT AND WINGWALLS (TYP.)  
REM. EXIST. 36"Ø HDPE PIPE  
PROP. PAVEMENT SAWCUT (SEE SHEET 6 FOR DETAILS)

ESSEX APPLE ST OVER UNNAMED TRIBUTARY TO ESSEX RIVER			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		22	36
PROJECT FILE NO.		T0967.02	
PLAN & ELEVATION			



**BRIDGE PLAN**  
SCALE: 1/8" = 1'-0"



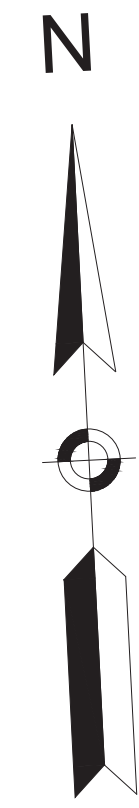
**NORTH ELEVATION (LOOKING SOUTH)**  
SCALE: 1/16" = 1'-0"

**COMMONWEALTH OF MASSACHUSETTS**  
**MassDOT, Highway Division**  
**CONCEPTUAL DESIGN IS ACCEPTABLE**  
**TO MASSDOT FOR CONTRACTING**

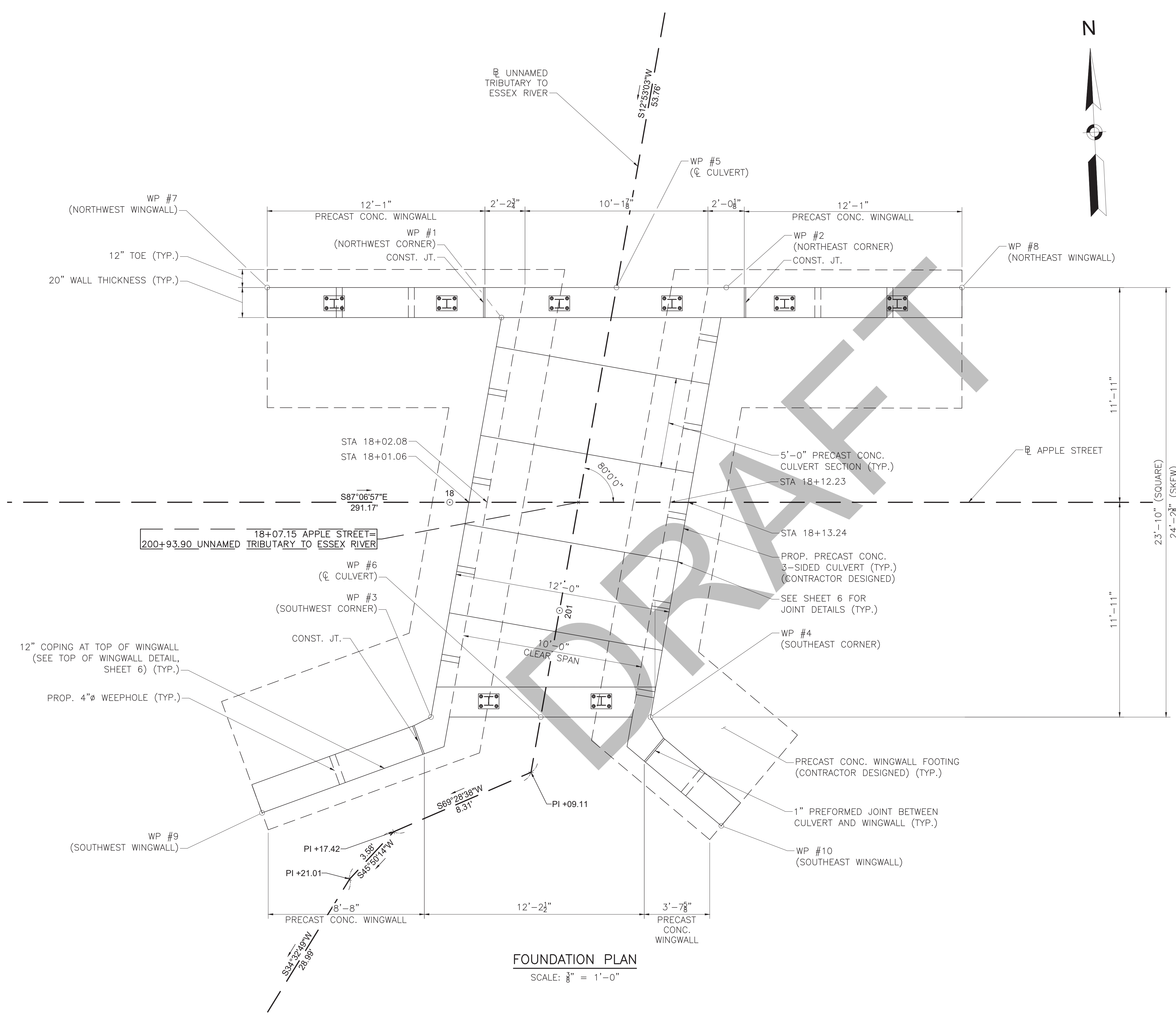
STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

T0967.02\_BR\_(PLANELEV).DWG Plotted on 10-Nov-2022 4:25 PM 06/30/22 Apple Street Essex





PRECAST CONCRETE CULVERT WORKING POINTS		
WORKING POINT	STATION	OFFSET (FT)
WP #1	18+03.16	11.92 LT
WP #2	18+15.35	11.92 LT
WP #3	17+98.96	11.92 RT
WP #4	18+11.14	11.92 RT
WP #5	18+09.25	11.92 LT
WP #6	18+05.05	11.92 RT
WP #7	17+89.87	11.92 LT
WP #8	18+28.43	11.92 LT
WP #9	17+89.58	17.23 RT
WP #10	18+15.07	17.95 RT



FOUNDATION PLAN  
SCALE: 3/8" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
TO MASSDOT FOR CONTRACTING

STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

T0967.02\_BR\_(SUBSTRUCTURE)DWG Plotted on 10-Nov-2022 4:25 PM  
06/30/22  
Apple Street Essex



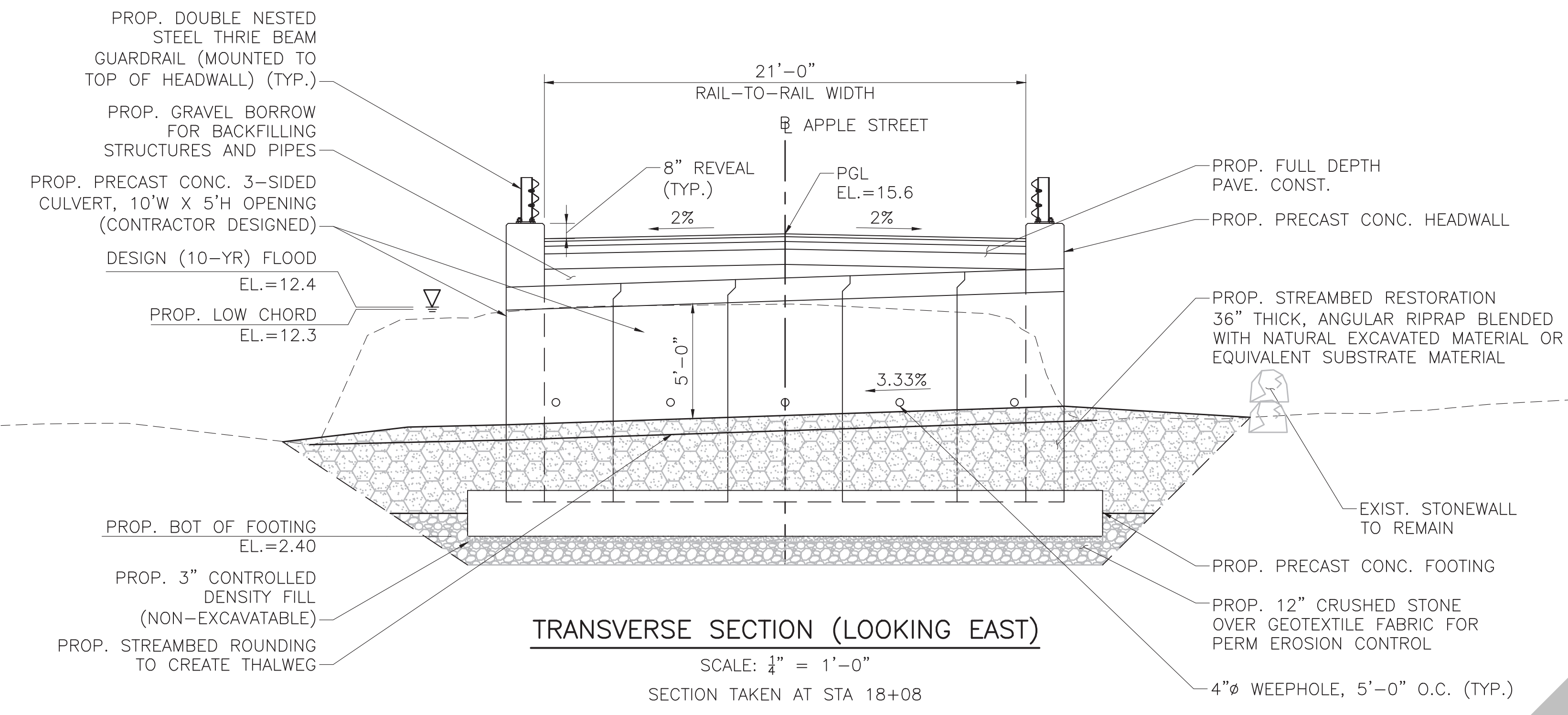
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	36
PROJECT FILE NO.		T0967.02	

**TRANSVERSE SECTION NOTES:**

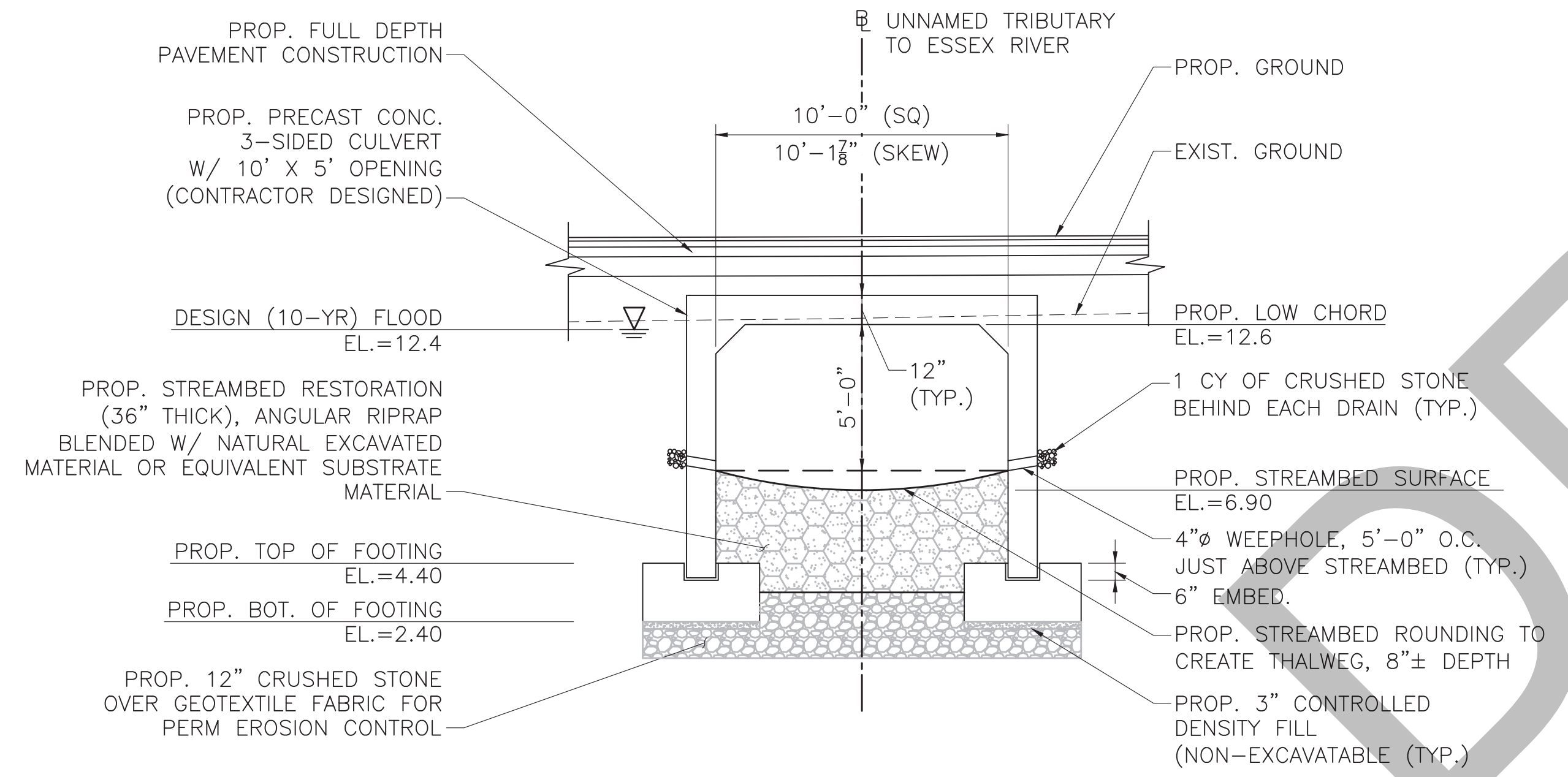
- EXISTING CULVERT AND HEADWALLS NOT SHOWN FOR CLARITY. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION OF ALL EXISTING CULVERT INFRASTRUCTURE.
- CONTRACTOR SHALL SMOOTHLY TRANSITION ALL PROPOSED ELEMENTS INTO THE EXISTING APPROACHES AND EMBANKMENT SLOPES.

**PRECAST CONCRETE CULVERT AND WINGWALLS NOTES:**

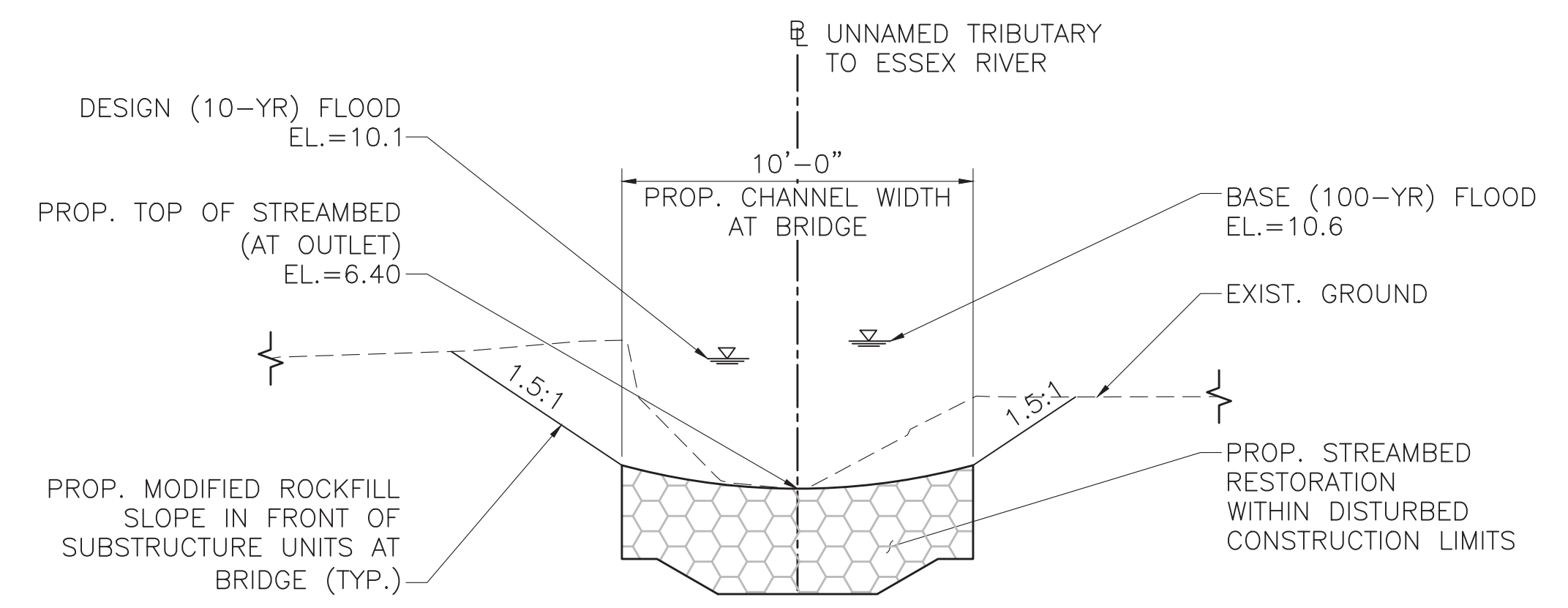
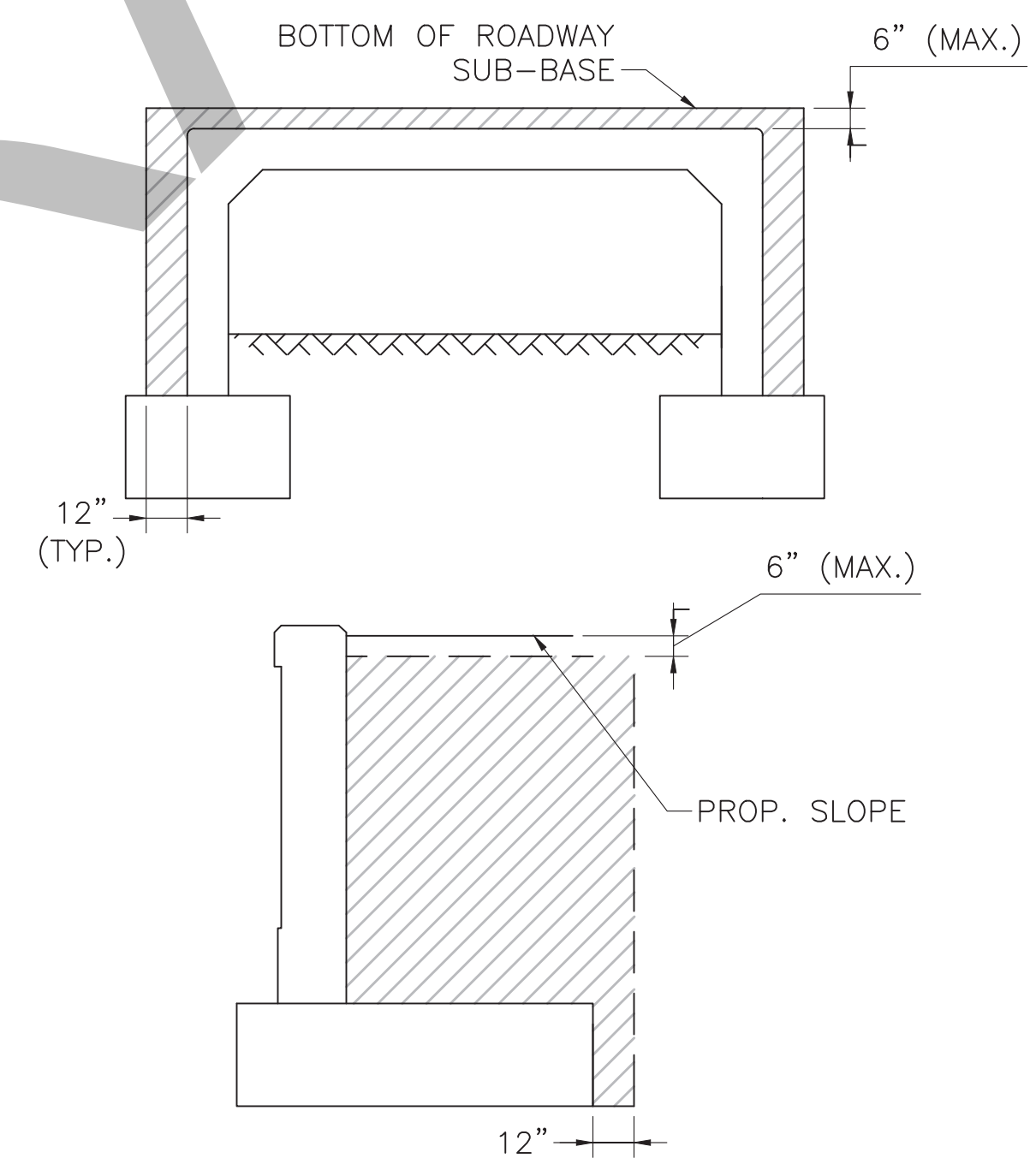
- CONTRACTOR SHALL SUBMIT PRECAST CONCRETE 3-SIDED CULVERT AND FOOTING DESIGN CALCULATIONS AND SHOP DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR APPROVAL PRIOR TO FABRICATION. PRESCRIBED HYDRAULIC OPENING (5'x10') SHALL BE MAINTAINED.
- ALL PRECAST CULVERT AND FOOTING COMPONENTS SHALL BE 5000PSI, 3/4", 685 HP CEMENT CONCRETE.
- THE CONTRACTOR SHALL APPROVE ALL ELEVATIONS AND DIMENSIONS OF THE SHOP DRAWINGS PRIOR TO FABRICATION. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
- REINFORCEMENT SHALL BE PLACED WITH A MINIMUM OF 1 1/2" COVER. TRANSVERSE REINFORCEMENT SHALL BE PLACED NORMAL TO THE  $\bar{C}$  OF APPLE STREET.
- 4"  $\phi$  WEEP HOLES AT 5'-0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
- ALL CULVERT REINFORCEMENT SHOWN IS CONCEPTUAL FOR BIDDING PURPOSES. THE CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS AS PART OF THE SHOP DRAWINGS.
- BITUMINOUS DAMP-PROOFING OR OTHER WATERPROOFING PROTECTIVE COURSE, SHALL BE APPLIED TO THE BACK OF THE STEM AND TOP OF THE CULVERT AS SPECIFIED IN MASSDOT BRIDGE MANUAL, PART II, DRAWING 11.3.1.
- DESIGN SHALL BE IN ACCORDANCE WITH THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, WITH CURRENT INTERIM SPECIFICATIONS THROUGH 2021 AND THE MASSDOT LRFD BRIDGE MANUAL PART 1 CHAPTER 3 FOR HL-93 LOADING.
- A FACTORED BEARING RESISTANCE OF 5.0 KSF SHALL BE USED IN THE DESIGN OF THE CULVERT AND WINGWALL FOOTINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBGRADE PREPARATION SUCH THAT THE DESIGN BEARING CAPACITY SHALL BE ACHIEVED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF THIS BEARING CAPACITY CANNOT BE MET.



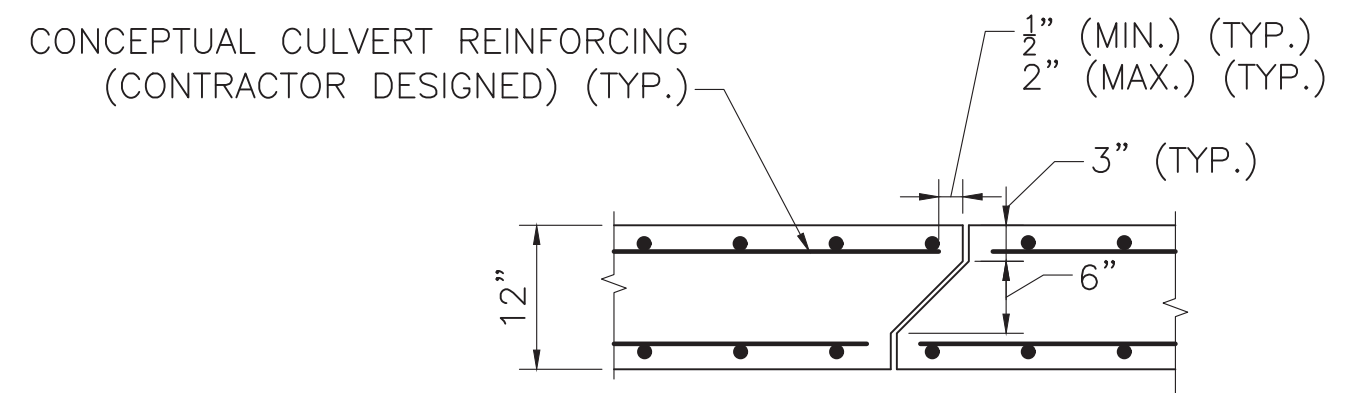
**TRANSVERSE SECTION (LOOKING EAST)**  
SCALE: 1/4" = 1'-0"  
SECTION TAKEN AT STA 18+08



**LONGITUDINAL SECTION (AT  $\bar{C}$  APPLE STREET)**  
SCALE: 1/4" = 1'-0"

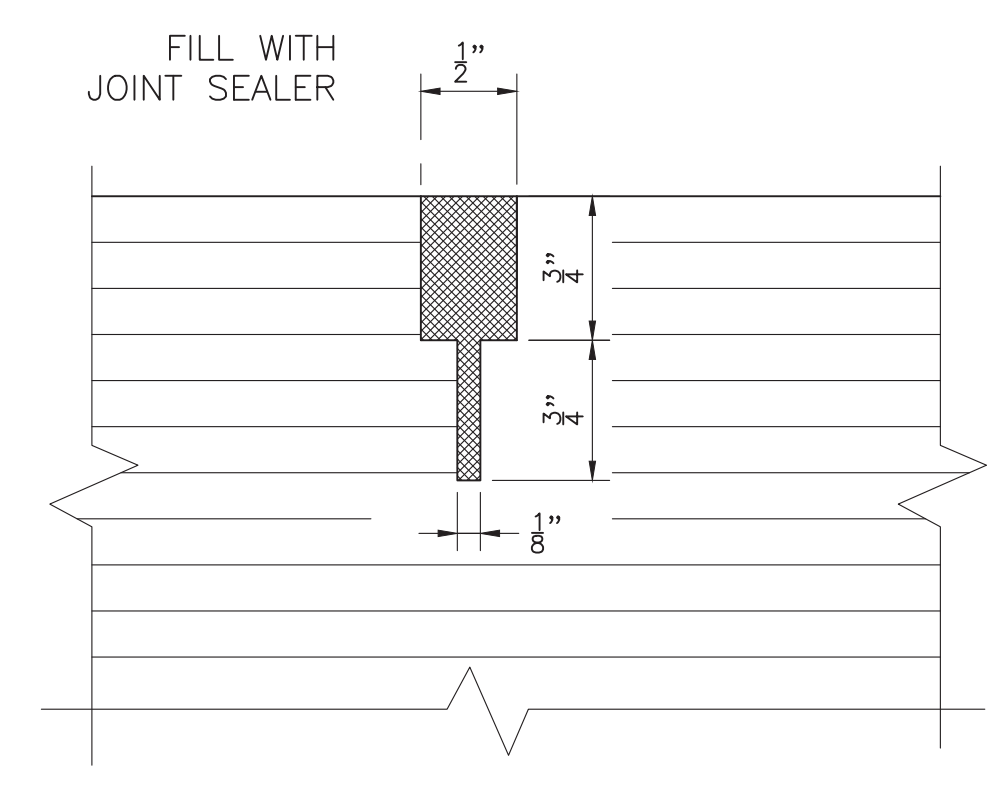


**CHANNEL APPROACH SECTION**  
SCALE: 1/4" = 1'-0"



NOTE:  
JOINT DIMENSIONS ARE CONCEPTUAL AND SHALL BE CONFIRMED BY THE PRECASTER.

**CULVERT JOINT DETAIL**  
SCALE: 1/4" = 1'-0"



**PAVEMENT SAWCUT DETAIL**  
FULL SIZE

**NOTES:**

- HATCHED AREAS INDICATE THE LIMIT OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
- THE BACKFILL PLACED AROUND THE STRUCTURE SHALL BE DEPOSITED ON BOTH SIDES TO APPROXIMATELY THE SAME ELEVATION AT THE SAME TIME.

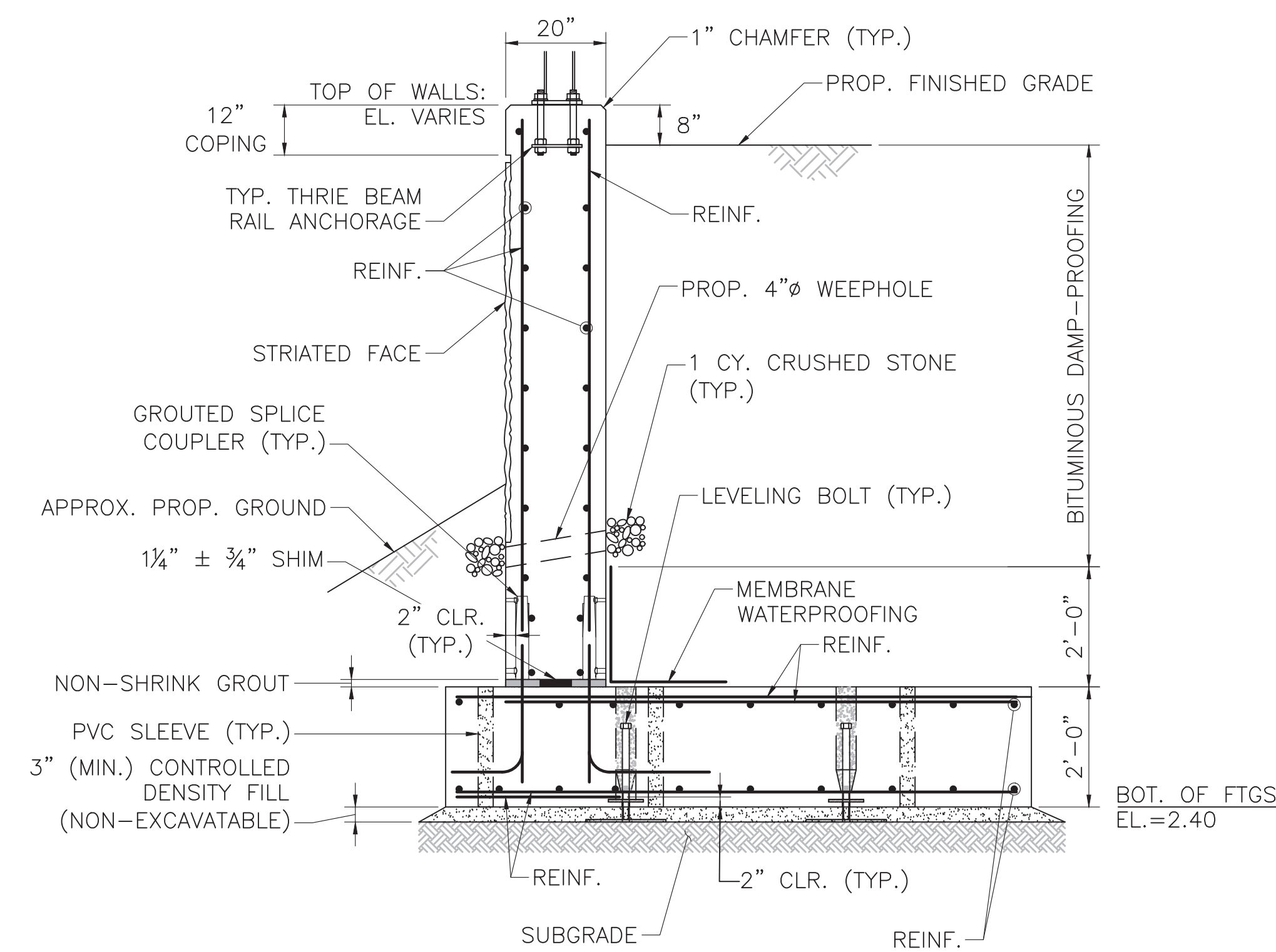
**LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES**

SCALE: 1/4" = 1'-0"

COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
CONCEPTUAL DESIGN IS ACCEPTABLE  
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STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_





NOTE:  
PRECASTER TO COORDINATE LOCATION OF REINFORCEMENT WITH THRIE BEAM RAIL ANCHORAGE.

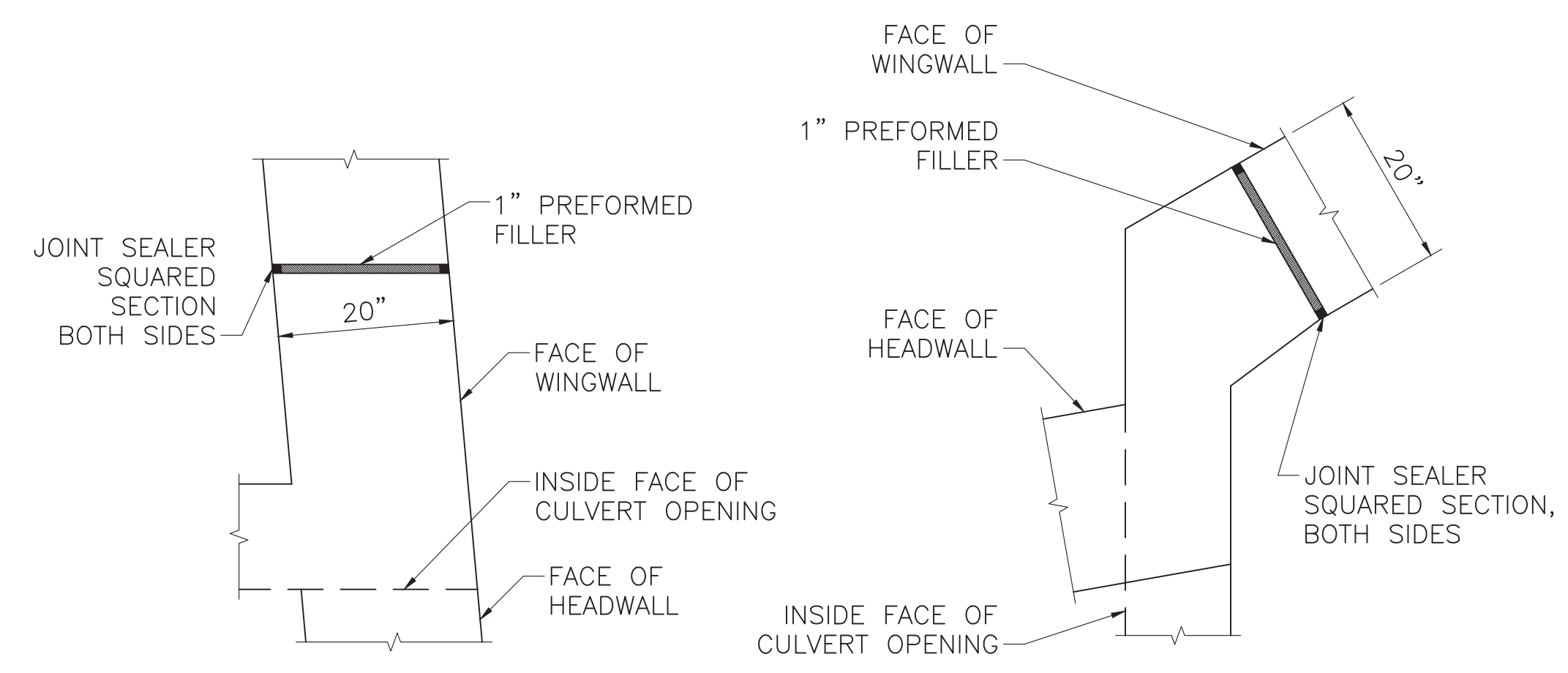
**PRECAST WINGWALL SECTION**  
SCALE: 1/2" = 1'-0"

**WINGWALL CONSTRUCTION NOTES:**

- CONTRACTOR SHALL SUBMIT PRECAST CONCRETE WINGWALL AND FOOTING DESIGN CALCULATIONS, INCLUDING DESIGN FOR AASHTO TL-2 CRASH LOADING, AND SHOP DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS FOR APPROVAL PRIOR TO FABRICATION.
- BITUMINOUS DAMP-PROOFING OR OTHER WATERPROOFING PROTECTIVE COURSE, SHALL BE APPLIED TO THE BACK OF THE STEM AS SPECIFIED IN MASSDOT STANDARD SPECIFICATIONS.
- 4"Ø WEEP HOLES AT THIRD POINTS OF NORTH WINGWALL LENGTHS (JUST ABOVE PROTECTIVE COURSE) AND HALF POINTS OF SOUTH WINGWALL LENGTHS (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
- ALL WINGWALL CONCRETE SHALL BE 5000 PSI, 3/4" IN, 685 HP CEMENT CONCRETE.
- THE FACTORED BEARING RESISTANCE = 5.0 KSF. FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.
- PRE-BED PRECAST ELEMENT WITH NON-SHRINK GROUT WITH THICKNESS MORE THAN SHIM STACK.
- THE CONTRACTOR SHALL DETERMINE THE SIZE AND SPACING OF THE GROUT PORTS BASED ON THE CONTROLLED DENSITY FILL'S FLOW PROPERTIES AND THE SIZE OF THE FOOTING.

**LEVELING BOLT ASSEMBLY NOTES:**

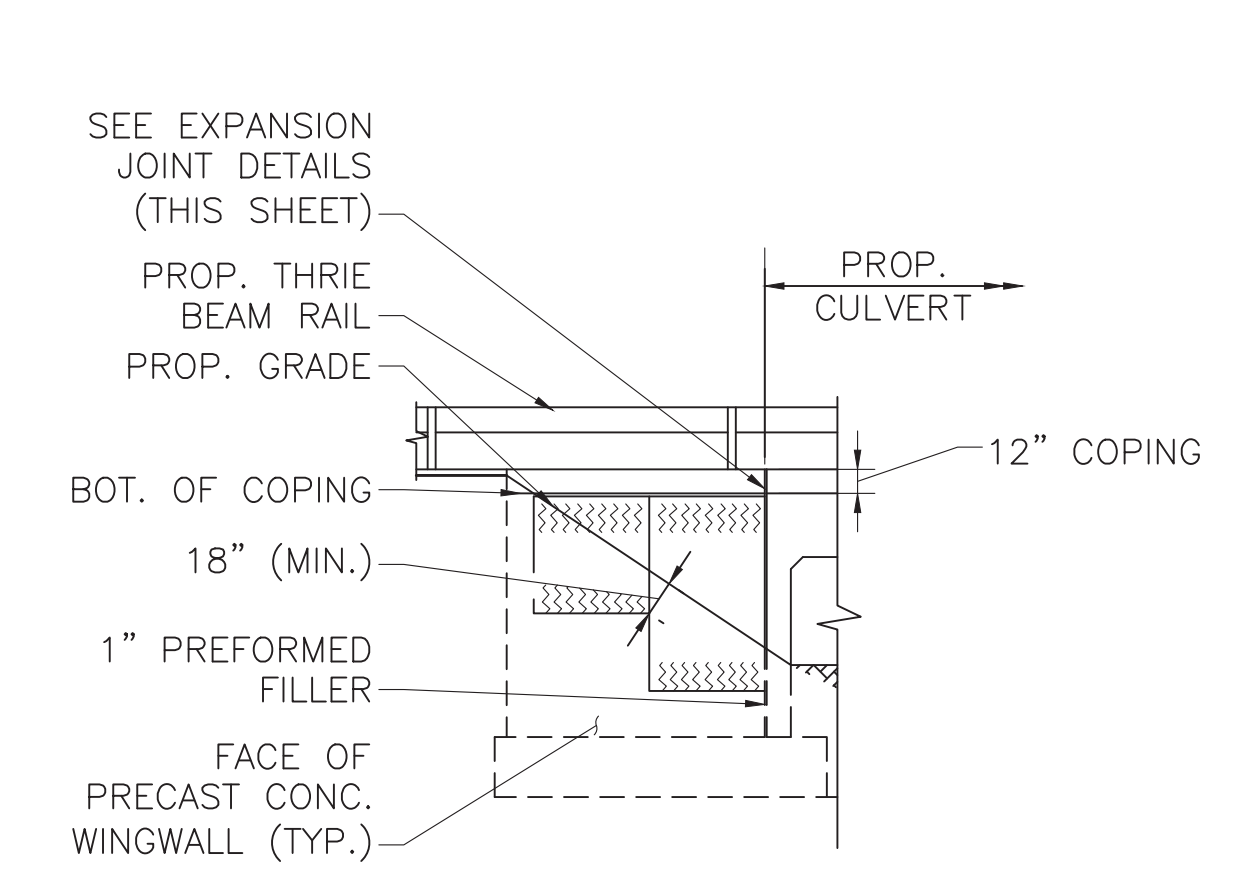
- THE LEVELING BOLT ASSEMBLY SHOWN IS SCHEMATIC. DESIGN OF THE LEVELING BOLT ASSEMBLY SHALL BE PERFORMED BY THE CONTRACTOR AND SUBMITTED WITH THE ASSEMBLY PLAN TO THE ENGINEER FOR APPROVAL.
- BOLT SHALL BE REMOVED AFTER THE CONTROLLED DENSITY FILL (NON-EXCAVATABLE) HAS SET.
- STEEL PLATES SHALL BE AASHTO M 270 GRADE 36 UNCOATED STEEL.
- BOLTS SHALL BE H.S. AASHTO M 164 AND UNCOATED.
- REINFORCEMENT SHALL BE WELDABLE LOW-ALLOY ASTM A 706 BARS.
- GREASE OF OIL NUT AND BOLT THREADS TO FACILITATE LEVELING AND REMOVAL.



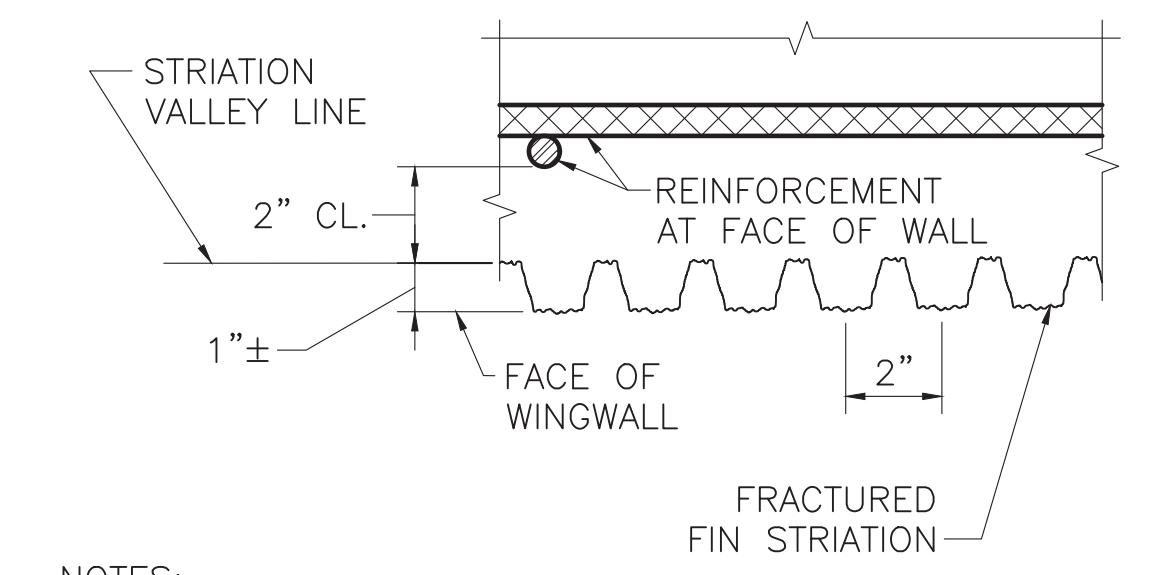
**U-WINGWALL JOINT PLAN**      **SPLAYED WINGWALL JOINT PLAN**

NOTE:  
REINFORCEMENT NOT SHOWN FOR CLARITY.

**EXPANSION JOINT DETAILS**  
SCALE: 3/4" = 1'-0"



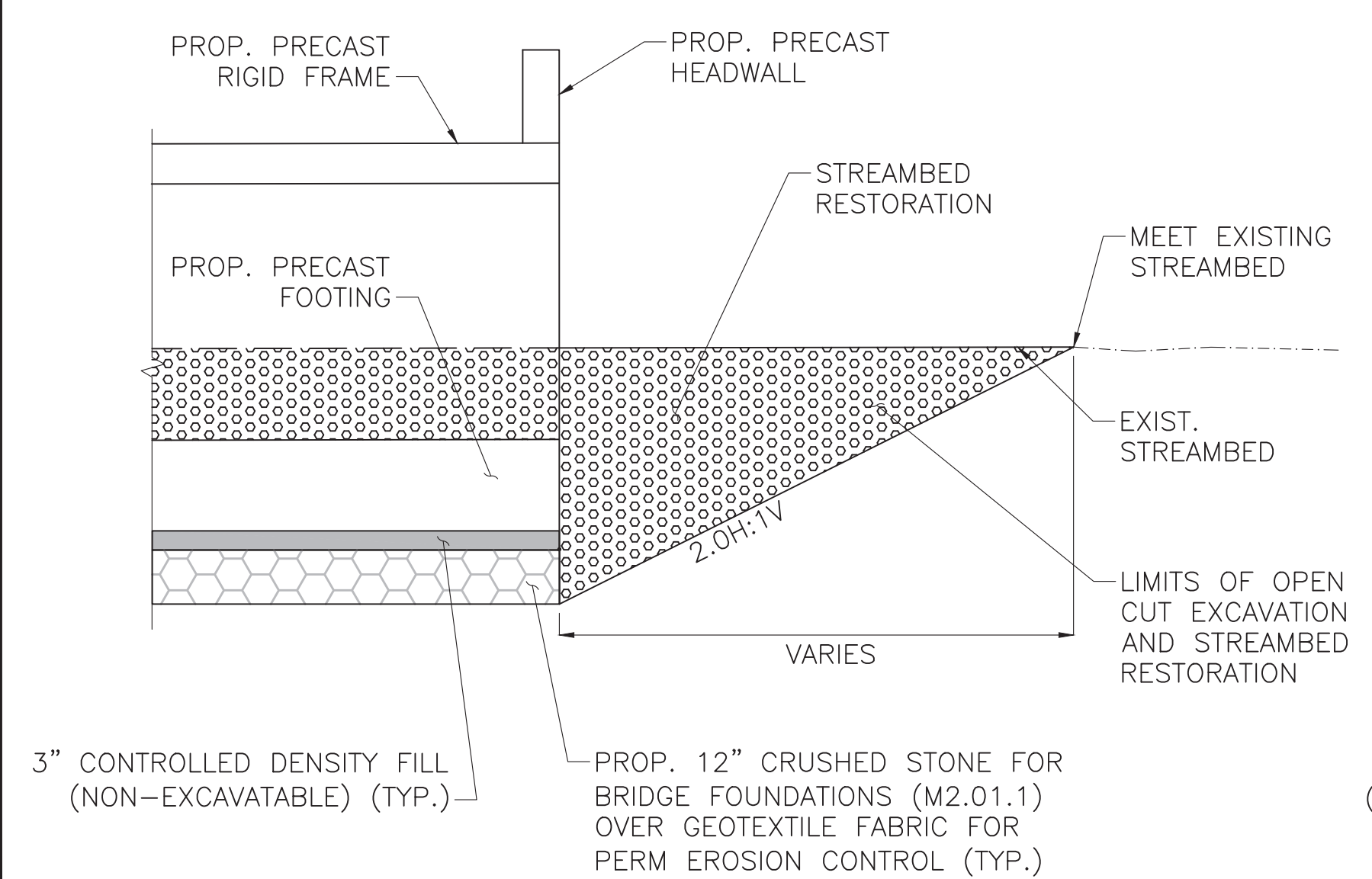
**WINGWALL STRIATION - ELEVATION**  
SCALE: 3/8" = 1'-0"



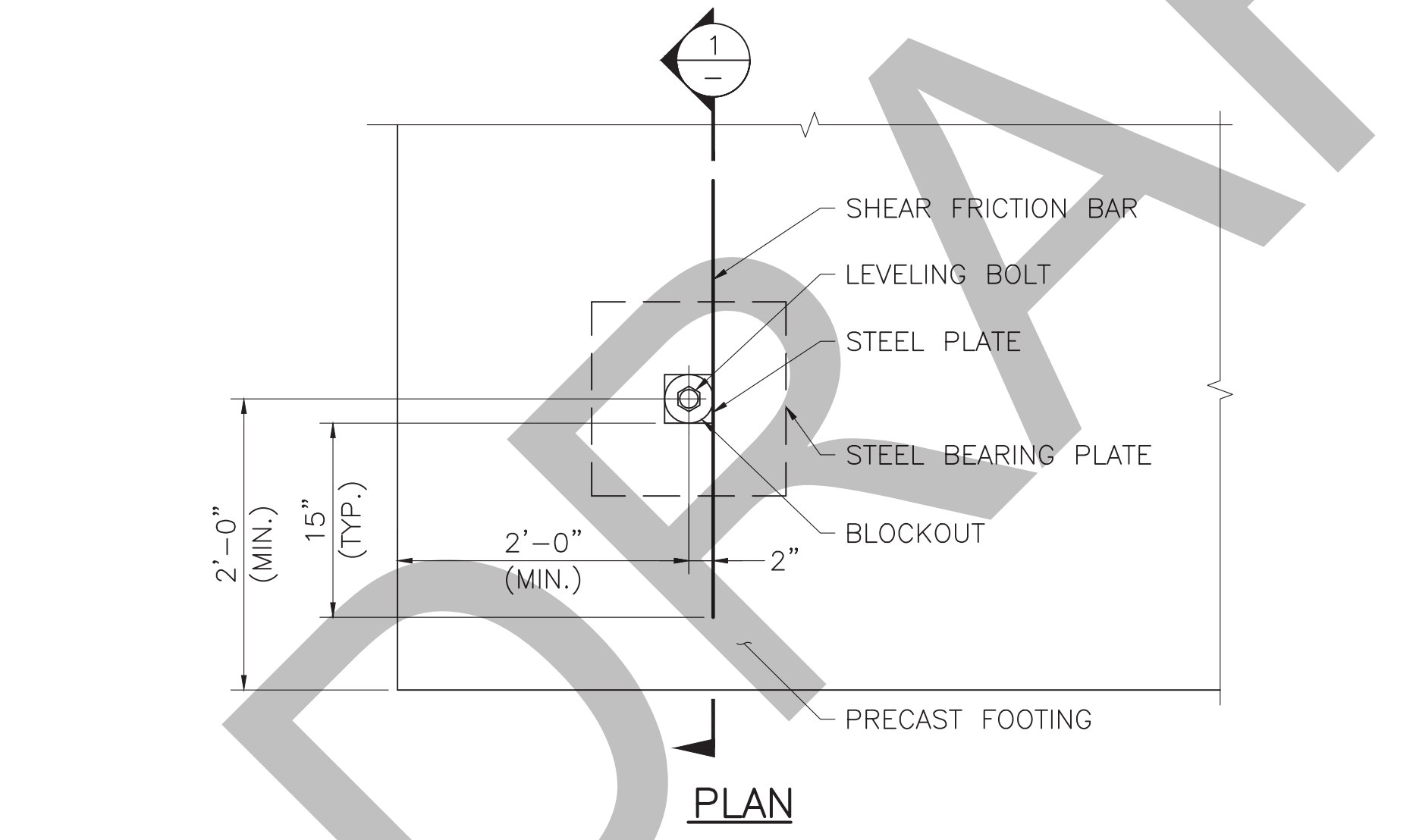
NOTES:

- THE CONTRACTOR SHALL MAKE SURE THAT THE STRIATION FINS ARE PLUMB AND LINED UP VERTICALLY FROM PANEL TO PANEL FOR THE FULL HEIGHT OF THE WALL.
- THE HORIZONTAL JOINT MAY BE OMITTED IF THE CONTRACTOR CAN DEMONSTRATE THAT THE FORM LINER PANELS CAN BE INSTALLED END TO END WITHOUT CREATING A VISIBLE SEAM IN THE FINAL CAST CONCRETE.
- STRIATION DETAILS SHALL ONLY BE INCORPORATED ON THE WINGWALLS.

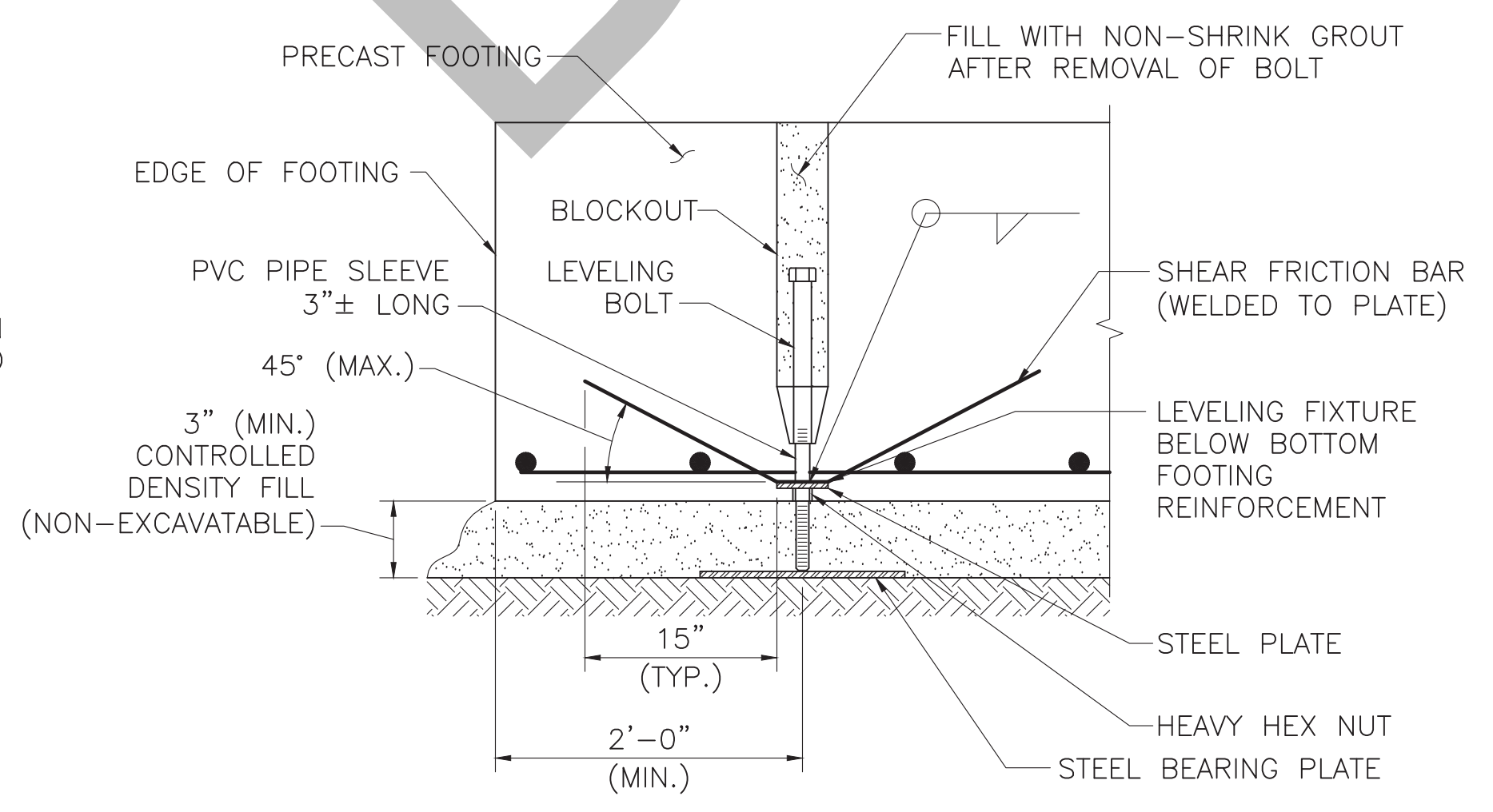
**TYPICAL STRIATION DETAIL**  
SCALE: 3" = 1'-0"



**STREAMBED RESTORATION DETAIL**  
NOT TO SCALE

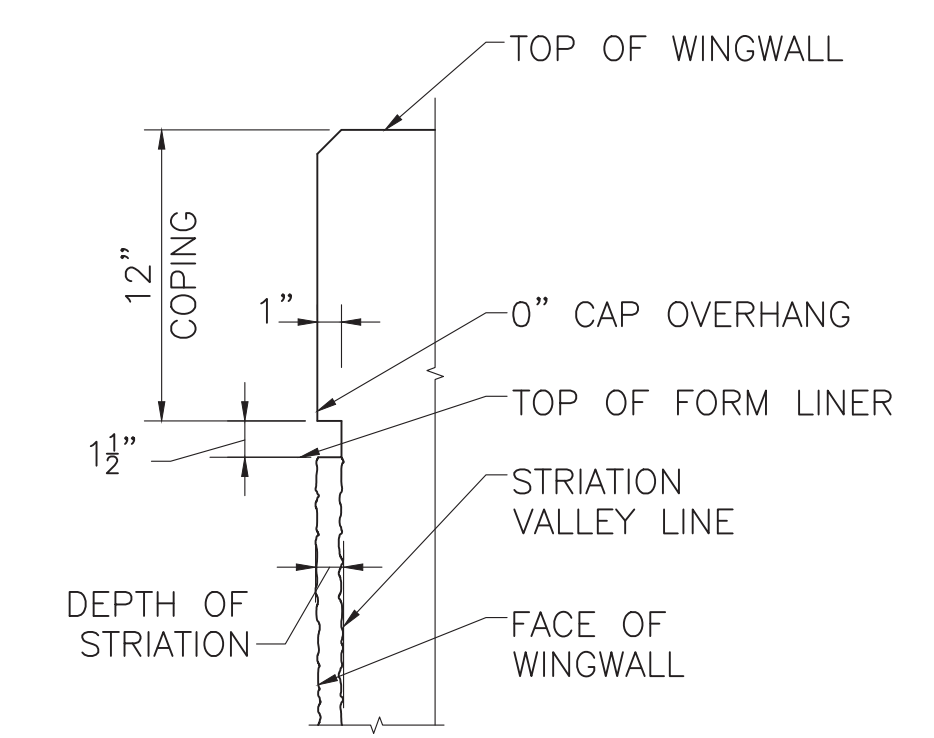


**PLAN**



**SECTION 1**

**LEVELING BOLT ASSEMBLY**  
SCALE: 1" = 1'-0"



**TOP OF WINGWALL DETAIL**  
NOT TO SCALE

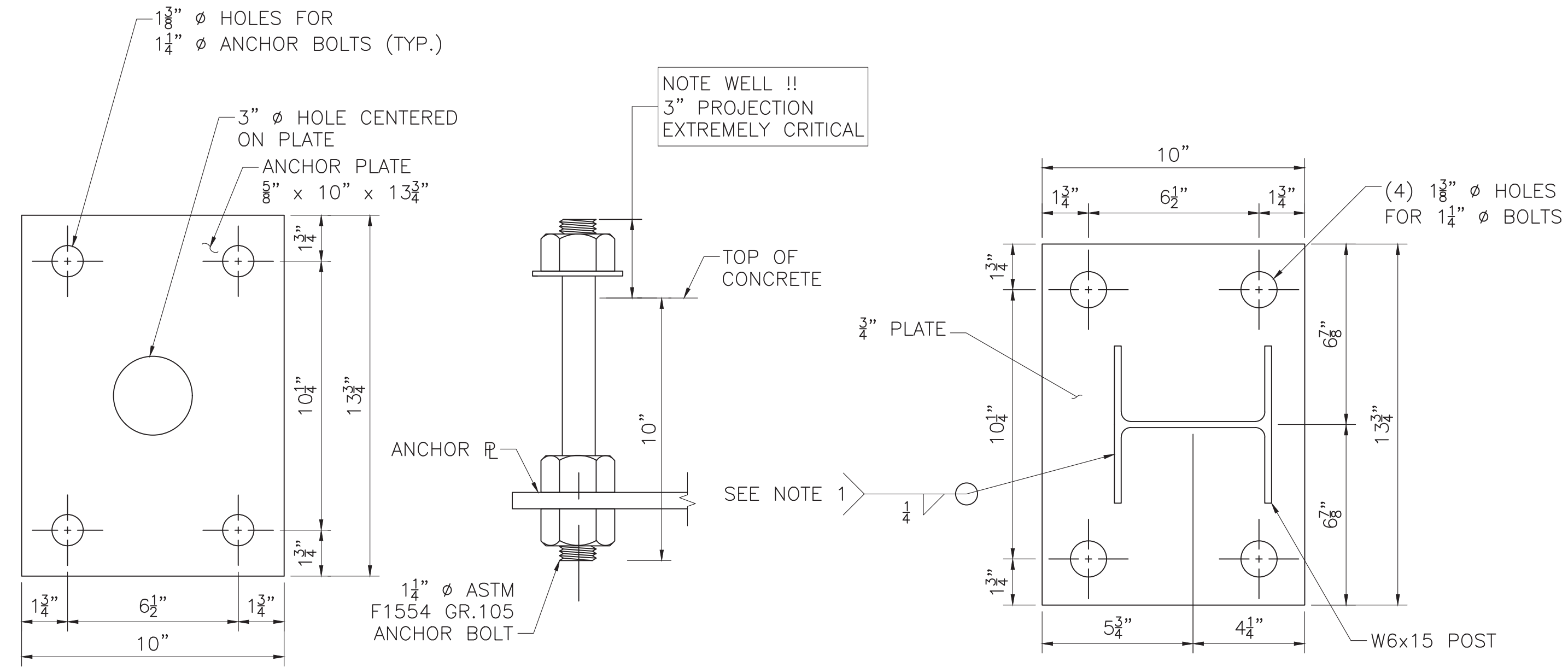
**COMMONWEALTH OF MASSACHUSETTS**  
**MassDOT, Highway Division**  
**CONCEPTUAL DESIGN IS ACCEPTABLE**  
**TO MASSDOT FOR CONTRACTING**

STATE BRIDGE ENGINEER      DATE

T0967.02\_BR\_(STRDETAILS)DWG      Plotted on 10-Nov-2022 4:25 PM      06/30/22      Apple Street Essex



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	36
PROJECT FILE NO.		T0967.02	

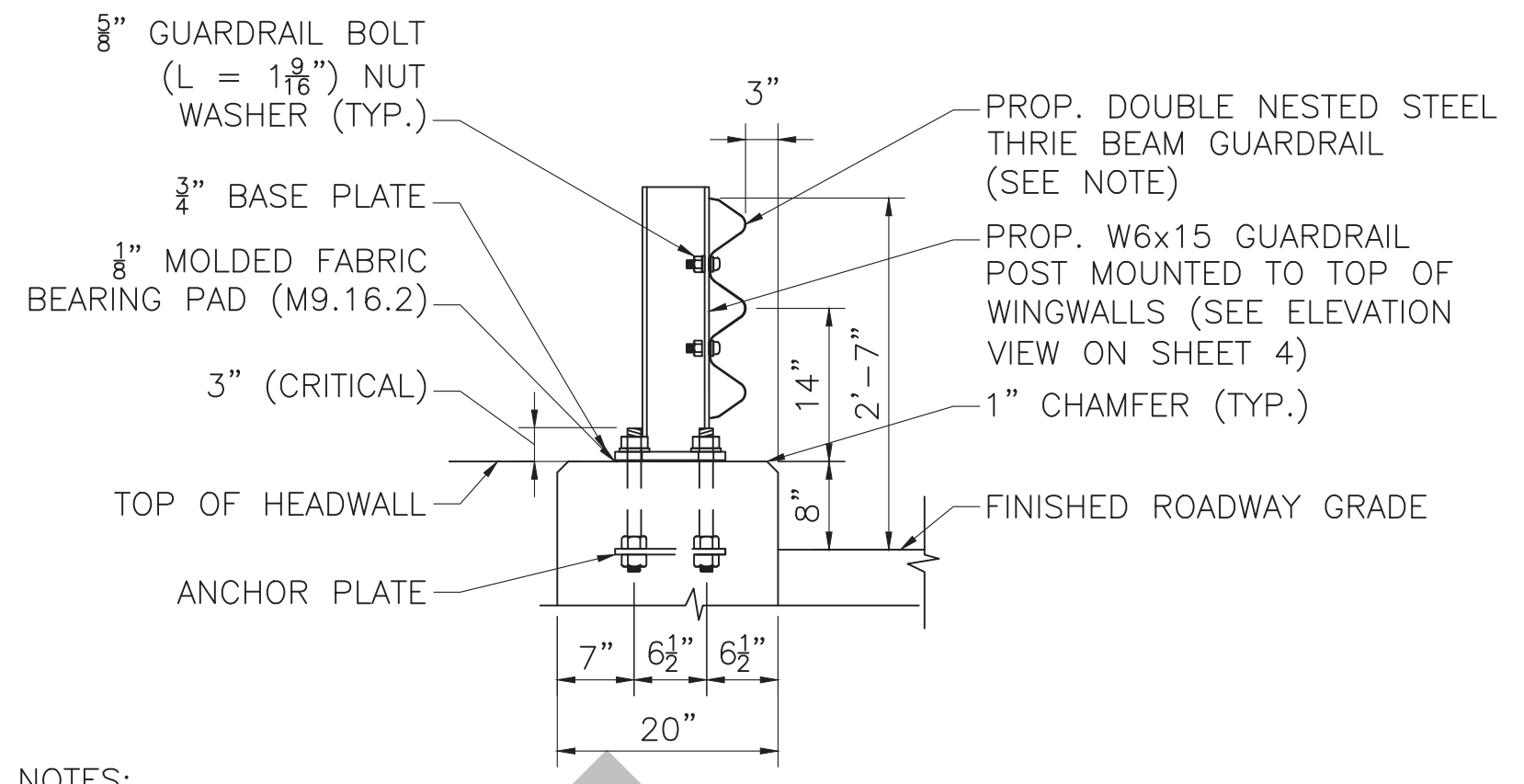


**ANCHOR PLATE**  
SCALE: 3" = 1'-0"

**ANCHOR BOLT**  
SCALE: 3" = 1'-0"

**BASE PLATE**  
SCALE: 3" = 1'-0"

**RAILING NOTES:**  
1. POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GOUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.



**NOTES:**  
1. REFER TO MASSDOT CONST. STD. DETAILS 400.1.0, 400.1.2 AND 400.1.3 FOR ADDITIONAL INFORMATION REGARDING THE THRIE BEAM GUARDRAIL AND HARDWARE DETAILS.  
2. SEE BASE PLATE, ANCHOR PLATE AND ANCHOR BOLT DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION.

**GUARDRAIL SECTION THROUGH TOP OF HEADWALL**  
SCALE: 3/8" = 1'-0"

**GUARDRAIL NOTES:**

1. ALL STEEL CONNECTING BOLTS AND FASTENERS FOR HANDRAIL POSTS, RAILINGS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232.
2. GUARDRAIL BASE PLATES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M270 GRADE 50.
3. ANCHOR BOLTS SHALL BE SET WITH TEMPLATES. THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN AFTER STEEL IS IN PLACE.
4. POST FLANGE WELD DOES NOT REQUIRE MAGNETIC PARTICLE TESTING. WELD SHALL BE BACK-GOUGED ON BACK SIDE EXCEPT AT WEB. WELD IS THE SAME ON BOTH FLANGES.
5. W-BEAM DETAILS, EXCEPT ATTACHMENT TO HEADWALLS, SHALL BE STANDARD RELEVANT TO MASSDOT CONSTRUCTION STANDARDS.

DRAFT

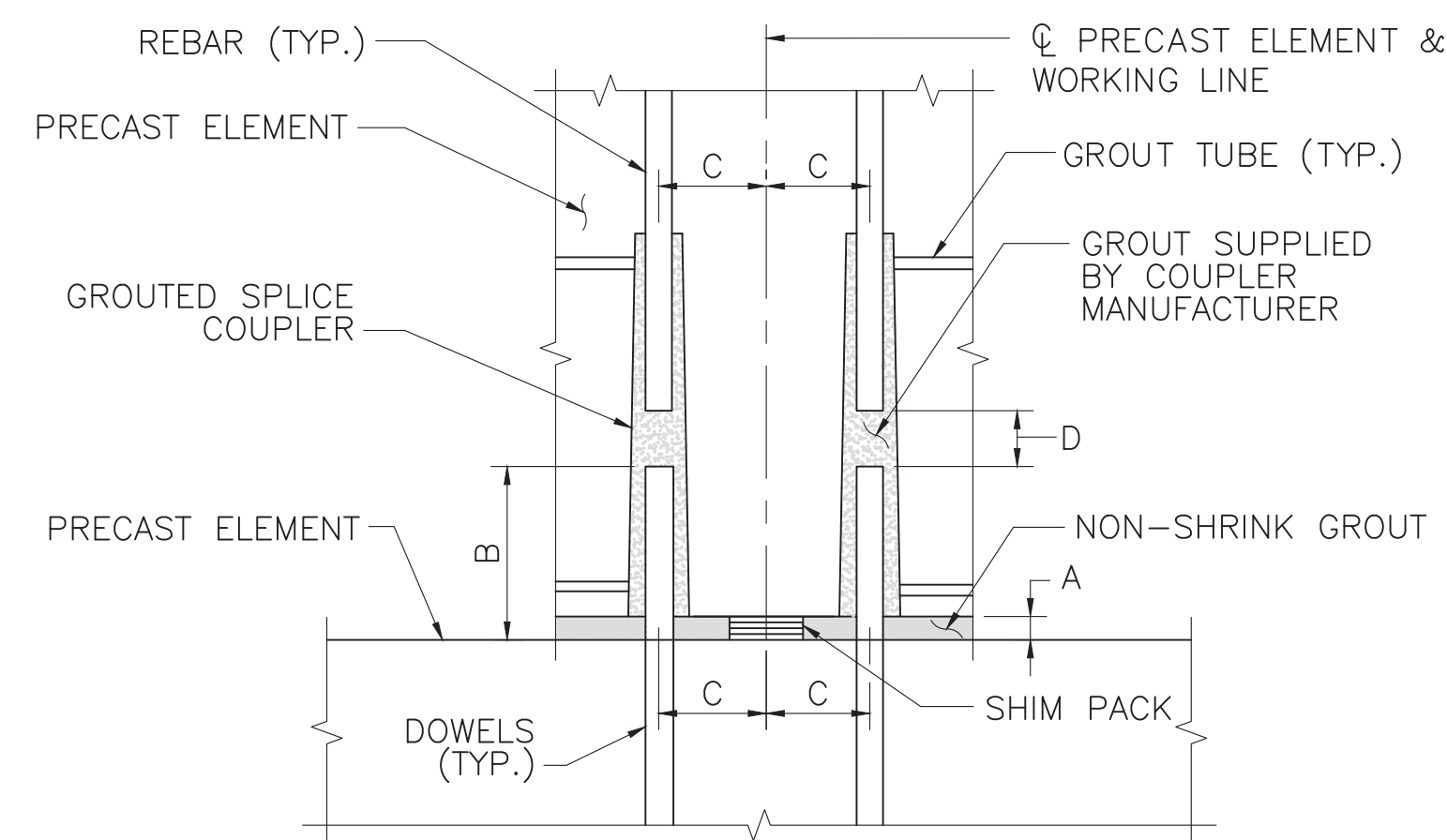
COMMONWEALTH OF MASSACHUSETTS  
MassDOT, Highway Division  
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STATE BRIDGE ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	36
PROJECT FILE NO.		T0967.02	

PREFABRICATION TOLERANCES



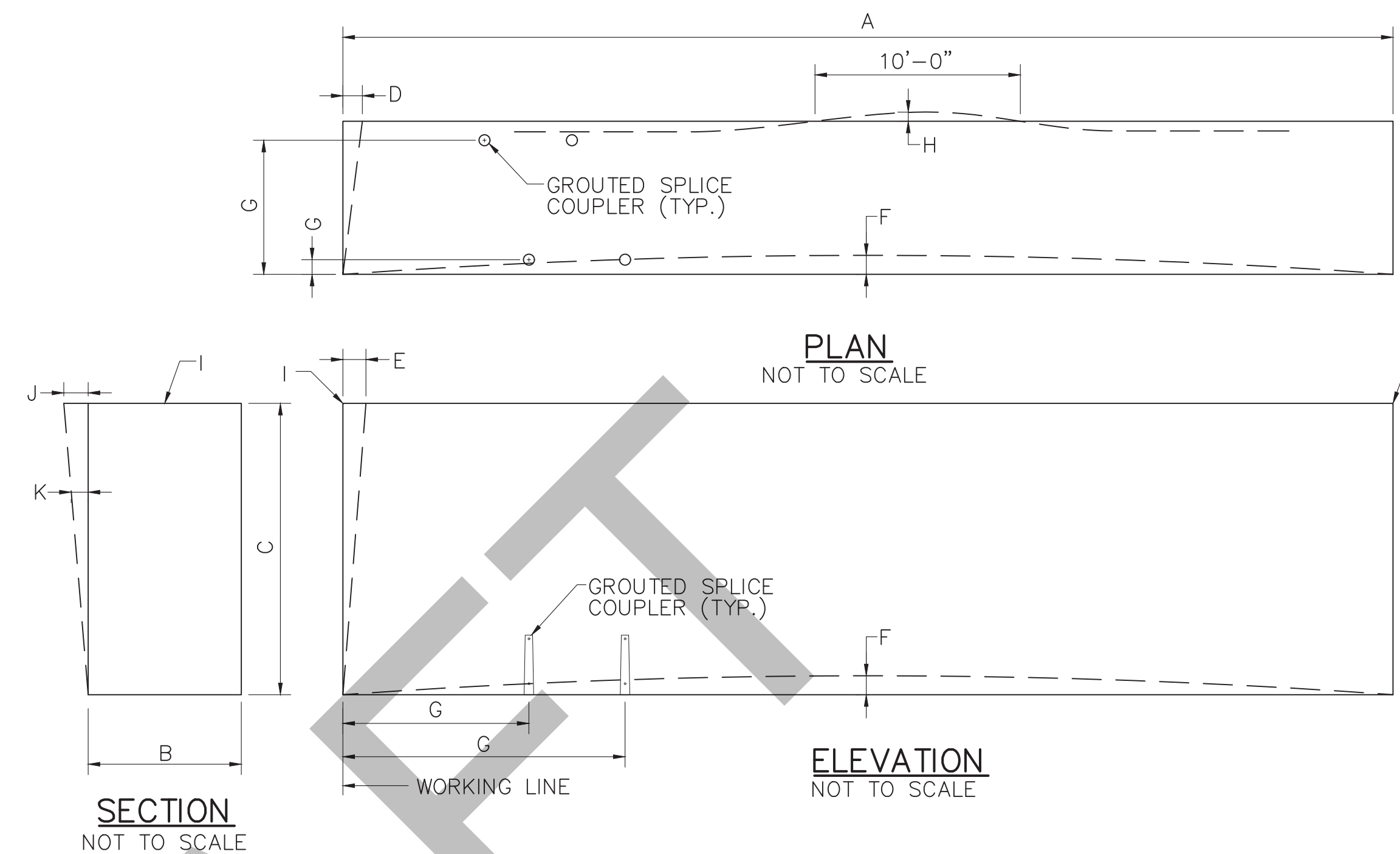
**NOTES:**

1. USE MATCHING TEMPLATES FOR THE LOCATION OF REINFORCEMENT AND GROUTED SPLICE COUPLER PLACEMENT WITHIN THE ELEMENTS TO CONTROL THE CRITICAL DIMENSION "C".
2. CONSULT MANUFACTURER OF THE GROUTED SPLICE COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCES ON THESE AND ALL DIMENSIONS.
3. BEFORE EXECUTING GROUTED SPLICE COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUTED SPLICE COUPLER USED.

**GROUTED SPLICE COUPLER DETAILS**  
NOT TO SCALE

**GROUTED SPLICE COUPLER TOLERANCES**

Dimension	Description	Tolerance
A	SHIM PACK HEIGHT	$1\frac{1}{4}'' \pm \frac{3}{4}''$
B	DOWEL HEIGHT	CONSULT MANUFACTURER
C	LOCATION OF REINFORCING, GROUTED SPLICE COUPLER, AND DOWELS MEASURED FROM A WORKING LINE	$\pm \frac{1}{4}''$
D	GAP BETWEEN DOWELS AND REINFORCING	CONSULT MANUFACTURER



**WALL SEGMENT ERECTION TOLERANCES**

Dimension	Description	Tolerance
I	TOP ELEVATION FROM NOMINAL TOP ELEVATION	$\frac{1}{4}''$
J	MAXIMUM PLUMB VARIATION OVER HEIGHT OF PANEL	$\frac{1}{2}''$
K	PLUMB IN ANY 10 FEET OF PANEL HEIGHT	$\frac{1}{4}''$

**WALL SEGMENT FABRICATION TOLERANCES**

Dimension	Description	Tolerance
A	LENGTH	$\pm \frac{1}{4}''$
B	WIDTH (OVERALL)	$\pm \frac{1}{4}''$
C	DEPTH (OVERALL)	$\pm \frac{1}{4}''$
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	$\pm \frac{1}{2}''$
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	$\pm \frac{1}{2}''$
F	SWEEP OVER MEMBER LENGTH	$\pm \frac{3}{8}''$
G	LOCATION OF GROUTED SPLICE COUPLER MEASURED FROM A WORKING LINE	$\pm \frac{1}{4}''$
H	LOCAL SMOOTHNESS OF ANY SURFACE	$\pm \frac{1}{4}''$ IN 10 FEET

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**CONTROL OF WATER NOTES:**

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE CONTROL OF WATER (C.O.W.) SYSTEM AND SHALL SUBMIT A C.O.W. PLAN TO THE ENGINEER AND ESSEX CONSERVATION FOR APPROVAL. THE C.O.W. SYSTEM SHOWN IS CONCEPTUAL ONLY. THE C.O.W. SYSTEM SHALL BE DESIGNED TO BYPASS NORMAL STREAM FLOW CONDITIONS WITH PROVISIONS TO PASS THE 2-YEAR DESIGN FLOW OF 24.8 CFS IF THERE IS A FORECASTED STORM EVENT.
2. APPLE STREET SHALL BE CLOSED TO VEHICULAR AND PEDESTRIAN TRAFFIC AT THE BRIDGE CROSSING PRIOR TO BEGINNING EXCAVATION. DETOUR SIGNAGE WILL BE INSTALLED IN ACCORDANCE WITH THE MUTCD AND THE TEMPORARY TRAFFIC CONTROL PLANS INCLUDED IN THESE CONSTRUCTION DRAWINGS.
3. C.O.W. SYSTEM SHALL BE INSPECTED DAILY FOR WATER LEAKS OR EROSION AND REPAIRS PROCEDURES SHALL BE IMPLEMENTED ACCORDINGLY.
4. THE CONSTRUCTION SEQUENCE WITH REGARDS TO THE C.O.W. SYSTEM SHALL BE AS FOLLOWS:
  - 4.1. CLOSE THE ROADWAY TO VEHICULAR AND PEDESTRIAN TRAFFIC AT THE BRIDGE CROSSING.
  - 4.2. INSTALL EROSION CONTROLS: TEMPORARY EROSION CONTROL AROUND PROJECT LIMITS TO PROTECT THE ESSEX RIVER FROM WORK ZONE SEDIMENT; FLOATING SILT FENCE IN THE ESSEX RIVER DOWNSTREAM OF THE PROJECT LIMITS TO TRAP ANY FLOATING DEBRIS/SILT THAT MAY ENTER THE TRIBUTARY.
  - 4.3. INSTALL C.O.W. COFFERDAMS, BYPASS PUMPS, DEWATERING PUMPS, AND TEMPORARY STILLING BASIN.
  - 4.4. PLACE TEMPORARY RIPRAP AT OUTLET FOR BYPASS DISCHARGE.
  - 4.5. DEWATER THE WORK AREA PRIOR TO (AND THROUGHOUT) EXCAVATION TO FACILITATE INSTALLING THE PRECAST CULVERT AND WINGWALLS IN THE DRY CONDITION. ALL DEWATERING FLOW SHALL PASS THROUGH THE STILLING BASIN TO REMOVE SEDIMENT PRIOR TO DEPOSITING BACK INTO THE STREAM.
  - 4.6. INSTALL THE THREE-SIDED PRECAST CULVERT AND WINGWALLS. RESTORE THE STREAMBED IN ACCORDANCE WITH THESE PLANS. INSTALL MODIFIED ROCKFILL EMBANKMENT AND LOAM AND SEED WITH EROSION CONTROL BLANKET IN FRONT OF THE WINGWALLS. INSTALL COIR LOGS ALONG UPLAND SIDES OF STREAMBED.
  - 4.7. REDIRECT STREAM FLOW THROUGH THE PRECAST CULVERT.
  - 4.8. REMOVE THE C.O.W. COFFERDAMS, BYPASS PUMPS, AND TEMPORARY STILLING BASIN.

**SANDBAG PREPARATION:**

1. UTILIZE 36" X 36" X 36" POLYPROPYLENE BAGS.
2. A HEAVY BODIED OR SANDY SOIL IS MOST DESIRABLE FOR FILLING SANDBAGS. ON-SITE SOURCES MAY BE UTILIZED, AS APPROPRIATE WITH THE APPROVAL OF THE ENGINEER.
3. BAGS SHOULD BE FILLED BETWEEN ONE-THIRD TO ONE-HALF OF THEIR CAPACITY TO PREVENT THE BAG FROM BEING TOO HEAVY AND PERMITS THE BAGS TO BE STACKED WITH A GOOD SEAL.

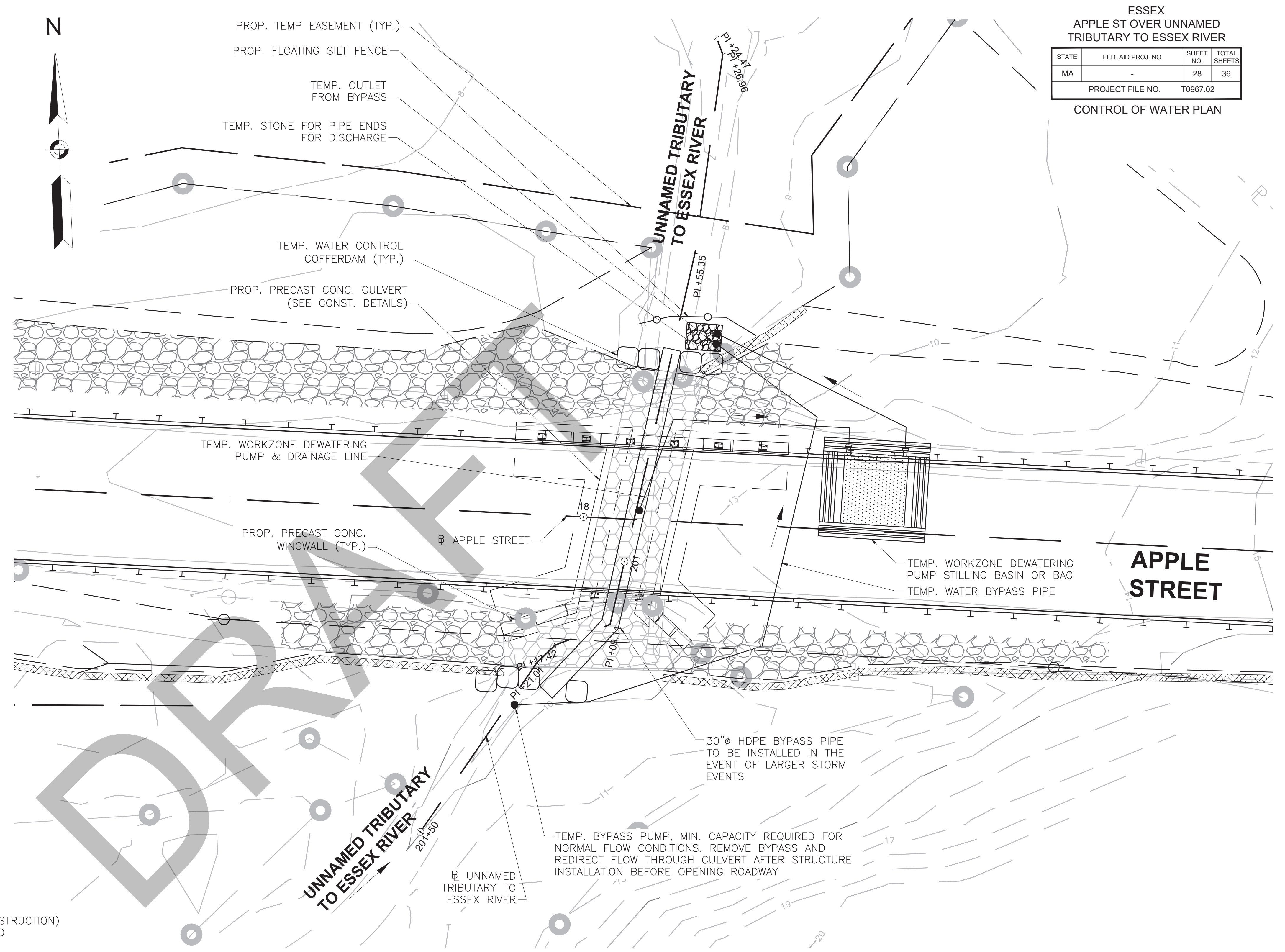
**SANDBAG PLACEMENT:**

1. REMOVE ANY DEBRIS FROM THE AREA WHERE THE BAGS ARE TO BE PLACED.
2. FOLD THE OPEN END OF THE UNFILLED PORTION OF THE SANDBAG TO FORM A TRIANGLE.
3. PLACE THE PARTIALLY FILLED BAGS LENGTHWISE AND PARALLEL TO THE DIRECTION OF FLOW WITH THE OPEN END FACING AGAINST THE WATER FLOW.
4. TUCK THE FLAPS UNDER, KEEPING THE UNFILLED PORTION UNDER THE WEIGHT OF THE SACK.
5. STAGGER THE JOINT CONNECTIONS WHEN MULTIPLE LAYERS ARE NECESSARY USING THE PYRAMID PLACEMENT METHOD.
6. ALL SANDBAG BERMS SHALL BE A MINIMUM OF 3- FEET HIGH, UNLESS NOTED OTHERWISE.
7. PLACE POLYETHYLENE LINER ALONG WATER SIDE OF COFFERDAM AND TUCK LINER INTO TOP COURSING OF SANDBAGS AS SHOWN ON THE DETAIL ON THIS PLAN. STABILIZE LINE WITH WOODEN STAKE AND ADDITIONAL SANDBAG IN STREAM.

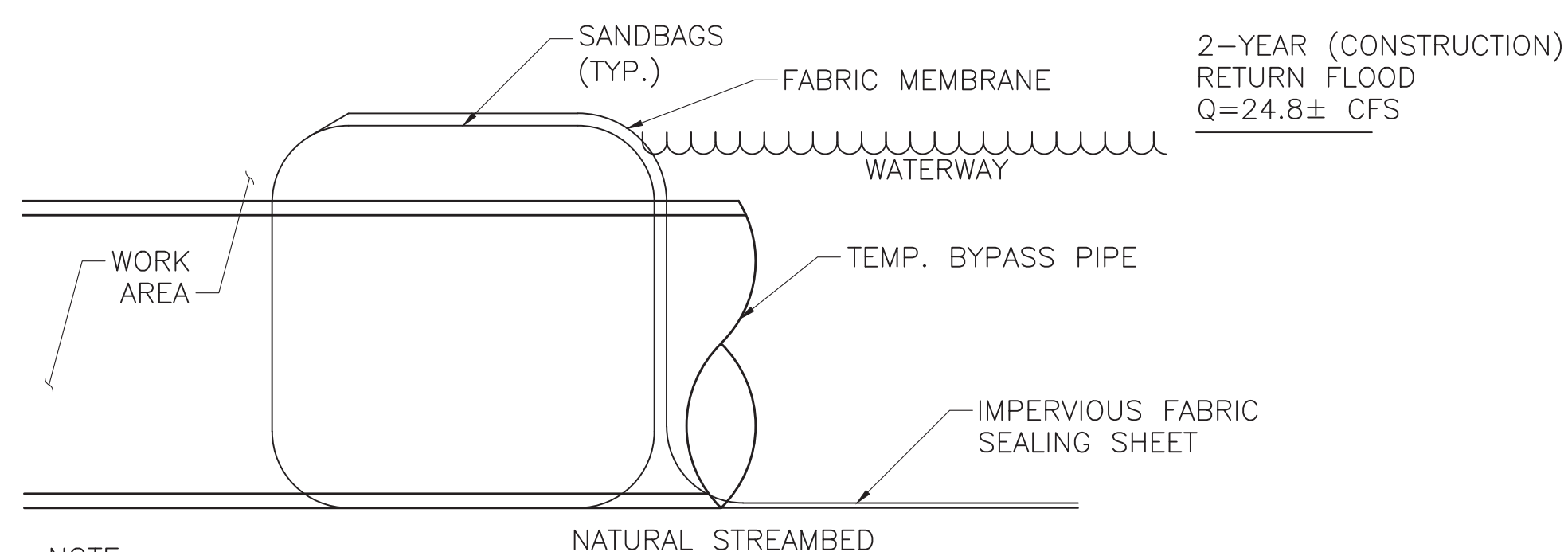
**ESSEX  
APPLE ST OVER UNNAMED  
TRIBUTARY TO ESSEX RIVER**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA		28	36

PROJECT FILE NO. T0967.02  
**CONTROL OF WATER PLAN**

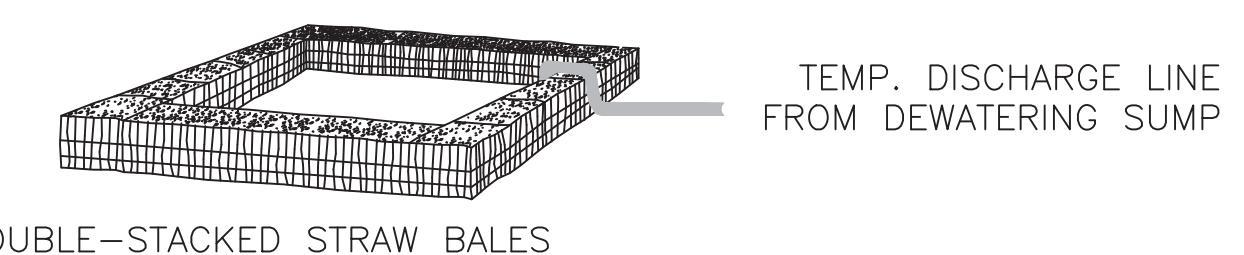


**CONTROL OF WATER PLAN**  
SCALE: 1/8" = 1'-0"



**NOTE:**  
THE SANDBAG COFFERDAM SHOWN ABOVE IS SHOWN IN CONCEPT ONLY AS ONE OPTION FOR CONTROL OF WATER. THE CONTRACTOR SHALL DETERMINE THE APPROPRIATE SYSTEM FOR CONTROLLING THE WATER (I.E. BULK SANDBAGS, SHEETING, ETC). THE CONTRACTOR SHALL SUBMIT THEIR PROPOSED CONTROL OF WATER DESIGN TO THE ENGINEER FOR REVIEW AND APPROVAL.

**TEMPORARY SANDBAG COFFERDAM**  
SCALE: N.T.S.



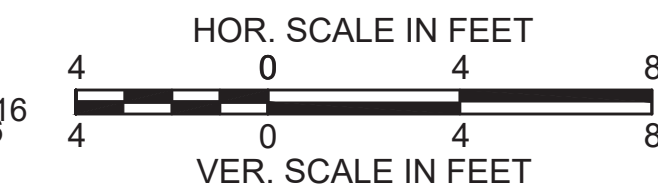
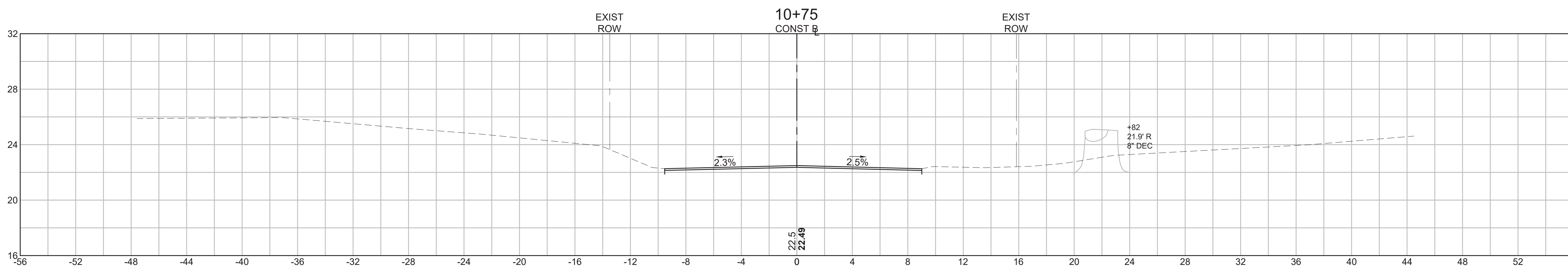
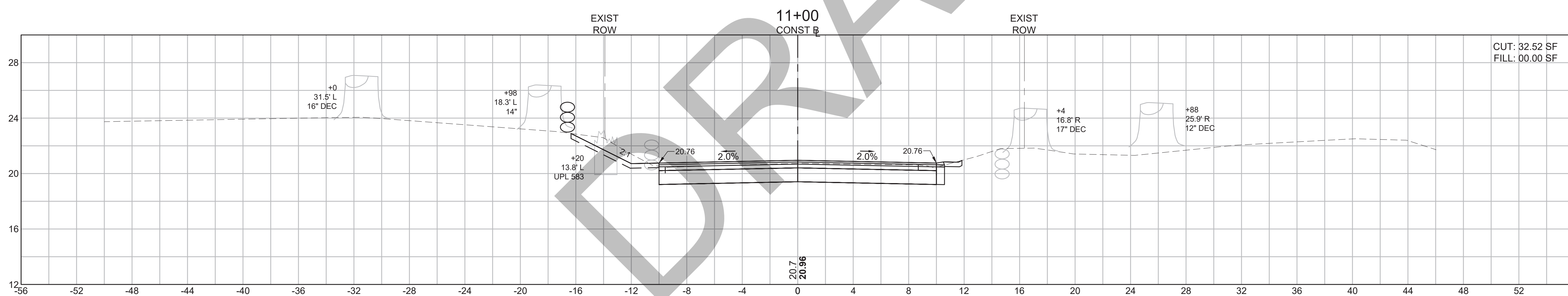
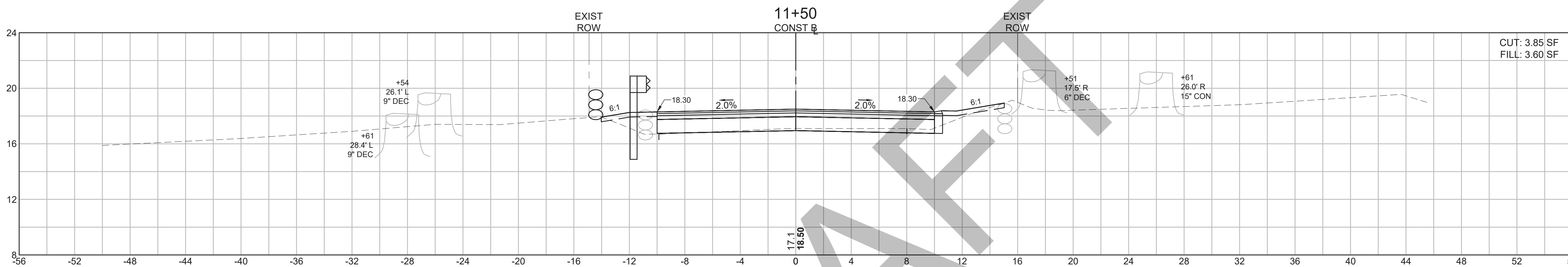
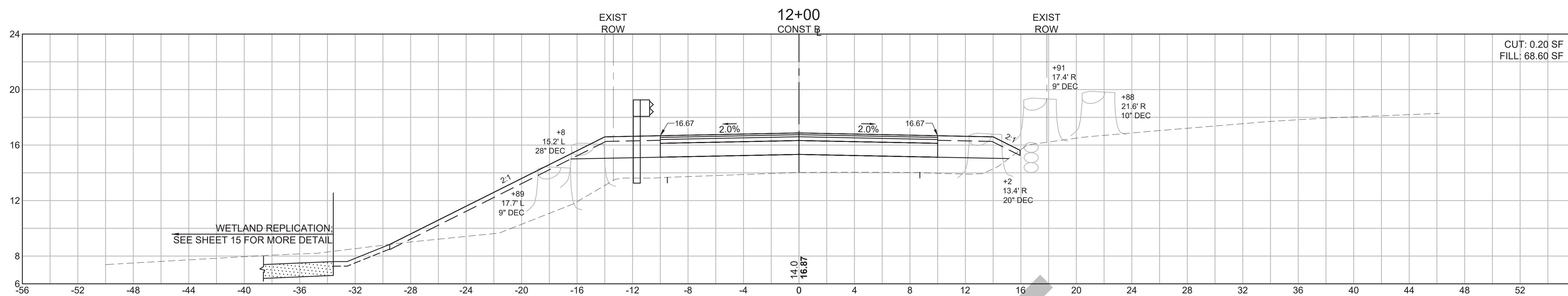
**NOTE:**  
DISCHARGE TO SEDIMENTATION BASIN (AS SHOWN) OR TO SILTATION/ DEWATERING BAG SUCH AS FLOGARD DEWATERING BAG MODEL SC-DW1215Z, OR APPROVED BAG EQUAL BY ESSEX CONSERVATION COMMISSION. SYSTEM SHOWN IS CONCEPTUAL ONLY AND IS TO BE DESIGNED BY CONTRACTOR.

**TEMPORARY STILLING AREA**  
SCALE: N.T.S.

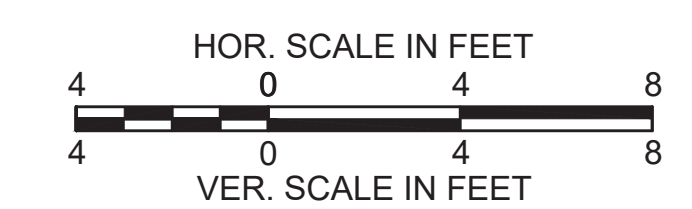
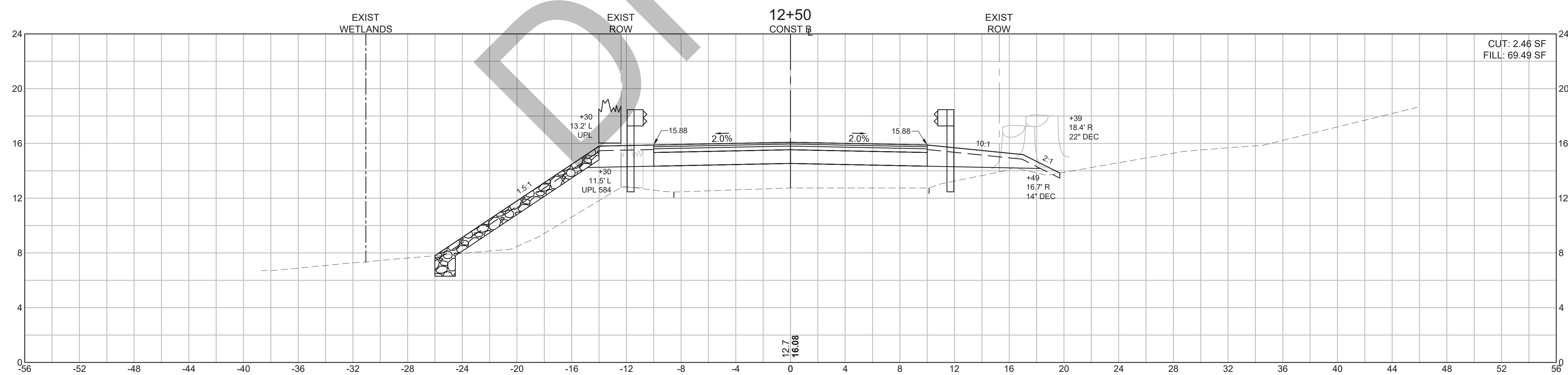
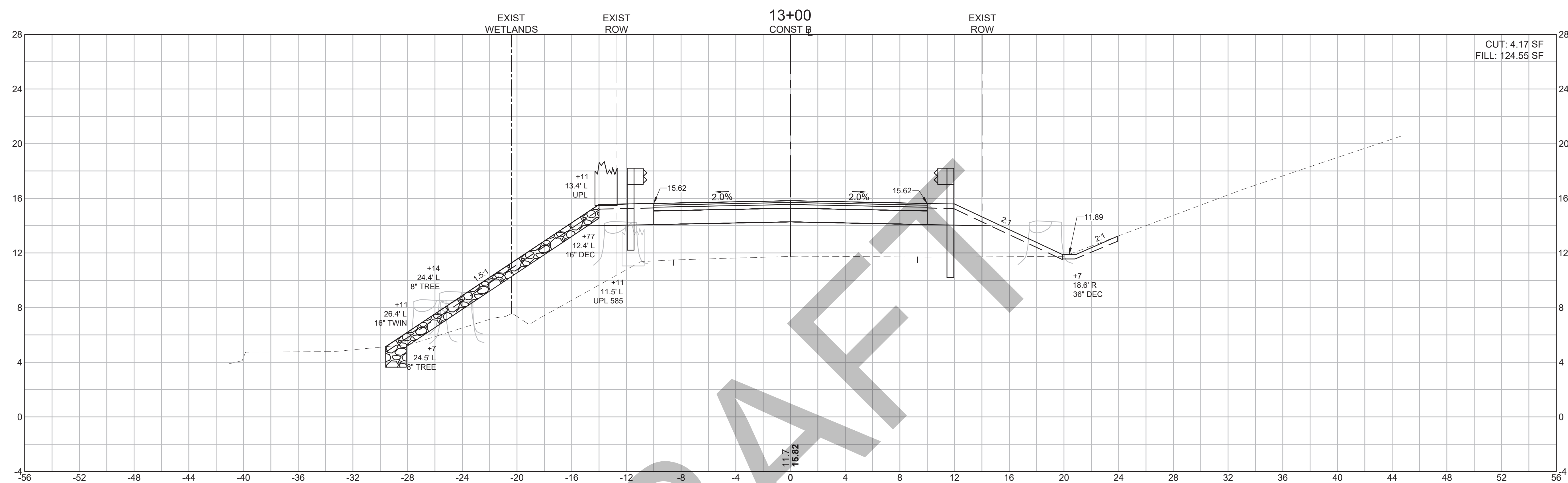
T0967.02\_BR\_(COW).DWG Plotted on 10-Nov-2022 4:26 PM Apple Street Essex 06/30/22



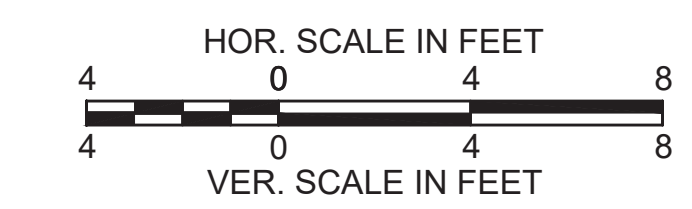
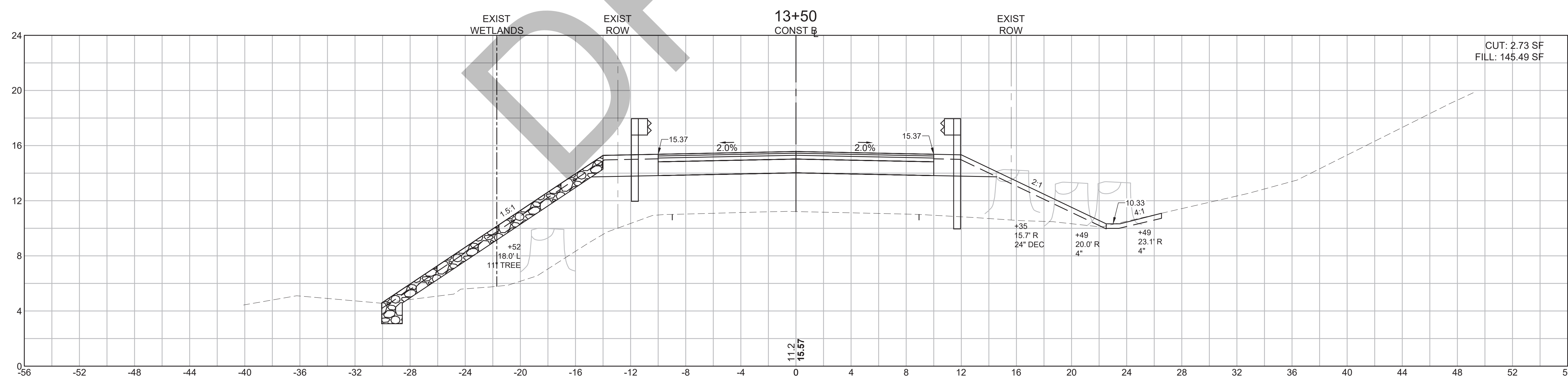
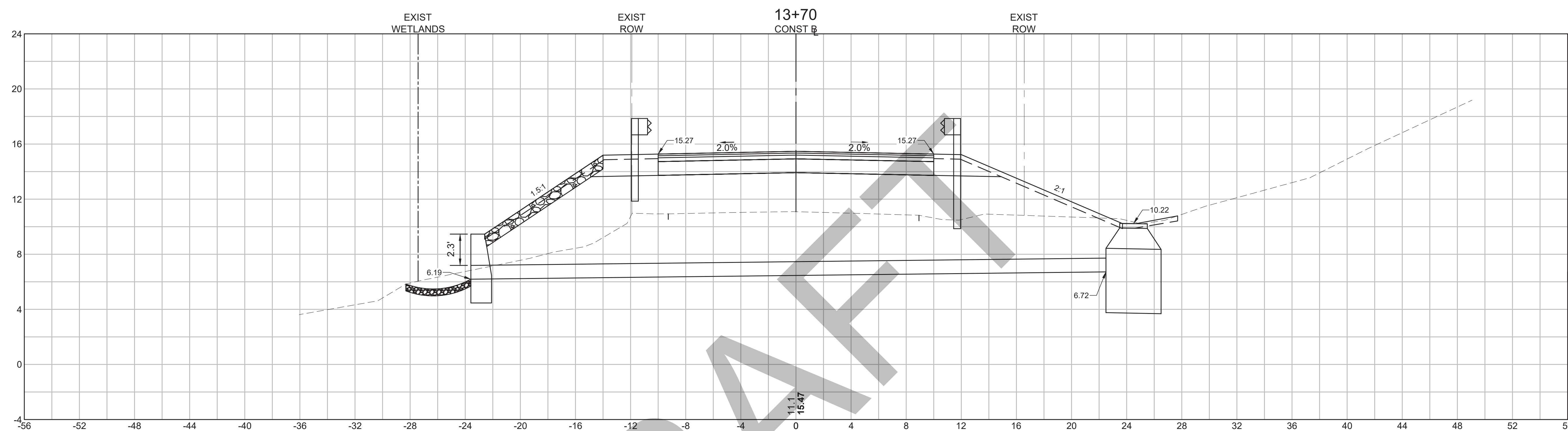
ESSEX  
APPLE STREET  
CROSS SECTIONS - 1 OF 8  
SHEET 29 OF 36



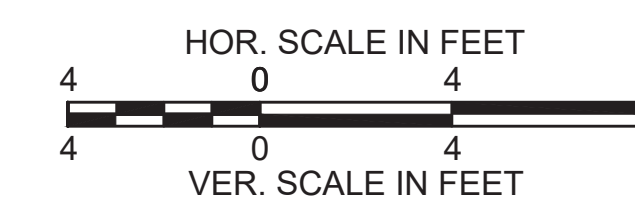
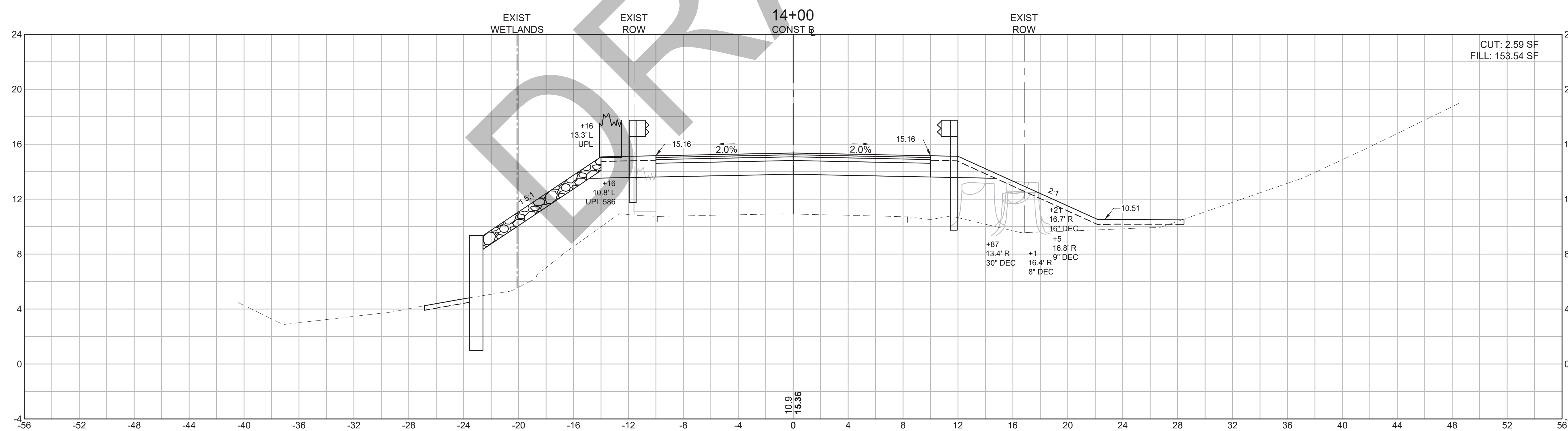
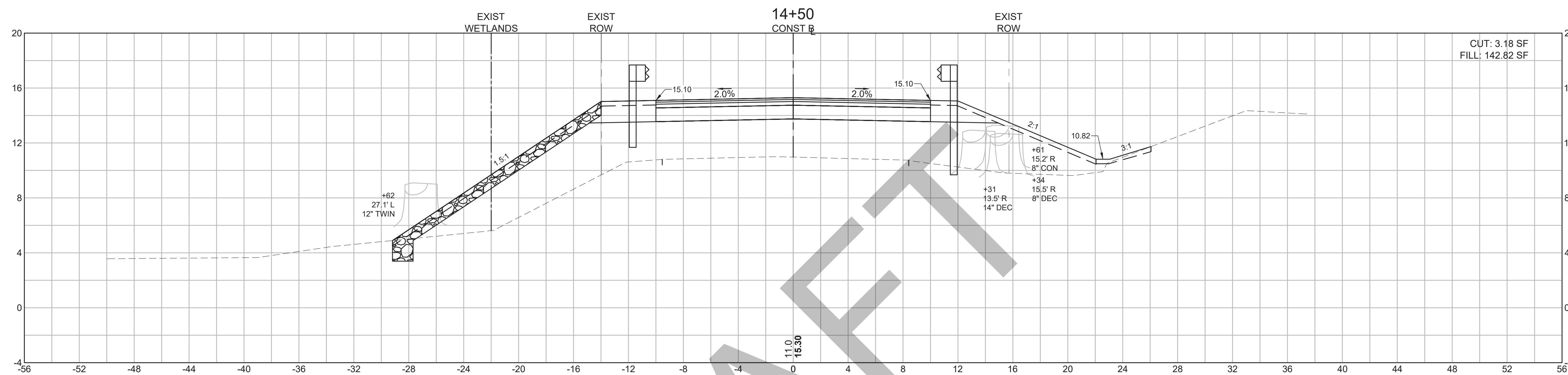




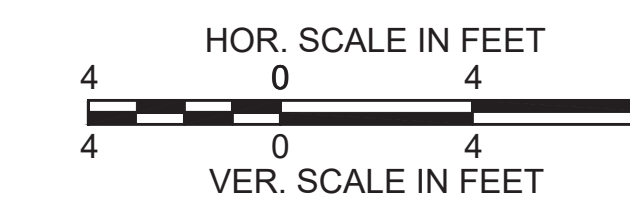
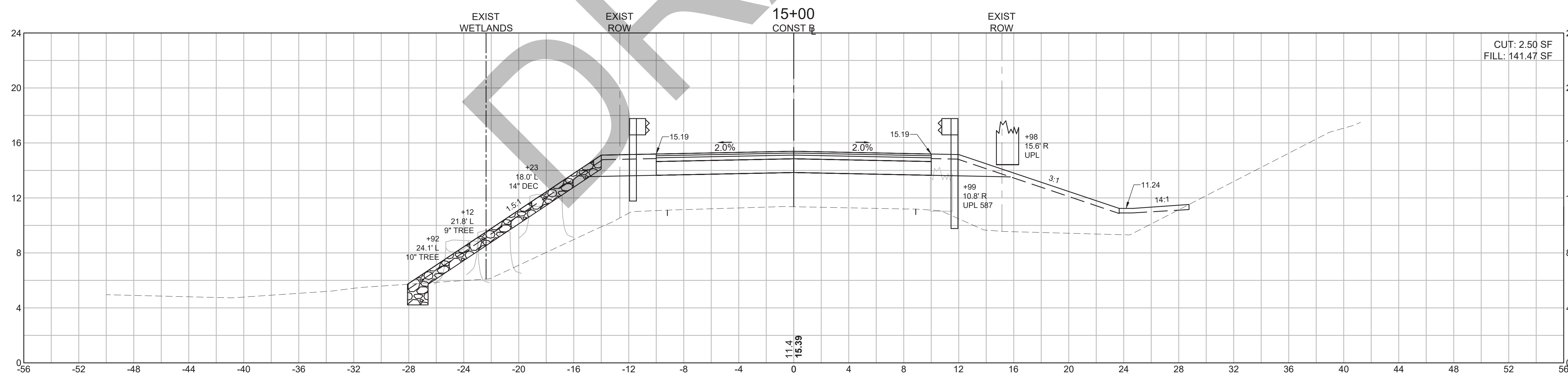
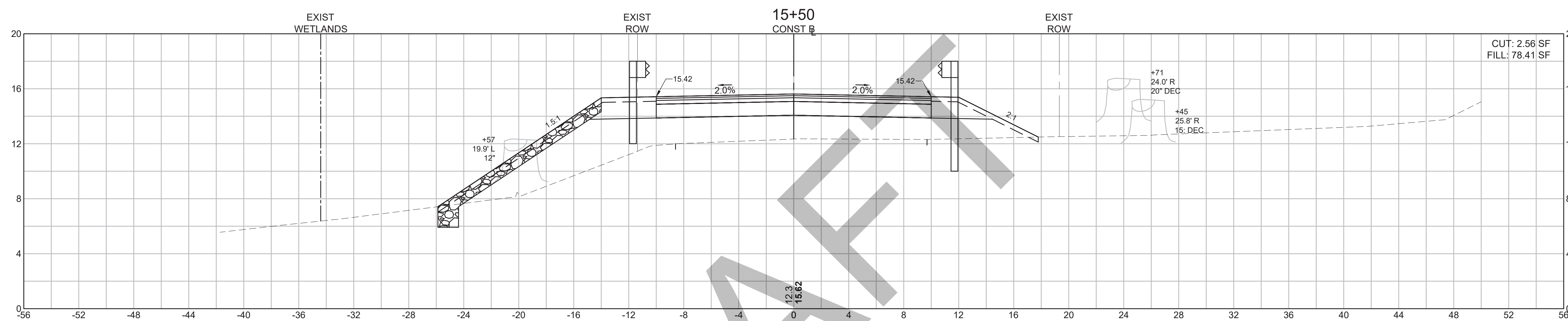




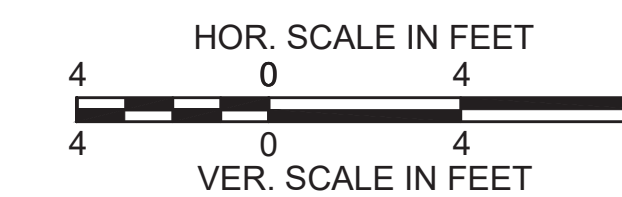
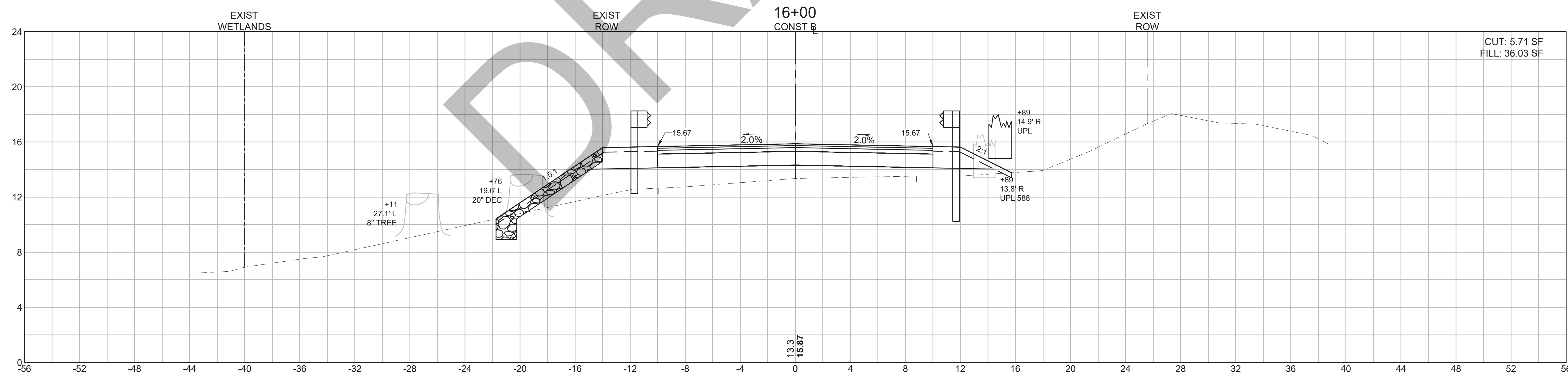
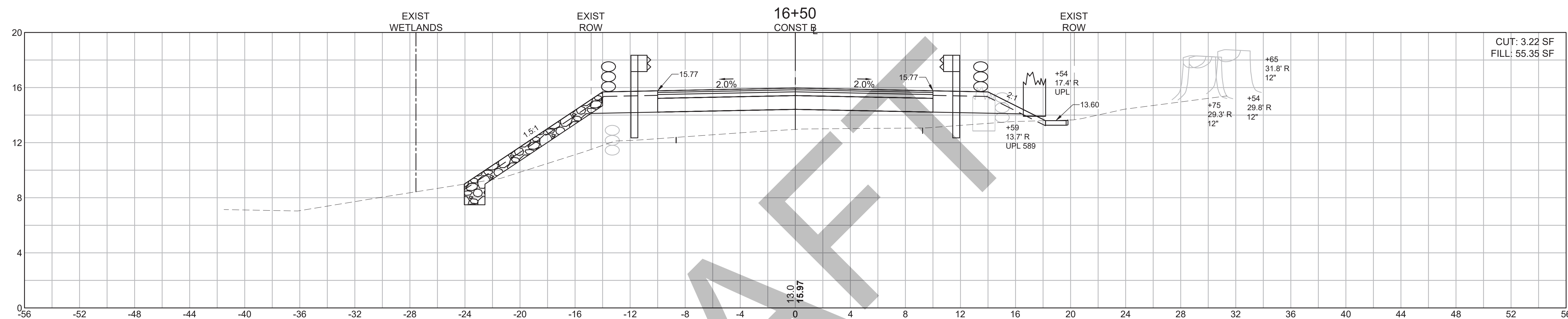




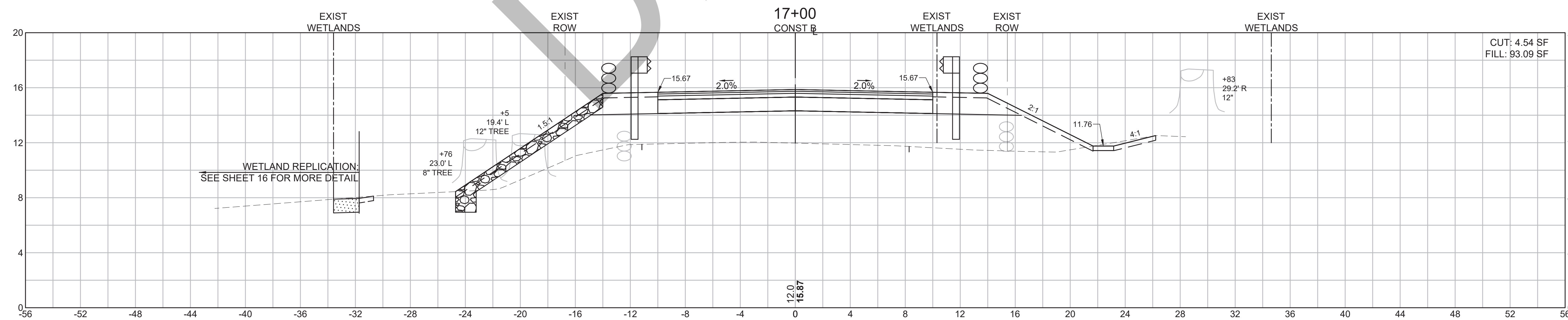
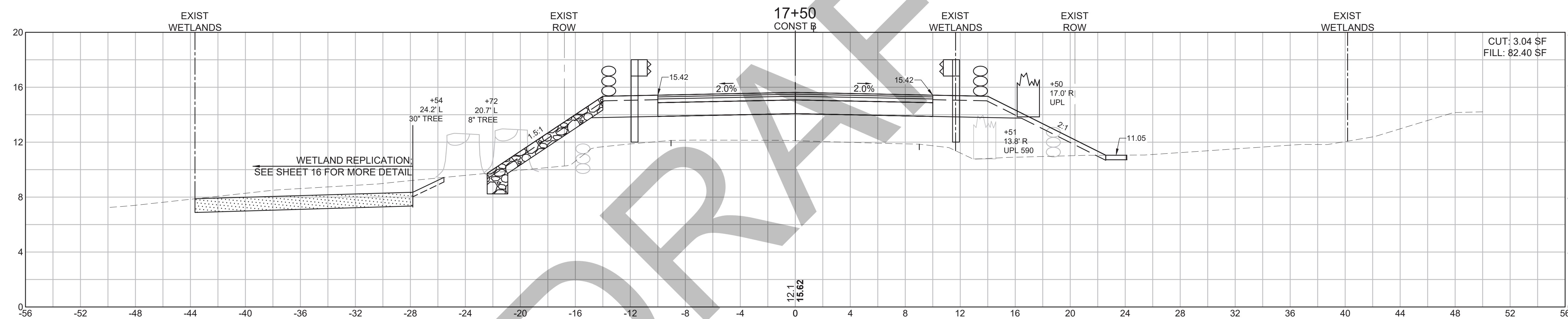
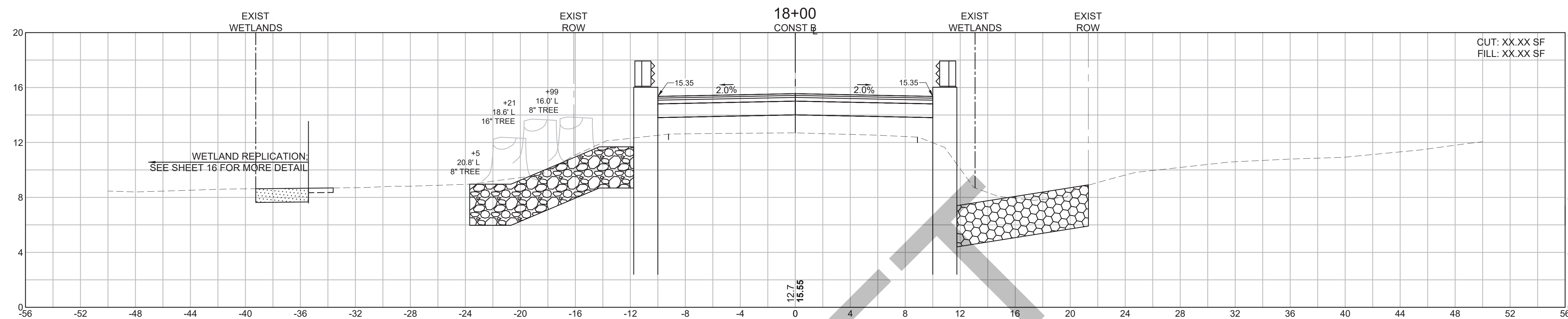












CUT: XX.XX SF  
FILL: XX.XX SF

CUT: 3.04 SF  
FILL: 82.40 SF

CUT: 4.54 SF  
FILL: 93.09 SF

