STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 6, 2007

Mr. William Wescott
U.S. Army Corps of Engineers
Washington Regulatory Field Office
Post Office Box 1000
Washington, North Carolina 27889-1000

Subject: As-Built Report for Jeffrey's Warehouse Stream and Wetland Mitigation Site, Wayne County, Tip Project No. R-1030AA, State Project No. 8.1330502, COE Action ID. 200610635, DWQ No. 060332

Dear Mr. Wescott:

Please find enclosed the As-Built Report for the subject site. The District Engineer responsible for administering the contract has certified that the site was constructed according to construction plan sheets, with any exceptions noted in this As-Built Report.

The following information has been included as part of the As-Built Report: 1) As-Built Plan Sheets, 2) Planting Plan (with vegetation plot and monitoring gauge locations), and 3) Buffer Restoration and Wetland Preservation Areas. The site will be monitored as described in the associated permit requirements.

An additional component of this project was the replacement of a perched culvert under Salem Church Road. This culvert was replaced with a 15'4" x 10'0" Corrugated Aluminum Alloy Pipe Arch Structural Plate (CAPASP). This culvert was buried 1 foot below existing streambed elevation. An inlet sill and baffles were used within the culvert. As-built drawings of this structure are provided.

If you should have any questions or require additional information, please contact Mr. Randy Griffin at (919) 715-1425. Thank you once again for your continued support and cooperation.

Sincerely,

Randy W. Griffin Jr.

for Philip S. Harris, III, P.E., CPM, Manager
PDEA - Natural Environment Unit

MAILING ADDRESS:
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334
FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
PARKER-LINCOLN BUILDING
2728 CAPITAL BOULEVARD, SUITE 240
RALEIGH NC

Enclosures

cc: Mr. John Hennessy, NCDWQ, Raleigh (w/ attachment)
Mr. Scott McLendon, USACE, Wilmington (w/o attachment)
Mr. Travis Wilson, NCWRC (w/o attachment)
Mr. Gary Jordan, USFWS (w/o attachment)
Ms. Kathy Matthews, USEPA (w/o attachment)
Mr. Randy Griffin, NCDOT-NEU (w/ attachment)
Mr. Randy Boyd, PE, NCDOT-Hydraulics (w/ attachment)
Mr. David B. Harris, PE, NCDOT- Roadside Environmental (w/ attachment)
Mr. Tim Little, PE, NCDOT, District Engineer (w/ attachment)
Mr. Jamie Guerrero, NCDOT, DEO (w/o attachment)

R-1030AA

PROJECT: 8.1330510

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAYNE COUNTY

LOCATION: -L- STA 63+00

TYPE OF WORK: STREAM & WETLAND RESTORATION

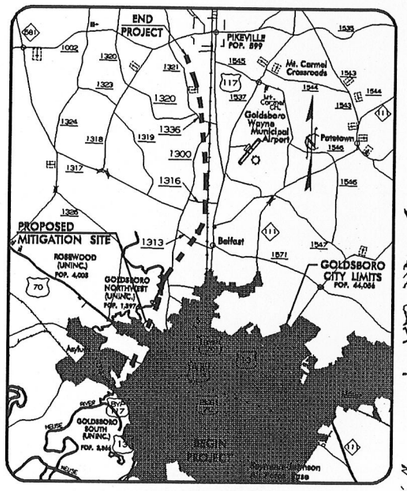
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1030AA/AB	1	44

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.1330502	DRP-0073(002)	P.E

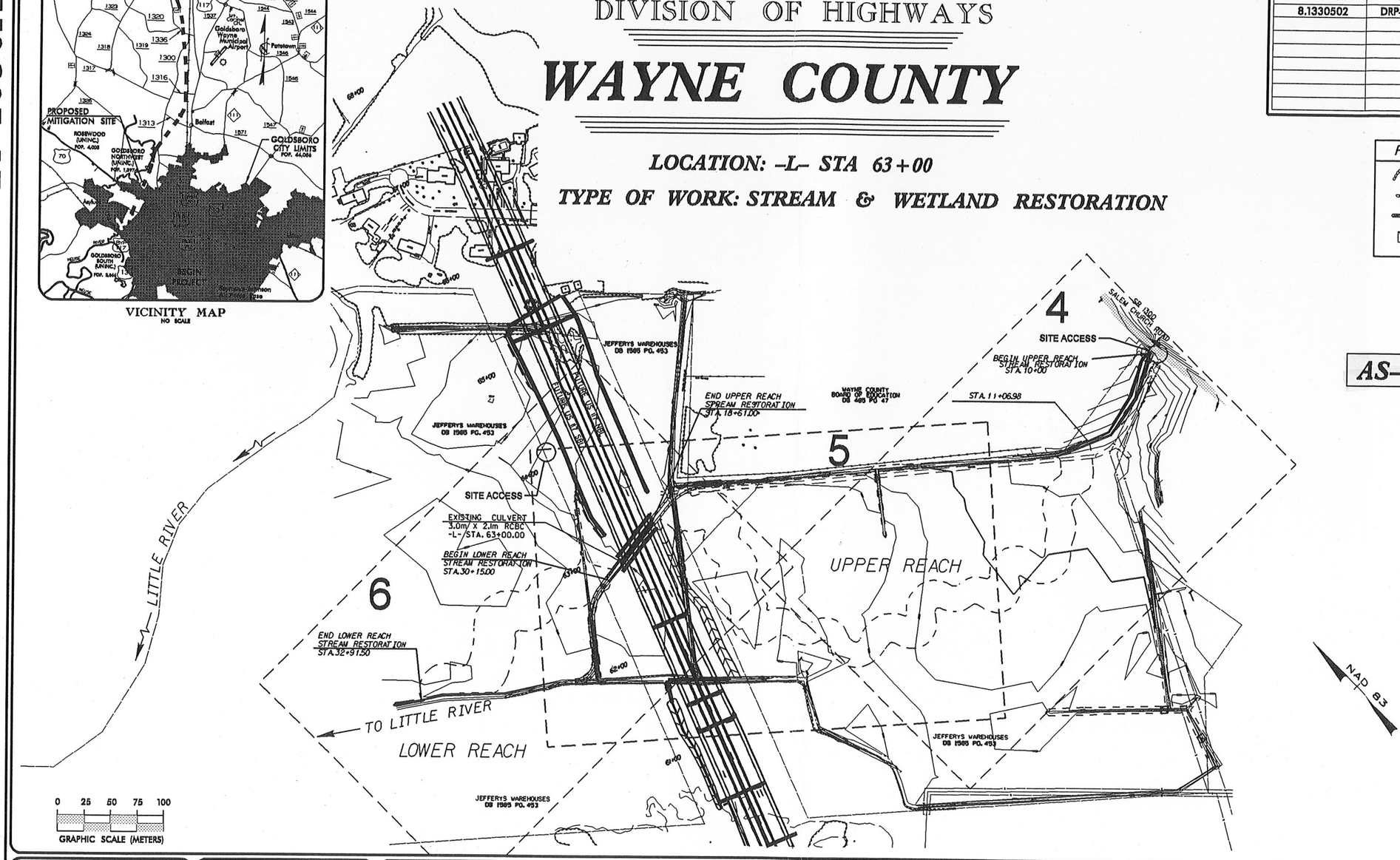
PLAN SHEET LEGEND

- ROCK CROSS VANE
- ROCK VANE
- ROOT WAD-LOG WANE
- CHANNEL/DITCH PLUG

AS-BUILT



VICINITY MAP
NO SCALE



GRAPHIC SCALES

SEE PLANS AND PROFILES

PROJECT

STREAM RESTORATION	3731 FT
WETLAND SUMMARY:	
RIVERINE RESTORATION	3.66 ac
NON-RIVERINE RESTORATION	23.02 ac
PRESERVATION	12.36 ac
NEUSE BUFFER RESTORATION	7.266 ac

DESIGN ENGINEER

SIGNATURE: P.E.

LETTING DATE:

PROJECT SCIENTIST

PROJECT DESIGN ENGINEER

30-OCT-2001 09:05
Bentley Microstation V8 [J:\pe\pr-10\cadd\as-built\pb1.dgn]
Bentley - XP PE\PE25713

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	1A

METRIC

*S.U.E = SUBSURFACE UTILITY ENGINEER

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

Edge of Pavement
Curb
Prop. Slope Stakes Cut — C
Prop. Slope Stakes Fill — F
Prop. Woven Wire Fence
Prop. Chain Link Fence
Prop. Barbed Wire Fence
Prop. Wheelchair Ramp — WCR
Curb Cut For Future Wheelchair Ramp — CCFR
Exist. Guardrail
Prop. Guardrail
Exist. Cable Guiderail
Prop. Cable Guiderail
Equality Symbol
Pavement Removal

RIGHT OF WAY

Baseline Control Point
Existing Right of Way Marker
Exist. Right of Way Line w/Marker
Prop. Right of Way Line with Proposed R/W marker (Iron Pin & Cap)
Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
Exist. Control of Access Line — CA
Prop. Control of Access Line — CA
Exist. Easement Line — E
Prop. Temp. Construction Easement Line — E
Prop. Temp. Drainage Easement Line — TDE
Prop. Perm. Drainage Easement Line — PDE

HYDROLOGY

Stream or Body of Water
Flow Arrow
Disappearing Stream
Spring
Swamp Marsh
Shoreline
Falls, Rapids
Prop Lateral, Tail, Head Ditches — FLOW

STRUCTURES

MAJOR
Bridge, Tunnel, or Box Culvert — CONC
Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR
Head & End Wall — CONC HW
Pipe Culvert
Footbridge
Drainage Boxes — CB
Paved Ditch Gutter

UTILITIES

Exist. Pole
Exist. Power Pole
Prop. Power Pole
Exist. Telephone Pole
Prop. Telephone Pole
Exist. Joint Use Pole
Prop. Joint Use Pole
Telephone Pedestal — T
Cable TV Pedestal — C
Hydrant
Satellite Dish
Exist. Water Valve
Sewer Clean Out
Power Manhole — P
Telephone Booth
Water Manhole — W
Light Pole
H-Frame Pole
Power Line Tower
Pole with Base
Gas Valve
Gas Meter
Telephone Manhole
Power Transformer
Sanitary Sewer Manhole
Storm Sewer Manhole — S
Tank; Water, Gas, Oil
Water Tank With Legs
Traffic Signal Junction Box
Fiber Optic Splice Box — S — F
Television or Radio Tower
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement — TS

Recorded Water Line — W
Designated Water Line (S.U.E.*) — W
Sanitary Sewer — SS
Recorded Sanitary Sewer Force Main — FSS
Designated Sanitary Sewer Force Main (S.U.E.*) — FSS
Recorded Gas Line — G
Designated Gas Line (S.U.E.*) — G
Storm Sewer — S
Recorded Power Line — P
Designated Power Line (S.U.E.*) — P
Recorded Telephone Cable — T
Designated Telephone Cable (S.U.E.*) — T
Recorded U/G Telephone Conduit — TC
Designated U/G Telephone Conduit (S.U.E.*) — TC
Unknown Utility (S.U.E.*) — ?UTL
Recorded Television Cable — TV
Designated Television Cable (S.U.E.*) — TV
Recorded Fiber Optics Cable — FO
Designated Fiber Optics Cable (S.U.E.*) — FO
Exist. Water Meter — 0
U/G Test Hole (S.U.E.*) — ⊗
Abandoned According to U/G Record — ATTUR
End of Information — E.O.I.

BOUNDARIES & PROPERTIES

State Line
County Line
Township Line
City Line
Reservation Line
Property Line
Property Line Symbol — PL
Exist. Iron Pin — EIP
Property Corner
Property Monument — ECM
Property Number — 123
Parcel Number — 6
Fence Line — WW & ISBW
Existing Wetland Boundaries — WLB
Proposed Wetland Boundaries — WLB
Existing Endangered Animal Boundaries — EAB
Existing Endangered Plant Boundaries — EPB

BUILDINGS & OTHER CULTURE

Buildings
Foundations
Area Outline
Gate
Gas Pump Vent or U/G Tank Cap
Church
School
Park
Cemetery
Dam
Sign
Well — S, W
Small Mine
Swimming Pool

TOPOGRAPHY

Loose Surface
Hard Surface
Change in Road Surface
Curb
Right of Way Symbol — R/W
Guard Post — GP
Paved Walk
Bridge
Box Culvert or Tunnel
Ferry
Culvert
Footbridge
Trail, Footpath
Light House

VEGETATION

Single Tree
Single Shrub
Hedge
Woods Line
Orchard
Vineyard — VINEYARD

RAILROADS

Standard Gauge
RR Signal Milepost — CSX TRANSPORTATION, MILEPOST 35
Switch — SWITCH

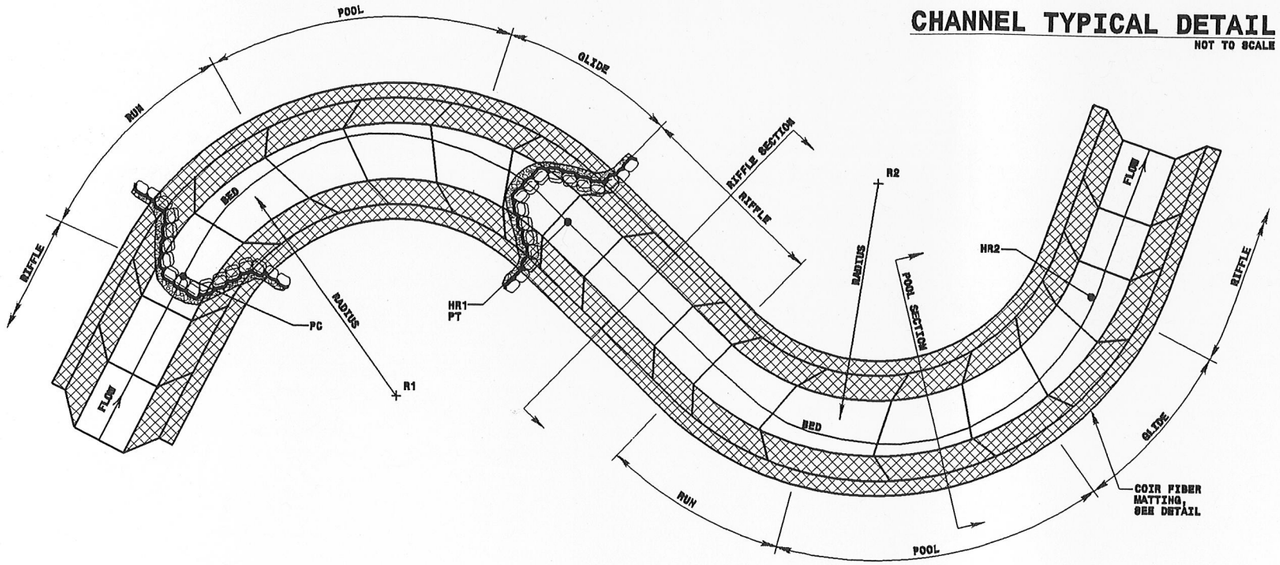
REVISIONS

10-SEP-2007 09:28
s:\unit_mgt\projects\r-1030aa\files\ja-1a\add\1a02z plans\DETails.dgn

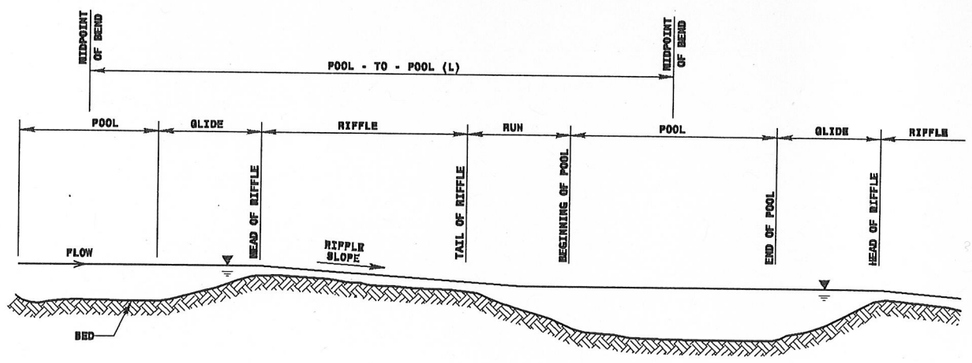
PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2
DESIGN ENGINEER	

CHANNEL TYPICAL DETAIL

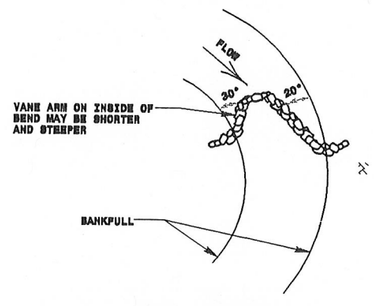
NOT TO SCALE



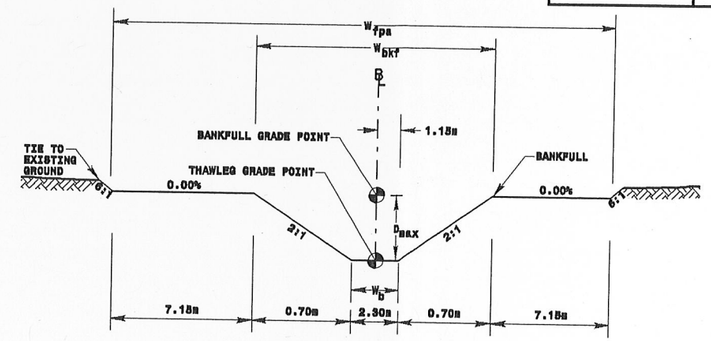
TYPICAL PLAN



TYPICAL PROFILE

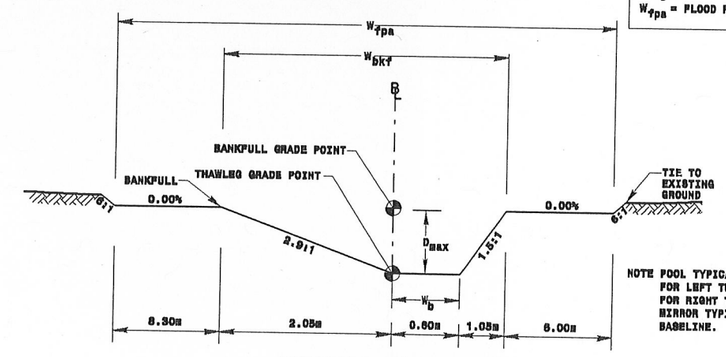


CROSS VANE CONSTRUCTION IN MEANDER-BEND PLAN VIEW



TYPICAL RIFFLE WITH BANKFULL BENCH

W_{bkf} = BANKFULL WIDTH
D_{max} = MAXIMUM DEPTH
W_b = BOTTOM WIDTH
W_{fpa} = FLOOD PRONE AREA WIDTH



TYPICAL POOL WITH BANKFULL BENCH

NOTE POOL TYPICAL SECTION SHOWN FOR LEFT TURNING CURVE. FOR RIGHT TURNING CURVE MIRROR TYPICAL SHOWN ABOUT BASELINE.

CROSS-SECTION DIMENSIONS

REACH	RIFFLE W_{bkf}	RIFFLE D_{max}	RIFFLE W_b	RIFFLE W_{fpa}	POOL W_{bkf}	POOL D_{max}	POOL W_b	POOL W_{fpa}	Width/Depth Ratio
Sta. 11+07 - Sta. 18+61	3.70	0.35	2.30	18.00	3.70	0.70	0.60	18.00	12
Sta. 30+15 - Sta. 32+92	3.70	0.35	2.30	18.00	3.70	0.70	0.60	18.00	12

NOTES:
1. THE COORDINATES FOR EACH CENTER OF RADIUS (EX. "R1","R2") AND EACH HEAD OF RIFFLE (EX. "HR1", "HR2") ARE INDICATED ON PLAN SHEET 2D.

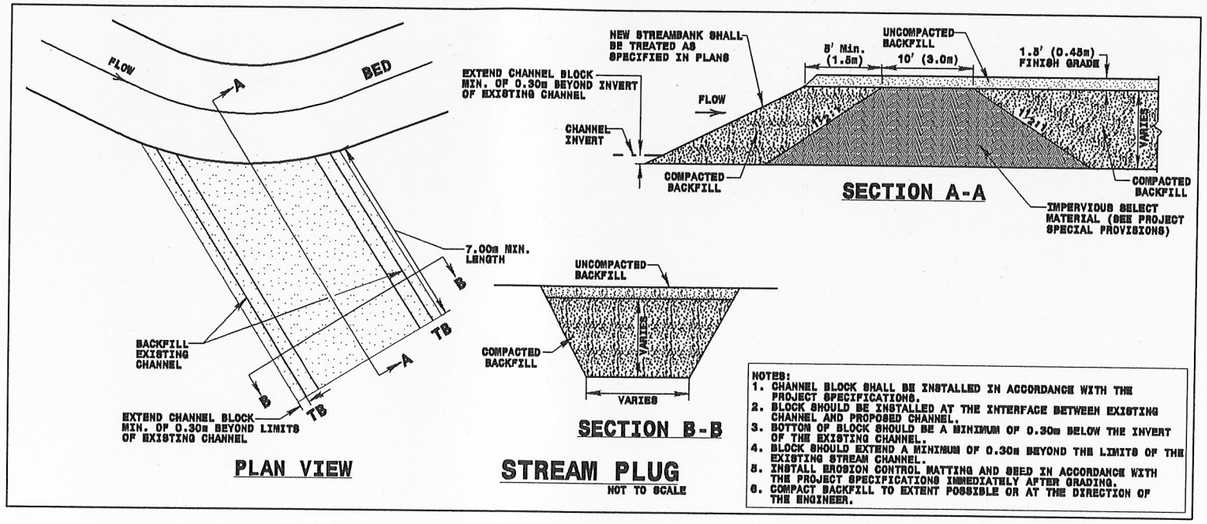
JEFFREYS WAREHOUSE MITIGATION SITE	TYPICAL SECTIONS

REVISIONS

09-OCT-2007 14:06
usaxwpm0 TPOCZWMS files\pr-10\cadd\1802z plans\details.dgn
pallck AT PDEC24978

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2A

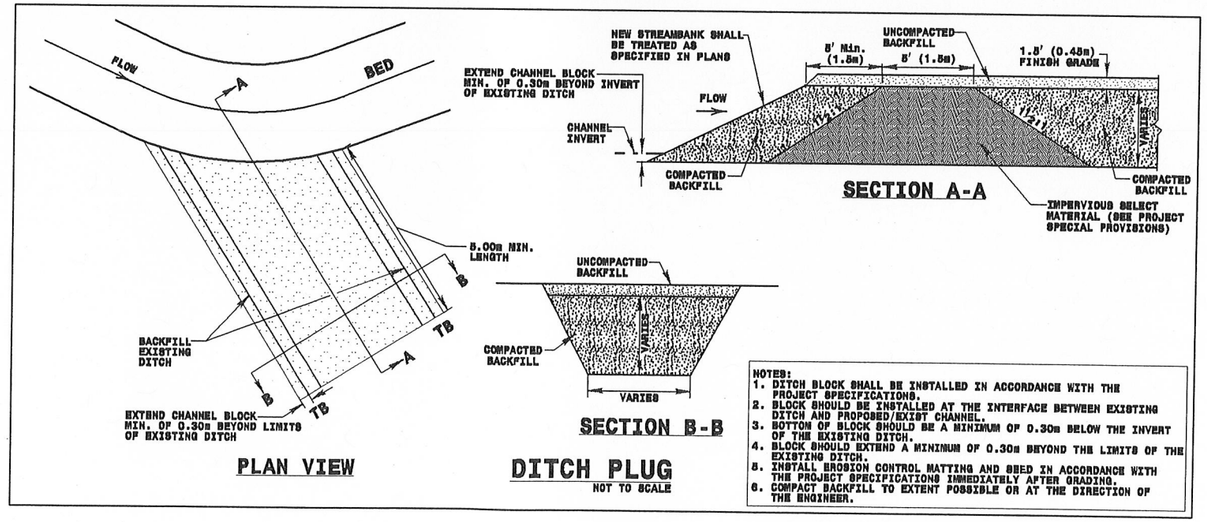
DESIGN ENGINEER



STREAM PLUG

NOT TO SCALE

NOTES:
1. CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3. BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 0.30m BELOW THE INVERT OF THE EXISTING CHANNEL.
4. BLOCK SHOULD EXTEND A MINIMUM OF 0.30m BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5. INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.



DITCH PLUG

NOT TO SCALE

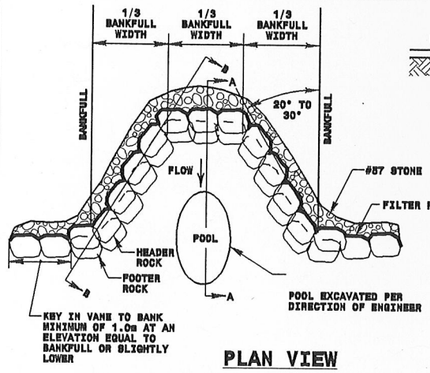
NOTES:
1. DITCH BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING DITCH AND PROPOSED/EXIST CHANNEL.
3. BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 0.30m BELOW THE INVERT OF THE EXISTING DITCH.
4. BLOCK SHOULD EXTEND A MINIMUM OF 0.30m BEYOND THE LIMITS OF THE EXISTING DITCH.
5. INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.

REVISIONS

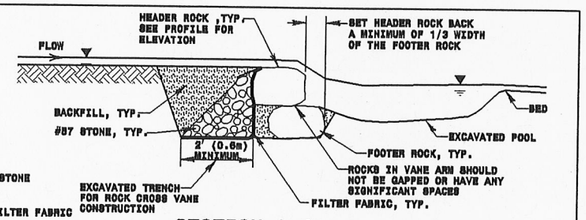
03-OCT-2007 14:06
s:\hydraulics\hydro\projects\jeffreys\r-1030aa\1802_plans\details.dgn

JEFFREYS WAREHOUSE MITIGATION SITE	DETAILS

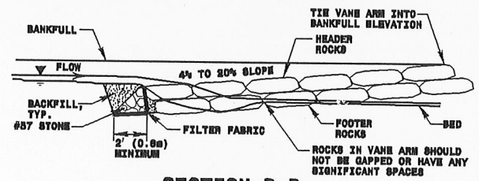
PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2B
DESIGN ENGINEER	



PLAN VIEW



SECTION A-A



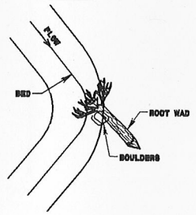
SECTION B-B

	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
11+38	0.7	0.7	0.7
12+70	0.7	0.7	0.7
14+34	0.7	0.7	0.7
14+84	0.7	0.7	0.7
16+03	0.7	0.7	0.7
16+64	0.7	0.7	0.7
18+25	0.7	0.7	0.7
30+20	0.7	0.7	0.7
30+47	0.7	0.7	0.7
32+60	0.7	0.7	0.7

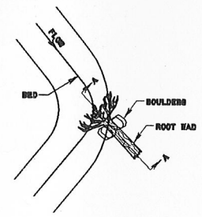
NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROCK CROSS VANE DETAIL

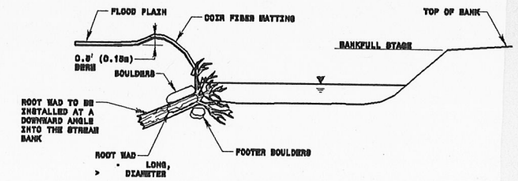
NOT TO SCALE



PLAN VIEW
DRIVE POINT METHOD



PLAN VIEW
TRENCHING METHOD



SECTION A-A

NOTES:

ORIENT ROOT WADS SO THAT THE STREAM FLOW HITS THE ROOT WAD STRAIGHT ON, DEFLECTING THE WATER AWAY FROM THE BANK.

METHODS OF INSTALLATION:

DRIVE POINT METHOD:

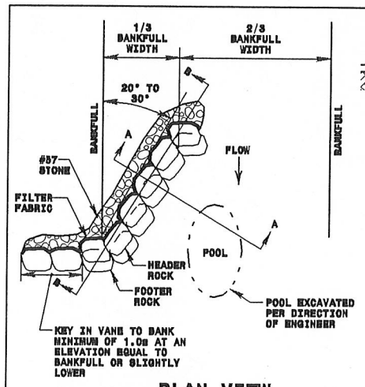
SHARPEN THE END OF THE LOG BEFORE "DRIVING" AT A DOWNWARD ANGLE INTO THE BANK. BOULDER SHOULD BE PLACED ON EACH SIDE OF THE ROOT WAD TO PIN IT IN PLACE. THE BOULDERS SHALL BE APPROXIMATELY X X . ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

TRENCHING METHOD:

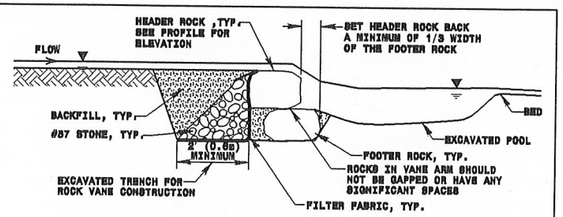
IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, FOOTER BOULDERS SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAM BED. BOULDERS SHOULD BE PLACED ON EACH SIDE OF THE ROOTWAD TO PIN IT IN PLACE. THE BOULDERS SHOULD BE APPROXIMATELY X X . ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

ROOT WAD DETAIL

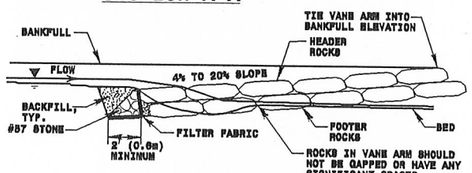
NOT TO SCALE



PLAN VIEW



SECTION A-A



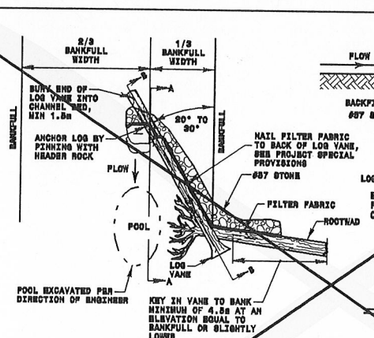
SECTION B-B

	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
13+20	0.7	0.7	0.7
13+30	0.7	0.7	0.7
14+44	0.7	0.7	0.7
14+50	0.7	0.7	0.7
14+59	0.7	0.7	0.7
15+17	0.7	0.7	0.7
15+29	0.7	0.7	0.7
15+35	0.7	0.7	0.7
16+75	0.7	0.7	0.7
16+83	0.7	0.7	0.7
16+90	0.7	0.7	0.7

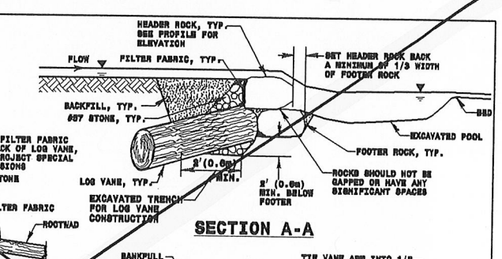
NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROCK VANE DETAIL

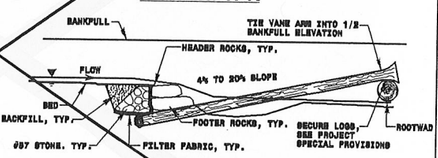
NOT TO SCALE



PLAN VIEW



SECTION A-A



SECTION B-B

	BOULDER DIMENSIONS (M)		
STATION	HEIGHT	LENGTH	WIDTH
16+40	0.7	0.7	0.7
16+88	0.7	0.7	0.7
17+85	0.7	0.7	0.7
18+00	0.7	0.7	0.7
30+55	0.7	0.7	0.7
30+75	0.7	0.7	0.7
30+95	0.7	0.7	0.7
30+98	0.7	0.7	0.7
31+40	0.7	0.7	0.7
31+50	0.7	0.7	0.7
31+60	0.7	0.7	0.7
32+50	0.7	0.7	0.7

NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

ROOTWAD/LOG VANE DETAIL

NOT TO SCALE

REVISIONS

8-OCT-2007 07:03
s:\engineering\projects\r-1030aa\2007_plans\details.dgn

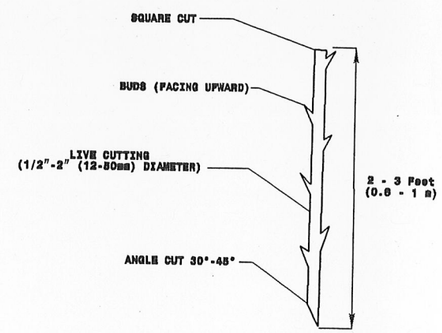
PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2C

DESIGN ENGINEER

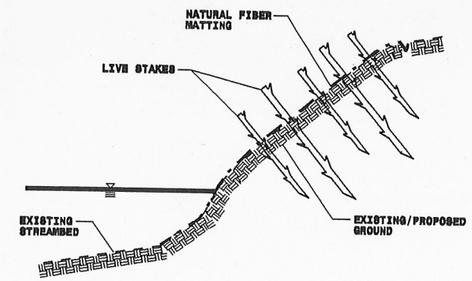
LIVE STAKE DETAIL

NOT TO SCALE

LIVE STAKE

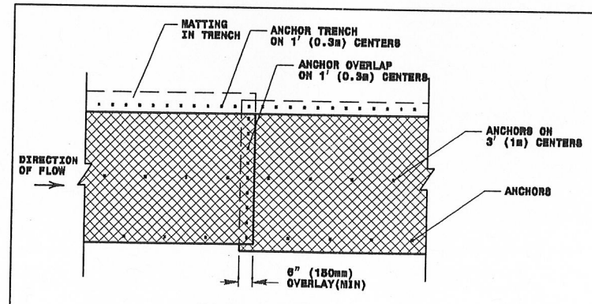


TYPICAL CROSS SECTION

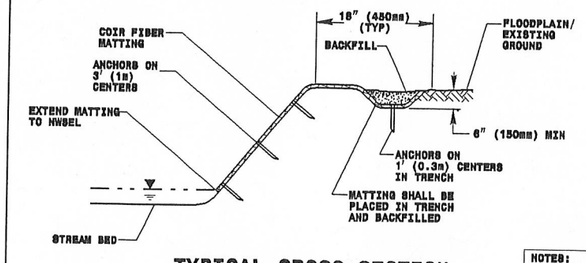


BANK STABILIZATION WITH LIVE STAKES

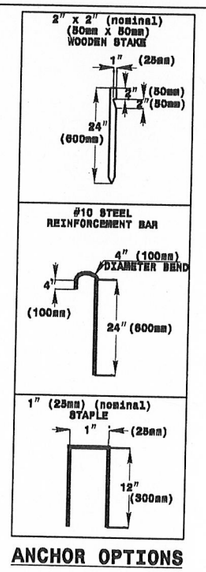
NOTE:
1. LIVE STAKES SHALL BE EVENLY SPACED 2' (0.6m) APART.
2. LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY ¾ OF LIVE STAKE IS WITHIN GROUND



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

NOTES:
1. IN AREAS TO BE MATTED, ALL SEEDING, SOIL AMENDMENTS, AND SOIL PREPARATION MUST BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS PRIOR TO PLACEMENT OF COIR FIBER MATTING.
2. REBAR OR STAPLES MAY BE USED IN PLACE OF WOODEN STAKES AS DIRECTED BY THE ENGINEER.

COIR FIBER MATTING DETAIL

NOT TO SCALE

REVISIONS

09-OCT-2007 14:08
s:\hydro\proj\R2429778 files\ja'lo'sauda\1882; plans\details.dgn
pallen "AT PROJECT"

JEFFREYS WAREHOUSE MITIGATION SITE	DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2D

DESIGN ENGINEER

COORDINATE GEOMETRY - UPPER REACH

STATIONS	TANGENT/ CURVE NO.	POINT DESCRIPTOR	NORTHING	EASTING	TANGENT/CHORD BEARING	TANGENT/CHORD LENGTH	CURVE LENGTH	DELTA ANGLE	RADIUS
10+00.000		POT	183899.755	700455.643					
	T1				S 84° 00' 19.36" W	9.173m	N/A	N/A	N/A
10+09.173		PINC	183898.797	700446.520					
	T2				S 60° 22' 28.86" W	35.485m	N/A	N/A	N/A
10+44.658		PINC	183881.256	700415.674					
	T3				S 77° 13' 02.76" W	40.262m	N/A	N/A	N/A
10+84.920		PINC	183872.348	700376.410					
	T4				N 86° 24' 27.44" W	21.618m	N/A	N/A	N/A
11+06.537		PC	183881.000	700356.599					
	C1	CC	183862.672	700346.595	S 67° 30' 51.06" W	28.811m	32.169m	92° 09' 22.95"LT	20.000m
11+38.706		PRC	183869.981	700329.978					
	C2	CC	183873.636	700320.670	S 62° 38' 36.88" W	13.176m	14.384m	82° 24' 54.54"RT	10.000m
11+53.090		PT	183863.926	700316.276					
	T5				N 76° 08' 55.85" W	7.662m	N/A	N/A	N/A
11+60.753		PC	183865.761	700310.836					
	C3	CC	183846.342	700306.048	S 55° 53' 04.74" W	29.710m	33.487m	95° 55' 58.62"LT	20.000m
11+94.239		PRC	183849.097	700286.239					
	C4	CC	183850.475	700276.334	S 44° 03' 29.27" W	11.795m	12.615m	72° 16' 47.88"RT	10.000m
12+06.855		PRC	183840.621	700276.037					
	C5	CC	183822.391	700281.186	S 53° 59' 55.08" W	16.335m	16.919m	52° 23' 56.27"LT	18.500m
12+23.774		PT	183831.019	700264.621					
	T6				S 27° 47' 56.95" W	1.706m	N/A	N/A	N/A
12+25.479		PC	183829.510	700264.026					
	C6	CC	183836.972	700249.672	N 73° 12' 13.03" W	31.412m	44.120m	157° 59' 40.04"RT	16.000m
12+69.600		PT	183838.557	700233.954					
	T7				N 05° 47' 36.99" E	1.766m	N/A	N/A	N/A
12+71.366		PC	183840.344	700234.132					
	C7	CC	183841.657	700221.199	N 76° 06' 03.68" W	25.740m	37.163m	163° 47' 21.34"LT	13.000m
13+08.528		PT	183846.527	700209.146					
	T8				S 22° 00' 15.65" W	7.129m	N/A	N/A	N/A
13+15.657		PC	183839.916	700206.475					
	C8	CC	183843.552	700197.481	N 74° 40' 16.70" W	19.266m	28.213m	166° 38' 55.30"RT	9.700m
13+43.870		PT	183845.012	700187.692					
	T9				N 06° 39' 10.95" E	1.660m	N/A	N/A	N/A
13+45.530		PC	183846.653	700188.142					
	C9	CC	183848.548	700175.685	N 45° 20' 10.06" W	20.384m	23.746m	107° 58' 42.03"LT	12.600m
13+69.276		PT	183860.982	700173.643					
	T10				S 80° 40' 28.92" W	1.489m	N/A	N/A	N/A
13+70.765		PC	183860.740	700172.174					
	C10	CC	183871.595	700170.391	N 51° 31' 44.64" W	16.297m	18.352m	95° 35' 32.88"RT	11.000m
13+89.117		PRC	183870.879	700159.415					
	C11	CC	183869.837	700143.449	N 85° 04' 30.02" W	31.635m	45.430m	162° 41' 3.63"LT	16.000m
14+34.547		PRC	183873.595	700127.896					
	C12	CC	183875.943	700118.176	N 84° 59' 39.23" W	19.776m	28.422m	162° 50' 45.21"RT	10.000m
14+62.969		PT	183875.320	700106.195					
	T11				N 03° 34' 16.62" W	1.089m	N/A	N/A	N/A
14+64.058		PC	183876.407	700106.128					
	C13	CC	183875.281	700089.763	N 62° 21' 08.40" W	31.471m	37.754m	117° 33' 43.55"LT	16.400m
15+01.812		PT	183891.011	700080.250					
	T12				S 58° 51' 59.83" W	1.811m	N/A	N/A	N/A
15+03.623		PC	183890.075	700078.700					
	C14	CC	183903.656	700070.376	N 40° 09' 12.24" W	31.802m	45.510m	161° 57' 35.88"RT	16.100m
15+49.133		PRC	183914.361	700058.193					
	C15	CC	183923.142	700048.053	N 23° 28' 35.80" W	24.150m	30.078m	128° 36' 23.00"LT	13.400m
15+79.211		PT	183936.532	700048.573					
	T13				N 87° 46' 47.30" W	1.061m	N/A	N/A	N/A
15+80.272		PC	183936.573	700047.513					
	C16	CC	183949.064	700047.997	N 34° 45' 19.50" W	19.972m	23.136m	106° 02' 55.59"RT	12.500m
16+03.408		PRC	183952.982	700036.127					
	C17	CC	183957.841	700021.406	N 38° 04' 21.83" W	25.603m	30.484m	112° 41' 00.24"LT	15.500m
16+33.892		PT	183973.295	700020.215					
	T14				S 85° 35' 08.05" W	2.429m	N/A	N/A	N/A
16+36.321		PC	183973.108	700017.793					
	C18	CC	183983.078	700017.023	N 10° 52' 43.53" W	19.673m	29.159m	167° 04' 16.83"RT	10.000m
16+65.480		PT	183992.624	700014.043					
	T15				N 72° 39' 24.86" E	1.745m	N/A	N/A	N/A
16+67.225		PC	183993.144	700015.706					
	C19	CC	184007.939	700011.088	N 24° 59' 33.21" E	22.916m	25.789m	95° 19' 43.34"LT	15.500m
16+93.014		PRC	184013.914	700025.390					
	C20	CC	184017.768	700034.617	N 32° 52' 57.11" E	16.493m	19.392m	111° 06' 31.13"RT	10.000m
17+12.406		PT	184027.764	700034.344					
	T16				N 88° 26' 12.67" E	0.634m	N/A	N/A	N/A
17+13.041		PC	184027.782	700034.979					
	C21	CC	184037.778	700034.706	N 22° 12' 37.98" E	18.303m	23.117m	132° 27' 09.39"LT	10.000m
17+36.158		PT	184044.727	700041.897					
	T17				N 44° 00' 56.72" W	0.201m	N/A	N/A	N/A
17+36.359		PC	184044.871	700041.757					
	C22	CC	184053.904	700051.106	N 23° 18' 17.38" E	23.990m	30.549m	134° 38' 28.19"RT	13.000m
17+66.908		PT	184066.904	700051.248					
	T18				S 89° 22' 28.52" E	0.700m	N/A	N/A	N/A
17+67.608		PC	184066.896	700051.948					
	C23	CC	184078.695	700052.077	N 04° 01' 36.70" W	23.522m	38.987m	189° 18' 16.36"LT	11.800m
18+06.595		PRC	184090.360	700050.296					
	C24	CC	184100.262	700048.894	N 52° 02' 36.31" W	14.390m	16.062m	92° 01' 49.63"RT	10.000m
18+22.658		PT	184099.211	700038.950					
	T19				N 06° 01' 41.50" W	5.746m	N/A	N/A	N/A
18+28.404		PC	184104.926	700038.346					
	C25	CC	184103.351	700023.429	N 51° 19' 4.25" W	21.320m	23.714m	90° 34' 45.51"LT	15.000m
18+52.118		PT	184118.251	700021.703					
	T20				S 83° 23' 32.99" W	9.336m	N/A	N/A	N/A
18+61.000		POT	184117.229	700012.660					

COORDINATE GEOMETRY - LOWER REACH

STATIONS	TANGENT/ CURVE NO.	POINT DESCRIPTOR	NORTHING	EASTING	TANGENT/CHORD BEARING	TANGENT/CHORD LENGTH	CURVE LENGTH	DELTA ANGLE	RADIUS
30+00.000		POT	184111.361	699965.819					
	T21				S 83° 05' 11.63" W	19.752m	N/A	N/A	N/A
30+19.752		PC	184108.983	699946.210					
	C26	CC	184118.910	699945.007	N 67° 30' 54.68" W	9.816m	10.262m	58° 47' 47.37"RT	10.000m
30+30.014		PT	184112.736	699937.139					
	T22				N 38° 07' 01.00" W	4.695m	N/A	N/A	N/A
30+34.709		PC	184116.431	699934.241					
	C27	CC	184109.641	699925.587	N 71° 28' 20.89" W	12.096m	12.808m	66° 42' 39.80"LT	11.000m
30+47.516		PRC	184120.275	699922.772					
	C28	CC	184130.425	699920.085	N 49° 16' 42.15" W	17.317m	20.360m	111° 05' 57.29"RT	10.500m
30+67.876		PRC	184131.572	699909.647					
	C29	CC	184132.665	699899.707	N 64° 04' 43.25" W	18.835m	24.557m	140° 41' 59.51"LT	10.000m
30+92.433		PRC	184139.806	699892.707					
	C30	CC	184153.517	699879.267	N 75° 28' 49.14" W	32.897m	39.508m	117° 53' 47.72"RT	19.200m
31+31.941		PRC	184148.054	699860.660					
	C31	CC	184144.355	699848.398	S 89° 08' 13.06" W	25.034m	33.730m	148° 39' 43.26"LT	13.000m
31+65.671		PRC	184147.677	699835.829					
	C32	CC	184151.510	699821.328	S 50° 46' 02.86" W	17.617m	18.829m	71° 55' 22.84"RT	15.000m
31+84.500		PRC	184136.534	699822.183					
	C33	CC	184116.068	699823.353	S 67° 44' 54.18" W	13.335m	13.582m	37° 57' 40.19"LT	20.500m
31+98.083		PRC	184131.485	699809.641					
	C34	CC	184146.902	699796.330	N 76° 15' 09.02" W	33.577m	39.343m	109° 57' 33.79"RT	20.500m
32+37.425		PRC	184139.464	699777.226					
	C35	CC	184133.659	699762.317	N 62° 51' 34.02" W	21.240m	23.226m	83° 10' 23.79"LT	16.000m
32+60.652		PRC	184149.153	699758.325					
	C36	CC	184170.458	699752.837	N 79° 16' 32.05" W	18.714m	19.330m	50° 20' 27.74"RT	22.000m
32+79.981		PT	184152.636	699739.938					

COORDINATE GEOMETRY - CONTROL POINTS

POINT NUMBER	NORTHING	EASTING	ELEVATION	LOCATION
400	184154.893	700049.508	23.679	US 117 STA 63+60 +/- 41.63m RT 3.5m INSIDE R/W FENCE
904	184333.419	700026.529	22.993	US 117 STA 65+16 +/- 44.90m LT AT R/W FENCE
937	183823.034	699872.946	25.027	US 117 STA 59+87 +/- 1.67m LT IN MEDIAN
944	184012.849	699930.460	25.016	US 117 STA 61+84 +/- 17.36m LT ON SHOULDER BERM GUTTER

REVISIONS

09-OCT-2007 14:09

JEFFREYS WAREHOUSE MITIGATION SITE

COORDINATE GEOMETRY TABLE

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	2E

DESIGN ENGINEER

MORPHOLOGICAL MEASUREMENTS TABLE

JEFFREYS WAREHOUSE MITIGATION SITE; WAYNE COUNTY, NC
-UPPER AND LOWER REACH- Sta. 11+07 to Sta. 18+61 & 30+15 to 32+92

Variables	Existing Channel	Proposed Reach	Reference Reach
1. Stream type	F5	E5	E5
2.Drainage area (sq.mi.)	0.68–0.76	0.68–0.76	0.38
3. Bankfull width (ft)	14.7	12.0	7.1
4. Bankfull mean depth (ft)	0.7	1.0	0.9
5. Width/depth ratio	21.0	12.0	7.9
6. Bankfull cross-sectional area (sf)	11.0	12.0	6.5
7. Bankfull mean velocity (ft/s)	*	1.04	1.27
8. Bankfull discharge (cfs)	12.5	12.5	8.3
9. Bankfull max depth (ft)	1.1	1.1	*
10. Width of floodprone area (ft)	24	59	102
11. Entrenchment ratio	1.6	4.9	14
12. Meander length (ft) (average)	N/A	190	*
13. Ratio of meander length to bankfull width	N/A	15.8	*
14. Radius of curvature (ft)	N/A	30–67	3.55–21.3
15. Ratio of radius of curvature to bankfull width	*	2.5–5.6	0.5–3.0
16. Belt width (ft)	19	59	*
17. Meander width ratio	*	4.9	*
18. Sinuosity (stream length/valley length)	*	1.6	1.6
19. Valley slope (ft/ft)	*	0.0032	*
20. Average slope (ft/ft)	19	0.002	0.0012
21. Pool slope (ft/ft)	*	0.002	*
22. Ratio of pool slope to average slope	*	1.0	*
23. Maximum pool depth (ft)	*	2.2	*
24. Ratio of pool depth to average bankfull depth	*	2.2	*
25. Pool width (ft)	*	12.0	*
26. Ratio of pool width to bankfull width	*	1.0	*
27. Pool to pool spacing (ft) (average)	*	98	*
28. Ratio of pool to pool spacing to bankfull width	*	8.2	*
29. Ratio of lowest bank height to bankfull height (or max bankfull depth)	*	1.0	*

* = NOT MEASURED

NOTE: ENGLISH UNITS WERE USED FOR ALL VARIABLES IN THE MORPHOLOGICAL MEASUREMENTS TABLE.

JEFFREYS WAREHOUSE MITIGATION SITE	MORPHOLOGICAL TABLE

REVISIONS

09-OCT-2007 14:40
s:\hydraulics\project\r-1030aa\r1030aa_plans\details.dgn
pallock "A" PW5521978

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	3
DESIGN ENGINEER	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC METERS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+25%	BORROW	WASTE
UPPER REACH STA 11+06.98 TO STA 18+61.00	15,500				15,500
UPPER REACH – EXISTING CHANNEL			2,000	2,000	
SIDE DITCH 14+80 RT +/-			130	130	
DRAINAGE DITCH 11+00 LT +/-			600	600	
LOWER REACH STA 30+15.00 TO STA 32+91.50	11,900				11,900
LOWER REACH – EXISTING CHANNEL			2,000	2,000	
SIDE DITCH 30+40 RT +/-			60	60	
SUBTOTAL	27,400		4,790	4,790	27,400
EST. 5% LOSS TO CLEARING AND GRUBBING	-1,370				-1,370
ADDITIONAL UNDERCUT		500	630	630	500
WASTE TO REPLACE BORROW				-5,420	-5,420
GRAND TOTAL	26,030	500	5,420	0	21,110
SAY TOTAL	26,000	500			21,000

NOTE: STOCKPILE TOPSOIL FROM EXCAVATION AREAS ON-SITE TO USE AS TOP LAYER OF EMBANKMENT WHEN FILLING EXISTING DITCHES AND CHANNELS

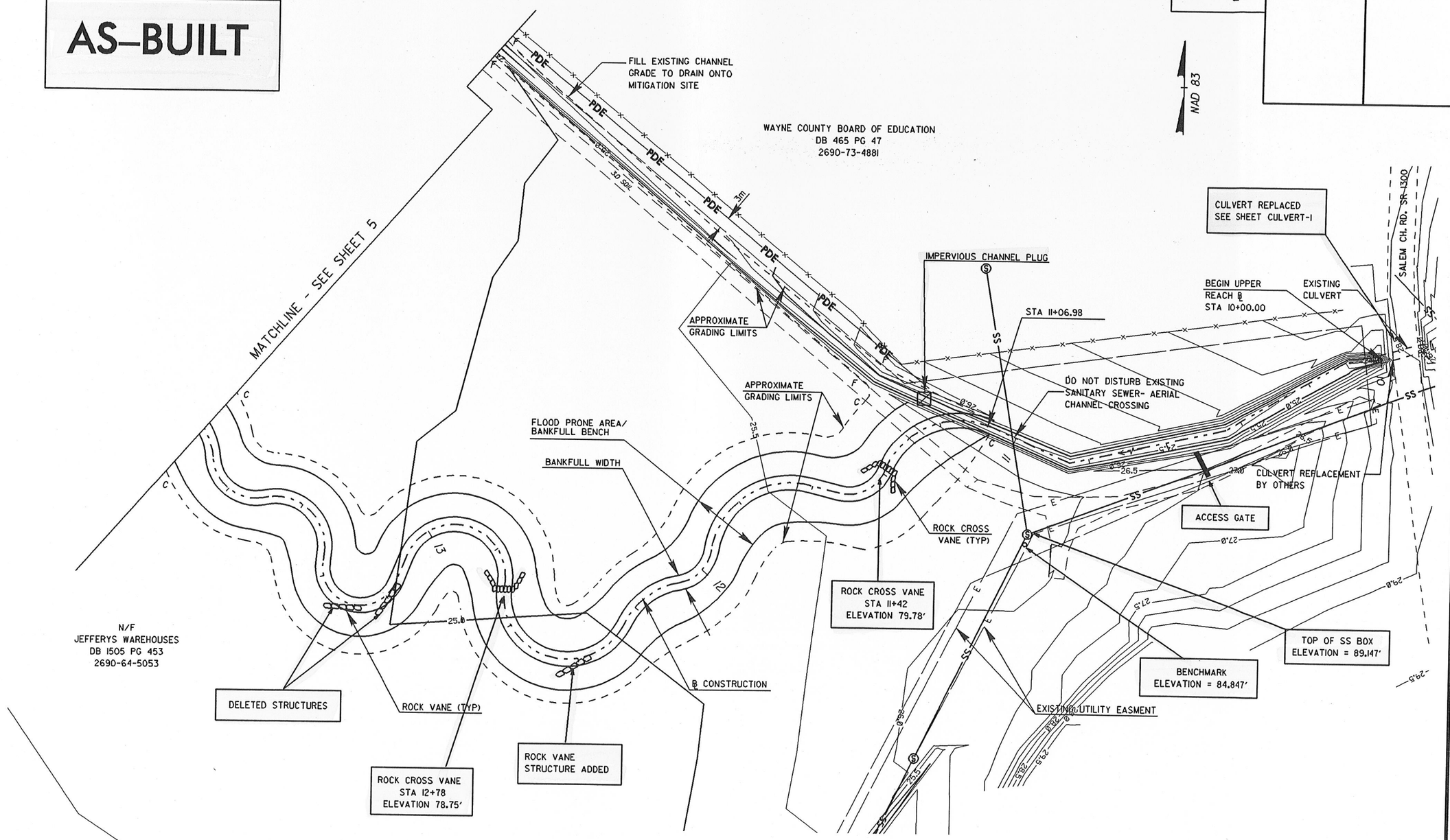
REVISIONS

JEFFREYS WAREHOUSE MITIGATION SITE	SUMMARY OF EARTHWORK

18-OCT-2007 07:05
c:\pwworking\ncdot\d0266\d1026266\plans\ja-ia\sum1002.plan\ja-ia\sum1002 plan\ja-ia\sum1002 plan\ja-ia\sum1002 plan

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	4

AS-BUILT



-UPPER REACH-

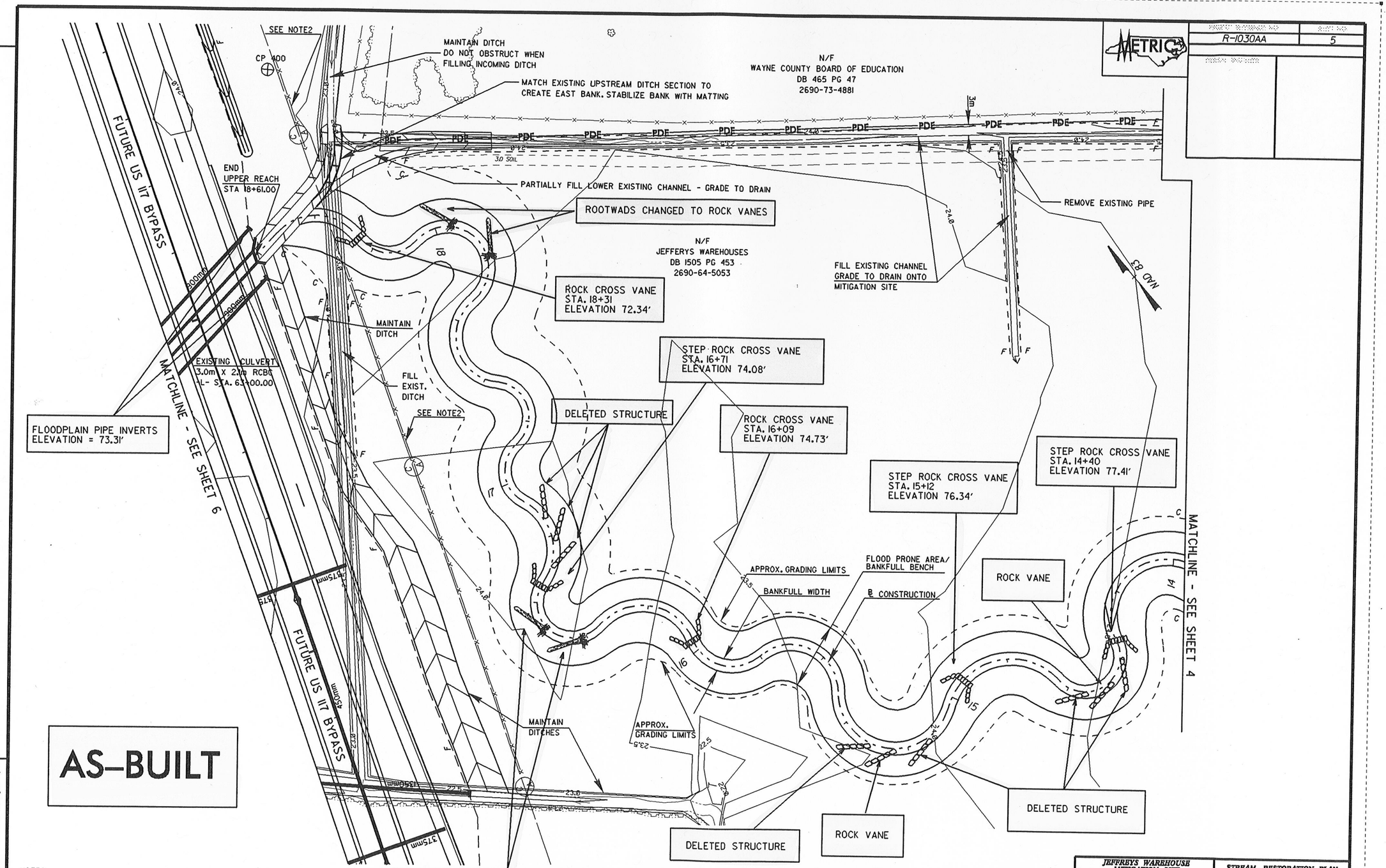
SCALE (METERS): 0 10 20 30 40 50

JEFFREYS WAREHOUSE MITIGATION SITE	STREAM RESTORATION PLAN

REVISIONS

30-OCT-2007 08:33
ALL-DOT-DOT 08:33
Opacity: 0 APPHEA2265713

R-1030AA	5



NOTES:

1. INSTALL ROOTWADS IF DIRECTED BY THE ENGINEER. THE NUMBER OF ROOT WADS CONSTRUCTED WILL BE BASED UPON THE AVAILABILITY OF ON-SITE MATERIAL.
2. COMPLETE THE INSTALLATION OF RIGHT-OF-WAY FENCE ABOVE INLET OF EXISTING 900mm FLOODPLAIN PIPES UNDER US 117.

-UPPER REACH-

SCALE (METERS): 0 10 20 30 40 50

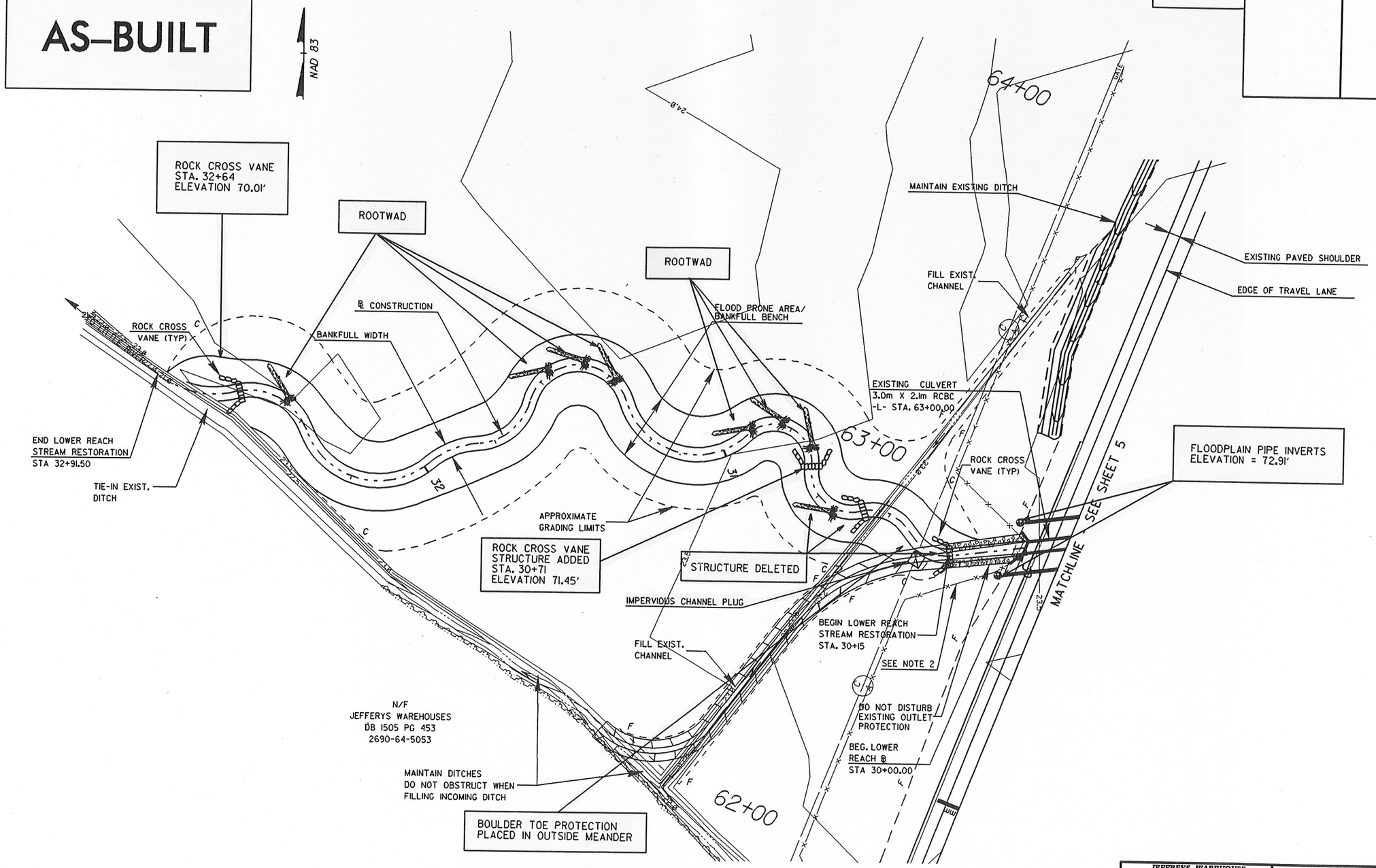
JEFFREYS WAREHOUSE MITIGATION SITE	STREAM RESTORATION PLAN

REVISIONS

8-OCT-2007 08:09
Bpacs2e ATP PROJECT

R-1030AA	6

AS-BUILT



-LOWER REACH-

NOTES:

1. INSTALL ROOTWADS IF DIRECTED BY THE ENGINEER. THE NUMBER OF ROOT WADS CONSTRUCTED WILL BE BASED UPON THE AVAILABILITY OF ON-SITE MATERIAL.
2. RELOCATE EXISTING RIGHT-OF-WAY FENCE ABOVE OUTLETS TO EXISTING 900mm FLOODPLAIN PIPES UNDER US 117.

SCALE (METERS): 0 10 20 30 40 50

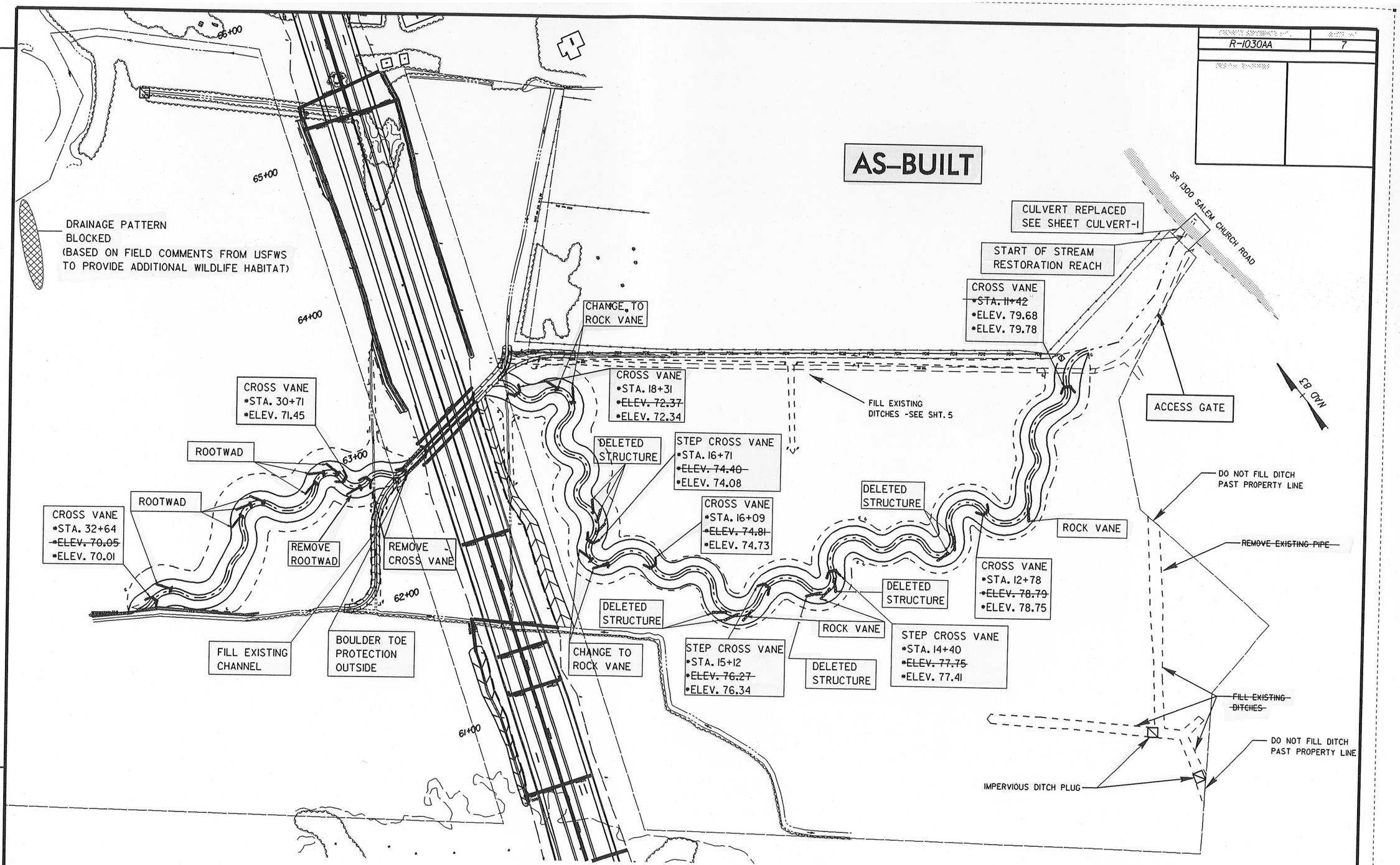
JEFFREYS WAREHOUSE MITIGATION SITE	STREAM RESTORATION PLAN

REVISIONS

15-OCT-2007 09:47

R-1030AA	7

AS-BUILT

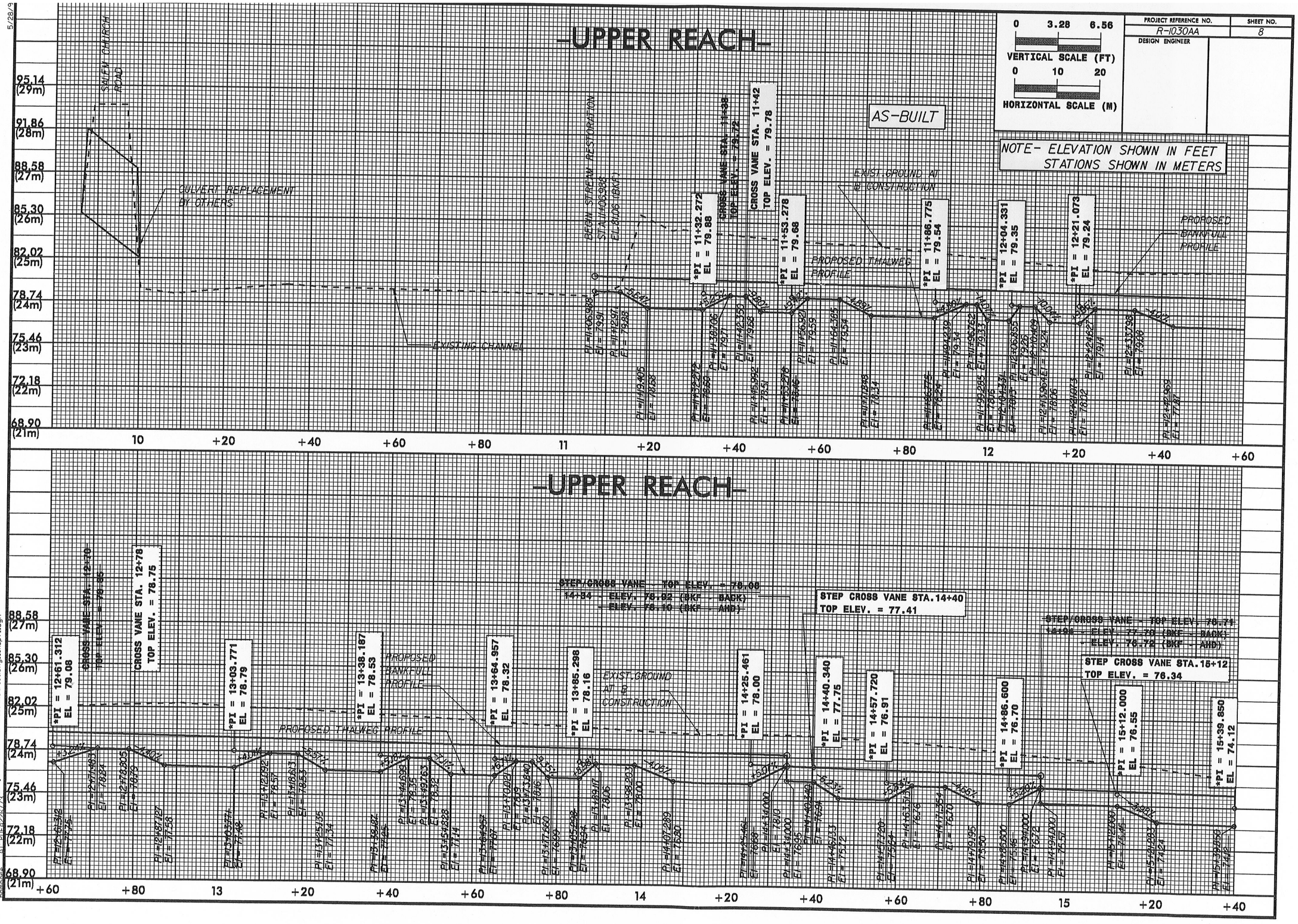


-STREAM & WETLAND CONSTRUCTION-

JEFFREYS WAREHOUSE MITIGATION SITE	WETLAND RESTORATION PLAN

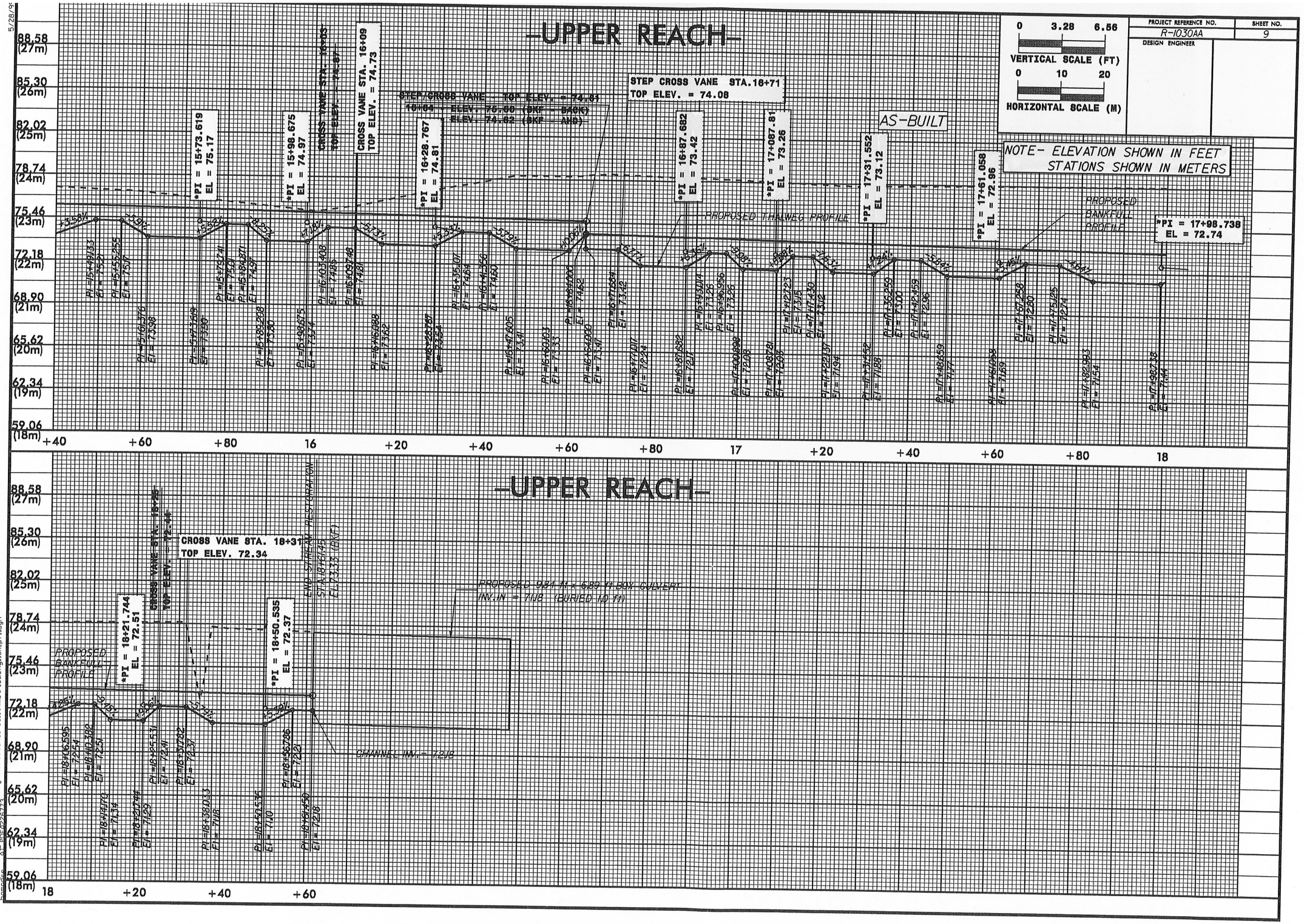
REVISIONS

30-OCT-2007 09:40

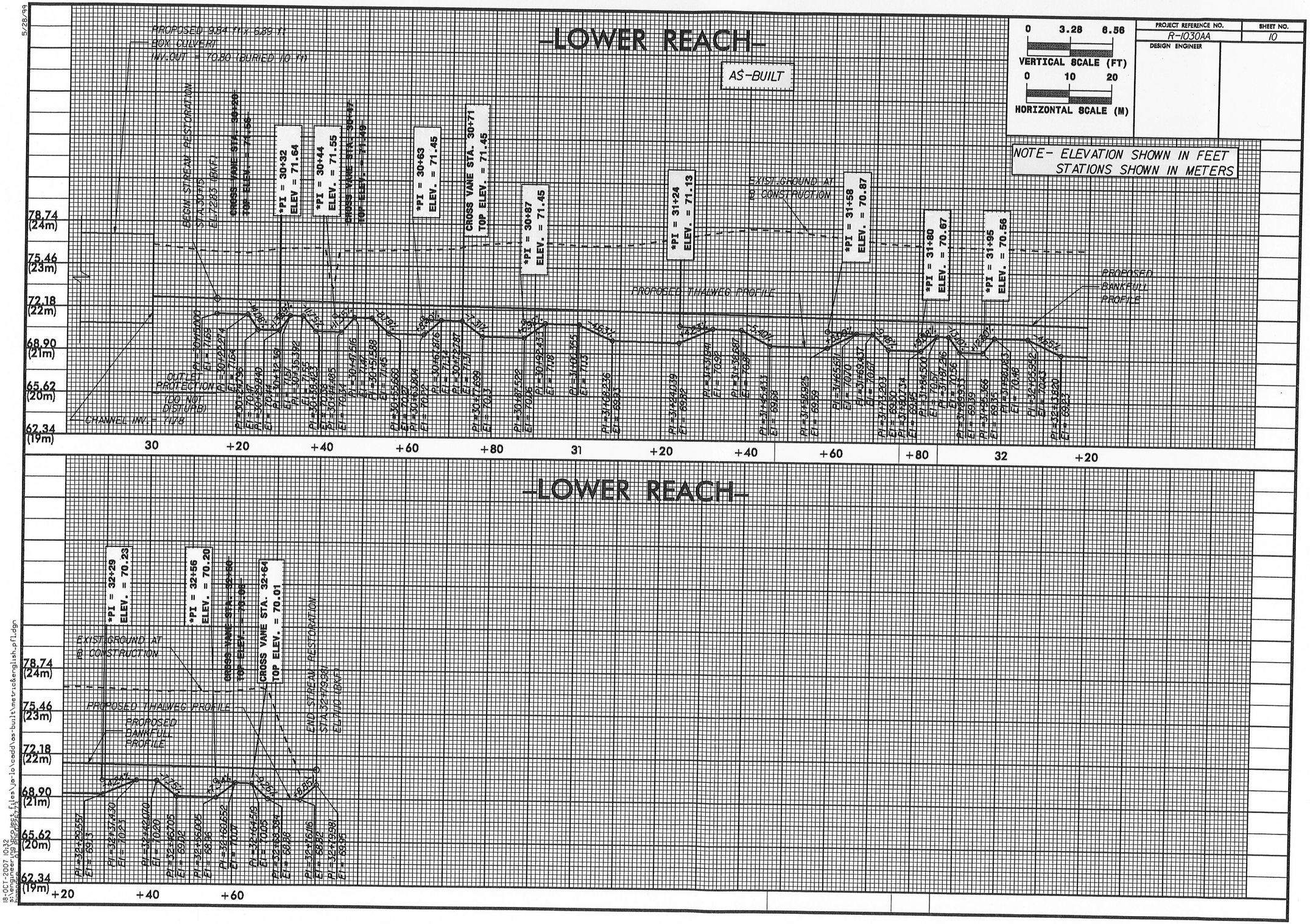


5/28/9

18-OCT-2007 10:22
$$$$ Project files\jo10\cadd\as-built\metric&english.pfl.dgn
Engineer



18-OCT-2007 14:30
z:\engineering\projects\ja-lo\cadd\as-built\metric&english-pfl.dgn



0 3.28 6.56
VERTICAL SCALE (FT)
0 10 20
HORIZONTAL SCALE (M)

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	10
DESIGN ENGINEER	

NOTE- ELEVATION SHOWN IN FEET
STATIONS SHOWN IN METERS

5/28/99

18-OCT-2007 10:32
s:\engineering\projects\ja-io\cadd\as-built\metric&english_pfl.dgn

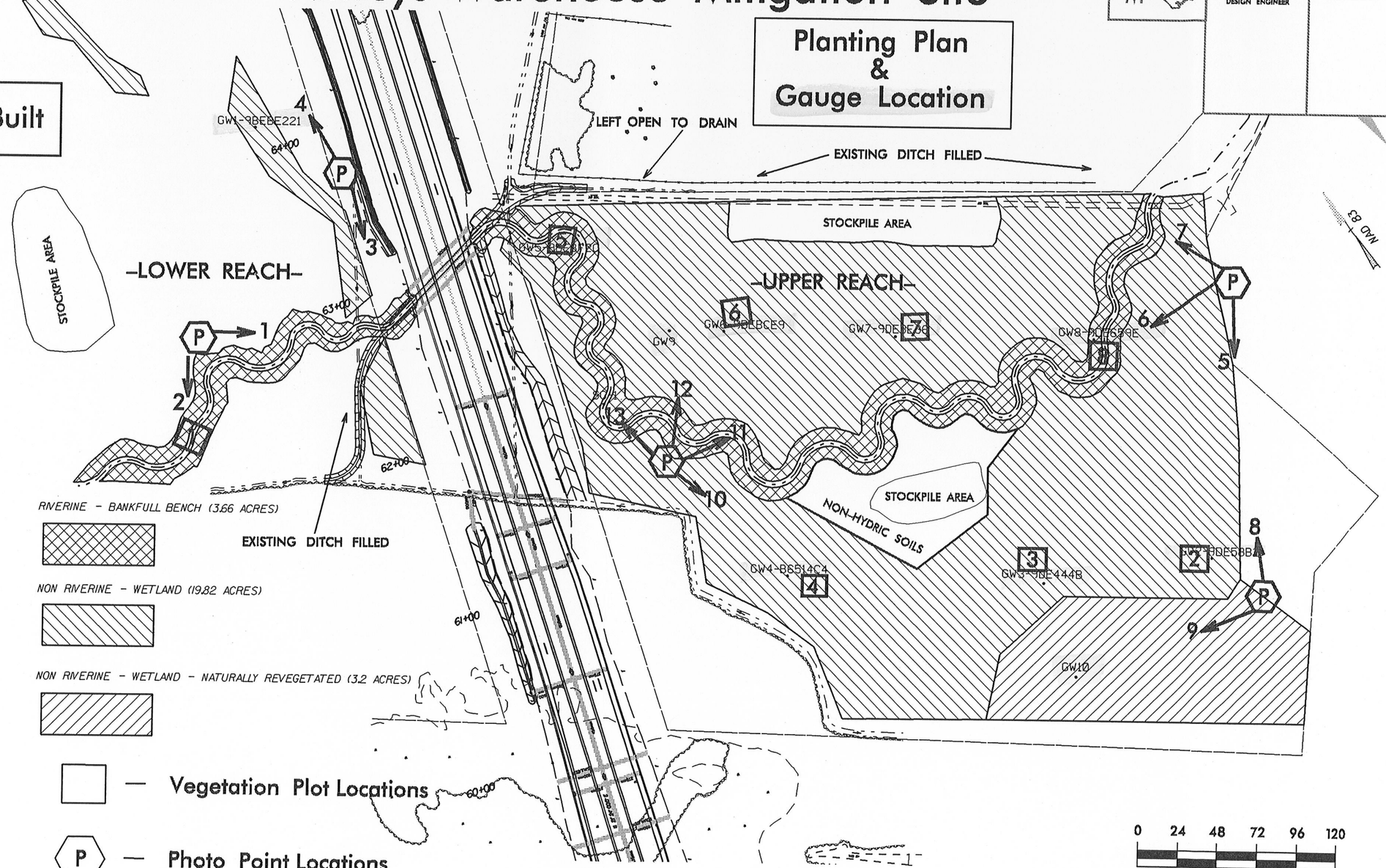
Jeffreys Warehouse Mitigation Site

PROJECT REFERENCE NO.	SHEET NO.
R-1030AA	11

DESIGN ENGINEER

Planting Plan & Gauge Location

As-Built



See RF-1 for species and spacing

See RF-1 and 2-C for planting specifications

JEFFREYS WAREHOUSE MITIGATION SITE	PLANTING PLAN

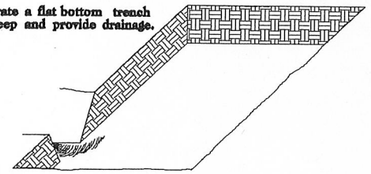
PLANTING DETAILS

SEEDLING / LINER BAREROOT PLANTING DETAIL

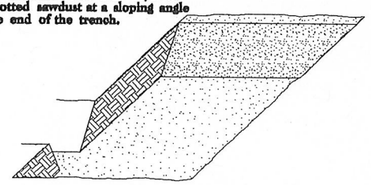
HEALING IN

1. Locate a healing-in site in a shady, well protected area.

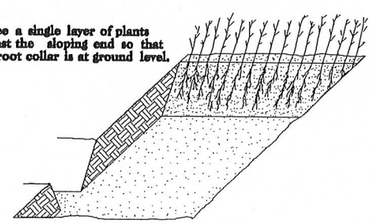
2. Excavate a flat bottom trench 12" deep and provide drainage.



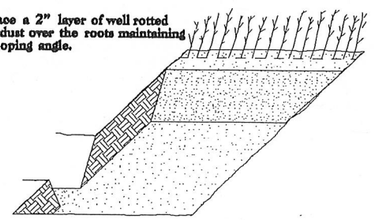
3. Backfill the trench with 2" well rotted sawdust. Place a 2" layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

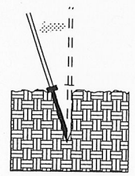


5. Place a 2" layer of well rotted sawdust over the roots maintaining a sloping angle.

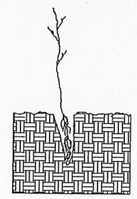


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

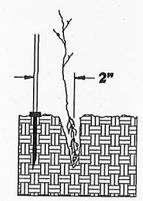
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



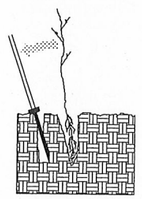
1. Insert planting bar as shown and pull handle toward planter.



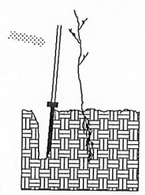
2. Remove planting bar and place seedling at correct depth.



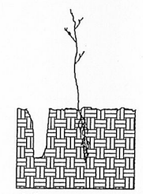
3. Insert planting bar 2" toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12" long, 4" wide and 1" thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches (10") below the root collar.

JEFFREYS WAREHOUSE MITIGATION SITE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1030AA	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

WETLAND TREE REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

RIVERINE BANKFULL BENCH

QUERCUS LAURIFOLIA	LAUREL OAK	BAREROOT SEEDLING
QUERCUS LYRATA	OVERCUP OAK	BAREROOT SEEDLING
QUERCUS PHELLOS	WILLOW OAK	BAREROOT SEEDLING
QUERCUS NIGRA	WATER OAK	BAREROOT SEEDLING
QUERCUS MICHAUXII	SWAMP CHESTNUT OAK	BAREROOT SEEDLING
BETULA NIGRA	RIVER BIRCH	BAREROOT SEEDLING

NON RIVERINE WETLAND

QUERCUS LAURIFOLIA	LAUREL OAK	BAREROOT SEEDLING
QUERCUS PHELLOS	WILLOW OAK	BAREROOT SEEDLING
QUERCUS MICHAUXII	SWAMP CHESTNUT OAK	BAREROOT SEEDLING
QUERCUS FALCATA VAR. PAGODAEFOLIA	CHERRYBARK OAK	BAREROOT SEEDLING
NYSSA AQUATICA	WATER TUPELO	BAREROOT SEEDLING

TREE REFORESTATION SHALL BE PLANTED 6' TO 10' ON CENTER, RANDOM SPACING, AVERAGING 8' ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

LIVE STAKING (See 2-C for specifications)

RIVERINE BANKFUL BENCH

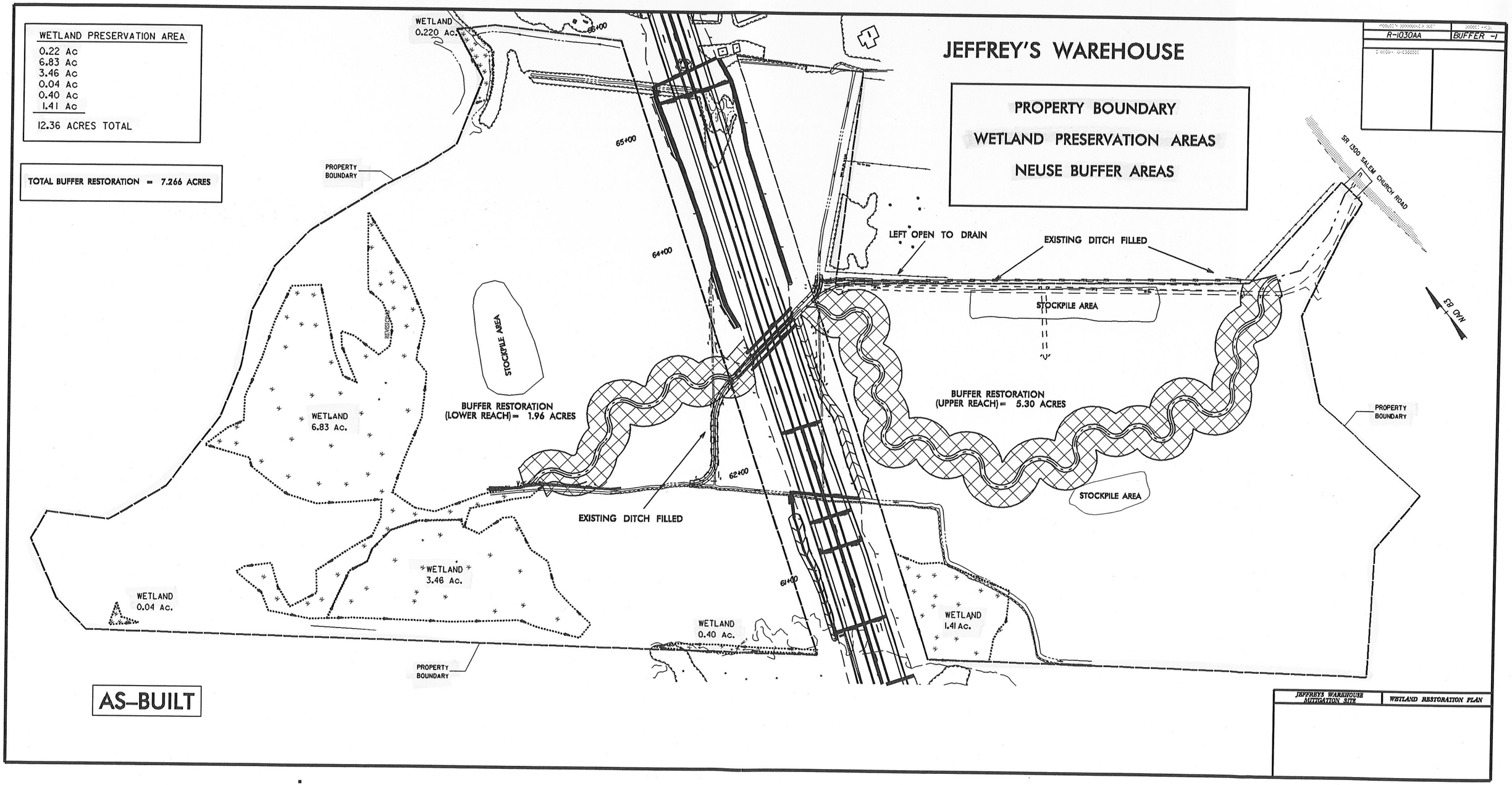
SALIX NIGRA	BLACK WILLOW	LIVE STAKE
CORNUS AMOMUM	SILKY DOGWOOD	LIVE STAKE

LIVE STAKES SHALL BE PLANTED 2' TO 6' ON CENTER, RANDOM SPACING, AVERAGING 4' ON CENTER

SEE PLAN SHEETS FOR AREAS TO BE PLANTED

WETLAND REFORESTATION DETAIL SHEET

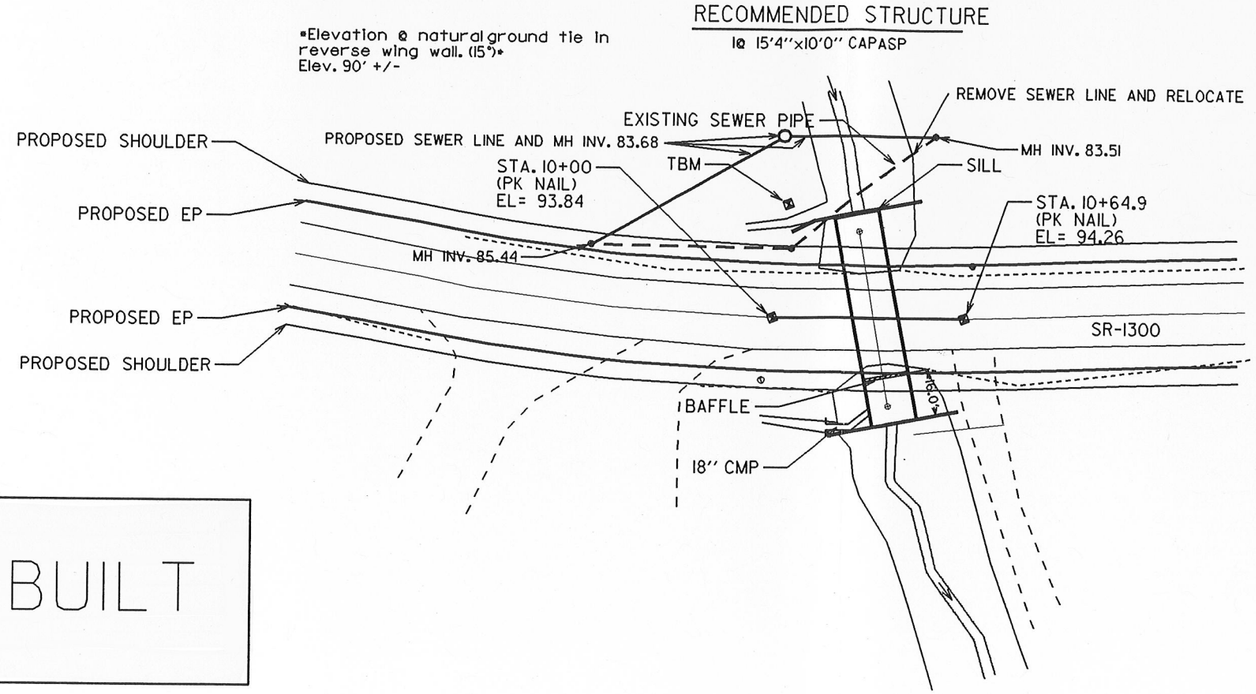
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT


WETLAND PRESERVATION AREA
0.22 Ac
6.83 Ac
3.46 Ac
0.04 Ac
0.40 Ac
1.41 Ac
12.36 ACRES TOTAL
TOTAL BUFFER RESTORATION = 7.266 ACRES
JEFFREY'S WAREHOUSE
PROPERTY BOUNDARY
WETLAND PRESERVATION AREAS
NEUSE BUFFER AREAS
R-1030AA
BUFFER -1
WETLAND 0.220 Ac.
66+00
65+00
64+00
62+00
61+00
PROPERTY BOUNDARY
SR 1300 SALEM CHURCH ROAD
LEFT OPEN TO DRAIN
EXISTING DITCH FILLED
STOCKPILE AREA
NAD 83
WETLAND 6.83 Ac.
BUFFER RESTORATION (LOWER REACH) = 1.96 ACRES
BUFFER RESTORATION (UPPER REACH) = 5.30 ACRES
EXISTING DITCH FILLED
STOCKPILE AREA
WETLAND 3.46 Ac.
WETLAND 0.04 Ac.
WETLAND 0.40 Ac.
WETLAND 1.41 Ac.
PROPERTY BOUNDARY
AS-BUILT
JEFFREYS WAREHOUSE MITIGATION SITE
WETLAND RESTORATION PLAN

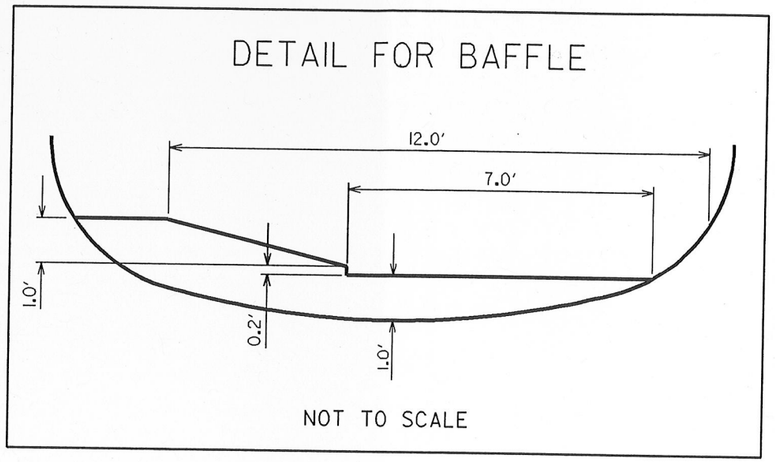
CULVERT-1

RECOMMENDED STRUCTURE

1@ 15'4"x10'0" CAPASP



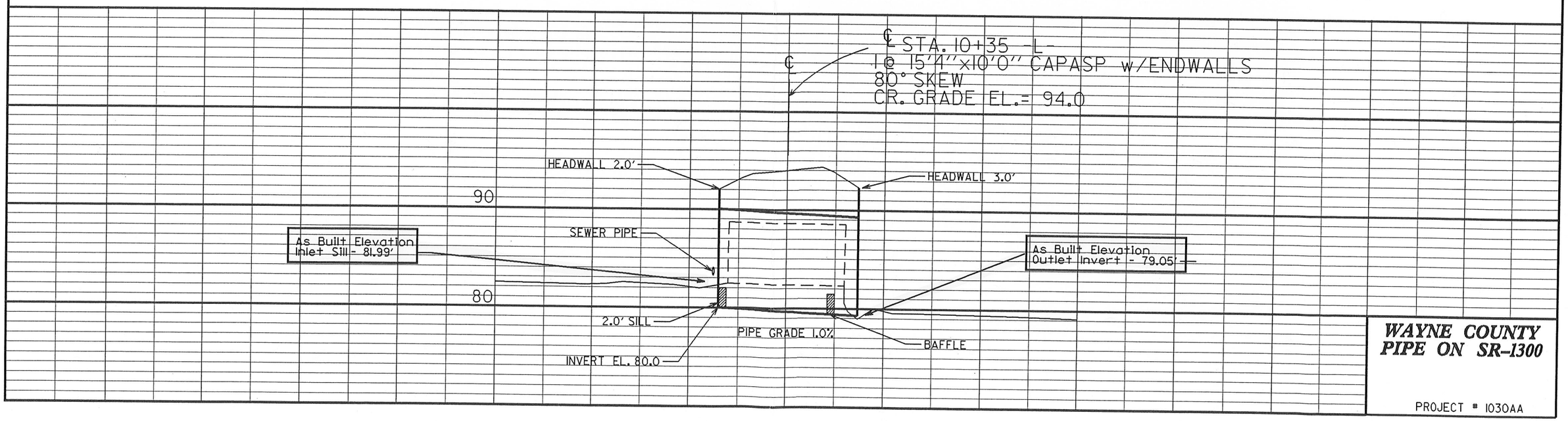
DETAIL FOR BAFFLE



AS-BUILT

TBM: RR SPIKE IN BASE OF POWER POLE.
STA. 10+05, 38' LT.EL.= 89.87'

NOTE: THIS SITE IS NOT LOCATED IN A FLOOD HAZARD ZONE.
D.A.= 450 ac.
(GOLDSBORO EAST, NC QUAD)
Q_{10}= 240 cfs
Q_{25}= 400 cfs
Q_{100}= 700 cfs
} USGS - BDF 6



WAYNE COUNTY
PIPE ON SR-1300

PROJECT # 1030AA