JEF - SR 7-10.00
150029 PID - 93192
Dist 11 1/29/2015

Contract Proposal Available
@ www.contracts.dot.
state.oh.us/home

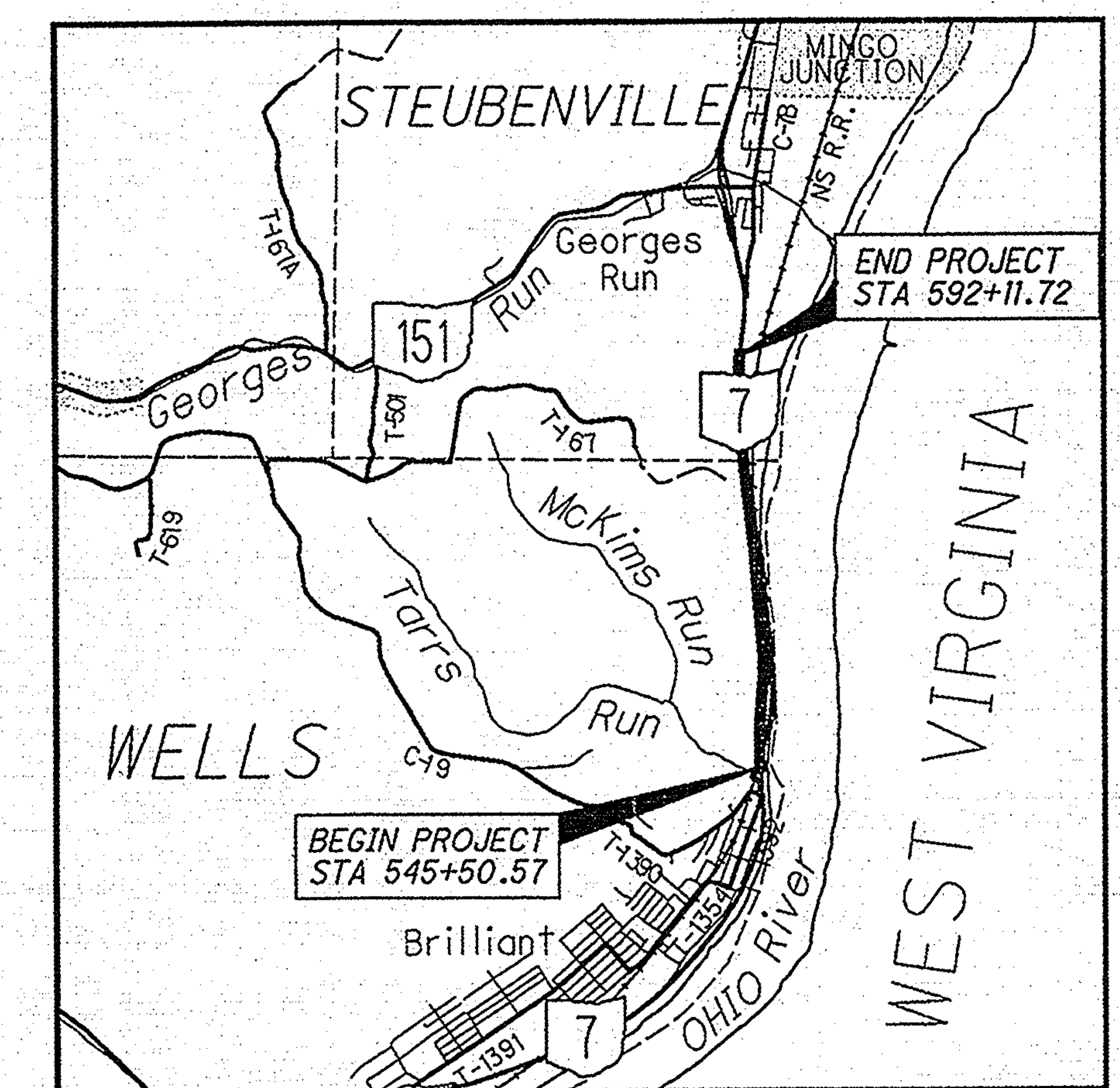
sshadix 1/29/2014 1:51:47 PM V:\1736\active\173620035\design\roadway\sheets\93192GT001.dgn

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

JEF-7-10.00

STEUBENVILLE TOWNSHIP
WELLS TOWNSHIP

JEFFERSON COUNTY



LOCATION MAP

LATITUDE: 40°16'30" N LONGITUDE: 80°39'05" W

SCALE IN MILES 0 1 2

PORTION TO BE IMPROVED
INTERSTATE HIGHWAY
FEDERAL ROUTES
STATE ROUTES
COUNTY & TOWNSHIP ROADS
OTHER ROADS

DESIGN DESIGNATION

CURRENT ADT (2014) ______ 13,400
DESIGN YEAR ADT (2034) ______ 16,000
DESIGN HOURLY VOLUME (2034) ______ 1,440
DIRECTIONAL DISTRIBUTION ______ 60%
TRUCKS (24 HOUR B&C) ______ 16%
DESIGN SPEED ______ 55 MPH
LEGAL SPEED ______ 55 MPH
DESIGN FUNCTIONAL CLASSIFICATION:
RURAL PRINCIPAL ARTERIAL
NHS PROJECT ______ YES

DESIGN EXCEPTIONS ______ NONE

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
BEFORE YOU DIG
CALL
1-800-362-2764
(TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY
OIL & GAS PRODUCERS UNDERGROUND
PROTECTION SERVICE CALL: 1-800-925-0988

PLAN PREPARED BY:

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, OH 45241-2012
(513) 842-8200
Stantec

INDEX OF SHEETS:

ENGINEERS SEAL:

STATE OF OHIO
STEVEN N SHADIX
E-63359
REGISTERED
PROFESSIONAL ENGINEER

SIGNED: [signature]
DATE: JANUARY 29, 2014

STANDARD CONSTRUCTION DRAWINGS									SUPPLEMENTAL SPECIFICATIONS		SPECIAL PROVISIONS
BP-3.1	7/18/14	CB-3.2	1/18/13	MT-95.40	7/18/14	TC-61.30	7/18/14		800	10/17/14	
BP-5.1	7/19/13			MT-99.20	7/19/13	TC-65.10	1/17/14		821	4/20/12	
BP-9.1	7/19/13	HW-1.1	1/18/13	MT-99.30	7/19/13	TC-65.11	7/18/14		832	1/17/14	
				MT-100.00	7/19/13	TC-72.20	7/18/14		836	1/18/13	
F-2.1	7/19/13	I-2.3	1/17/14	MT-101.60	7/19/13						
F-3.4	7/19/13			MT-101.70	1/17/14						
		MH-1.1	1/18/13	MT-105.10	7/19/13						
MGS-1.1	7/19/13	MH-1.2	1/18/13								
MGS-2.1	7/19/13										
MGS-3.1	7/18/14	DM-1.1	1/18/13	TC-41.10	7/19/13						
MGS-5.3	7/19/13	DM-1.2	1/18/13	TC-42.10	10/18/13						
		DM-1.4	1/18/13	TC-42.20	10/18/13						
RM-1.1	7/18/14	DM-4.2	7/20/12	TC-51.11	1/17/14						
RM-4.2	4/18/14	DM-4.3	7/19/13	TC-52.10	10/18/13						
RM-4.3	7/18/14	DM-4.4	7/20/12	TC-52.20	7/18/14						
RM-4.6	7/19/13										

PROJECT DESCRIPTION

EMERGENCY PROJECT TO REPAIR 0.88 MILES OF FAILED ROCK FACE ON THE WEST SIDE OF STATE ROUTE 7. REMEDIATION INCLUDES REMOVAL OF ROCK, BENCHING OF SLOPES, DRAINAGE IMPROVEMENTS, INSTALLATION OF CONCRETE BARRIER AND PAVEMENT REHABILITATION ALONG S.R.7. PROJECT ALSO INCLUDES REMOVAL OF MOT FACILITIES CURRENTLY IN PLACE. FHWA DISASTER OH12-01 DSR JEF-001.

PROJECT EARTH DISTURBED AREA: 52.21 ACRES
ESTIMATED CONTRACTOR EARTH DISTURBED AREA: 184.00 ACRES
NOTICE OF INTENT EARTH DISTURBED AREA: 236.21 ACRES

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2013 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

UNDER AUTHORITY OF SECTION 4511.21, DIVISION (H) OF THE OHIO REVISED CODE, THE REVISED PRIMA FACIE SPEED LIMITS AS INDICATED HEREIN ARE DETERMINED TO BE REASONABLE AND SAFE, AND ARE HEREBY ESTABLISHED FOR THE DURATION OF THIS PROJECT. THE PRIMA FACIE SPEED LIMIT OF LIMITS HEREBY ESTABLISHED SHALL BECOME EFFECTIVE WHEN APPROPRIATE SIGNS GIVING NOTICE THEREOF ARE ERECTED.

APPROVED Lloyd V. MacAdam, P.E., P.S.
DATE 10/22/14 DISTRICT DEPUTY DIRECTOR

APPROVED Jerry Wray
DATE 11-7-14 DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO. E120(445)
PID NO. 93192
CONSTRUCTION PROJECT NO.
RAILROAD INVOLVEMENT NONE
JEF-7-10.00

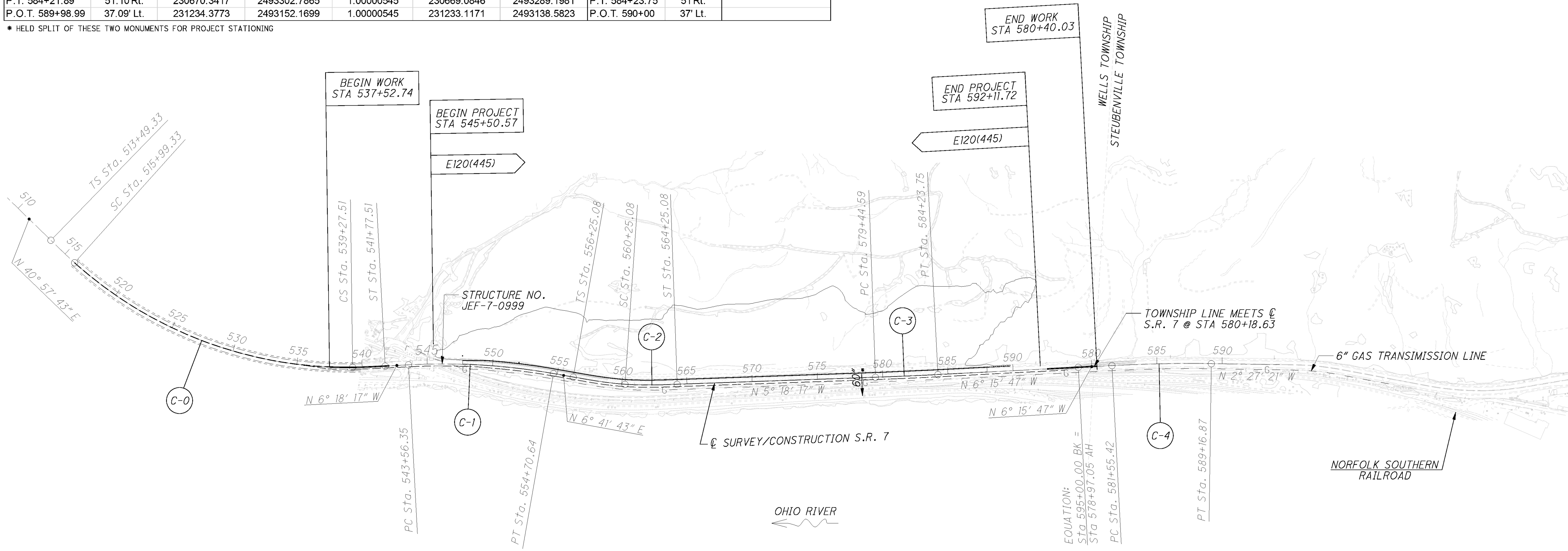
RECOVERED CENTERLINE MONUMENTS COORDINATES AND LOCATION							Plan	Location	⊗ CENTERLINE REF. MON. EXPECTED TO BE DISTURBED & RESET
JEF-7-10.00 PID# 93192							JEF-7-8.56 Plans		
Station	Offset	Grid North	Grid East	ODOT P.A.F.	Project North	Project East	Station	Offset	
P.O.C. 529+99.47	53.96' Lt.	225277.7640	2493327.8348	1.00000545	225276.5362	2493314.2462	P.O.C. 530+00	54' Lt.	
P.O.C. 529+99.44	42.41' Rt.	225256.0521	2493421.7305	1.00000545	225254.8245	2493408.1414	P.O.C. 530+00	42' Rt.	
P.O.C. 534+99.29	42.43' Lt.	225762.3723	2493411.1789	1.00000545	225761.1419	2493397.5899	P.O.C. 535+00	42' Lt.	
C.S. 539+27.28 *	38.09' Lt.	226184.5227	2493414.8737	1.00000545	226183.2900	2493401.2847	C.S. 539+27.51	38' Lt.	
C.S. 539+27.73 *	38.10' Rt.	226190.3054	2493490.8468	1.00000545	226189.0727	2493477.2573	C.S. 539+27.51	38' Rt.	
S.T. 541+77.40	38.28' Lt.	226431.9226	2493390.6869	1.00000545	226430.6886	2493377.0980	S.T. 541+77.51	38' Lt.	
P.O.C. 550+03.67	39.75' Lt.	227261.0837	2493340.8205	1.00000545	227259.8451	2493327.2319	P.O.C. 550+00	39' Lt.	1
P.O.C. 549+97.07	38.07' Rt.	227252.8386	2493418.4695	1.00000545	227251.6001	2493404.8804	P.O.C. 550+00	38' Rt.	
P.T. 554+65.14	37.36' Lt.	227724.7448	2493375.1241	1.00000545	227723.5037	2493361.5353	P.T. 554+70.64	37' Lt.	1
P.T. 584+21.89	51.10'Rt.	230670.3417	2493302.7865	1.00000545	230669.0846	2493289.1981	P.T. 584+23.75	51'Rt.	
P.O.T. 589+98.99	37.09' Lt.	231234.3773	2493152.1699	1.00000545	231233.1171	2493138.5823	P.O.T. 590+00	37' Lt.	

* HELD SPLIT OF THESE TWO MONUMENTS FOR PROJECT STATIONING

⊗ **MONUMENT NOTE:**

REFERENCE STANDARD DRAWING RM 1.1, MONUMENT TYPE A, CAP DESIGN 6. CENTERLINE REFERENCE MONUMENTS WILL BE RESET AFTER CONSTRUCTION IS COMPLETE BY ODOT AS SHOWN ON STANDARD CONSTRUCTION DRAWING RM 1.1 MONUMENT TYPE A, CAP DESIGN 6.

THERE ARE NO EXISTING LANDSCAPED AREAS WITHIN THE WORK LIMITS



CURVE NO. C-0
P.I. Sta. 528+42.23
Δ = 47° 16' 00" (LT)
Dc = 1° 50' 00"
R = 3,125.22'
Ls = 250.00'
θs = 2° 17' 30"
LT = 166.68'
ST = 83.35'
x = 249.96'
y = 3.33'
k = 124.99'
p = 0.83'
Δc = 42° 41' 00" (LT)
Lc = 2,328.18'
Ts = 1,492.90'
Es = 287.02'
C = 2,274.72'
C1 = C2 = 249.98'
C.B.1 = N 40° 11' 53" E
C.B. = N 17° 19' 43" E
C.B.2 = S 5° 32' 27" E

CURVE NO. C-1
P.I. Sta. 549+15.90
Δ = 13° 00' 00" (RT)
Dc = 1° 10' 00"
R = 4,911.07'
T = 559.55'
L = 1,114.29'
E = 31.77'
C = 1,111.90'
C.B. = N 0° 11' 43" E

CURVE NO. C-2
P.I. Sta. 560+26.11
Δ = 12° 00' 00" (LT)
Dc = 3° 00' 00"
R = 1,909.86'
Ls = 400.00'
θs = 6° 00' 00"
LT = 266.82'
ST = 133.47'
x = 399.56'
y = 13.95'
k = 199.93'
p = 3.49'
Δc = 0° 00' 00" (LT)
Lc = 0.00'
Ts = 401.03'
Es = 14.03'
C = 0.00'
C1 = C2 = 399.81'
C.B.1 = N 4° 41' 44" E
C.B. = N 0° 29' 02" E
C.B.2 = S 3° 18' 18" E

CURVE NO. C-3
P.I. Sta. 581+84.18
Δ = 0° 57' 30" (LT)
Dc = 0° 12' 00"
R = 28,647.89'
T = 239.59'
L = 479.16'
E = 1.00'
C = 479.16'
C.B. = N 5° 47' 02" W

CURVE NO. C-4
P.I. Sta. 585+36.29
Δ = 3° 48' 26" (RT)
Dc = 0° 30' 00"
R = 11,459.16'
T = 380.87'
L = 761.44'
E = 6.33'
C = 761.30'
C.B. = N 4° 21' 34" W

EX. CENTERLINE OF R/W AND CONSTRUCTION					
JEF-7-10.00 PID#93192					
STATION	Grid North	Grid East	ODOT P.A.F.	Project North	Project East
S.T. 541+77.51	226436.2323	2493428.7220	1.00000545	226434.9982	2493415.1329
P.C. 543+56.35	226613.9955	2493409.0821	1.00000545	226612.7605	2493395.4931
P.T. 554+70.64	227725.8922	2493412.8724	1.00000545	227724.6511	2493399.2834
T.S. 556+25.08	227879.2818	2493430.8789	1.00000545	227878.0399	2493417.2898
S.C. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
P.C. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
P.T. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
C.S. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
S.T. 564+25.08	228676.8896	2493440.5588	1.00000545	228675.6433	2493426.9696
P.C. 579+44.59	230189.8981	2493300.0765	1.00000545	230188.6436	2493286.4881
P.T. 584+23.75	230666.6225	2493251.7883	1.00000545	230665.3654	2493238.2002
STA. EQ. 578+97.05 AH	231736.4500	2493134.3773	1.00000545	231735.1870	2493120.7898
STA. EQ. 595+00.00 BK	231736.4500	2493134.3773	1.00000545	231735.1870	2493120.7898
P.C. 581+55.42	231993.2839	2493106.1904	1.00000545	231992.0195	2493092.6030

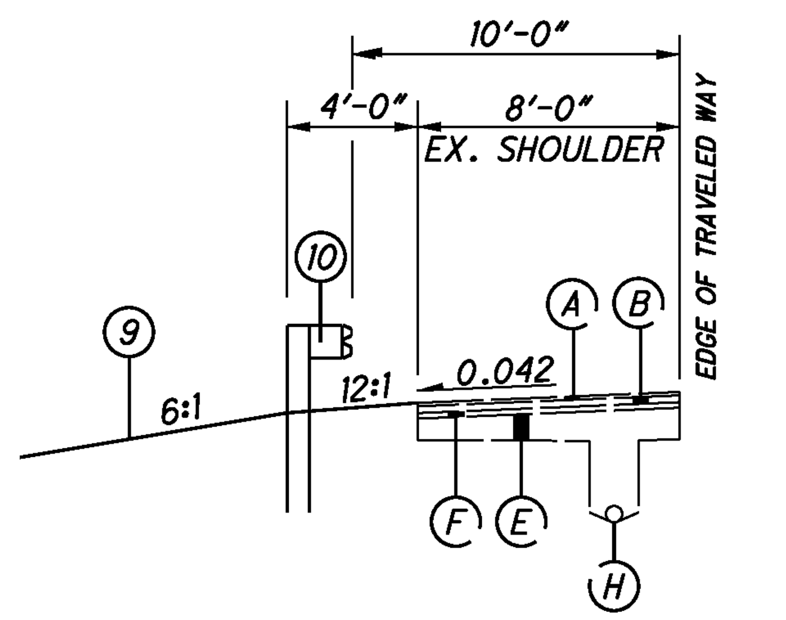
N

0 200 400 800
HORIZONTAL SCALE IN FEET

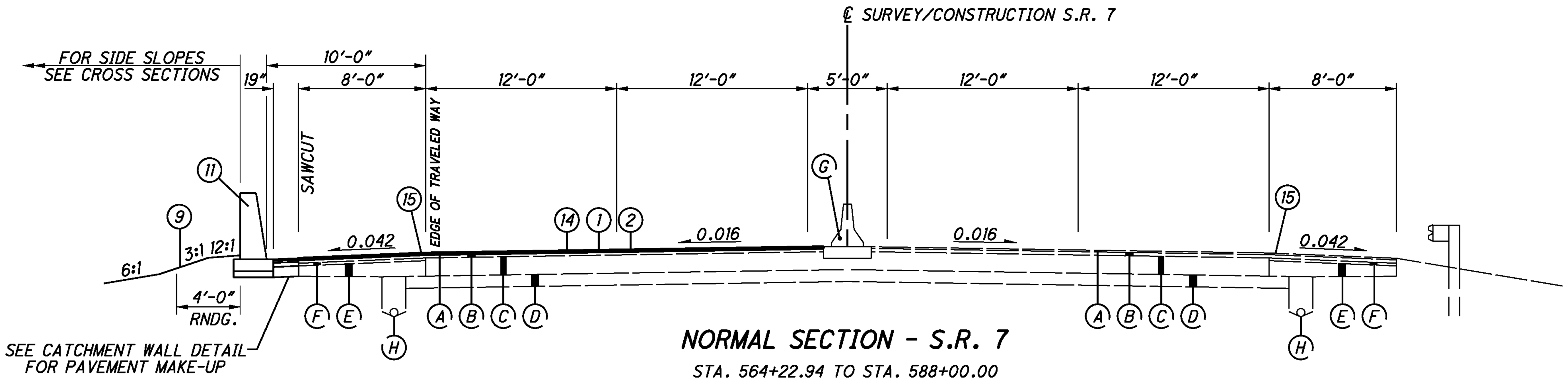
CALCULATED EDA
CHECKED SNS

SCHEMATIC PLAN

JEF-7-10.00

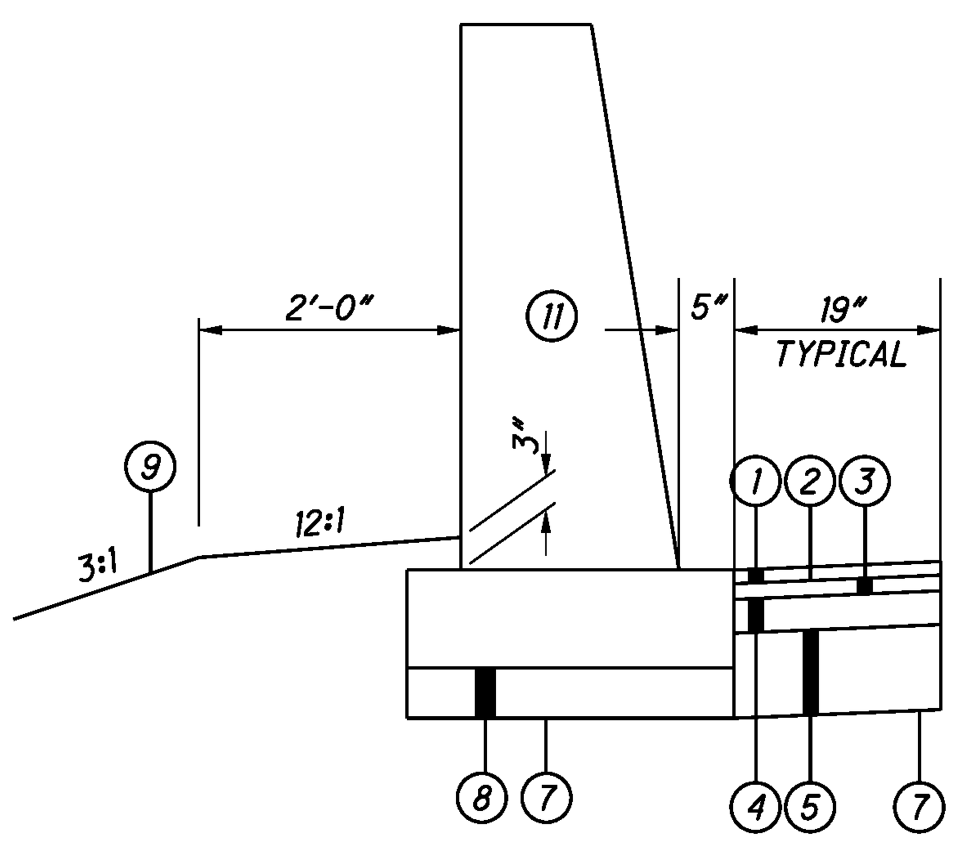


STA. 588+00.00 TO STA 589+74.40



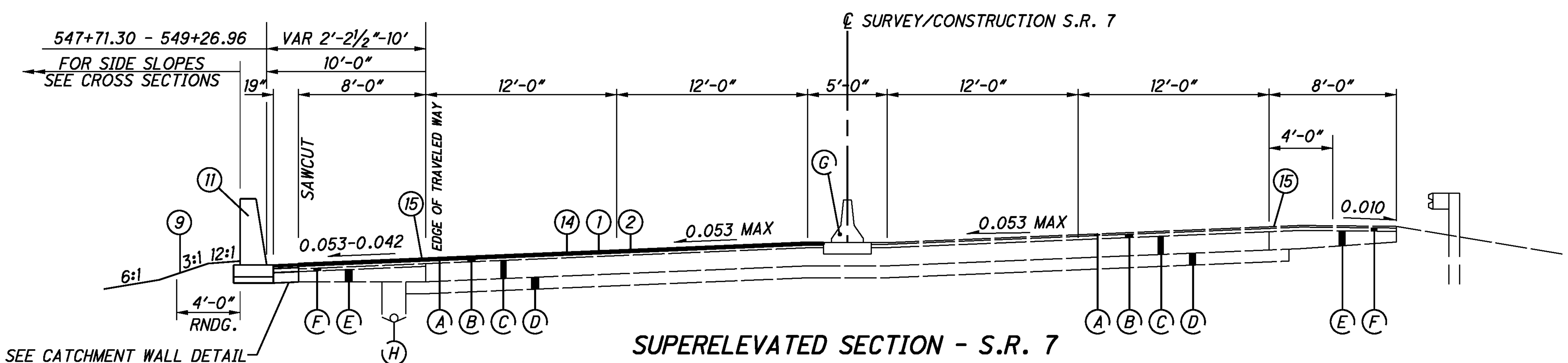
NORMAL SECTION - S.R. 7

STA. 564+22.94 TO STA. 588+00.00



CATCHMENT WALL DETAIL

STA. 547+71.30 TO STA 588+00.00



SUPERELEVATED SECTION - S.R. 7

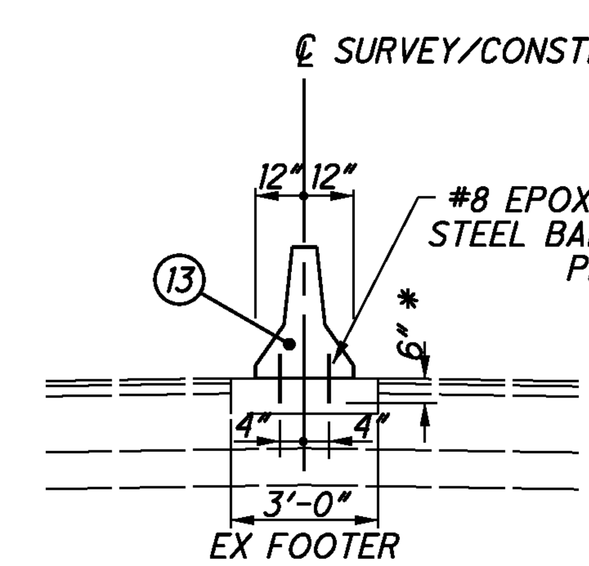
STA. 547+71.30 TO STA. 555+51.99 (Opposite Hand)
STA. 555+51.99 TO STA. 564+22.94

PROPOSED LEGEND

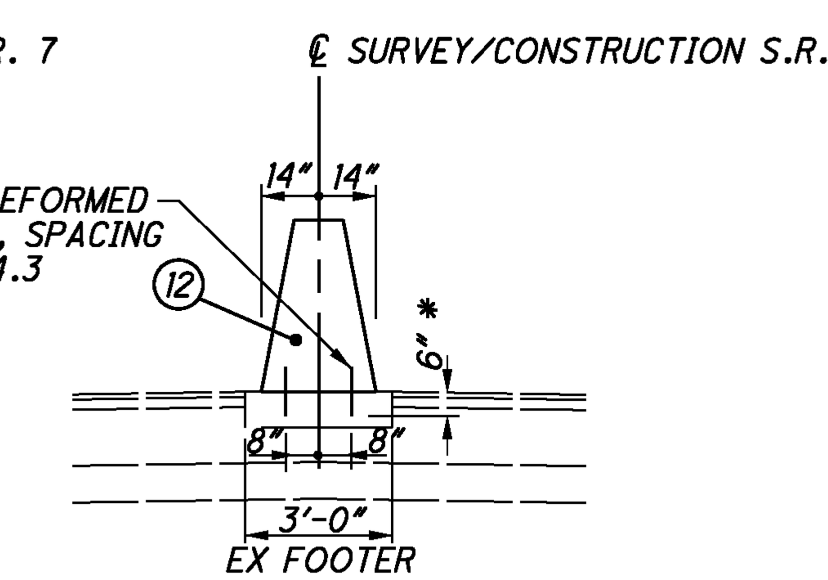
1. ITEM 441, 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (446), AS PER PLAN (PG70-22M)
2. ITEM 407, TACK COAT (APPLIED AT 0.075 GAL/SQ YD)
3. ITEM 441, 1¾" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (446)
4. ITEM 302, 3" ASPHALT CONCRETE BASE, PG64-22
5. ITEM 304, 8" AGGREGATE BASE
6. NOT USED
7. ITEM 204, SUBGRADE COMPACTION
8. ITEM 304, 5" AGGREGATE BASE
9. ITEM 659, SEEDING AND MULCHING
10. ITEM 606, GUARDRAIL, TYPE MGS
11. ITEM 622, CONCRETE BARRIER, TYPE D, AS PER PLAN (50")
12. ITEM 622, CONCRETE BARRIER, TYPE B (42")
13. ITEM 622, CONCRETE BARRIER, AS PER PLAN (32")
14. ITEM 254, PAVEMENT PLANING, ASPHALT CONCRETE (1¼")
15. ITEM 618 RUMBLE STRIPS, ASPHALT CONCRETE

EXISTING LEGEND

- A: 1¼" ASPHALT CONCRETE SURFACE COURSE
- B: 2½" ASPHALT CONCRETE INTERMEDIATE COURSE
- C: 12½" ASPHALT CONCRETE BASE
- D: 11" SUBBASE
- E: SUBBASE (VARIABLE DEPTH 8"-12")
- F: 2" ASPHALT CONCRETE
- G: CONCRETE BARRIER
- H: UNDERDRAIN



#8 EPOXY COATED DEFORMED STEEL BARS 12" LONG, SPACING PER SCD RM 4.3



* 1½" DIA. x 6" DEEP DRILLED HOLE GROUTED IN PLACE

MEDIAN BARRIER REPLACEMENT

STA. 537+52.74 TO STA 542+04.83

MEDIAN BARRIER REPLACEMENT

STA. 592+64.61 TO STA 595+00.00 BACK
STA. 578+97.05 AHEAD TO STA 580+40.03

CALCULATED PJD
CHECKED LEH

TYPICAL SECTION

JEF-7-10.00

ROUNDING

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLIES TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN.

UTILITIES

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

AMERICAN ELECTRIC POWER (AEP OHIO)
TRANSMISSION LINE ENGINEERING
ATTN: BRENT GATES
850 TECH CENTER DRIVE
GAHANNA, OHIO 43230-6642
PHONE: (614) 883-6802

COLUMBIA GAS TRANSMISSION
ATTN: SHANE CURTIS
4115 CORK-BOCKTOWN RD
CLINTON, PA 15026
PHONE: (724) 223-3943

COLUMBIA GAS OF OHIO
ATTN: TIMOTHY SEECH
300 LURAY DRIVE
WINTERSVILLE, OH 43953
PHONE: (740) 266-4282

FRONTIER COMMUNICATIONS
ATTN: ASHLEY MORAN
9444 CAMPBELL STREET
CAMBRIDGE, OH 43725
PHONE: (740) 432-5000

SURVEYING PARAMETERS

USE THE FOLLOWING VERTICAL POSITIONING AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID: 12A

HORIZONTAL POSITIONING

REFERENCE FRAME:	NAD83 (2011)
ELLIPSOID:	GRS80
MAP PROJECTION:	CONIC LAMBERT CONFORMAL
COORDINATE SYSTEM:	OHIO STATE PLANE, NORTH ZONE 3401
COMBINED SCALE FACTOR:	0.999994550

UNITS ARE IN U.S. SURVEY FEET. USE THE FOLLOWING CONVERSION FACTOR: 1 METER = 3.280833333 U.S. SURVEY FEET.

WORK LIMITS

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

CLEARING AND GRUBBING, AS PER PLAN

THE DEPARTMENT HAS NOT MARKED INDIVIDUAL TREES AND STUMPS FOR REMOVAL. UNLESS SPECIFICALLY DESIGNATED AS "DO NOT DISTURB" IN THE PLANS, REMOVE ALL TREES AND STUMPS WITHIN THE CONSTRUCTION LIMITS UNDER THE LUMP SUM BID FOR ITEM 201 CLEARING AND GRUBBING.

ALL TREES WITHIN THE CONSTRUCTION LIMITS WILL BE CUT DOWN (DROPPED) PRIOR TO CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF ALL "DROPPED" TREES AND CLEARING AND GRUBBING AS PER ITEM 201.

REVIEW OF DRAINAGE FACILITIES

BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE STATE, REPRESENTATIVES OF THE STATE AND THE CONTRACTOR, ALONG WITH LOCAL REPRESENTATIVES, SHALL MAKE AN INSPECTION OF ALL EXISTING SEWERS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCE SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTION SHALL BE KEPT IN WRITING BY THE STATE.

ALL NEW CONDUITS, INLETS, CATCH BASINS, AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE STATE.

ALL EXISTING SEWERS INSPECTED INITIALLY BY THE ABOVE MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEMS.

CROSSINGS AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

WHERE PLANS PROVIDE FOR A PROPOSED CONDUIT TO BE CONNECTED TO, OR CROSS OVER OR UNDER AN EXISTING SEWER OR UNDERGROUND UTILITY, THE CONTRACTOR SHALL LOCATE THE EXISTING PIPES OR UTILITIES BOTH AS TO LINE AND GRADE BEFORE STARTING TO LAY THE PROPOSED CONDUIT.

IF IT IS DETERMINED THAT THE ELEVATION OF THE EXISTING CONDUIT, OR EXISTING APPURTENANCE TO BE CONNECTED, DIFFERS FROM THE PLAN ELEVATION OR RESULTS IN A CHANGE IN THE PLAN CONDUIT SLOPE, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WILL BE AFFECTED BY THE VARIANCE IN THE EXISTING ELEVATIONS.

IF IT IS DETERMINED THAT THE PROPOSED CONDUIT WILL INTERSECT AN EXISTING SEWER OR UNDERGROUND UTILITY IF CONSTRUCTED AS SHOWN ON THE PLAN, THE ENGINEER SHALL BE NOTIFIED BEFORE STARTING CONSTRUCTION OF ANY PORTION OF THE PROPOSED CONDUIT WHICH WOULD BE AFFECTED BY THE INTERFERENCE WITH AN EXISTING FACILITY.

PAYMENT FOR ALL THE OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PERTINENT 611 CONDUIT ITEM.

BLASTING NEAR NATURAL GAS FACILITIES

ANY BLASTING PROPOSED WITHIN 300 FEET OF COLUMBIA GAS TRANSMISSION (NGT&S) FACILITIES MUST BE SUBMITTED TO NGT&S IN ADVANCE ALONG WITH A BLASTING PLAN OUTLINING SUCH PROPOSED ACTIVITY. NO BLASTING MAY BEGIN UNLESS AND UNTIL NGT&S PROVIDES WRITTEN CONFIRMATION THAT IT DOES NOT OBJECT TO SUCH BLASTING. ANY MODIFICATIONS TO THE BLASTING PLAN MUST ALSO BE SUBMITTED TO NGT&S FOR REVIEW AND SHOULD NOT BE IMPLEMENTED UNLESS AND UNTIL NGT&S PROVIDES WRITTEN CONFIRMATION THAT IT DOES NOT OBJECT TO SUCH MODIFICATIONS. THE BLASTING CONTRACTOR MAY BE REQUIRED TO MONITOR AND RECORD SEISMIC SHOCK AT THE FACILITIES. THE CONTRACTOR SHOULD CONTACT SHANE CURTIS, (724) 223-3965, FOR COORDINATION WITH NGT&S.

ITEM 208 - ROCK BLASTING

PERFORM THIS WORK AS REQUIRED IN ACCORDANCE WITH SECTION 208 OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS.

THE FOLLOWING QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR ROCK BLASTING WORK:

208, PRE-BLAST CONDITION	LUMP
208, BLASTING CONSULTANT	LUMP
208, AIR BLAST AND NOISE CONTROL	LUMP
208, VIBRATION CONTROL AND MONITORING	LUMP
208, HYDROLOGIST	LUMP

ITEM 618 - RUMBLE STRIPS, (ASPHALT CONCRETE)

AFTER THE TEMPORARY CONCRETE BARRIER AND THE EXISTING MAINTENANCE OF TRAFFIC ZONE HAVE BEEN REMOVED, INSTALL RUMBLE STRIPS ON THE NORTHBOUND OUTSIDE SHOULDERS, AS PER SCD BP-9.1.

LIMITING STATIONS FOR THE INSTALLATION OF RUMBLE STRIPS ON THE NORTHBOUND OUTSIDE SHOULDERS ARE AS FOLLOWS:

STA 535+50.00 TO STA 581+00.00±

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY FOR THIS WORK:

ITEM 618 - RUMBLE STRIPS, (ASPHALT CONCRETE)
4550 FT

ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN CONTRACT BID PRICE PER FOOT OF ITEM 618- RUMBLE STRIPS, (ASPHALT CONCRETE).

SEE OFFICE CALCULATIONS FOR SOUTHBOUND RUMBLE STRIPS QUANTITIES.

DRINKING WATER SOURCES

THE PROJECT IS LOCATED WITHIN THE SOURCE WATER PROTECTION ONE YEAR TIME-OF-TRAVEL FOR THE BRILLIANT WATER & SEWER DISTRICT. BEST MANAGEMENT PRACTICES SHALL BE EXERCISED WITH REGARD TO CONDUCTING VEHICLE MAINTENANCE, REFUELING, AND THE STORAGE OF POTENTIAL WATER CONTAMINANTS WITHIN THE PROJECT AREA. SPILLS OF FUELS, OILS, CHEMICALS OR OTHER MATERIALS WHICH COULD POSE A THREAT TO THE DRINKING WATER SOURCE AREA SHALL BE CLEANED UP IMMEDIATELY BY THE CONTRACTOR AND THE PUBLIC WATER BOARD SHALL BE NOTIFIED IMMEDIATELY BY CONTACTING DAVID ROUSH AT 740-632-5400. IF THE SPILL IS A REPORTABLE AMOUNT, THE CONTRACTOR SHOULD CONTACT THE JEFFERSON COUNTY EMERGENCY MANAGEMENT AGENCY AT 740-283-8542 FOR CLEANUP OF THE SPILL.

EXISTING GROUND TOPOGRAPHY

THE PROJECT IS LOCATED IN AN AREA WHERE THE EXISTING GROUND IS ACTIVELY ERODING. THE PLANS AND QUANTITIES ARE BASED ON THE EXISTING CONDITIONS AT THE TIME OF FIELD SURVEY. THE CONTRACTOR IS TO FIELD VERIFY THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND ADJUST AS NECESSARY.

PROFILE AND ALIGNMENT

PLACE THE PROPOSED PAVEMENT TO FOLLOW THE ALIGNMENT AND PROFILE OF THE EXISTING PAVEMENT. PREVIOUS CONSTRUCTION PLANS, PROJECT NO. F-430(11), SHOWING THE ORIGINAL ALIGNMENT AND PROFILE, ARE AVAILABLE FOR INSPECTION AT THE ODOT DISTRICT 11 OFFICE. PLACE THE PROPOSED ASPHALT CONCRETE OVERLAY WITH A UNIFORM THICKNESS OF 1¼ INCHES AS SHOWN ON THE TYPICAL SECTIONS.

ITEM 441 ASPHALT CONCRETE SURFACE COURSE, TYPE I, (446), AS PER PLAN (PG70-22M)

FOLLOW SPECIFICATION 703.05, EXCEPT DO NOT USE COARSE AGGREGATE FROM A SOURCE DESIGNATED 'SR' OR 'SRH' ACCORDING TO THE OFFICE OF MATERIALS MANAGEMENT (OMM) IN ANY JOB MIX FORMULA (JMF) FOR THIS ITEM.

ITEM 606 - ANCHOR ASSEMBLY, MGS TYPE E

THIS ITEM SHALL CONSIST OF FURNISHING AND INSTALLING ANY OF THE GUARDRAIL END TERMINALS FOR TYPE MGS GUARDRAIL AS LISTED ON ROADWAY ENGINEERING'S WEB PAGE UNDER ROADSIDE SAFETY DEVICES FOR APPROVED GUARDRAIL END TREATMENTS. INSTALLATION SHALL BE AT THE LOCATIONS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE FACE OF THE TYPE E IMPACT HEAD SHALL BE COVERED WITH A SHEET OF TYPE G REFLECTIVE SHEETING, PER CMS 730.19.

REFER TO THE MANUFACTURER'S INSTRUCTIONS REGARDING THE INSTALLATION OF, AND THE GRADING AROUND THE FOUNDATION TUBES AND GROUND STRUT. THE TOP OF ANY FOUNDATION TUBE SHOULD BE LESS THAN 4 INCHES ABOVE THE GROUND. THE PLACEMENT OF THE FOUNDATION TUBES SHOULD BE AN APPROPRIATE DEPTH BELOW THE LEVEL LINE IN ORDER TO MAINTAIN THE FINISHED GUARDRAIL HEIGHT OF 31 INCHES FROM THE EDGE OF THE SHOULDER.

ON-SITE GRADING IS REQUIRED IF THE TOP OF THE FOUNDATION TUBES OR TOP OF THE GROUND STRUT DOES PROJECT MORE THAN 4 INCHES ABOVE THE GROUND LINE.

PAYMENT FOR THE ABOVE WORK SHALL BE MADE AT THE UNIT PRICE BID FOR ITEM 606, ANCHOR ASSEMBLY, MGS TYPE E, EACH, AND SHALL INCLUDE ALL LABOR, TOOLS, EQUIPMENT AND MATERIALS NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL ANCHOR ASSEMBLY SYSTEM, INCLUDING ALL RELATED TRANSITIONS, REFLECTIVE SHEETING, HARDWARE, GRADING, EMBANKMENT AND EXCAVATION NOT SEPARATELY SPECIFIED, AS REQUIRED BY THE MANUFACTURER.

ITEM 611 - INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 611, THE INLETS SHALL BE CONSTRUCTED AS SHOWN ON SHEET 27. ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE PER EACH FOR ITEM 611 INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN

EXISTING UNDERDRAINS

PROVIDE UNOBSTRUCTED OUTLETS FOR ALL EXISTING UNDERDRAINS ENCOUNTERED DURING CONSTRUCTION.

PROVIDE AN OUTLET PER STANDARD CONSTRUCTION DRAWING DM-1.1 FOR ALL UNDERDRAINS THAT OUTLET TO A SLOPE.

UNDERDRAINS THAT CAN BE CONNECTED TO THE NEW STORM SYSTEM OR EXISTING UNDERDRAINS AT THE END OF THE PROJECT LIMITS AS WELL AS ALL NECESSARY BENDS OR BRANCHES REQUIRED FOR CONNECTION ARE INCLUDED IN THE BASIS OF PAYMENT FOR UNCLASSIFIED PIPE UNDERDRAINS.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

601	TIED CONCRETE BLOCK MAT, TYPE 1	4 SQ. YD.
611	6" CONDUIT, TYPE F	20 FT.
611	PRECAST REINFORCED CONCRETE OUTLET	2 EACH
605	6" UNCLASSIFIED PIPE UNDERDRAINS	100 FT.

ITEM 208 PRESPLITTING, AS PER PLAN

PERFORM THIS WORK AS REQUIRED IN ACCORDANCE WITH SECTION 208 OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS EXCEPT AS NOTED BELOW.

PRESPLITTING IS REQUIRED FOR ALL SLOPES 1 TO 1 OR STEEPER.

THE FOLLOWING QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THIS WORK:

208, PRESPLITTING, AS PER PLAN 166838 SQ. YD.

SEEDING AND MULCHING

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

659, SEEDING AND MULCHING	56813 SQ. YD.
659, REPAIR SEEDING AND MULCHING	2841 SQ. YD.
659, COMMERCIAL FERTILIZER	7.67 TON
659, LIME	11.74 ACRES
659, WATER	307 M. GAL.
659, MOWING	58 M. SQ. FT.

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL WITH SLOPES 2:1 OR FLATTER BETWEEN THE RIGHT-OF-WAY LINES, AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF- WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

ITEM SPECIAL - PIPE CLEANOUT

THIS WORK SHALL CONSIST OF REMOVING SEDIMENT AND DEBRIS FROM THE EXISTING DRAINAGE CONDUITS AS DIRECTED BY THE ENGINEER. ALL MATERIAL REMOVED SHALL BE DISPOSED OF AS PER 105.16 AND 105.17. ALL SEWERS SHALL BE CLEANED OUT TO THE SATISFACTION OF THE ENGINEER.

CLEANOUT OF THE PIPE SHALL BE PAID FOR AT THE UNIT PRICE BID FOR ITEM SPECIAL - PIPE CLEANOUT. THIS PRICE SHALL INCLUDE THE COST FOR MATERIAL, EQUIPMENT, LABOR, AND ALL INCIDENTALS REQUIRED TO COMPLETE THE CLEANOUT.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE ABOVE NOTED WORK:

SPECIAL, PIPE CLEANOUT 500 FT.

DUST CONTROL

THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

ITEM 616, WATER 5482 M. GAL

SPECIAL REQUIREMENTS FOR PROTECTION OF ENDANGERED SPECIES HABITAT - INDIANA BAT, NORTHERN LONG-EARED BAT

UNAVOIDABLE CUTTING OF TREES WILL BE PERFORMED ONLY BEFORE APRIL 1 OR AFTER SEPTEMBER 30, WHEN BATS, INCLUDING THE INDIANA BAT AND THE NORTHERN LONG-EARED BAT, WILL NOT BE USING TREES FOR ROOST HABITAT.

ITEM 622 CONCRETE BARRIER, SINGLE SLOPE, TYPE D, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF CMS 622, THE CONCRETE BARRIER SHALL BE CONSTRUCTED AS SHOWN ON SHEET 26 AND ON THE CATCHMENT WALL DETAIL ON SHEET 3. ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE PER LINEAR FOOT FOR ITEM 622 CONCRETE BARRIER, SINGLE SLOPE, TYPE D, AS PER PLAN.

ITEM 690 SCALING

THIS ITEM IS FOR THE REMOVING OF LOOSE ROCK MATERIAL FROM THE ROCK FACE ABOVE THE TEMPORARY EXCAVATION. THE DEFINITION OF A CREW HOUR SHALL BE CONSIDERED ONE SUPERVISOR AND 3 SCALERS.

THE FOLLOWING QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 690 SCALING - - - - - - 200 CRHR

ALL LABOR, MATERIALS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR ITEM 690 SCALING.

ITEM 622 - CONCRETE BARRIER, TYPE A, AS PER PLAN

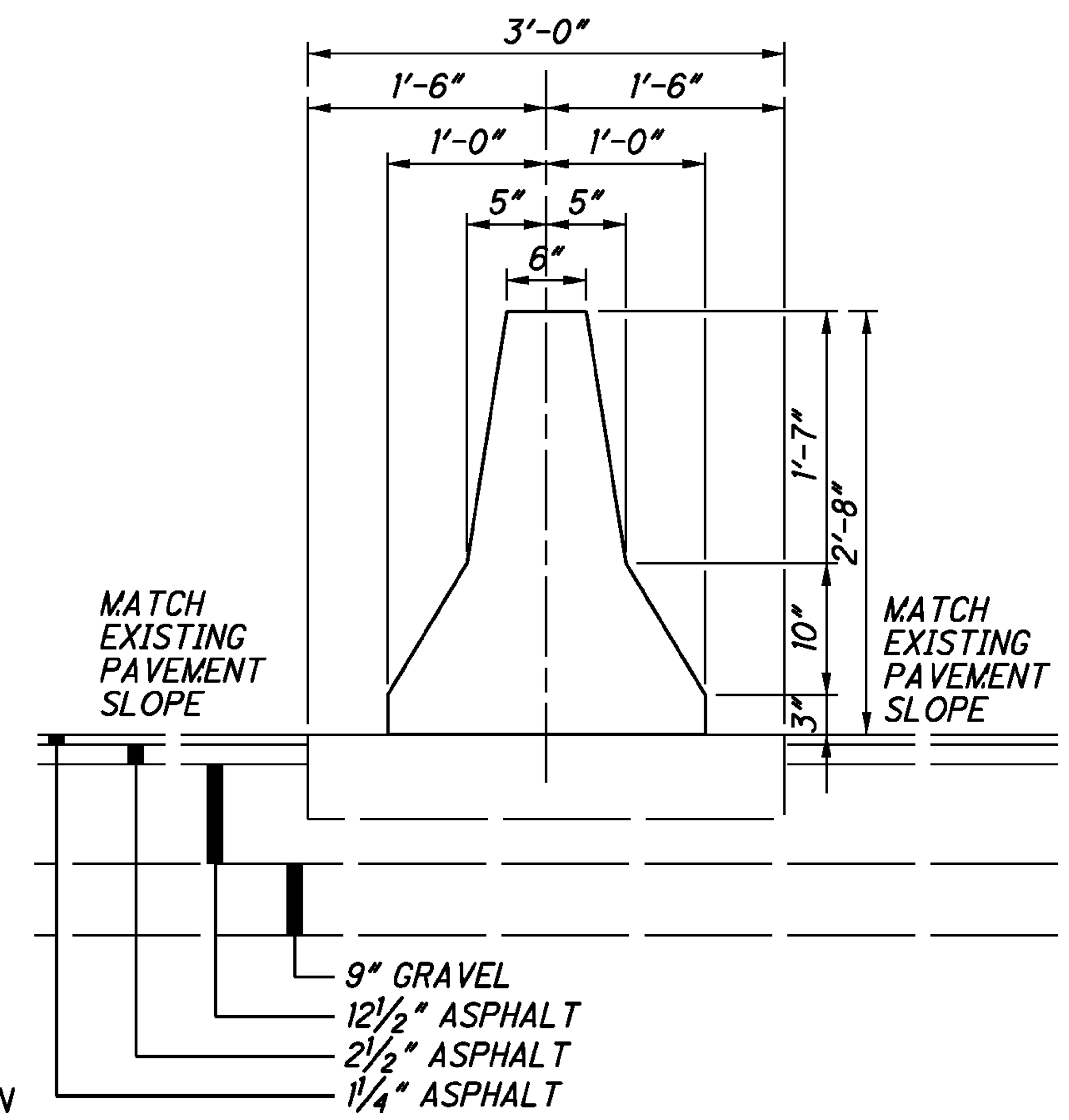
IN ADDITION TO THE REQUIREMENTS OF CMS 622, THE CONCRETE BARRIER SHALL BE CONSTRUCTED AS SHOWN IN THE FOLLOWING DETAIL AND SHOWN IN THE PLANS. THE EXISTING FOOTER SHALL BE REUSED.

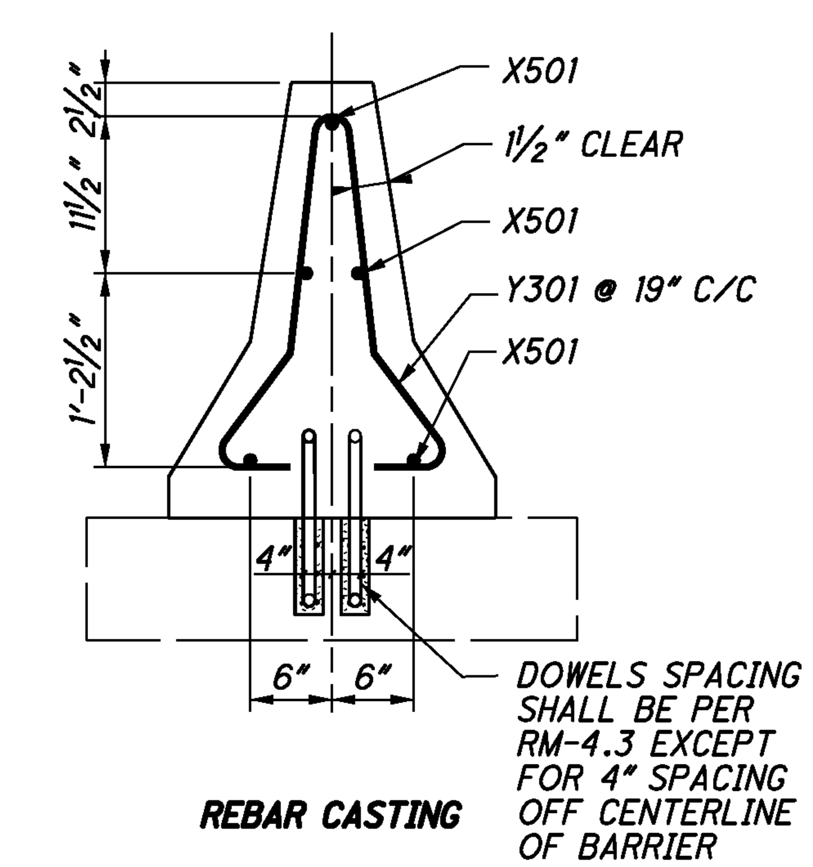
LIMITING STATIONS FOR THE INSTALLATION OF THE BARRIER IS STA 537+52.74 - STA 542+04.83.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY FOR THIS WORK:

512, SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
310 SQ YD
622, CONCRETE BARRIER, TYPE A, AS PER PLAN
452 FT
626, BARRIER REFLECTOR
10 EACH

EXCEPT AS NOTED ABOVE, ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO PERFORM THE REQUIRED WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE PER LINEAR FOOT FOR ITEM 622 - CONCRETE BARRIER, TYPE A, AS PER PLAN





REBAR CASTING

EXISTING PLANS

EXISTING PLANS ENTITLED JEF-7-(8.22-10.35), 1956 ORIGINAL CONSTRUCTION AND JEF-7-9.29, 1973 UPGRADE AND JEF-7-10.82, 1992 UPGRADE MAY BE INSPECTED IN THE ODOT DISTRICT 11 OFFICE AT 2201 REISER AVENUE, NEW PHILADELPHIA, OHIO 44663

THESE EXISTING PLANS CAN ALSO BE DOWNLOADED FROM THE FOLLOWING FTP SITE:

ftp://ftp.dot.state.oh.us/pub/Contracts/Attach

COOPERATION BETWEEN CONTRACTORS

THE CONTRACTOR IS HEREBY ADVISED THAT A PROJECT TO DROP THE TREES IS CURRENTLY UNDER WAY. THIS TREE CUTTING PROJECT WILL HAVE UNTIL APRIL 1, 2015 TO BE COMPLETED.

THE CONTRACTOR SHALL COOPERATE WITH THE OTHER CONTRACTOR IN ACCORDANCE WITH CMS 105.08 AND ARRANGE A MUTALLY ACCEPTABLE WORK SCHEDULE, SUBJECT TO THE APPROVAL OF THE ENGINEER.

ANY CONFLICTS BETWEEN CONTRACTORS INVOLVING WORK SCHEDULES, WORK AREAS, OR COOPERATION WILL BE RESOLVED BY THE ENGINEER.

ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN

MOT WORK SHALL CONSIST OF MAINTENANCE OF TRAFFIC CONTROL FEATURES CURRENTLY IN PLACE AT THE SITE, AND SHOWN ON THE MOT PLAN SHEETS DURING CONSTRUCTION OPERATIONS; REMOVING ALL MOT FEATURES AFTER COMPLETING SLOPE IMPROVEMENTS, SHOULDER WIDENING AND BARRIER INSTALLATION; AND REPLACING MEDIAN BARRIER THAT WAS REMOVED TO FACILITATE THE CROSSOVERS AT THE LOCATIONS INDICATED IN THIS PLAN.

THE CONTRACTOR SHALL MAINTAIN THE EXISTING MAINTENANCE OF TRAFFIC ZONE AS SHOWN IN THE PLAN INCLUDING BUT NOT LIMITED TO THE TEMPORARY CONCRETE BARRIER, TEMPORARY PAVMENT MARKINGS, DRUMS, CROSSOVER LIGHTING, SIGNS AND SUPPORTS FOR THE DURATION OF THE PROJECT.

WHEN THE PROJECT IS COMPLETED THE CONTRACTOR SHALL REMOVE THE MAINTENANCE OF TRAFFIC ZONE INCLUDING BUT NOT LIMITED TO TEMPORARY CONCRETE BARRIER, DRUMS, CROSSOVER LIGHTING, TEMPORARY PAVEMENT MARKINGS, SIGNS AND SUPPORTS, LIGHT POLES, AND LUMINAIRES. THE FOLLOWING REMOVED ITEMS SHALL BE DELIVERED TO THE LOCATIONS SHOWN:

BARRIER WALL & GLARE SCREEN:
JAMES WHITE CONSTRUCTION
4156 FREEDOM WAY
WEIRTON, WV 26062
PHONE: (304) 748-8181

IMPACT ATTENUATORS:
LAKE ERIE CONSTRUCTION COMPANY
25 NORWALD ROAD
NORWALK, OH 44857
PHONE: (419) 668-3302

SIGNS:
ROADSAFE TRAFFIC SYSTEMS
56301 FERRY LANDING ROAD
SHADYSIDE, OH 43947
PHONE: (740) 671-4855

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, AS PER PLAN, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

WORK SEQUENCE

PHASE I
MAINTAIN EXISTING TRAFFIC PATTERN WHICH IS IN PLACE. EXCAVATE FOR THE BENCHING OF SLOPES, ADD CATCHMENT WALL, REMOVE TEMPORARY CATCHMENT WALL, MODIFY EXISTING STORM SYSTEM, RESURFACE PAVEMENT AND INSTALL RUMBLE STRIPS BETWEEN STA 547+71.30 TO STA 588+00.00 AND PLACE TEMPORARY EDGE LINE FOR SOUTHBOUND TRAFFIC. SEE SHEET NO. 8 FOR ADVANCE BLASTING ZONE SIGNS.

PHASE 2
CONTINUE USING EXISTING MAINTENANCE OF TRAFFIC IN PLACE FOR NORTHBOUND TRAFFIC. SOUTHBOUND TRAFFIC SHALL BE MAINTAINED PER SHEETS 9 TO 12. RECONSTRUCT THE MEDIAN BARRIER IN THE TWO GAPS CREATED BY EXISTING MAINTENANCE OF TRAFFIC CROSSOVER.

PHASE 3
REMOVE ALL MAINTENANCE OF TRAFFIC ITEMS AND ADD NEW PAVEMENT MARKINGS BETWEEN STA 513+00.00 TO STA 598+00.00 AS DETAILED ON SHT. NO. 121. MAINTENANCE OF TRAFFIC FOR PAVEMENT MARKINGS SHALL BE DONE USING SCD MT 99.20. RUMBLE STRIPS SHALL BE REPLACED BETWEEN STA 535+50.00 TO STA 581+00.00 NORTHBOUND, PRIOR TO PAVEMENT MARKING.

ITEM 614, BARRIER REFLECTORS AND/OR OBJECT MARKERS

BARRIER REFLECTORS AND/OR OBJECT MARKERS SHALL BE INSTALLED ON ALL PORTABLE BARRIER (PB) USED FOR TRAFFIC CONTROL. BARRIER REFLECTORS, OBJECT MARKERS AND THEIR INSTALLATION SHALL CONFORM TO CMS 626, EXCEPT THAT THE SPACING SHALL BE 50 FEET. AN ESTIMATED QUANTITY OF 32 EACH OF ITEM 614 BARRIER REFLECTOR, TYPE B AND 30 EACH OF ITEM 614 OBJECT MARKER, ONE-WAY HAVE BEEN PROVIDED AND CARRIED TO THE GENERAL SUMMARY.

ITEM 614, WORK ZONE CROSSOVER LIGHTING SYSTEM, AS PER PLAN

THIS WORK SHALL CONSIST OF MAINTAINING AND REMOVING AN EXISTING WORK ZONE LIGHTING SYSTEM FOR A SINGLE CROSSOVER. THE SYSTEM SHALL BE AS SHOWN ON SCD MT-100.00. THE CONTRACTOR SHALL ARRANGE FOR AND PAY FOR POWER.

PAYMENT WILL BE MADE AT THE UNIT PRICE PER EACH FOR ITEM 614, WORK ZONE CROSSOVER LIGHTING SYSTEM, AS PER PLAN THROUGHOUT ALL PHASES OF WORK WHEN THE CROSSOVER ROADWAYS ARE USED.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614 - WORK ZONE CROSSOVER LIGHTING SYSTEM, AS PER PLAN
2 EACH

ITEM 614 - WORK ZONE PAVEMENT MARKING, MISC.: REMOVAL OF WORK ZONE PAVEMENT MARKING

THIS WORK SHALL INCLUDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO PERFORM THE WORK. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE PER FOOT FOR ITEM 614, WORK ZONE PAVEMENT MARKING, MISC.: REMOVAL OF WORK ZONE PAVEMENT MARKING

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614, MAINTAINING TRAFFIC, MISC.: REMOVAL OF WORK ZONE PAVEMENT MARKING LUMP

ITEM 622 - BARRIER, MISC.: REMOVAL OF TEMPORARY CONCRETE BARRIER

THIS WORK SHALL CONSIST OF REMOVING PORTABLE CONCRETE BARRIER (PCB) AT THE LOCATIONS SHOWN ON THE PLANS. PCB REMOVED SHALL BE DELIVERED TO JAMES WHITE CONSTRUCTION COMPANY.

PAYMENT SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND DELIVERY NECESSARY TO PERFORM THE WORK. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE PER FOOT FOR ITEM 622, BARRIER, MISC.: REMOVAL OF TEMPORARY CONCRETE BARRIER.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 622, BARRIER, MISC.: REMOVAL OF TEMPORARY CONCRETE BARRIER 5826 FOOT

ITEM 622 - BARRIER, MISC.: REMOVAL OF GLARE SCREEN

THIS WORK SHALL CONSIST OF REMOVING THE GLARE SCREEN FROM THE TEMPORARY CONCRETE BARRIER AT THE LOCATIONS SHOWN ON THE PLANS. THE GLARE SCREEN REMOVED SHALL BE DELIVERED TO JAMES WHITE CONSTRUCTION COMPANY.

PAYMENT SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND DELIVERY NECESSARY TO PERFORM THE WORK. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE PER FOOT FOR ITEM 622, BARRIER, MISC.: REMOVAL OF GLARE SCREEN.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 622, BARRIER MISC.: REMOVAL OF GLARE SCREEN
5826 FOOT

ITEM 614 - LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS

USE OF LAW ENFORCEMENT OFFICERS (LEOS) BY CONTRACTORS OTHER THAN THE USES SPECIFIED BELOW WILL NOT BE PERMITTED AT PROJECT COST. LEOS SHOULD NOT BE USED WHERE THE OMUTCD INTENDS THAT FLAGGERS BE USED.

IN ADDITION TO THE REQUIREMENTS OF CMS 614 AND THE OMUTCD, A UNIFORMED LEO WITH AN OFFICIAL PATROL CAR (CAR WITH TOP-MOUNTED EMERGENCY FLASHING LIGHTS AND COMPLETE MARKINGS OF THE APPROPRIATE LAW ENFORCEMENT AGENCY) SHALL BE PROVIDED FOR THE FOLLOWING TRAFFIC CONTROL TASKS:

ITEM 614 - LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE DURING CONSTRUCTION OPERATIONS (CONTINUED)

DURING THE ENTIRE ADVANCE PREPARATION AND CLOSURE SEQUENCE WHERE COMPLETE BLOCKAGE OF TRAFFIC IS REQUIRED.

FOR LANE CLOSURES: DURING INITIAL SET-UP PERIODS, TEAR DOWN PERIODS, SUBSTANTIAL SHIFTS OF A CLOSURE POINT OR WHEN NEW LANE CLOSURE ARRANGEMENTS ARE INITIATED FOR LONG-TERM LANE CLOSURES/SHIFTS (FOR THE FIRST AND LAST DAY OF MAJOR CHANGES IN TRAFFIC CONTROL SETUP). IN GENERAL, LEOS SHOULD BE POSITIONED AT THE POINT OF LANE RESTRICTION.

WHEN CONSTRUCTION VEHICLES ARE ENTERING/EXITING THE ZONE DIRECTLY FROM/INTO AN OPEN LANE OF TRAFFIC. IF A LANE HAS BEEN CLOSED TO PROVIDE AN ACCELERATION/DECELERATION LANE FOR THE VEHICLE, THE LEO WILL NOT BE REQUIRED.

LEOS SHOULD NOT FORGO THEIR TRAFFIC CONTROL RESPONSIBILITIES TO APPREHEND MOTORISTS FOR ROUTINE TRAFFIC VIOLATIONS. HOWEVER, IF A MOTORIST'S ACTIONS ARE CONSIDERED TO BE RECKLESS, THEN PURSUIT OF THE MOTORIST IS APPROPRIATE.

THE LEOS WORK AT THE DIRECTION OF THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE SERVICES OF THE LEOS WITH THE APPROPRIATE AGENCIES AND COMMUNICATING THE INTENTIONS OF THE PLANS WITH RESPECT TO DUTIES OF THE LEOS. THE ENGINEER SHALL HAVE FINAL CONTROL OVER THE LEOS' DUTIES AND PLACEMENT, AND WILL RESOLVE ANY ISSUES THAT MAY ARISE BETWEEN THE TWO PARTIES.

THE LEO SHALL REPORT IN TO THE CONTRACTOR PRIOR TO THE START OF THE SHIFT, IN ORDER TO RECEIVE INSTRUCTIONS REGARDING SPECIFIC WORK ASSIGNMENTS DURING HIS/HER SHIFT. THE LEO IS EXPECTED TO STAY AT THE PROJECT SITE FOR THE ENTIRE DURATION OF HIS/HER SHIFT. THE LEO SHALL REPORT TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT. ONCE THE LEO HAS COMPLETED THE DUTIES DESCRIBED ABOVE AND STILL HAS TIME REMAINING ON HIS/HER SHIFT, THE LEO MAY BE ASKED TO PATROL THROUGH THE WORK ZONE (WITH FLASHING LIGHTS OFF) OR BE PLACED AT A LOCATION TO DETER MOTORISTS FROM SPEEDING. SHOULD IT BE NECESSARY TO LEAVE THE PROJECT SITE, THE LEO SHALL NOTIFY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE LEO WITH A TWO-WAY COMMUNICATION DEVICE WHICH SHALL BE RETURNED TO THE CONTRACTOR AT THE END OF HIS/HER SHIFT.

LEOS (WITH PATROL CAR) REQUIRED BY THE TRAFFIC MAINTENANCE TASKS ABOVE SHALL BE PAID FOR ON A UNIT PRICE (HOURLY) BASIS UNDER ITEM 614, LAW ENFORCEMENT OFFICER (WITH PATROL CAR) FOR ASSISTANCE. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE 1000 HOURS

THE HOURS PAID SHALL INCLUDE ANY MINIMUM SHOW-UP TIME REQUIRED BY THE LAW ENFORCEMENT AGENCY INVOLVED.

ANY ADDITIONAL COSTS (ADMINISTRATIVE OR OTHERWISE) INCURRED BY THE CONTRACTOR TO OBTAIN THE SERVICES OF AN LEO ARE INCLUDED WITH THE BID UNIT PRICE FOR ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE.

CALCULATED LEH
CHECKED SNS

MAINTENANCE OF TRAFFIC NOTES

JEF-7-10.00

ITEM 614 - WORK ZONE IMPACT ATTENUATOR, MISC.: REMOVAL OF IMPACT ATTENUATOR

THIS WORK SHALL CONSIST OF THE REMOVAL OF EXISTING IMPACT ATTENUATORS.

PAYMENT SHALL INCLUDE ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY TO PERFORM THE REQUIRED WORK AND THE DELIVERY TO LAKE ERIE CONSTRUCTION COMPANY. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, WORKZONE IMPACT ATTENUATOR, MISC.: REMOVAL OF IMPACT ATTENUATOR.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614, WORK ZONE IMPACT ATTENUATOR, MISC.: REMOVAL OF IMPACT ATTENUATOR 2 EACH

ITEM 614 - MAINTAINING TRAFFIC, MISC.: REMOVAL OF FLASHING ARROW PANEL

THIS WORK SHALL CONSIST OF THE REMOVAL OF FLASHING ARROW PANELS. FLASHING ARROW PANELS REMOVED SHALL BE DELIVERED TO ROADSAFE TRAFFIC SYSTEMS.

PAYMENT SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND DELIVERY NECESSARY TO PERFORM THE WORK. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE PER EACH FOR ITEM 614, MAINTAINING TRAFFIC, MISC.: REMOVAL OF FLASHING ARROW PANEL.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614, MAINTAINING TRAFFIC, MISC.: REMOVAL OF FLASHING ARROW PANEL 2 EACH

ITEM 614 - MAINTAINING TRAFFIC, MISC.: REMOVAL OF GROUND-MOUNTED SIGN AND SUPPORT

THIS WORK SHALL CONSIST OF THE REMOVAL OF GROUND-MOUNTED SIGNS AND SUPPORTS AND THE UNCOVERING OF EXISTING SIGNS. SIGNS REMOVED SHALL BE DELIVERED TO ROADSAFE TRAFFIC SYSTEMS.

PAYMENT SHALL INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, AND DELIVERY NECESSARY TO PERFORM THE WORK. PAYMENT SHALL BE MADE AT THE CONTRACT PRICE AS A LUMP SUM FOR ITEM 614, MAINTAINING TRAFFIC, MISC.: REMOVAL OF GROUND-MOUNTED SIGN AND SUPPORT.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

ITEM 614, MAINTAINING TRAFFIC, MISC.: REMOVAL OF GROUND-MOUNTED SIGN AND SUPPORT LUMP

SHORT-DURATION CLOSING OF THE HIGHWAY

THE FOLLOWING NOTES SHALL APPLY FOR THE REQUIRED BLASTING OF ROCK ON THE HILLSIDE.

1. THE CONTRACTOR SHALL COORDINATE CLOSURE TIMES WITH JEFFERSON COUNTY AND THE STATE OF OHIO TRAFFIC AND LAW ENFORCEMENT DEPARTMENTS SO CLOSURES DO NOT OCCUR DURING CROWD EVENTS WHICH INCREASE S.R. 7 TRAFFIC.

2. THE MAXIMUM DURATION OF TWO LANE CLOSURES SHALL NOT EXCEED 15 MINUTES. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, TRAFFIC SHALL BE COMPLETELY CLEARED BEFORE BEGINNING THE NEXT CLOSURE.

3. THE CONTRACTOR SHALL FURNISH AND INSTALL TWO (2) "WATCH FOR STOPPED TRAFFIC" SIGNS (SPECIAL) 1500 FEET UPSTREAM FROM THE "ROAD CONSTRUCTION AHEAD" SIGNS ON S.R. 7 NORTHBOUND AND SOUTHBOUND. THE CONTRACTOR SHALL INSTALL ADDITIONAL "WATCH FOR STOPPED TRAFFIC" EVERY 1800 FEET UPSTREAM FROM THE "WATCH FOR STOPPED TRAFFIC" ON S.R. 7 IF TRAFFIC BACKUPS REACH THE FIRST SET OF SIGNS. THE NEED FOR THESE SIGNS SHALL BE CONSTANTLY MONITORED BY THE CONTRACTOR. ALL "WATCH FOR STOPPED TRAFFIC" SIGNS AND "PREPARE TO STOP" SIGNS SHALL BE EQUIPPED WITH A TYPE B HIGH INTENSITY FLASHING WARNING LIGHT.

4. A MINIMUM OF TWO (2) LAW ENFORCEMENT OFFICERS WITH PATROL VEHICLES SHALL BE USED TO PACE MOTORISTS TO A STOP. AFTER TRAFFIC HAS BEEN STOPPED, ONE PATROL VEHICLE SHALL TRAVEL ALONG THE ROADWAY SHOULDER 50 FEET BEHIND THE BACKUP OF STOPPED VEHICLES WHEN STOPPAGES OCCUR. IN THE VICINITY OF FREEWAY ENTRANCES OR EXITS, THE CONTRACTOR SHALL PLACE FLAGGERS ON THE RAMPS TO SLOW ENTERING TRAFFIC. AN ADDITIONAL LAW ENFORCEMENT OFFICER WITH PATROL CAR SHALL BE PLACED IN THE VICINITY OF THE S.R. 7 AND RUSH RUN ROAD (C.R. 17) INTERSECTION.

5. PATROL VEHICLES SHALL HAVE FLASHING BEACONS TO PROVIDE ADEQUATE VISIBILITY TO APPROACHING TRAFFIC. PAYMENT FOR THE ABOVE IS INCLUDED IN ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR.

6. CLOSURE OF S.R. 7 SHALL BE AS PER PLAN INSERT SHEET 209960 SHOWN ON SHEET 13.

7. FOR A PERIOD OF FIVE (5) CALENDAR DAYS BEFORE THE START OF ANY SHORT-TERM CLOSURES, THE CONTRACTOR SHALL PLACE A PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) NEAR THE POINT OF CLOSURE, FACING THE APPROPRIATE DIRECTION TRAVEL.

THE PCMS SHALL BE PROGRAMMED AS SHOWN IN THE DIAGRAM BELOW LABELED "PORTABLE CHANGEABLE MESSAGE SIGN ADVANCED NOTICE OF CLOSURE".

PORTABLE CHANGEABLE MESSAGE SIGN ADVANCED NOTICE OF CLOSURE

EXPECT DELAYS	(DATE) AND (DATE)	BETWEEN (TIME)-(TIME)
FRAME 1 0.8 SEC	FRAME 2 0.8 SEC	FRAME 3 0.8 SEC

FLOODLIGHTING

FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHTTIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE THE ADEQUACY OF THE FLOODLIGHT PLACEMENT, THE CONTRACTOR AND THE ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED, THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS.

PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, A CHANGEABLE MESSAGE SIGN. THE SIGN SHALL BE OF A TYPE SHOWN ON A LIST OF APPROVED PCMS UNITS AVAILABLE ON THE (OFFICE OF MATERIALS MANAGEMENT WEB PAGE). THE LIST CONTAINS CLASS A AND B UNITS WITH MINIMUM LEGIBILITY DISTANCES OF 650 FEET AND 475 FEET, RESPECTIVELY.

EACH SIGN SHALL BE TRAILER-MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM, TO DIM THE SIGN DURING DARKNESS, AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY.

THE PROBABLE PCMS LOCATIONS AND WORK LIMITS FOR THOSE LOCATIONS ARE SHOWN ON SHEET 13 OF THE PLAN. PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS SHALL BE TURNED OFF. ADDITIONALLY, WHEN NOT IN USE FOR EXTENDED PERIODS OF TIME, THE PCMS SHALL BE TURNED AWAY FROM ALL TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT, AND TO REVISE SIGN MESSAGES, IF NECESSARY.

THE CONTRACTOR SHALL IMPLEMENT A SYSTEM WHEREBY CHANGEABLE MESSAGES WILL BE IMPLEMENTED WITHIN 2 HOURS FOLLOWING TELEPHONE NOTIFICATION FROM THE PROJECT ENGINEER TO A DESIGNATED PHONE.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGNS, AS PER PLAN (CONTINUED)

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PRE-PROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE. THE SIGN SHALL HAVE THE CAPABILITY TO STORE UP TO 99 MESSAGES. MESSAGE MEMORY OR PRE-PROGRAMMED DISPLAYS SHALL NOT BE LOST AS A RESULT OF POWER FAILURES TO THE ON-BOARD COMPUTER. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. THREE-LINE PRESENTATION FORMATS WITH UP TO SIX MESSAGE PHASES SHALL BE SUPPORTED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST TWICE. THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE DATA LINK WHICH WILL (IN ACTIVE CELLULAR PHONE AREAS) ALLOW REMOTE SIGN ACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES. ONE REMOTE DATA INPUT DEVICE (LAPTOP COMPUTER PLUS MODEM OR EQUIVALENT) SHALL BE FURNISHED FOR USE BY THE DISTRICT TRAFFIC ENGINEER, OR EQUIVALENT, AND SHALL BE INSURED AGAINST THEFT.

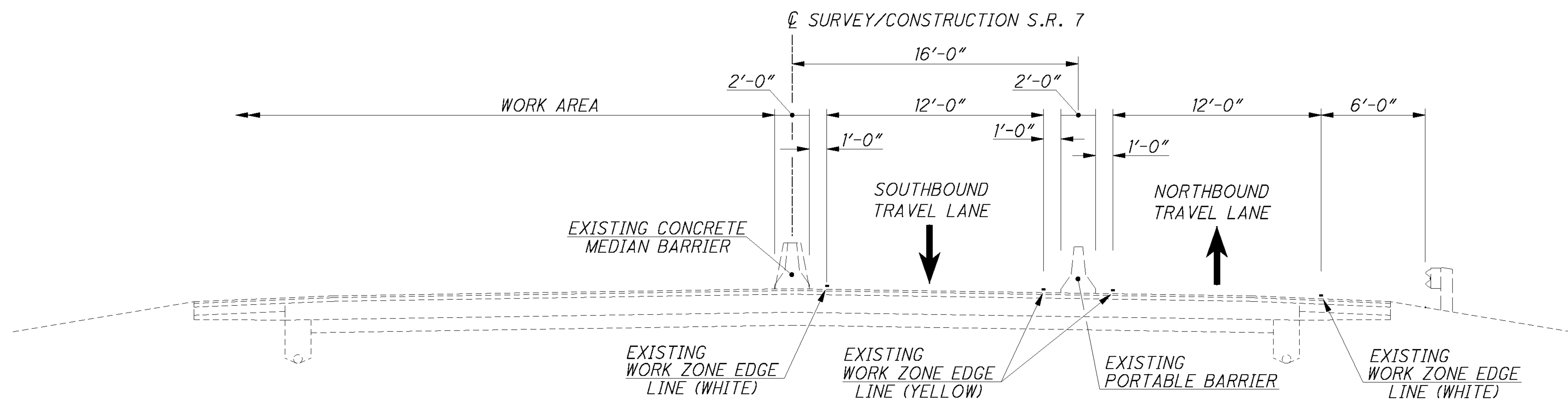
THE PCMS UNIT SHALL BE MAINTAINED IN GOOD WORKING ORDER BY THE CONTRACTOR IN ACCORDANCE WITH THE PROVISIONS OF CMS 614.07. THE CONTRACTOR SHALL, PRIOR TO ACTIVATING THE UNIT, MAKE ARRANGEMENTS, WITH AN AUTHORIZED SERVICE AGENT FOR THE PCMS, TO ASSURE PROMPT SERVICE IN THE EVENT OF FAILURE. ANY FAILURE SHALL NOT RESULT IN THE SIGN BEING OUT OF SERVICE FOR MORE THAN 12 HOURS, INCLUDING WEEKENDS. FAILURE TO COMPLY MAY RESULT IN AN ORDER TO STOP WORK AND OPEN ALL TRAFFIC LANES AND/OR IN THE DEPARTMENT TAKING APPROPRIATE ACTION TO SAFELY CONTROL TRAFFIC. THE ENTIRE COST TO CONTROL TRAFFIC, ACCRUED BY THE DEPARTMENT DUE TO THE CONTRACTOR'S NONCOMPLIANCE, WILL BE DEDUCTED FROM MONEYS DUE, OR TO BECOME DUE THE CONTRACTOR ON HIS CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24-HOUR-PER- DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

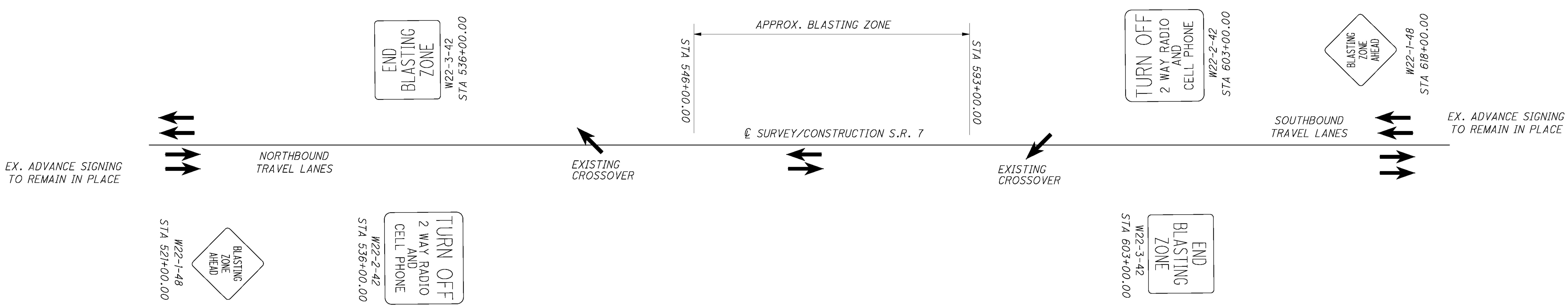
PAYMENT FOR THE ABOVE DESCRIBED ITEM SHALL BE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, FUELS, LUBRICATING OILS, SOFTWARE, HARDWARE AND INCIDENTALS TO PERFORM THE ABOVE DESCRIBED WORK.

IT IS ESTIMATED THAT 2 PCMS'S WILL BE USED FOR A DURATION OF 24 MONTHS. THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY.

ITEM 614, PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 48 SIGN MONTH



EXISTING MAINTENANCE OF TRAFFIC - S.R. 7
(PHASE 1)

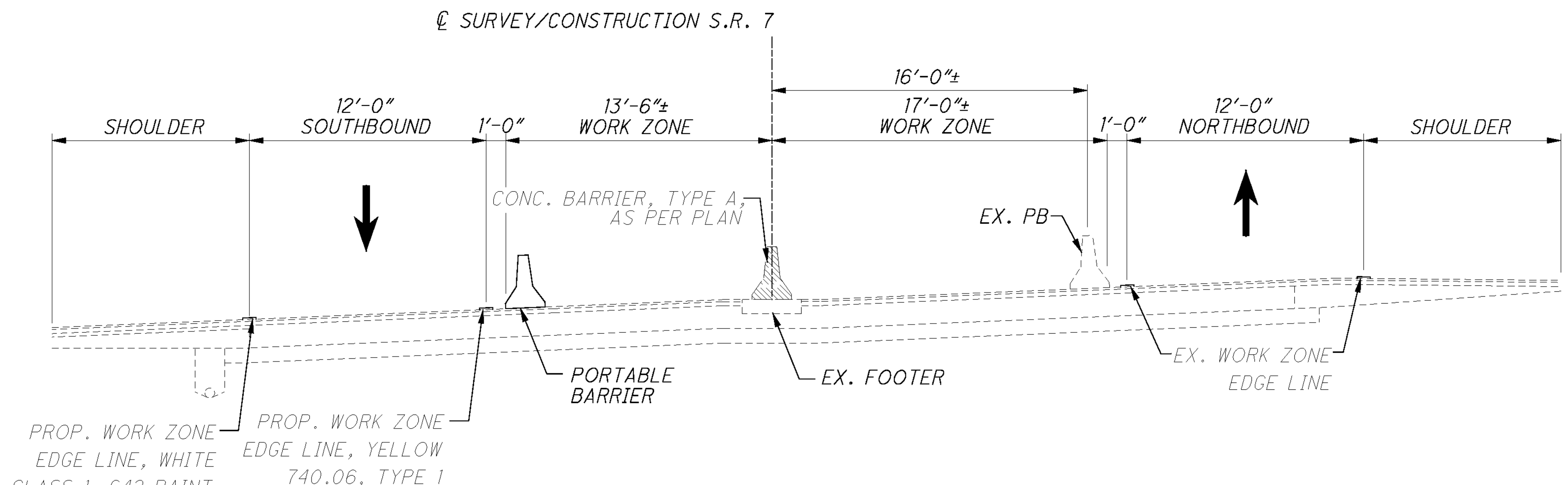


SIGNING SCHEMATIC PLAN - S.R. 7
(PHASE 1)

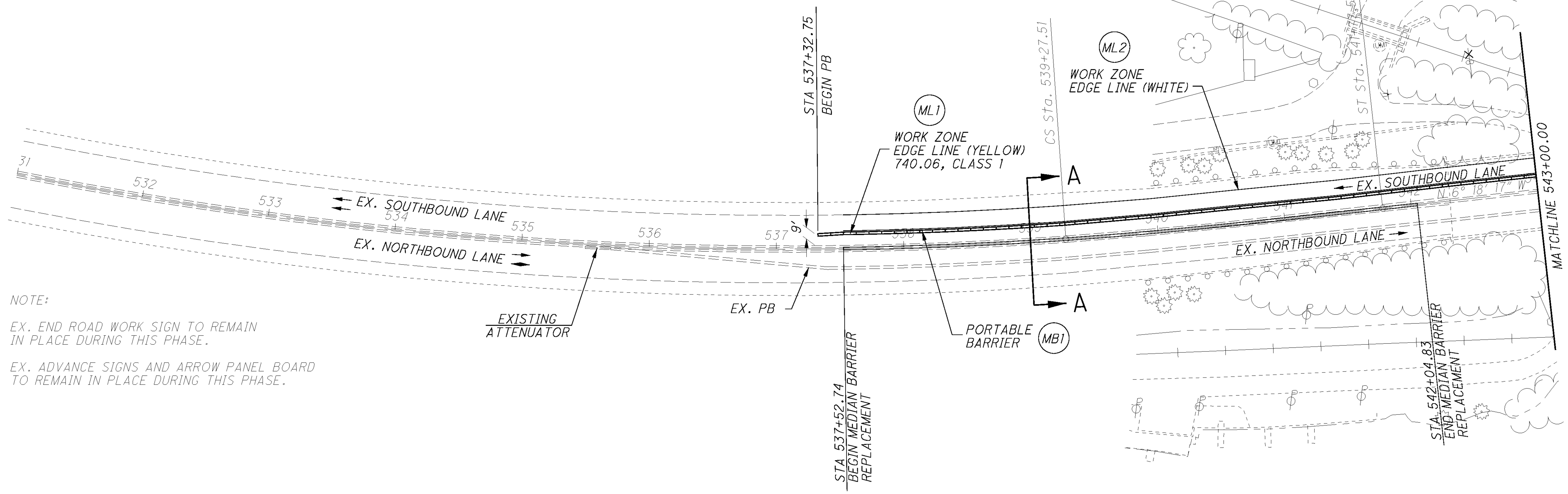
CALCULATED LEH
CHECKED SNS

MAINTENANCE OF TRAFFIC - PHASE 1

JEF-7-10.00



SECTION A-A



NOTE:

EX. END ROAD WORK SIGN TO REMAIN IN PLACE DURING THIS PHASE.

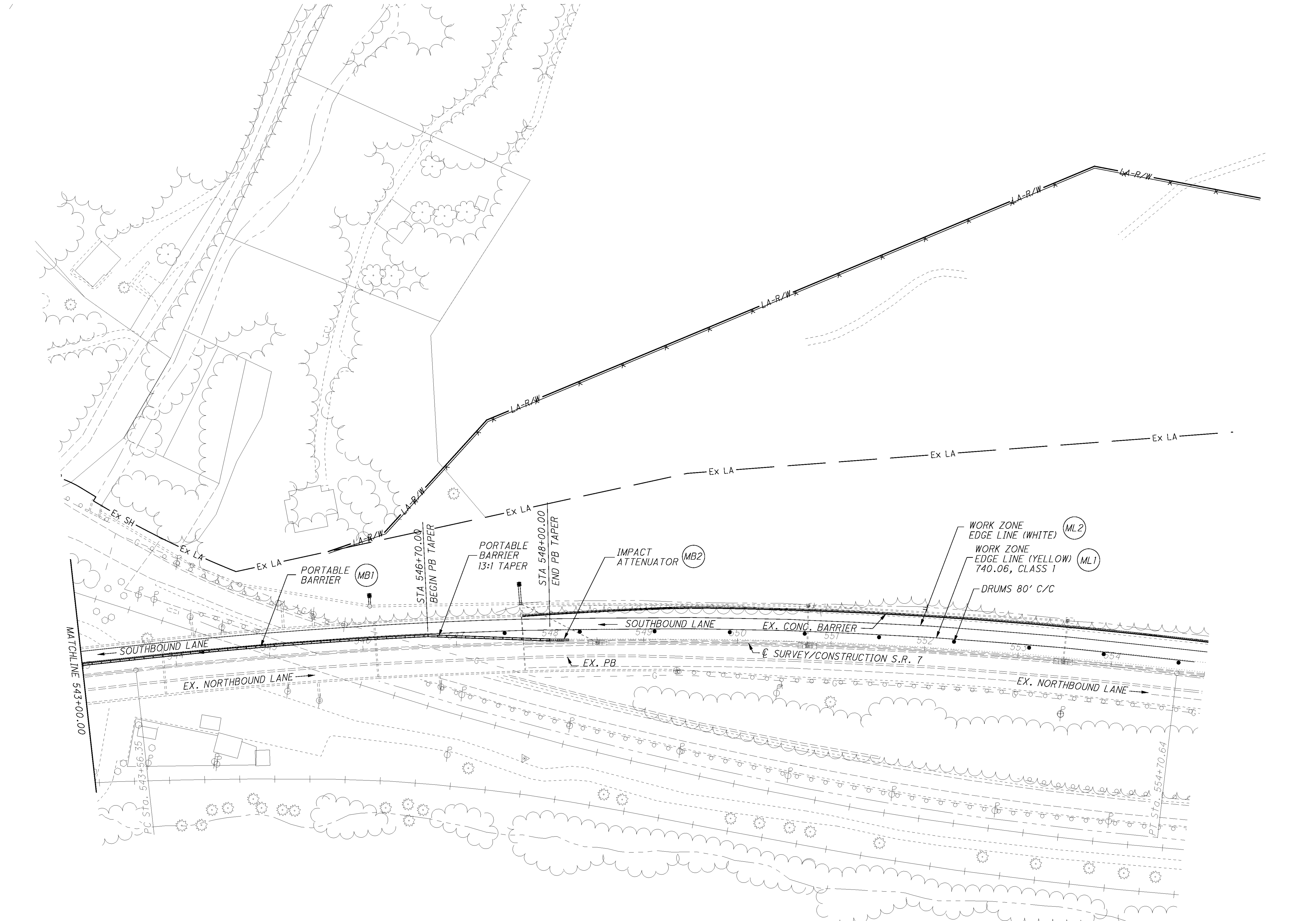
EX. ADVANCE SIGNS AND ARROW PANEL BOARD TO REMAIN IN PLACE DURING THIS PHASE.

HORIZONTAL SCALE IN FEET: 0, 25, 50, 100

CALCULATED LEH
CHECKED SNS

MAINTENANCE OF TRAFFIC - PHASE 2
STA. 531+00.00 TO STA. 543+00.00

JEF-7-10.00

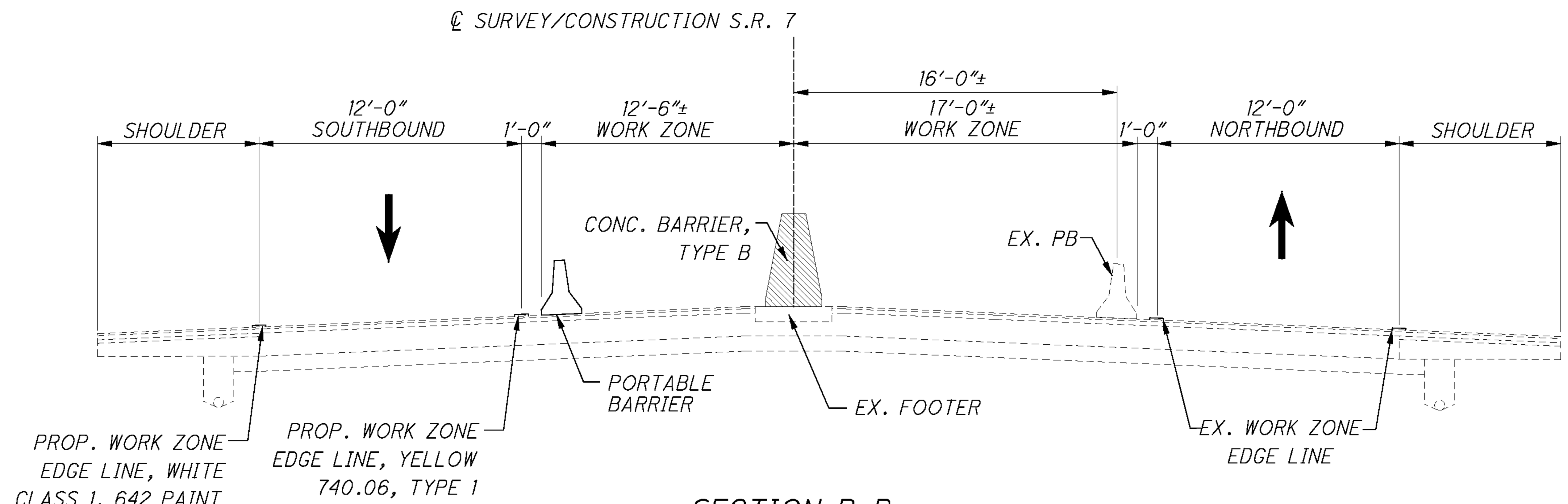


CALCULATED LEH
CHECKED SNS

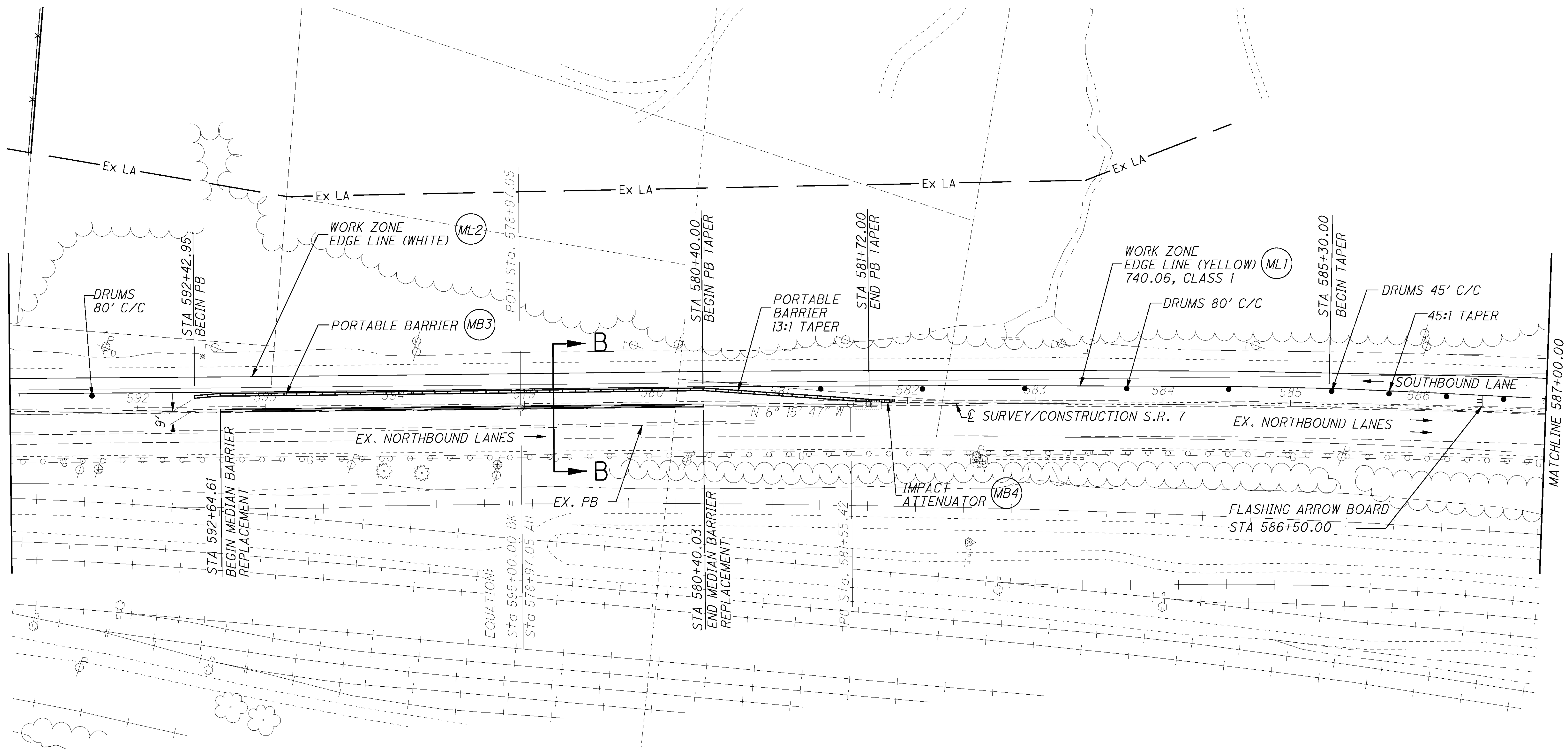
HORIZONTAL SCALE IN FEET 0 25 50 100

MAINTENANCE OF TRAFFIC - PHASE 2
STA. 543+00.00 TO STA. 555+00.00

JEF-7-10.00



SECTION B-B



V:\1736\active\173620035\design\roadway\sheets\93192MP003.dgn 1/27/2014 1:27:10 PM pdurham

N

0 25 50 100
HORIZONTAL SCALE IN FEET

CALCULATED LEH
CHECKED SNS

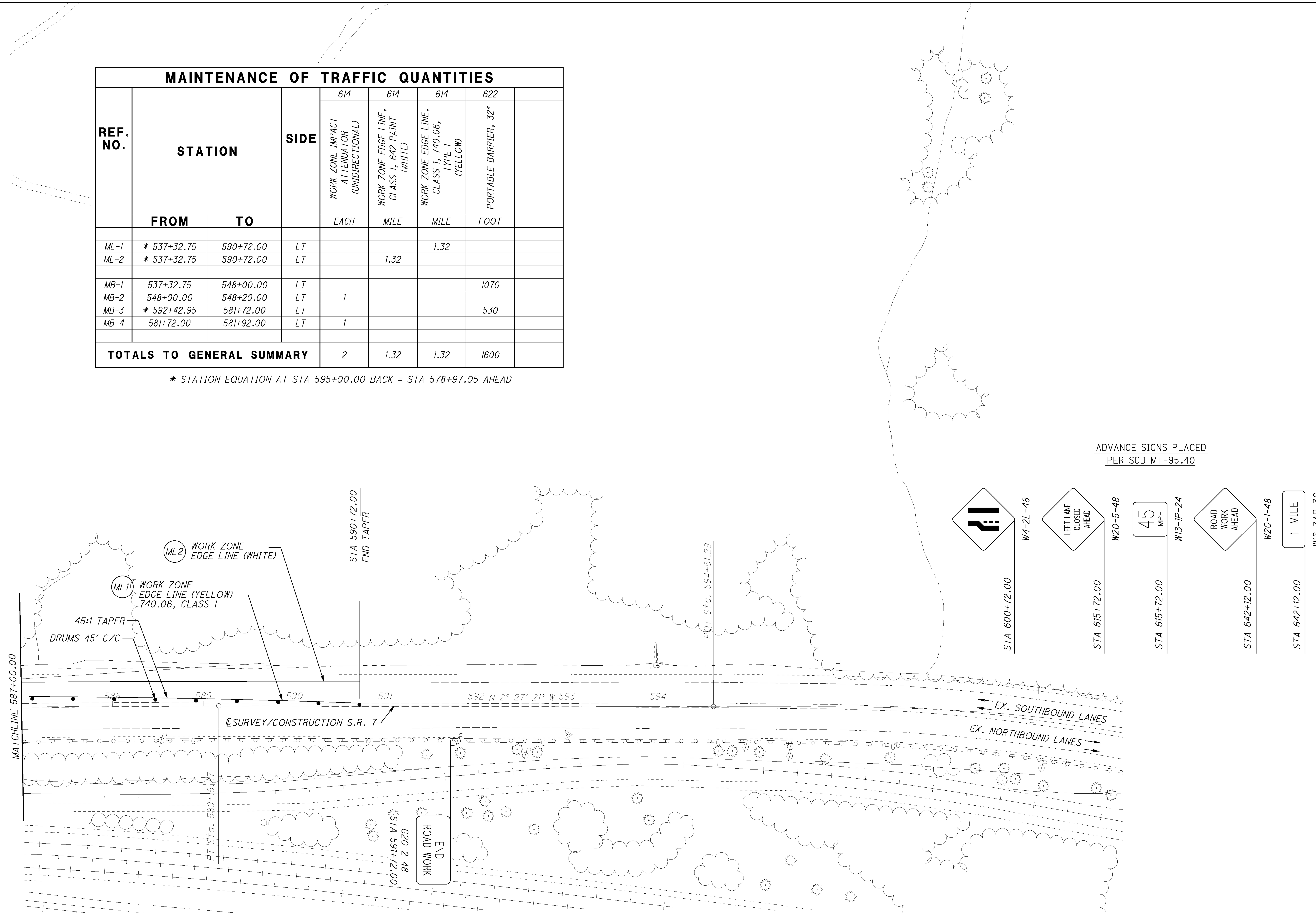
MAINTENANCE OF TRAFFIC - PHASE 2
STA. 591+00.00 TO STA. 587+00.00

JEF-7-10.00

MAINTENANCE OF TRAFFIC QUANTITIES

REF. NO.	STATION FROM	STATION TO	SIDE	614 WORK ZONE IMPACT ATTENUATOR (UNIDIRECTIONAL) EACH	614 WORK ZONE EDGE LINE, CLASS 1, 642 PAINT (WHITE) MILE	614 WORK ZONE EDGE LINE, CLASS 1, 740.06, TYPE 1 (YELLOW) MILE	622 PORTABLE BARRIER, 32" FOOT	
ML-1	* 537+32.75	590+72.00	LT			1.32		
ML-2	* 537+32.75	590+72.00	LT		1.32			
MB-1	537+32.75	548+00.00	LT				1070	
MB-2	548+00.00	548+20.00	LT	1				
MB-3	* 592+42.95	581+72.00	LT				530	
MB-4	581+72.00	581+92.00	LT	1				
TOTALS TO GENERAL SUMMARY				2	1.32	1.32	1600	

* STATION EQUATION AT STA 595+00.00 BACK = STA 578+97.05 AHEAD

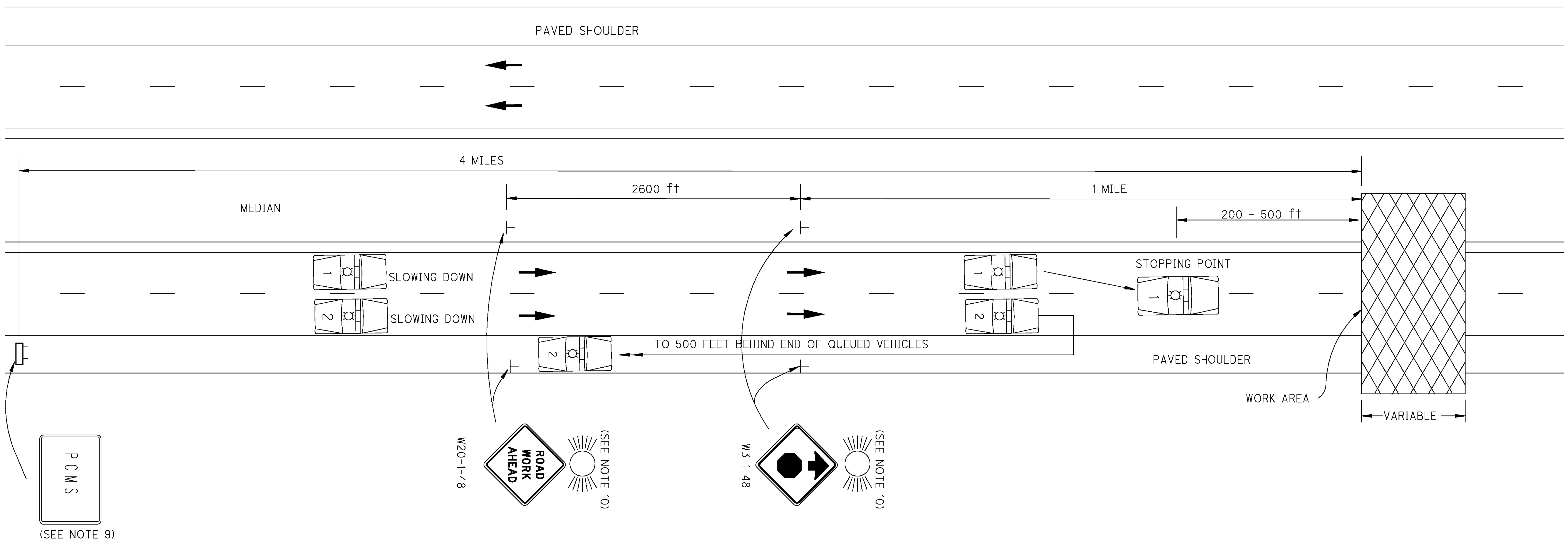


HORIZONTAL SCALE IN FEET 0 25 50 100

CALCULATED LEH
CHECKED SNS

MAINTENANCE OF TRAFFIC - PHASE 2
STA. 587+00.00 TO STA. 594+61.29

JEF-7-10.00



NOTES

1. This type of highway closure shall be used for all construction, maintenance and utility operations when the duration of closure will not exceed 15 minutes.
2. A minimum of two law enforcement officers (LEO) with patrol cars per direction shall be provided to block traffic and pace motorists to a stop. The number of patrol cars shall equal the number of lanes closed on the highway.
3. Patrol cars, with lights flashing, should enter the stream of traffic at approximately 3 miles before the point of closure. At approximately 2 miles before the point of closure, they should begin the gradual slow down. Traffic shall be brought to a complete stop a safe distance, between 200 and 500 feet, from the work area. This slowing operation shall take no more than 10 minutes. After traffic has been stopped, one patrol car shall travel along the roadway shoulder 500 feet behind the end of the queued vehicles.
4. The Contractor shall not begin work until traffic has been brought to a complete stop.
5. All entrance ramps located between the stopped traffic and the work area shall be closed.
6. After the highway has been closed and reopened via this procedure, both of the following requirements shall have been met before implementation of another short duration closure, except with the approval of the Engineer:
   a) A minimum period of 15 minutes shall have elapsed; and
   b) The queued traffic shall have dissipated.
7. The time frame for stopping traffic shall be specified.
8. The public shall be given advance notice of the upcoming closure by providing portable changeable message signs at the site in advance of the scheduled closing. Closure information should also be provided to the Engineer.
9. An ODOT-approved portable changeable message sign, Class 1, shall be provided during operation. The message sign shall be placed approximately 4 miles in advance of the closure or as directed by the Engineer. The message shall be ROAD CLOSED AHEAD (2 sec.), PREPARE TO STOP (2 sec.)
10. The Contractor shall erect and maintain 48-inch ROAD WORK AHEAD and Stop Ahead signs on each side of the highway. Each sign shall be equipped with one Type A flashing warning light and one flare. There shall be one flare at each sign on both sides of the roadway. The flare shall be replaced if it burns out.

OFFICE OF TRAFFIC ENGINEERING

DESIGNED SHB
REVIEWED LAM
REVISION DATE 07/20/12
CHECKED
PID NUMBER 209960

PLAN INSERT SHEET
SHORT-DURATION CLOSURE OF MULTI-LANE DIVIDED HIGHWAY

JEF-7-10.00

1/1

SHEET NUMBER												PARTICIPATION		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
OFFICE CALCS	4	5	6	7		12	16	24	25		121		01/NHS/OT						
																		ROADWAY	
	LUMP												LUMP	201	11001	LUMP		CLEARING AND GRUBBING, AS PER PLAN	4
								500					500	202	30700	500	FT	CONCRETE BARRIER REMOVED	
								75					75	202	38000	75	FT	GUARDRAIL REMOVED	
		500											500	SPECIAL	20270100	500	FT	PIPE CLEANOUT	5
								LUMP					LUMP	202	98000	LUMP		REMOVAL MISC.: CATCHMENT WALL	
								2740112					2740112	203	10000	2740112	CU YD	EXCAVATION	
								640					640	203	20000	640	CU YD	EMBANKMENT	
1822													1822	204	10000	1822	SQ YD	SUBGRADE COMPACTION	
	LUMP												LUMP	208	10000	LUMP		PRE-BLAST CONDITION SURVEY	
	LUMP												LUMP	208	12000	LUMP		BLASTING CONSULTANT	
	LUMP												LUMP	208	13000	LUMP		AIR BLAST AND NOISE CONTROL	
	LUMP												LUMP	208	14000	LUMP		VIBRATION CONTROL AND MONITORING	
		166838											166838	208	15001	166838	SQ YD	PRESPLITTING, AS PER PLAN	5
	LUMP												LUMP	208	16000	LUMP		HYDROLOGIST	
		310						4076	105				4491	512	10100	4491	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
								100					100	606	15050	100	FT	GUARDRAIL, TYPE MGS	
								1					1	606	26150	1	EACH	ANCHOR ASSEMBLY, MGS TYPE E	
								1					1	606	35002	1	EACH	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1	
								5511					5511	607	15000	5511	FT	FENCE, TYPE 47	
								5511					5511	607	70000	5511	FT	FENCELINE SEEDING AND MULCHING	
								349					349	622	10060	349	FT	CONCRETE BARRIER, SINGLE SLOPE, TYPE B	
								3793					3793	622	10161	3793	FT	CONCRETE BARRIER, SINGLE SLOPE, TYPE D, AS PER PLAN	5
		452											452	622	23301	452	FT	CONCRETE BARRIER, TYPE A, AS PER PLAN	5
								1					1	622	25000	1	EACH	CONCRETE BARRIER END SECTION, TYPE D	
								2					2	622	25004	2	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE B	
								8					8	622	25050	8	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D	
		200											200	690	68000	200	CRHR	SCALING	
																		EROSION CONTROL	
									27				27	601	11000	27	SQ YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB	
		4							90				94	601	21050	94	SQ YD	TIED CONCRETE BLOCK MAT, TYPE 1	
		56813											56813	659	10000	56813	SQ YD	SEEDING AND MULCHING	
		2841											2841	659	14000	2841	SQ YD	REPAIR SEEDING AND MULCHING	
		7.67											7.67	659	20000	7.67	TON	COMMERCIAL FERTILIZER	
		11.74											11.74	659	31000	11.74	ACRE	LIME	
		307											307	659	35000	307	M GAL	WATER	
		58											58	659	40000	58	M SQ FT	MOWING	
									1631				1631	670	00710	1631	SQ YD	DITCH EROSION PROTECTION MAT, TYPE A	
							LUMP						LUMP	832	15000	LUMP		STORM WATER POLLUTION PREVENTION PLAN	
							75000						75000	832	30000	75000	EACH	EROSION CONTROL	
									1415				1415	836	10000	1415	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1	
									3284				3284	836	10020	3284	SQ YD	SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 2	
																		DRAINAGE	
									12.3				12.3	602	20000	12.3	CU YD	CONCRETE MASONRY	
		100											100	605	13300	100	FT	6" UNCLASSIFIED PIPE UNDERDRAINS	
		20											20	611	01500	20	FT	6" CONDUIT, TYPE F	
									32				32	611	10600	32	FT	24" CONDUIT, TYPE C	
									8				8	611	23600	8	FT	60" CONDUIT, TYPE A	
									2				2	611	98300	2	EACH	CATCH BASIN, NO. 5	
									11				11	611	98634	11	EACH	CATCH BASIN RECONSTRUCTED TO GRADE	
									5				5	611	99115	5	EACH	INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN	4
		2											2	611	99710	2	EACH	PRECAST REINFORCED CONCRETE OUTLET	

CALCULATED PJD
CHECKED LEH

GENERAL SUMMARY

JEF-7-10.00

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SHEET NUMBER												PARTICIPATION		ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
OFFICE CALCS	4	5	6	7		12	16	24	25		121		01/NHS/OT						
																		PAVEMENT	
14701													14701	254	01000	14701	SQ YD	PAVEMENT PLANING, ASPHALT CONCRETE	
59													59	302	46000	59	CU YD	ASPHALT CONCRETE BASE, PG64-22	
314													314	304	20000	314	CU YD	AGGREGATE BASE	
1156													1156	407	10000	1156	GALLON	TACK COAT	
514													514	441	10101	514	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (446), AS PER PLAN (PG70-22M)	4
36													36	441	10200	36	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (446)	
4027	4550							18					18	609	24510	18	FT	CURB, TYPE 4-C	
													8577	618	40100	8577	FT	RUMBLE STRIPS, (ASPHALT CONCRETE)	
																		TRAFFIC CONTROL	
											170		170	621	00100	170	EACH	RPM	
		10						50					60	626	00100	60	EACH	BARRIER REFLECTOR	
											32		32	630	04100	32	FT	GROUND MOUNTED SUPPORT, NO. 4 POST	
											39.9		39.9	630	07600	39.9	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10X12	
											16		16	630	80100	16	SQ FT	SIGN, FLAT SHEET	
											60		60	630	80200	60	SQ FT	SIGN, GROUND MOUNTED EXTRUSHEET	
											2		2	630	84500	2	EACH	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION	
											1		1	630	84900	1	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	
											1		1	630	85400	1	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL	
											2		2	630	86002	2	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	
											2		2	630	86102	2	EACH	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL	
											7.66		7.66	646	10010	7.66	MILE	EDGE LINE, 6"	
											3.83		3.83	646	10110	3.83	MILE	LANE LINE, 6"	
											1000		1000	646	10310	1000	FT	CHANNELIZING LINE, 12"	
																		MAINTENANCE OF TRAFFIC	
			1000										1000	614	11110	1000	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR ASSISTANCE	
						2							2	614	12336	2	EACH	WORK ZONE IMPACT ATTENUATOR (UNIDIRECTIONAL)	
				2									2	614	12400	2	EACH	WORK ZONE IMPACT ATTENUATOR, MISC.: REMOVAL OF IMPACT ATTENUATOR	7
			2										2	614	12757	2	EACH	WORK ZONE CROSSOVER LIGHTING SYSTEM, AS PER PLAN	6
			32										32	614	13300	32	EACH	BARRIER REFLECTOR, TYPE B	
			30										30	614	13350	30	EACH	OBJECT MARKER, ONE WAY	
				2									2	614	18000	2	EACH	MAINTAINING TRAFFIC, MISC.: REMOVAL OF FLASHING ARROW PANEL	7
				LUMP									LUMP	614	18002	LUMP		MAINTAINING TRAFFIC, MISC.: REMOVAL OF GROUND MOUNTED SIGN AND SUPPORT	7
			LUMP										LUMP	614	18002	LUMP		MAINTAINING TRAFFIC, MISC.: REMOVAL OF WORK ZONE PAVEMENT MARKING	6
				48									48	614	18601	48	SIGN MNTH	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN	7
						1.32							1.32	614	22100	1.32	MILE	WORK ZONE EDGE LINE, CLASS I, 642 PAINT	
						1.32							1.32	614	22200	1.32	MILE	WORK ZONE EDGE LINE, CLASS I, 740.06, TYPE I	
		5482											5482	616	10000	5482	M GAL	WATER	
						1600							1600	622	41000	1600	FT	PORTABLE BARRIER, 32"	
			5826										5826	622	90000	5826	FT	BARRIER, MISC.: REMOVAL OF GLARE SCREEN	6
			5826										5826	622	90000	5826	FT	BARRIER, MISC.: REMOVAL OF TEMPORARY CONCRETE BARRIER	6
													LUMP	SPECIAL	10810000	LUMP		CPM SCHEDULE	
													LUMP	614	11001	LUMP		MAINTAINING TRAFFIC, AS PER PLAN	6
													24	619	16020	24	MONTH	FIELD OFFICE, TYPE C	
													LUMP	623	10000	LUMP		CONSTRUCTION LAYOUT STAKES AND SURVEYING	
													LUMP	623	11000	LUMP		PROVIDING ELECTRONIC INSTRUMENTATION	
													LUMP	624	10000	LUMP		MOBILIZATION	

CALCULATED PJD
CHECKED LEH

GENERAL SUMMARY

JEF-7-10.00

PROJECT DESCRIPTION

EMERGENCY PROJECT TO REPAIR 0.88 MILES OF FAILED ROCK FACE ON THE WEST SIDE OF STATE ROUTE 7. REMEDIATION INCLUDES REMOVAL OF ROCK, BENCHING OF SLOPES, DRAINAGE IMPROVEMENTS, INSTALLATION OF CONCRETE BARRIER AND PAVEMENT REHABILITATION ALONG S.R.7. PROJECT ALSO INCLUDES REMOVAL OF MOT FACILITIES CURRENTLY IN PLACE. FHWA DISASTER OH12-01 DSR JEF-001.

LATITUDE: 40°16'30" N
LONGITUDE: 80°39'05" W

USGS QUADRANT: STEUBENVILLE EAST, OHIO

QUANTITIES CARRIED TO GENERAL SUMMARY

ITEM 832 STORM WATER POLLUTION PREVENTION PLAN	LUMP
ITEM 832 EROSION CONTROL	75000 EACH

POST CONSTRUCTION BMP:
POST CONSTRUCTION STORM WATER IS TREATED USING ENHANCED BANKFULL WIDTH DITCHES ON THIS PROJECT. THE ROADSIDE DITCHES, WHICH ARE ALSO USED AS CATCHMENT AREAS FOR FALLING ROCK, MEET ALL REQUIREMENTS TO BE CONSIDERED FOR THIS BMP. THE FIRST DITCH BEGINS BEGINS AT STA. 547+68 AND ENDS AT STA. 553+00. THE SECOND DITCH BEGINS AT STA. 559+00 AND ENDS AT STA 586+00. SEE CROSS SECTIONS FOR DETAILS.

PROJECT DATA

Total Area (Right-of Way)	52.210 AC.	Runoff Coefficient for Pre-Construction Site	0.70
Project Earth Disturbed Area	52.210 AC.	Runoff Coefficient for Post-Construction Site	0.70
Estimated Contractor Earth Disturbed Area	184.00 AC.	Post Construction BMP: ENHANCED BANKFULL WIDTH DITCH	
Notice of Intent Earth Disturbed Area	236.210 AC.	Immediate Receiving Waters	OHIO RIVER
Impervious (Paved) Area for Pre-Construction Site	3.015 AC.	Subsequent Receiving Waters	MISSISSIPPI RIVER
Impervious (Paved) Area for Post-Construction Site	3.159 AC.		

LEGEND
- ■ BARRIER INLET
- ▲ CATCH BASIN (DITCH)
- ✱ CULVERT EXTENSION

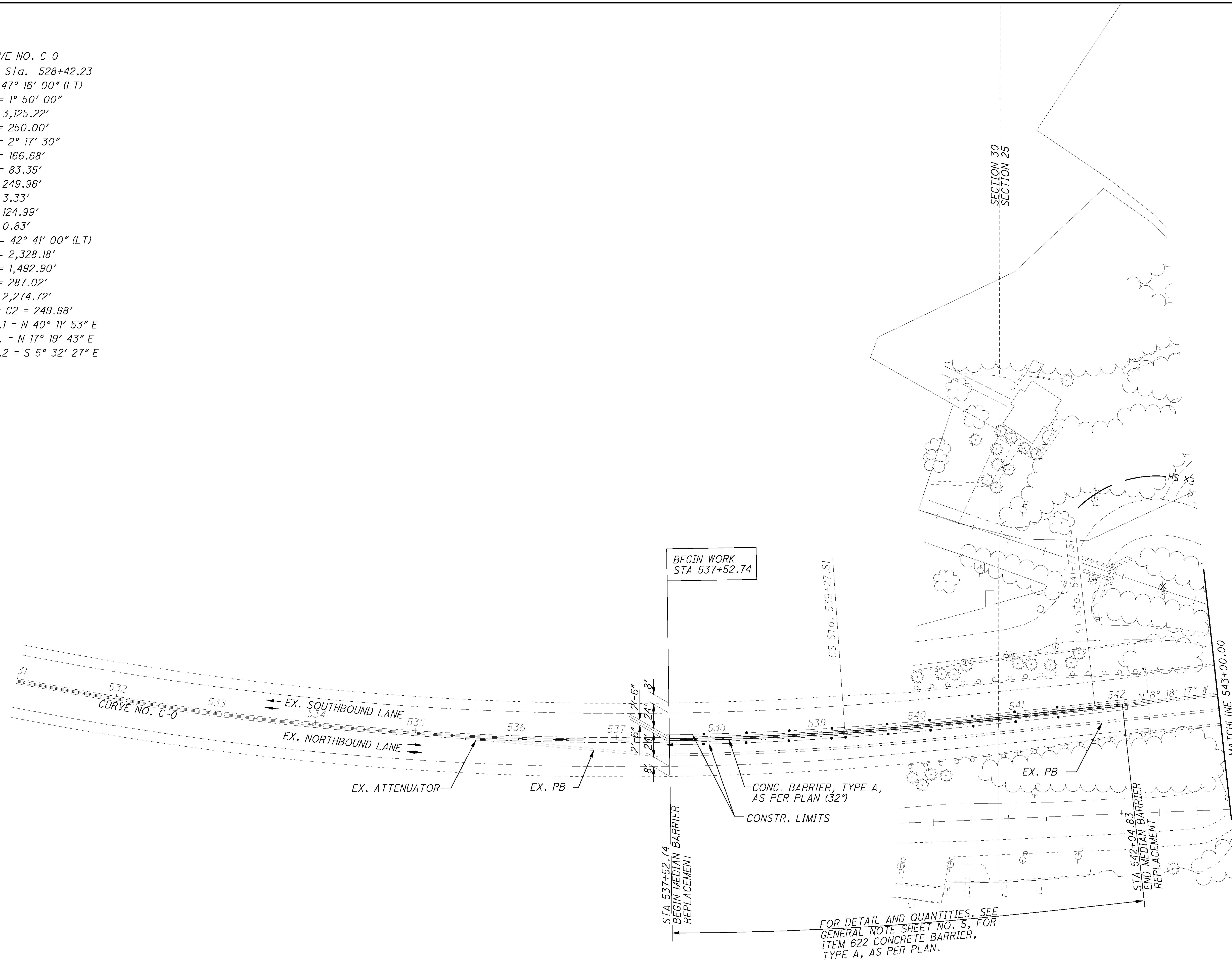
0 100 200 400
HORIZONTAL SCALE IN FEET

CALCULATED PJD
CHECKED SNS

PROJECT SITE PLAN

JEF-7-10.00

CURVE NO. C-0
P.I. Sta. 528+42.23
Δ = 47° 16′ 00″ (LT)
Dc = 1° 50′ 00″
R = 3,125.22′
Ls = 250.00′
θs = 2° 17′ 30″
LT = 166.68′
ST = 83.35′
x = 249.96′
y = 3.33′
k = 124.99′
p = 0.83′
Δc = 42° 41′ 00″ (LT)
Lc = 2,328.18′
Ts = 1,492.90′
Es = 287.02′
C = 2,274.72′
C1 = C2 = 249.98′
C.B.1 = N 40° 11′ 53″ E
C.B. = N 17° 19′ 43″ E
C.B.2 = S 5° 32′ 27″ E



FOR QUANTITIES SEE SHT. NO. 5, 121

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N

0 25 50 100
HORIZONTAL
SCALE IN FEET

CALCULATED EDA
CHECKED SNS

PLAN
STA. 531+00.00 TO STA. 543+00.00

JEF-7-10.00

FENCE LEGEND

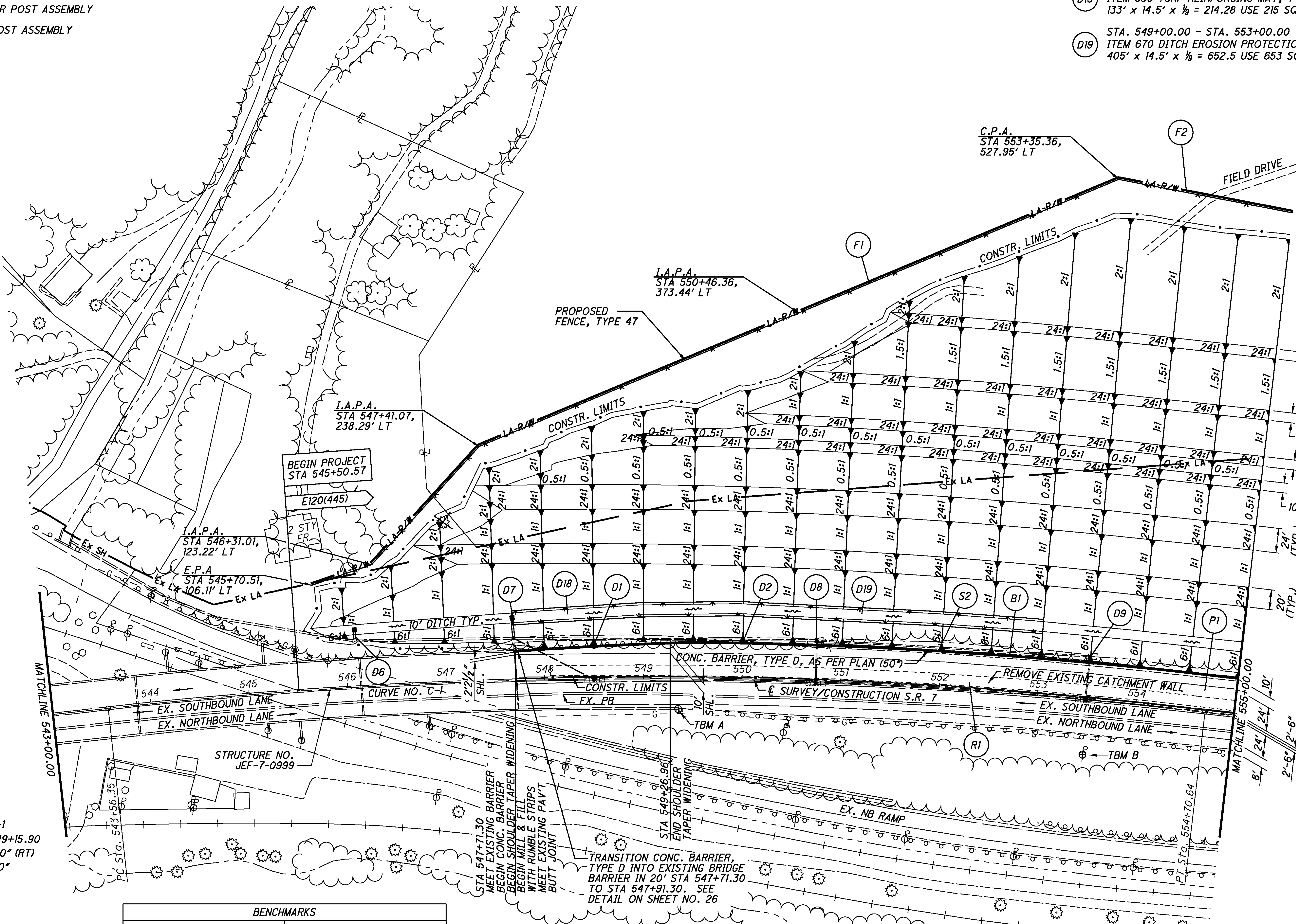
I.A.P.A. = INTERMEDIATE ANCHOR POST ASSEMBLY

C.P.A. = CORNER POST ASSEMBLY

E.P.A. = END POST ASSEMBLY

D18 STA. 547+69.50 - STA. 549+00.00
ITEM 836 TURF REINFORCING MAT, TYPE 1
133' x 14.5' x 1/9 = 214.28 USE 215 SQ YD

D19 STA. 549+00.00 - STA. 553+00.00
ITEM 670 DITCH EROSION PROTECTION, TYPE A
405' x 14.5' x 1/9 = 652.5 USE 653 SQ YD



CURVE NO. C-1
P.I. Sta. 549+15.90
Δ = 13° 00' 00" (RT)
Dc = 1° 10' 00"
R = 4,911.07'
T = 559.55'
L = 1,114.29'
E = 31.77'
C = 1,111.90'
C.B. = N 0° 11' 43" E

BENCHMARKS	
TBM A STA 549+35.36, 30.45' RT. CROSS NOTCH IN NORTH EAST CORNER OF BRIDGE ELEV. = 713.97	TBM B STA 553+50.82, 56.15' RT. RAIL SPIKE IN POLE NO. 26282-51 ELEV. = 719.04

FOR QUANTITIES SEE SHT. NO. 24, 25, 121
FOR SIGNING DETAIL SEE SHT. NO. 121

HORIZONTAL SCALE IN FEET 0 25 50 100

CALCULATED EDA
CHECKED SNS

PLAN
STA. 543+00.00 TO STA. 555+00.00

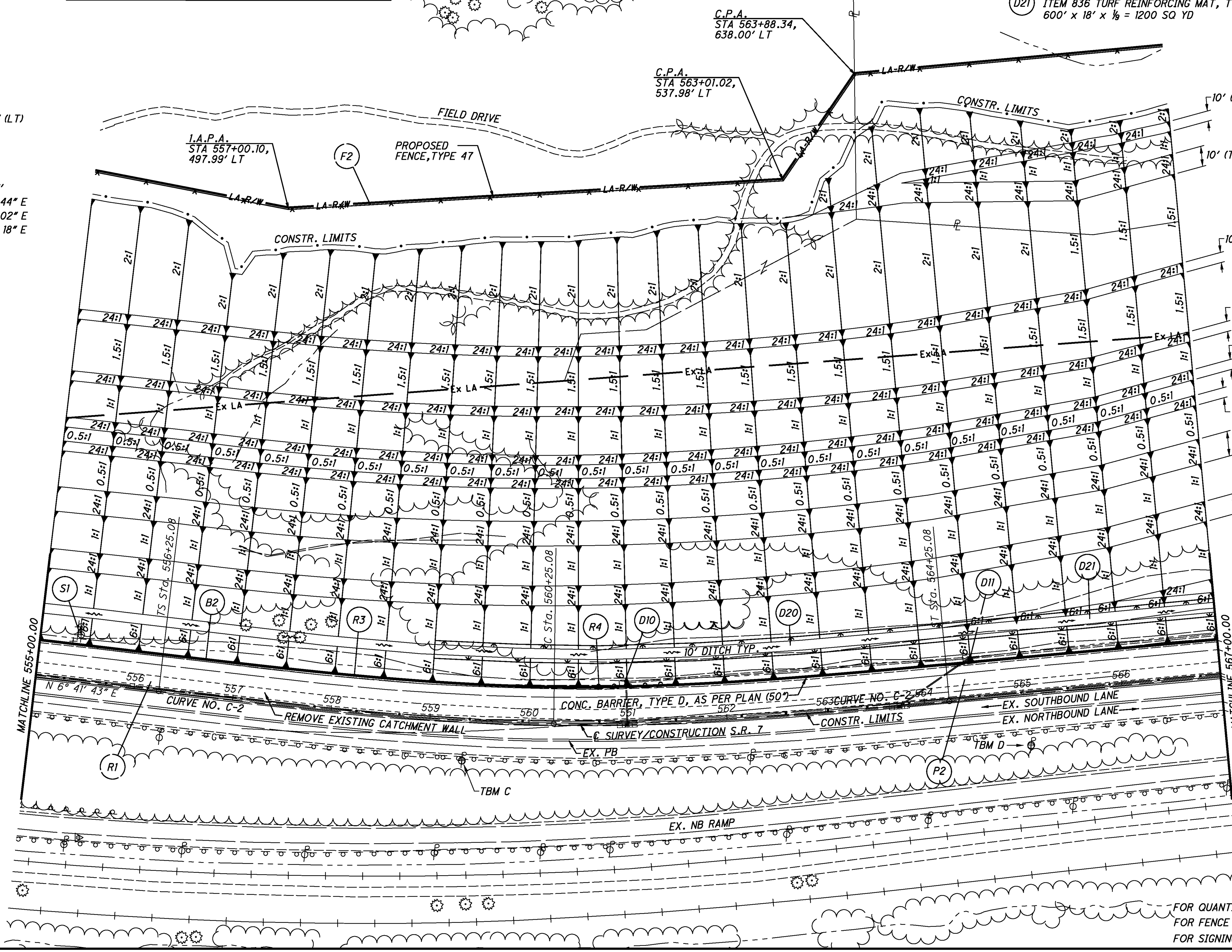
JEF-7-10.00

CURVE NO. C-2
P.I. Sta. 560+26.11
Δ = 12° 00' 00" (LT)
Dc = 3° 00' 00"
R = 1,909.86'
Ls = 400.00'
θs = 6° 00' 00"
LT = 266.82'
ST = 133.47'
x = 399.56'
y = 13.95'
k = 199.93'
p = 3.49'
Δc = 0° 00' 00" (LT)
Lc = 0.00'
Ts = 401.03'
Es = 14.03'
C = 0.00'
C1 = C2 = 399.81'
C.B.1 = N 4° 41' 44" E
C.B. = N 0° 29' 02" E
C.B.2 = S 3° 18' 18" E

BENCHMARKS	
TBM C STA 559+34.57, 40.39' RT. RAIL SPIKE IN POLE NO. OPCL 262-65 ELEV. = 726.80	TBM D STA 565+03.29, 51.63' RT. RAIL SPIKE IN POLE NO. 262-63 ELEV. = 713.15

(D20) STA. 559+00.00 - STA. 564+00.00
ITEM 670 DITCH EROSION PROTECTION MAT, TYPE A
489' x 18' x ⅓ = 978 SQ YD

(D21) STA. 564+00.00 - STA. 570+00.00
ITEM 836 TURF REINFORCING MAT, TYPE 1
600' x 18' x ⅓ = 1200 SQ YD



FOR QUANTITIES SEE SHT. NO. 24, 25, 121
FOR FENCE LEGEND SEE SHT. NO. 18
FOR SIGNING DETAIL SEE SHT. NO. 121

HORIZONTAL SCALE IN FEET
0 25 50 100

CALCULATED EDA
CHECKED SNS

PLAN
STA. 555+00.00 TO STA. 567+00.00

JEF-7-10.00

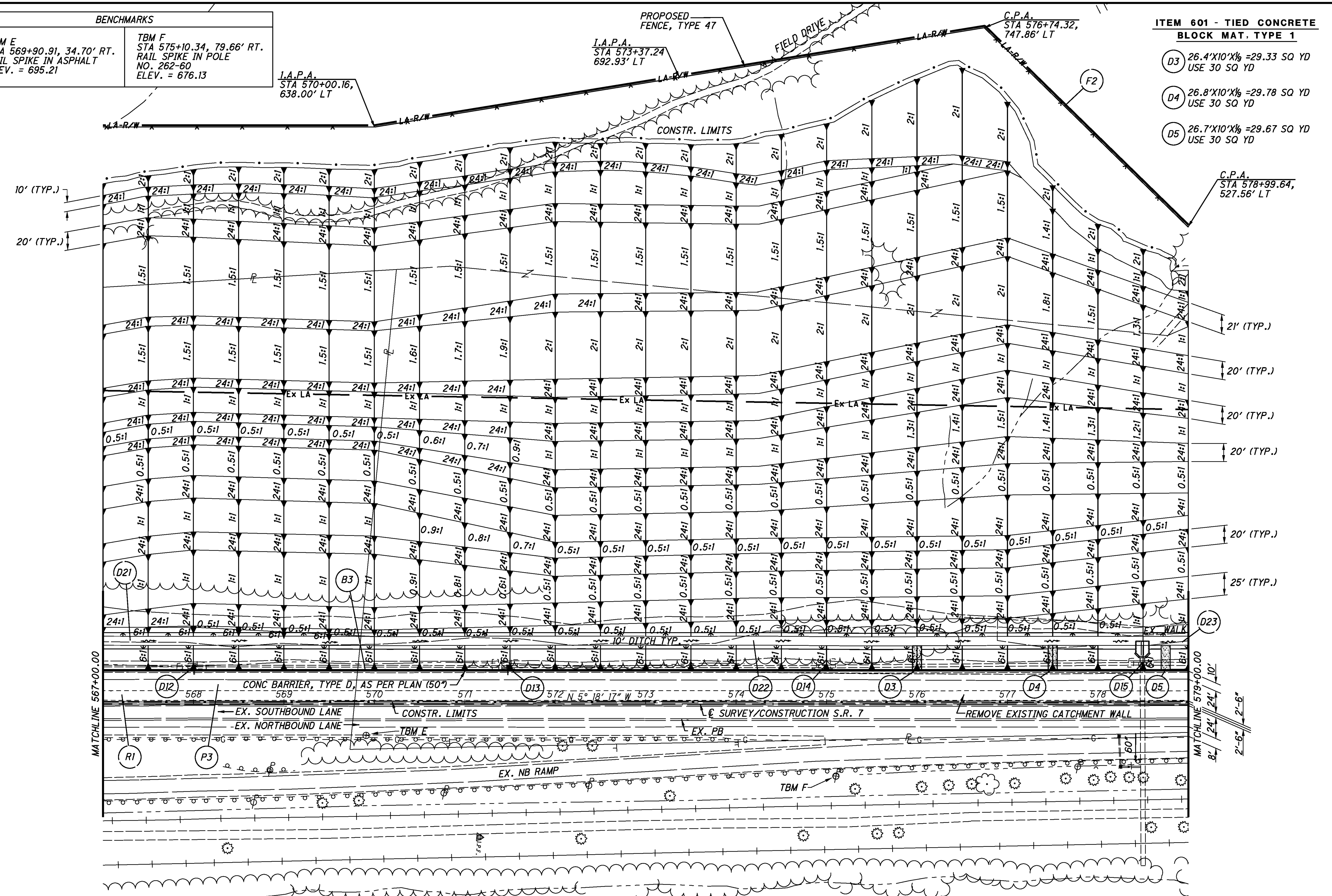
BENCHMARKS	
TBM E STA 569+90.91, 34.70' RT. RAIL SPIKE IN ASPHALT ELEV. = 695.21	TBM F STA 575+10.34, 79.66' RT. RAIL SPIKE IN POLE NO. 262-60 ELEV. = 676.13

ITEM 601 - TIED CONCRETE BLOCK MAT, TYPE 1

(D3) 26.4'X10'X1/9 =29.33 SQ YD USE 30 SQ YD

(D4) 26.8'X10'X1/9 =29.78 SQ YD USE 30 SQ YD

(D5) 26.7'X10'X1/9 =29.67 SQ YD USE 30 SQ YD



(D22) STA. 570+00.00 - STA. 578+50.00
ITEM 836 TURF REINFORCING MAT, TYPE 2
850' x 18' x 1/9 = 1700 SQ YD

FOR QUANTITIES SEE SHT. NO. 24, 25, 121
FOR FENCE LEGEND SEE SHT. NO. 18

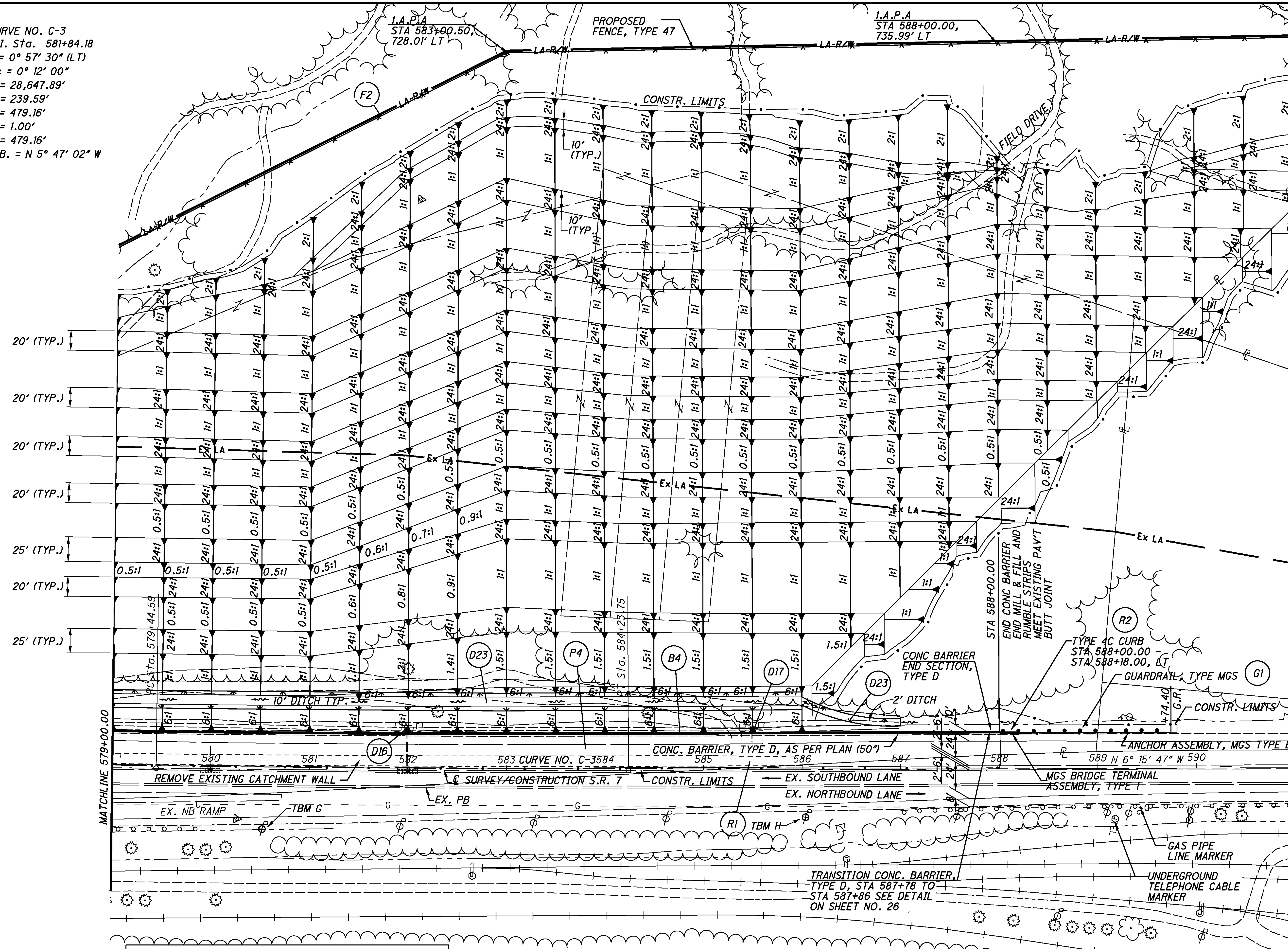
HORIZONTAL SCALE IN FEET 0 25 50 100

CALCULATED EDA
CHECKED SNS

PLAN
STA. 567+00.00 TO STA. 579+00.00

JEF-7-10.00

CURVE NO. C-3
P.I. Sta. 581+84.18
Δ = 0° 57' 30" (LT)
Dc = 0° 12' 00"
R = 28,647.89'
T = 239.59'
L = 479.16'
E = 1.00'
C = 479.16'
C.B. = N 5° 47' 02" W



BENCHMARKS	
TBM G STA 580+52.42, 60.55' RT. RAIL SPIKE IN POLE NO. 262-58 ELEV. 674.53	TBM H STA 586+03.25, 48.21' RT. RAIL SPIKE IN POLE NO. 262-56 ELEV. 677.81

(D23) STA. 578+50.00 - STA. 587+00.00
ITEM 836 TURF REINFORCING MAT TYPE, 2
750' x 18' x 1/9 = 1500 SQ YD
100' x 7.5' x 1/9 = 83.33 SQ YD
TOTAL = 1584 SQ YD

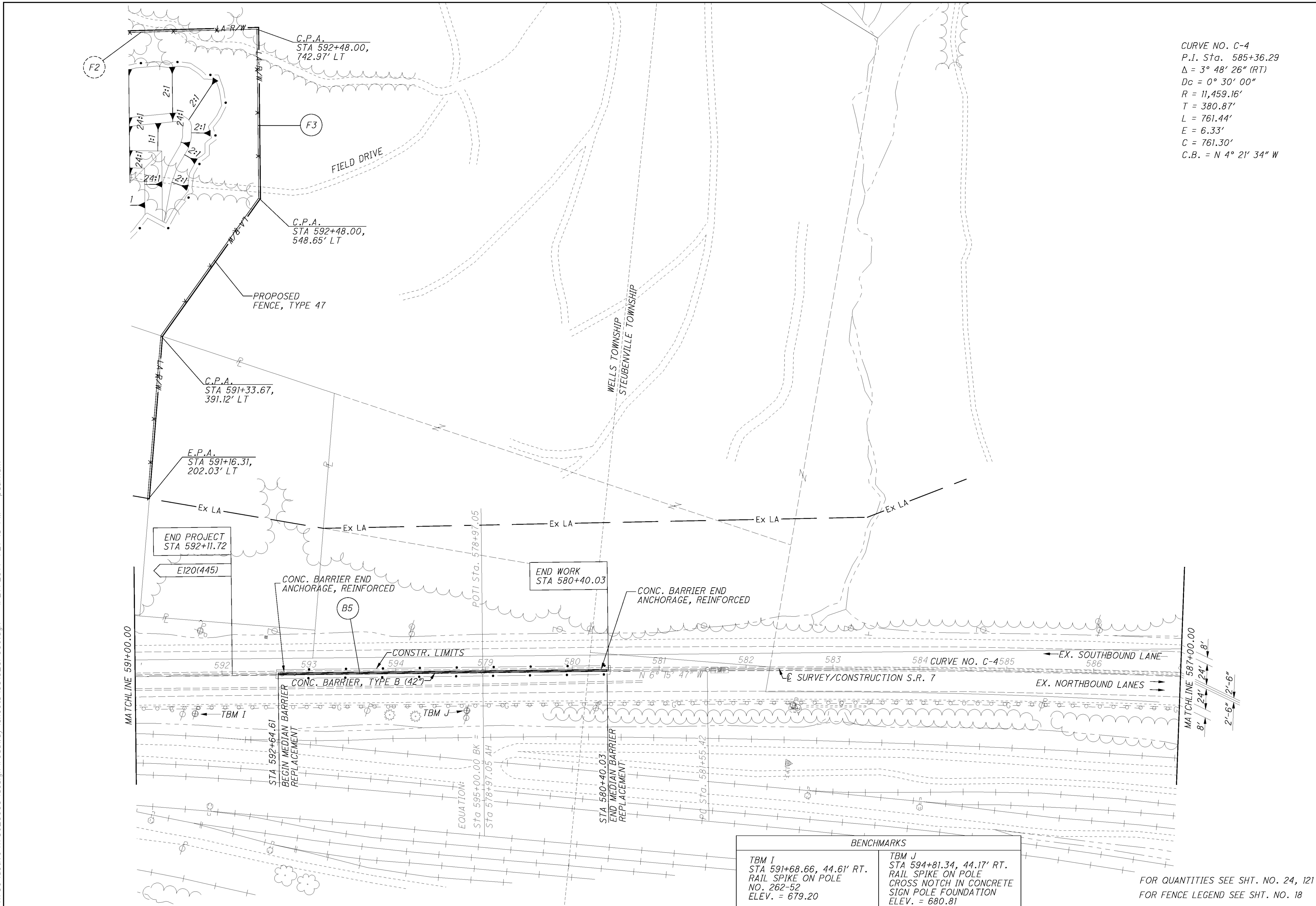
FOR QUANTITIES SEE SHT. NO. 24, 25, 121
FOR FENCE LEGEND SEE SHT. NO. 18

HORIZONTAL SCALE IN FEET

CALCULATED EDA CHECKED SNS

PLAN
STA. 579+00.00 TO STA. 591+00.00

JEF-7-10.00



BENCHMARKS	
TBM I STA 591+68.66, 44.61' RT. RAIL SPIKE ON POLE NO. 262-52 ELEV. = 679.20	TBM J STA 594+81.34, 44.17' RT. RAIL SPIKE ON POLE CROSS NOTCH IN CONCRETE SIGN POLE FOUNDATION ELEV. = 680.81

FOR QUANTITIES SEE SHT. NO. 24, 121
FOR FENCE LEGEND SEE SHT. NO. 18

HORIZONTAL SCALE IN FEET 0 25 50 100

CALCULATED EDA
CHECKED SNS

PLAN
STA. 591+00.00 TO STA. 587+00.00

JEF-7-10.00

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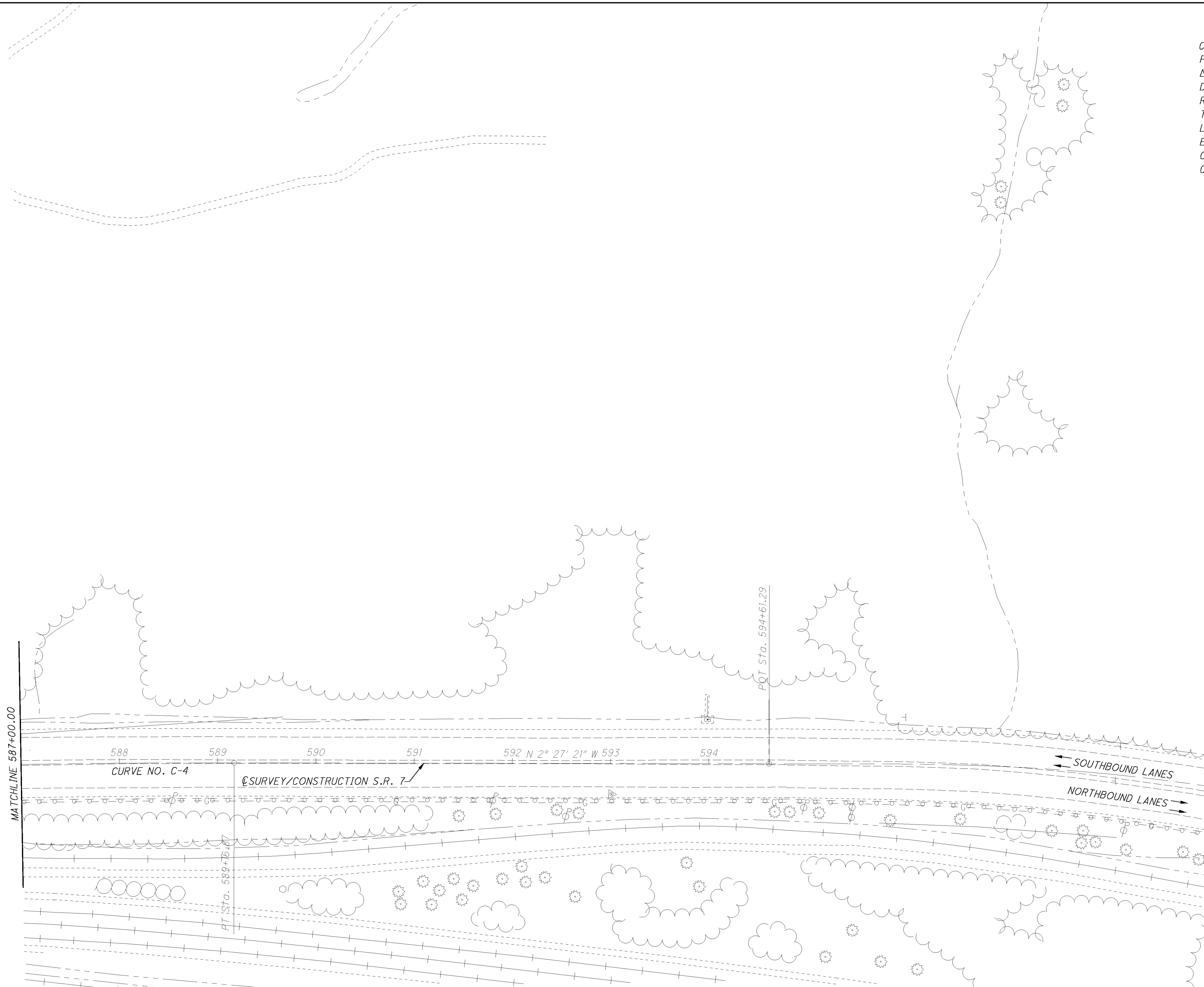

CURVE NO. C-4
P.I. Sta. 585+36.29
Δ = 3° 48' 26" (RT)
Dc = 0° 30' 00"
R = 11,459.16'
T = 380.87'
L = 761.44'
E = 6.33'
C = 761.30'
C.B. = N 4° 21' 34" W

FOR QUANTITIES SEE SHT. NO. 121

N

0 25 50 100
HORIZONTAL SCALE IN FEET

CALCULATED EDA
CHECKED SNS

PLAN
STA. 587+00.00 TO STA. 594+61.29

JEF-7-10.00

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ROADWAY QUANTITIES

REF. NO.	SHEET NO.	STATION FROM	STATION TO	SIDE	202 CONCRETE BARRIER REMOVED (FOOT)	202 GUARDRAIL REMOVED (FOOT)	202 REMOVAL MISC: CATCHMENT WALL (LUMP)	512 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE) (SQ YD)	606 GUARDRAIL, TYPE MGS (FOOT)	606 ANCHOR ASSEMBLY, MGS TYPE E (EACH)	606 MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1 (EACH)	609 CURB, TYPE 4C (FOOT)	622 CONCRETE BARRIER, SINGLE SLOPE, TYPE B (FOOT)	622 CONCRETE BARRIER, SINGLE SLOPE, TYPE D, AS PER PLAN (FOOT)	622 CONCRETE BARRIER END SECTION, TYPE D (EACH)	622 CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE B (EACH)	622 CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D (EACH)	626 BARRIER REFLECTOR (EACH)	607 FENCE, TYPE 47 (FEET)	607 FENCELINE SEEDING & MULCHING (FEET)	FOR INFORMATION ONLY: END POST ASSEMBLY (EACH)	FOR INFORMATION ONLY: INTERMEDIATE ANCHOR POST ASSEMBLY (EACH)	FOR INFORMATION ONLY: CORNER POST ASSEMBLY (EACH)
B1	18	547+71.30	555+00.00	LT				721						694.62				8					
B2	19	555+00.00	567+00.00	LT				1244						1132.34			4	12					
B3	20	567+00.00	579+00.00	LT				1189						1110			2	12					
B4	21	579+00.00	588+00.00	LT				922						855.39	1		2	10					
B5	22	(*)592+64.61	580+40.03	℄									348.37			2		8					
R1	18-21	548+06.00	586+00.00	LT			LUMP																
R2	21	588+00.00	588+18.00	LT								18											
R3	19	555+58.80	560+62.46	LT	500																		
R4	19	560+62.46	561+39.09	LT		75																	
G1	21	587+99.40	589+74.40	LT					100	1	1												
F1	18	545+70.51	553+35.36	LT															928.80	928.80	1	3	0
F2	18-22	553+35.36	592+48.00	LT															4002.60	4002.60	0	5	5
F3	22	591+16.31	592+48.00	LT															578.85	578.85	1	0	3
			SUBTOTAL		500	75	LUMP	4076	100	1	1	18	348.37	3792.35	1	2		50	5510.25	5510.25	2	8	8
TOTALS CARRIED TO GENERAL SUMMARY					500	75	LUMP	4076	100	1	1	18	349	3793	1	2	8	50	5511	5511			

(*) STATION EQUATION AT 595+00.00 BACK = 578+97.05 AHEAD

EARTHWORK QUANTITIES

(FROM SHEET NO. 120)	
ITEM 203 EXCAVATION	2740112 CU YD
ITEM 203 EMBANKMENT	640 CU YD

QUANTITIES CARRIED TO GENERAL SUMMARY

SEEDING AND MULCHING QUANTITY

		(FROM SHEET NO. 120)
ITEM 659 SEEDING AND MULCHING		58561 SQ. YD.
ITEM 601 RIPRAP USING 6" REINFORCED CONC. SLAB	DEDUCT	-27 SQ. YD.
ITEM 601 TIED CONC. BLOCK MAT, TYPE 1	DEDUCT	-90 SQ. YD.
ITEM 670 DITCH EROSION PROTECTION MAT, TYPE A	DEDUCT	-1631 SQ. YD.
	TOTAL	56813 SQ. YD.

ITEM 659 SEEDING AND MULCHING
56813 SQ YD *

ITEM 659 REPAIR SEEDING AND MULCHING
56813 SY x 0.05 = 2840.65 SY, USE 2841 SY *

ITEM 659 COMMERCIAL FERTILIZER
56813 SY x 1.00 TON/7410 SY = 7.67 TONS *

ITEM 659 LIME
56813 SY x 9 x 1/43560 = 11.74 ACRES *

ITEM 659 WATER
56813 SY x 0.0027 GAL/SY x 2 = 306.79 M GAL, USE 307 M GAL *

ITEM 659 MOWING
4800' x 4' x 3 / 1000 = 57.6 M SQ FT, USE 58 M SQ FT *

* QUANTITIES CARRIED TO GENERAL NOTES

CALCULATED PJD
CHECKED LEH

ROADWAY QUANTITIES

JEF-7-10.00

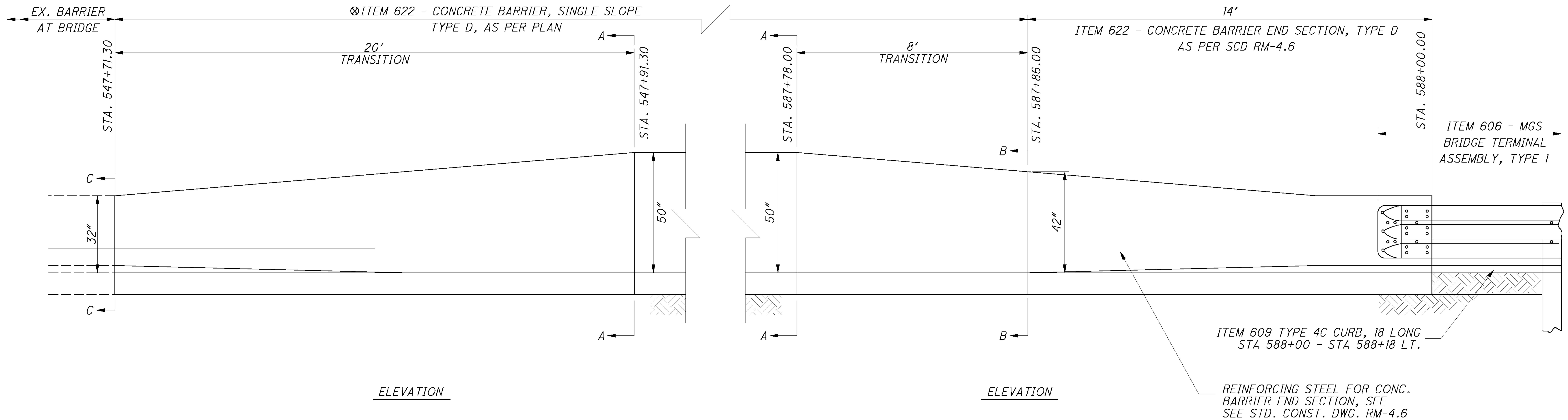
DRAINAGE QUANTITIES

REF. NO.	SHEET NO.	STATION FROM	STATION TO	SIDE	512 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	601 RIPRAP USING 6" REINFORCED CONCRETE SLAB	601 TIED CONCRETE BLOCK MAT, TYPE 1	602 CONCRETE MASONRY	611 24" CONDUIT, TYPE C	611 60" CONDUIT, TYPE A	611 CATCH BASIN, NO. 5	611 CATCH BASIN RECONSTRUCTED TO GRADE,	611 INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN	670 DITCH EROSION PROTECTION MAT, TYPE A	836 SEEDING & EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1	836 SEEDING & EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 2
					SQ YD	SQ YD	SQ YD	CU YD	FOOT	FOOT	EACH	EACH	EACH	SQ YD	SQ YD	SQ YD
D1	18/27	548+50.00		LT	21								1			
D2	18/27	550+00.00		LT	21								1			
D3	20/27	576+00.00		LT	21		30						1			
D4	20/27	577+50.00		LT	21		30						1			
D5	20/27	578+75.00		LT	21		30						1			
D6	18/28	546+10.00		LT					11.00		1					
D7	18/28	547+69.45		LT					21.00		1	1				
D8	18/28	550+74.31		LT								1				
D9	18/28	553+49.57		LT								1				
D10	19/28	560+99.20		LT								1				
D11	19/28	564+49.21		LT								1				
D12	20/28	568+00.82		LT								1				
D13	20/28	571+47.76		LT								1				
D14	20/28	574+98.94		LT								1				
D15	20/28/29	578+49.21		LT		26.2		12.30		8.00		1				
D16	21/28	581+98.16		LT								1				
D17	21/28	585+48.96		LT								1				
D18	18	547+69.45	549+00.00	LT											215	
D19	18	549+00.00	553+00.00	LT										653		
D20	19	559+00.00	564+00.00	LT										978		
D21	19/20	564+00.00	570+00.00	LT											1200	
D22	20	570+00.00	578+50.00	LT												1700
D23	20/21	578+50.00	587+00.00	LT												1584
			SUBTOTAL		105	26.20	90	12.30	32.00	8.00	2	11	5	1631	1415	3284
TOTALS TO GENERAL SUMMARY					105	27	90	12.3	32	8	2	11	5	1631	1415	3284

CALCULATED PJD
CHECKED LEH

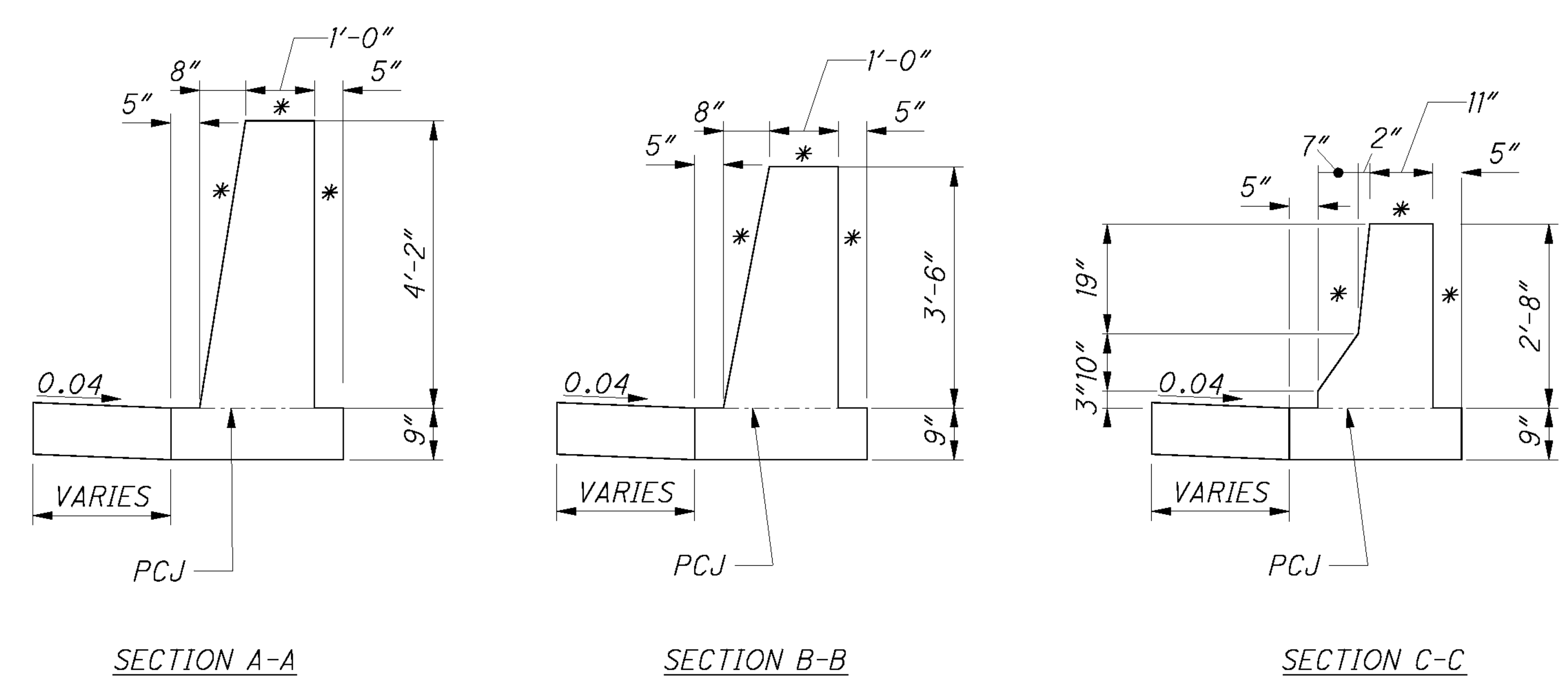
DRAINAGE QUANTITIES

JEF-7-10.00



CONCRETE BARRIER DETAILS

⊗NO REINFORCING STEEL REQUIRED IN WALL



PCJ = PERMISSIBLE CONSTRUCTION JOINT

* SEALING OF CONCRETE SURFACES SHALL BE INCLUDED IN ITEM 512 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

MISCELLANEOUS DETAILS

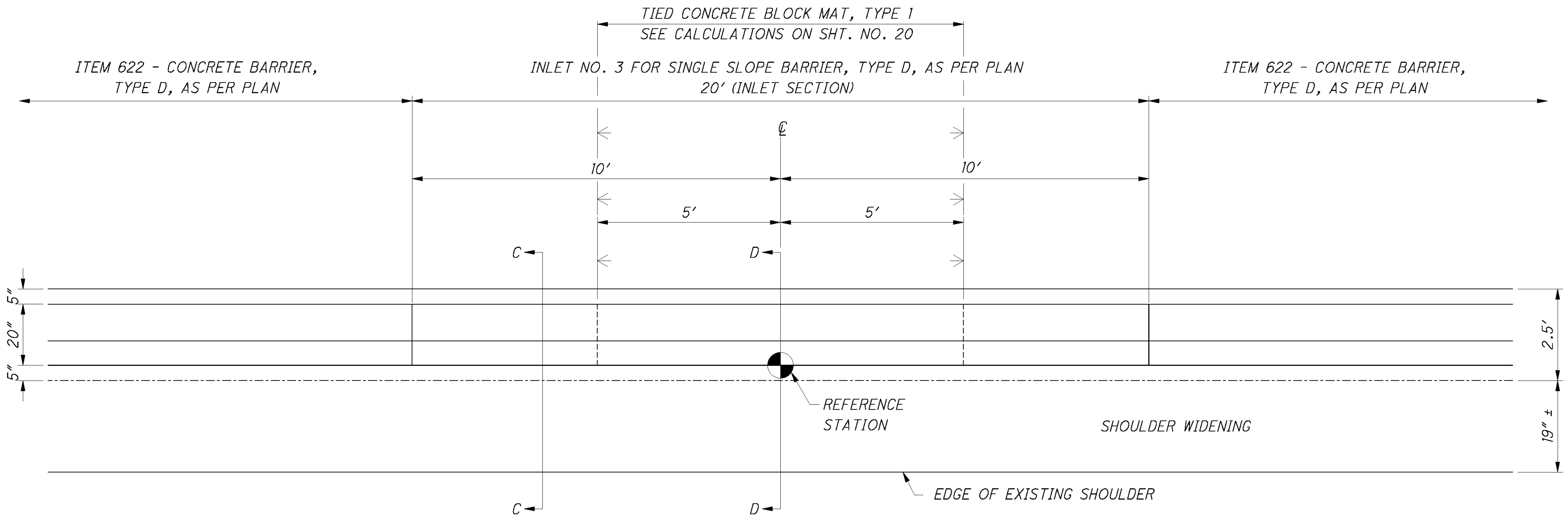
JEF-7-10.00

MARK	NUMBER TOTAL	LENGTH	WEIGHT	TYPE
X501	2	19'-8"	41	STR
SUB-TOTAL			41 ⊛	

⊛ STEEL WEIGHT IS FOR ONE SECTION ONLY AND FOR INFORMATION ONLY.

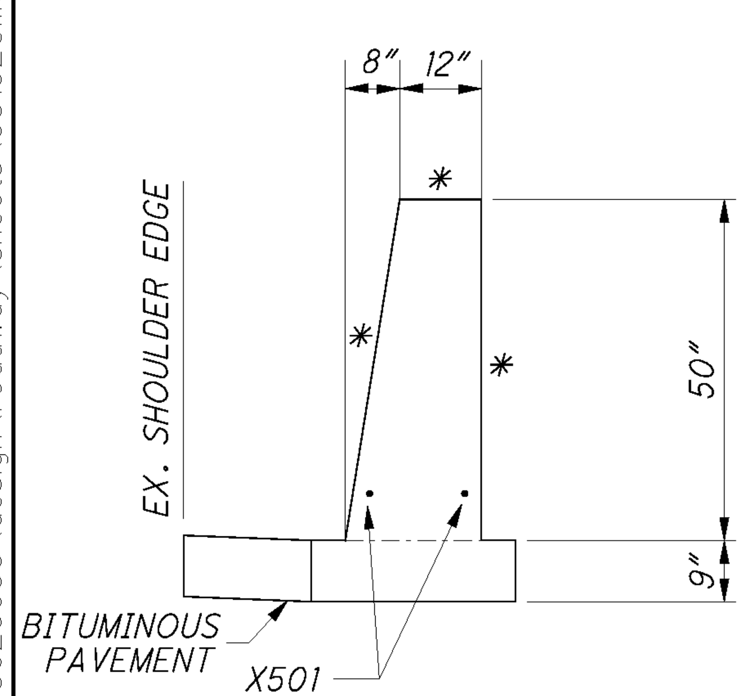
REFERENCE No.	SHEET No.	STATION	SIDE	INLET No. 3 SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
				EACH	SQ YD
D1	18	548+50.00	LT	1	21
D2	18	550+00.00	LT	1	21
D3	20	576+00.00	LT	1	21
D4	20	577+50.00	LT	1	21
D5	20	578+75.00	LT	1	21

FOR INFORMATION ONLY,
FOR QUANTITIES SEE SHT. NO. 25

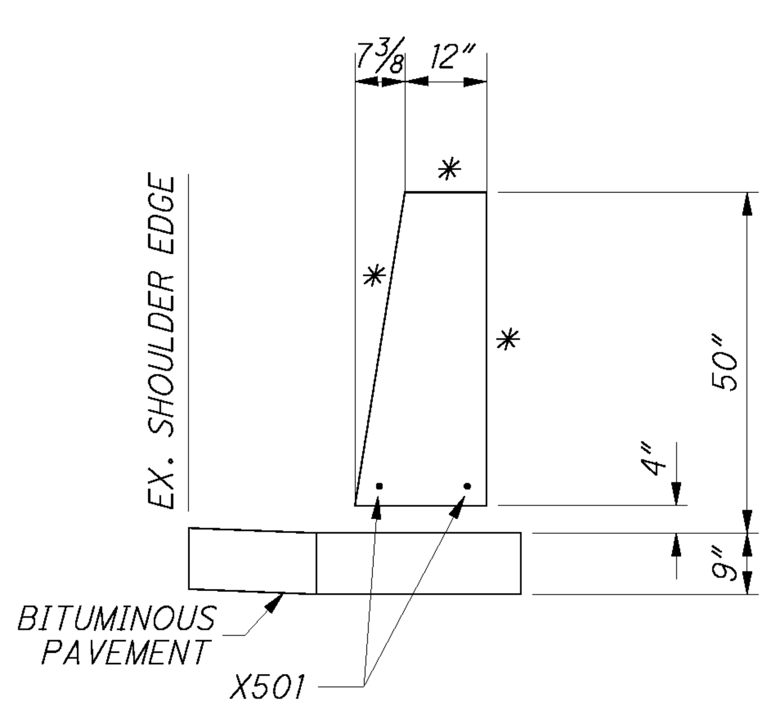


PLAN VIEW

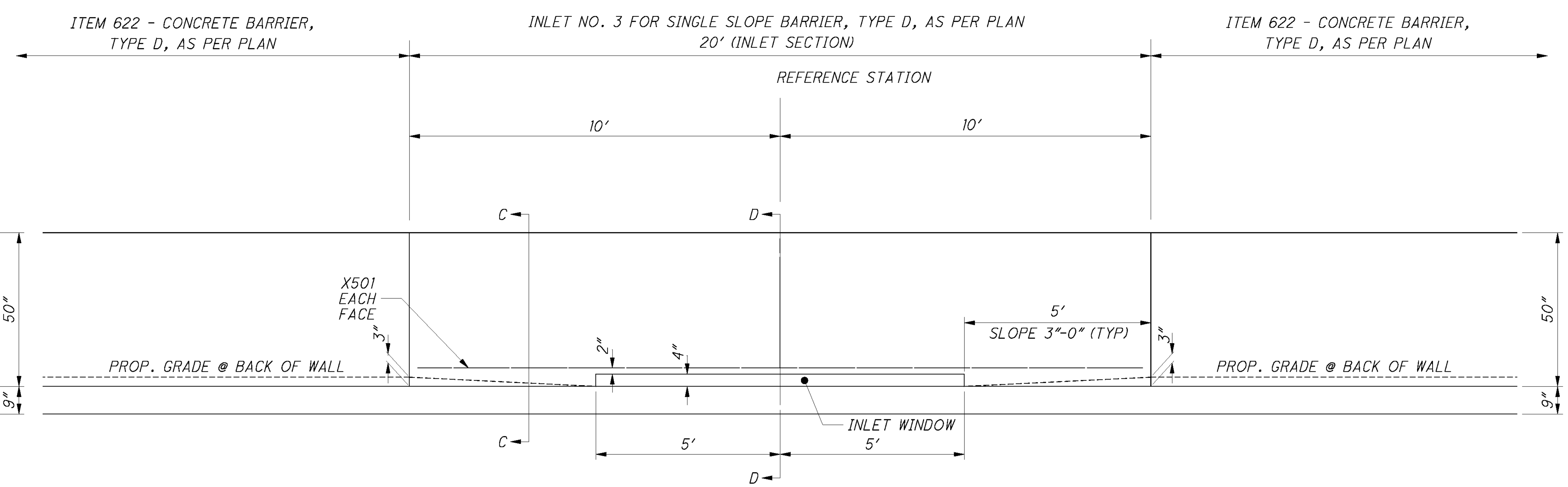
* SEALING OF CONCRETE SURFACES SHALL BE INCLUDED IN ITEM 512 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)



SECTION C-C



SECTION D-D



ELEVATION

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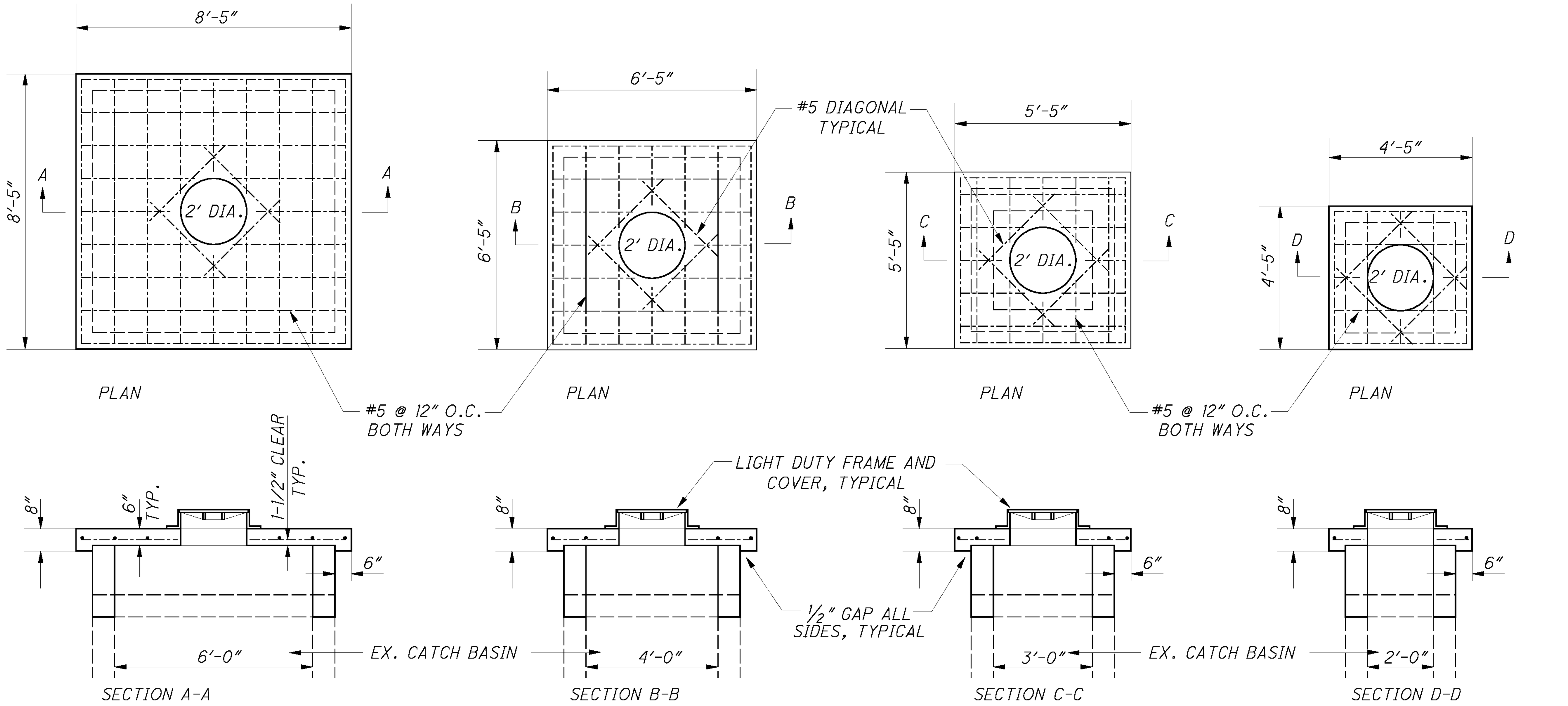
CONCRETE BARRIER DETAILS
INLET No. 3 SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN

JEF-7-10.00



CATCH BASIN, No. 2-6 CATCH BASIN, No. 2-4 CATCH BASIN, No. 2-3 CATCH BASIN, No. 2-2A

CATCH BASIN, RECONSTRUCTED TO GRADE

REFERENCE No.	SHEET No.	STATION	SIDE	CATCH BASIN TYPE TO BE RECONSTRUCTED TO GRADE	EXISTING GRATE ELEVATION	PROPOSED RIM ELEVATION
D-7	18, 28	547+69.45	LT.	2-3CB	706.19	706.77
D-8	18	550+74.31	LT.	2-3CB	716.02	717.41
D-9	18	553+49.57	LT.	2-2ACB	721.22	722.26
D-10	19	560+99.20	LT.	2-2ACB	718.15	720.05
D-11	19	564+49.21	LT.	2-2ACB	712.04	714.52
D-12	20	568+00.82	LT.	2-3CB	700.29	702.71
D-13	20	571+47.76	LT.	2-3CB	687.49	688.82
D-14	20	574+98.94	LT.	2-4CB	674.42	677.04
D-15	20, 29	578+49.21	LT.	2-6CB	669.25	671.51
D-16	21	581+98.16	LT.	2-4CB	671.95	674.08
D-17	21	585+48.96	LT.	2-4CB	672.84	676.04

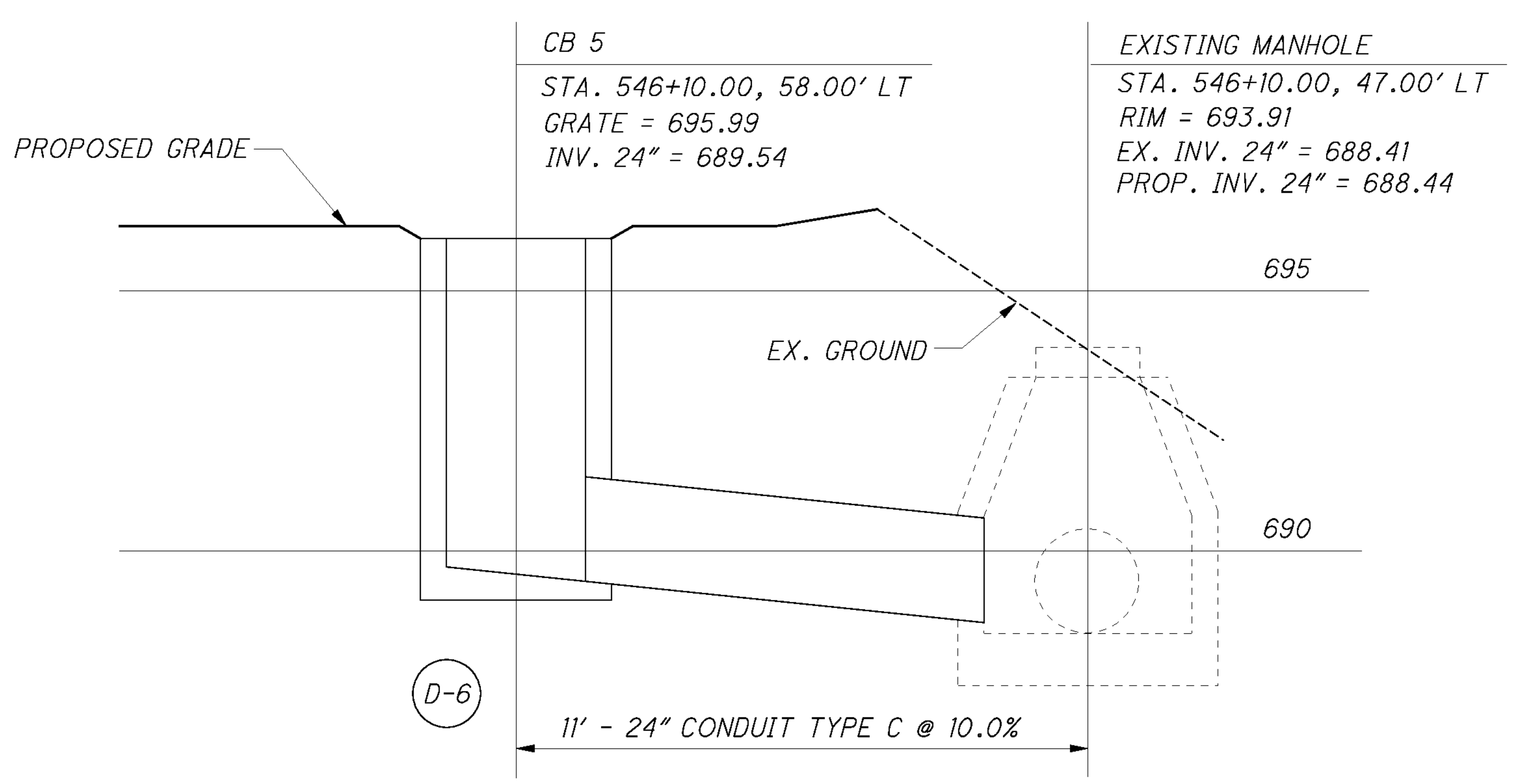
FOR INFORMATION ONLY, FOR QUANTITIES SEE SHT. NO. 25

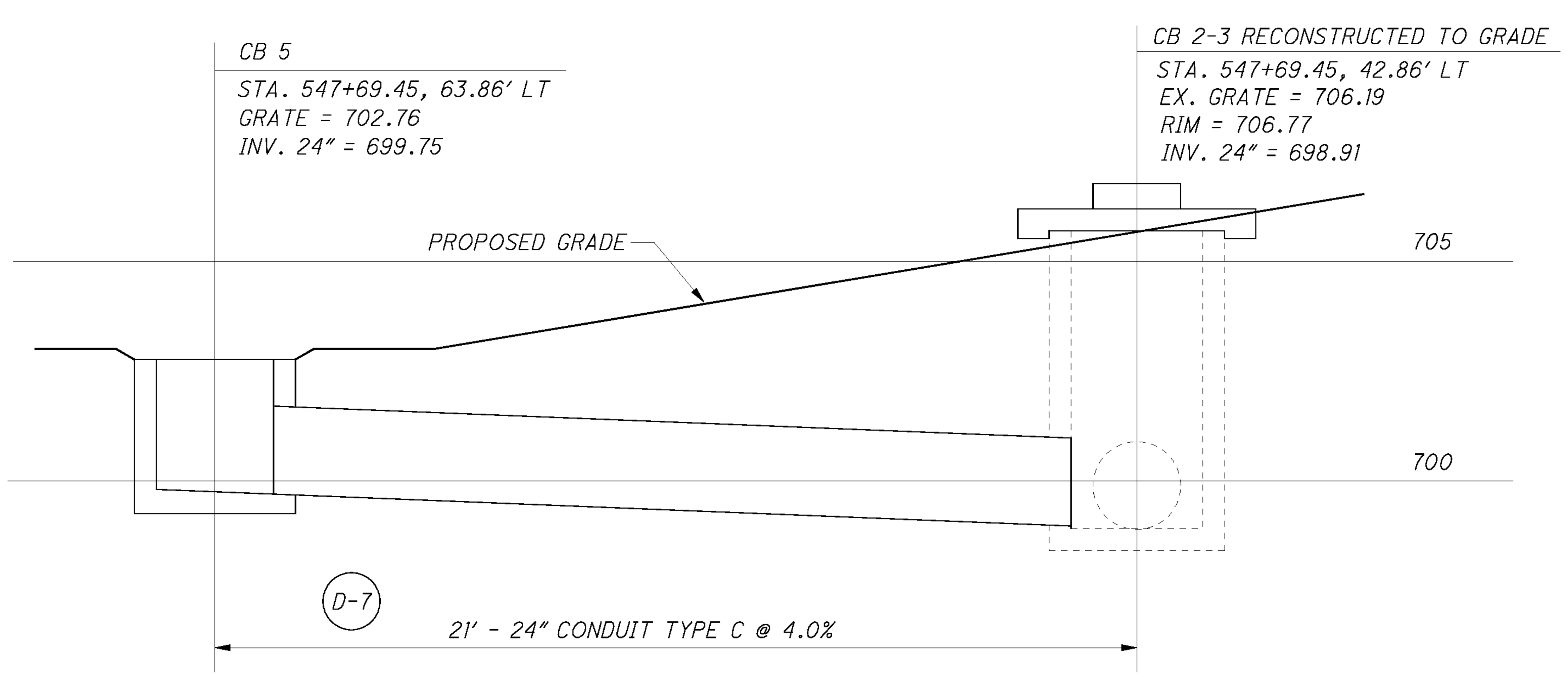
NOTES:

CONTRACTOR SHALL VERIFY SIZE OF EXISTING CATCH BASIN PRIOR TO FABRICATION OF FLAT SLAB TOP.

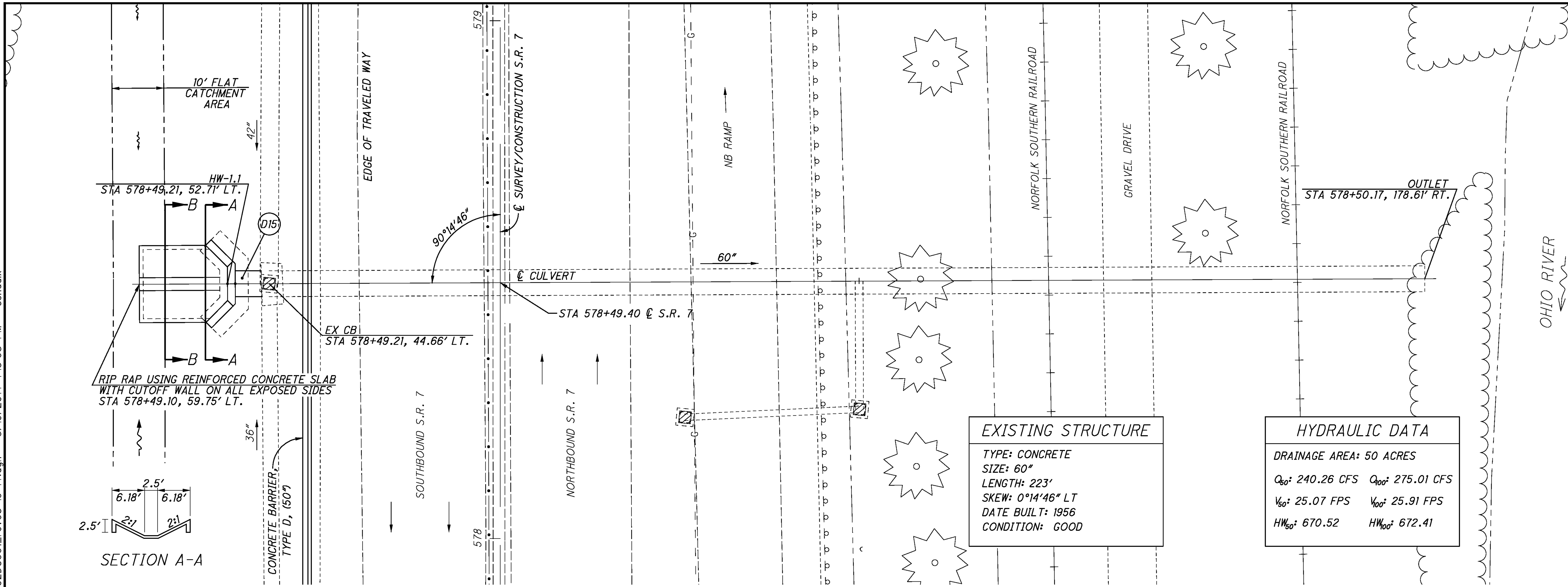
FLAT SLAB TOPS CAN BE PRE-FABRICATED OR CAST-IN-PLACE.

RECONSTRUCTION TO GRADE, USING BRICKS OR OTHER APPROVED METHODS AND MATERIALS, ON FILE BY THE OFFICE OF MATERIALS MANAGEMENT.





DRAINAGE DETAILS



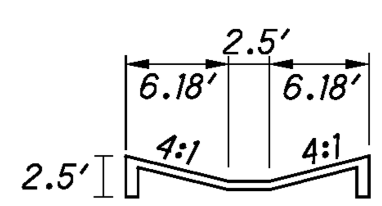
EXISTING STRUCTURE

TYPE: CONCRETE
SIZE: 60"
LENGTH: 223'
SKEW: 0°14'46" LT
DATE BUILT: 1956
CONDITION: GOOD

HYDRAULIC DATA

DRAINAGE AREA: 50 ACRES
Q_{50}: 240.26 CFS Q_{100}: 275.01 CFS
V_{50}: 25.07 FPS V_{100}: 25.91 FPS
HW_{50}: 670.52 HW_{100}: 672.41

SECTION A-A



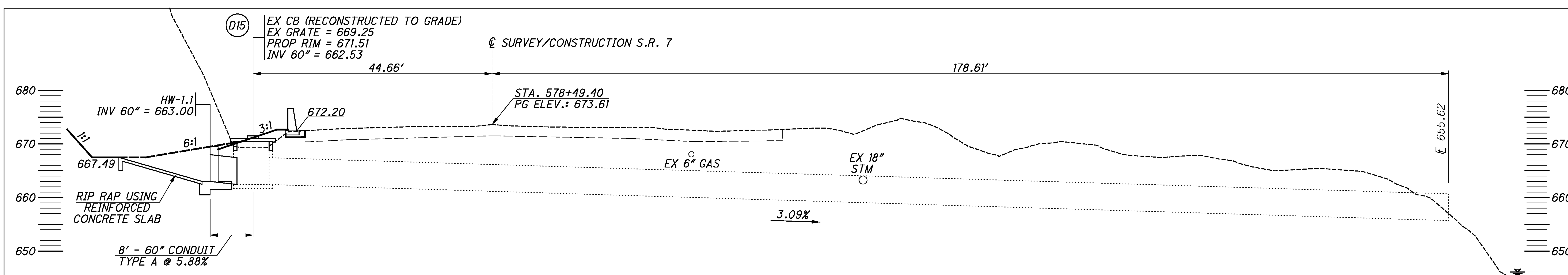
SECTION B-B

PLAN VIEW

ESTIMATED QUANTITIES

ITEM	QUANTITY	UNIT	DESCRIPTION
601	26.2	SQ YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB
602	12.3	CU YD	CONCRETE MASONRY
611	8	FOOT	60" CONDUIT, TYPE A 706.02

FOR INFORMATION ONLY, FOR QUANTITIES SEE SHT. NO. 25



PROFILE ALONG CENTERLINE OF CULVERT

V:\1736\active\173620035\design\admin\submittals\Final Tracings\Sheet 29 Revised 3-19-14\93192DC001_rev03-19-14.dgn 3/19/2014 1:15:08 PM sshadix

0 5 10 20
HORIZONTAL SCALE IN FEET

CALCULATED PJD
CHECKED SNS

CULVERT DETAIL STA. 578+50.00

JEF-7-10.00

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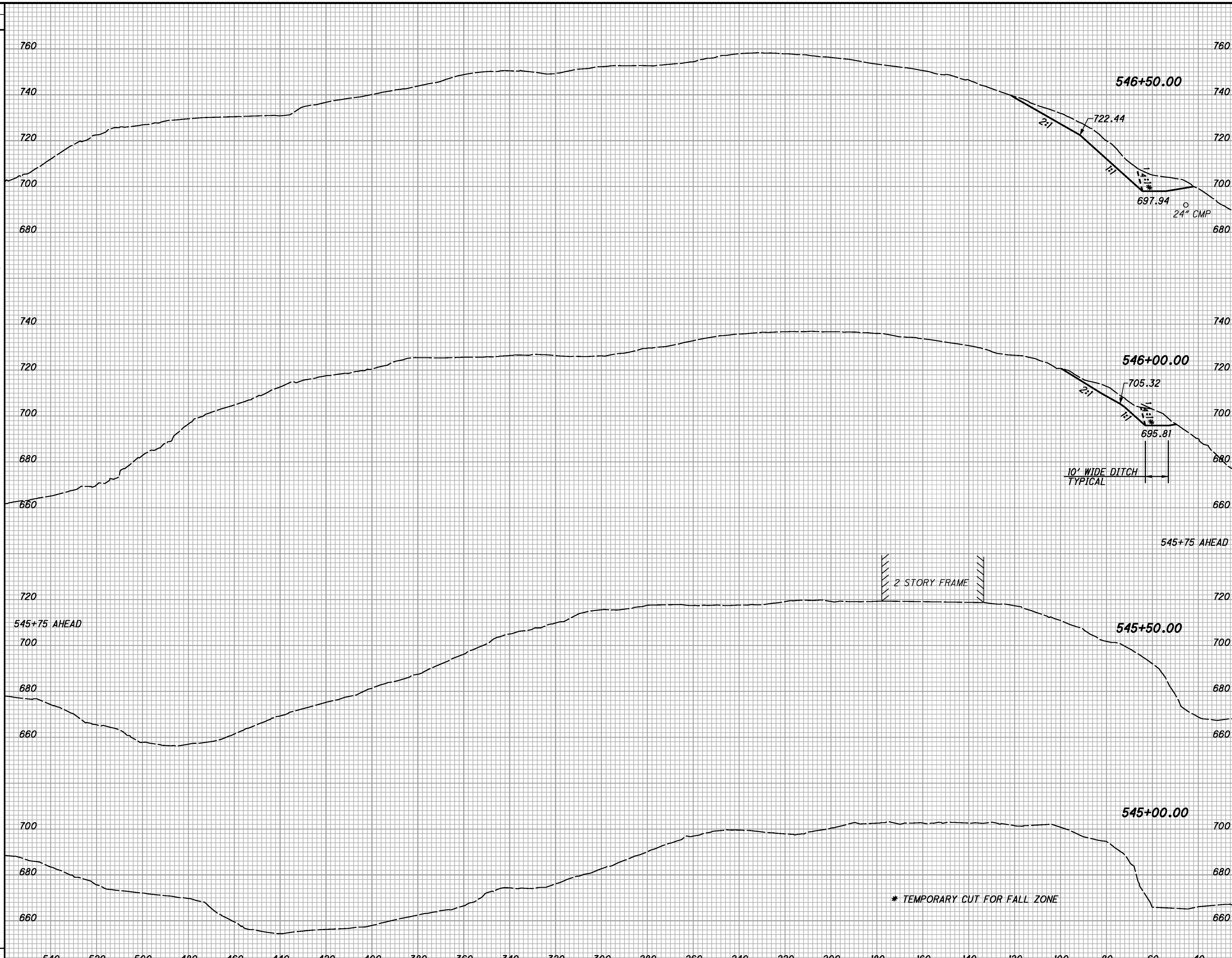
SEEDING	
END WIDTH	SQ. YDS.
70	
	347
55	
	146
50	
	493



Station	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
546+50.00	422	0		
			567	0
546+00.00	182	0		
			84	0
545+75 AHEAD	0	0		
Total			651	0

CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 545+00.00 TO STA. 546+50.00

JEF-7-10.00

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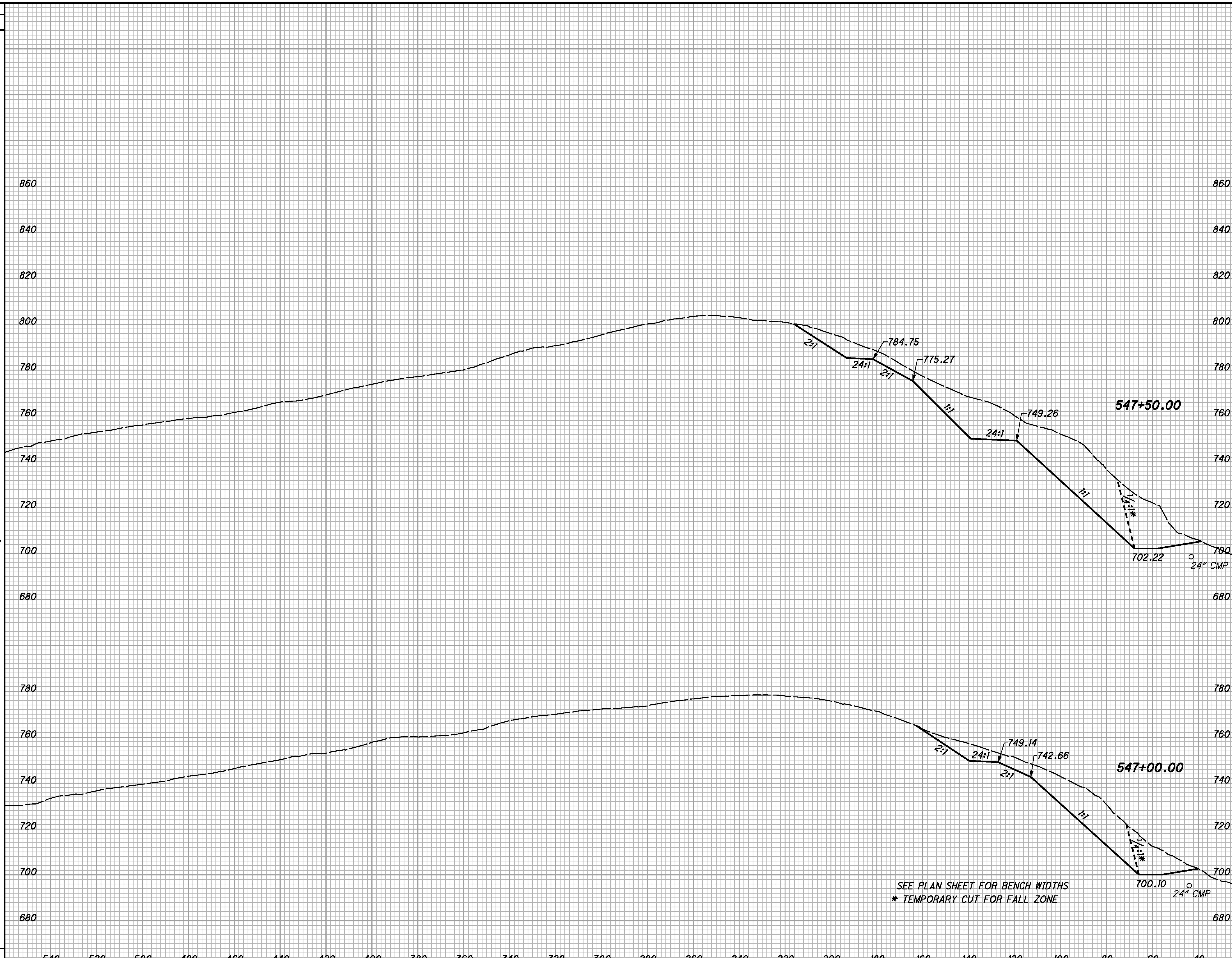
SEEDING	
END WIDTH	SQ. YDS.
80	444
80	417
	861



END AREA		VOLUME	
CUT	FILL	CUT	FILL
2212	0		
		3136	0
1107	0		
		1440	0
		4576	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 547+00.00 TO STA. 548+00.00

JEF-7-10.00

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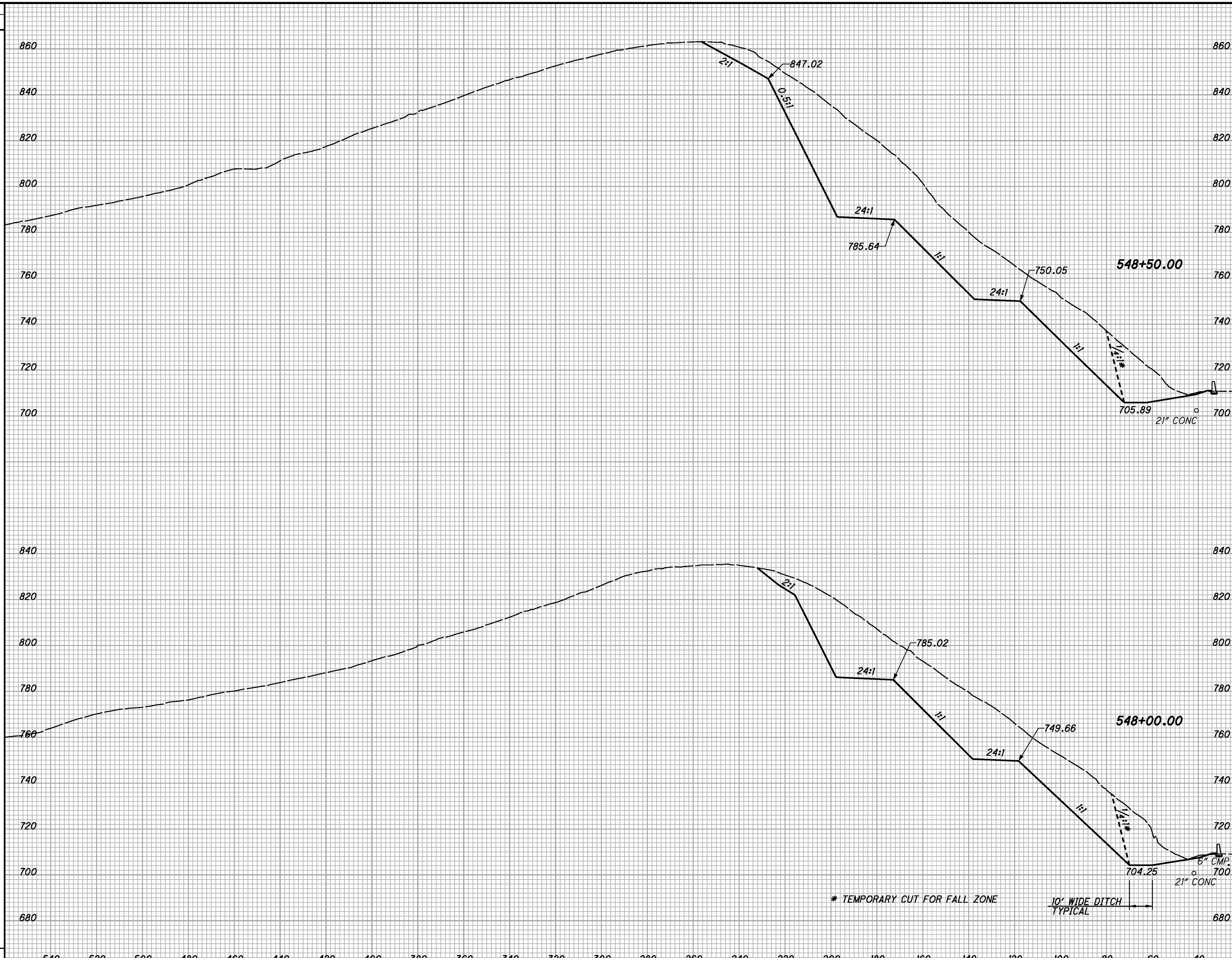
SEEDING	
END WIDTH	SQ. YDS.
80	
	417
70	
	417
	834



END AREA		VOLUME	
CUT	FILL	CUT	FILL
4509	1		
		7710	2
3578	1		
		5497	1
		13207	3

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 548+50.00

JEF-7-10.00

32
130

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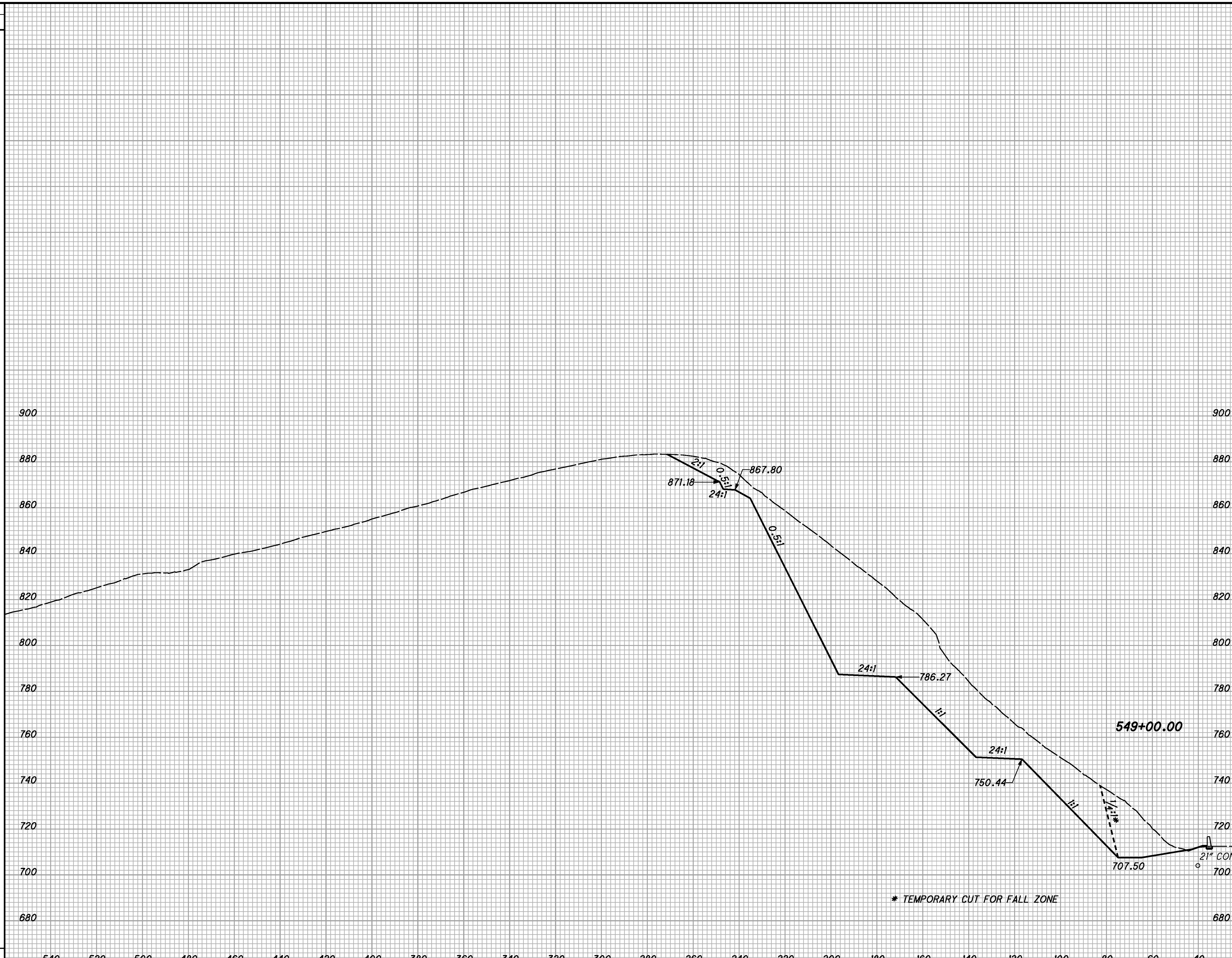
SEEDING	
END WIDTH	SQ. YDS.
85	458
	458



END AREA		VOLUME	
CUT	FILL	CUT	FILL
5249	3		
		9322	4
		9322	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 549+00.00

JEF-7-10.00

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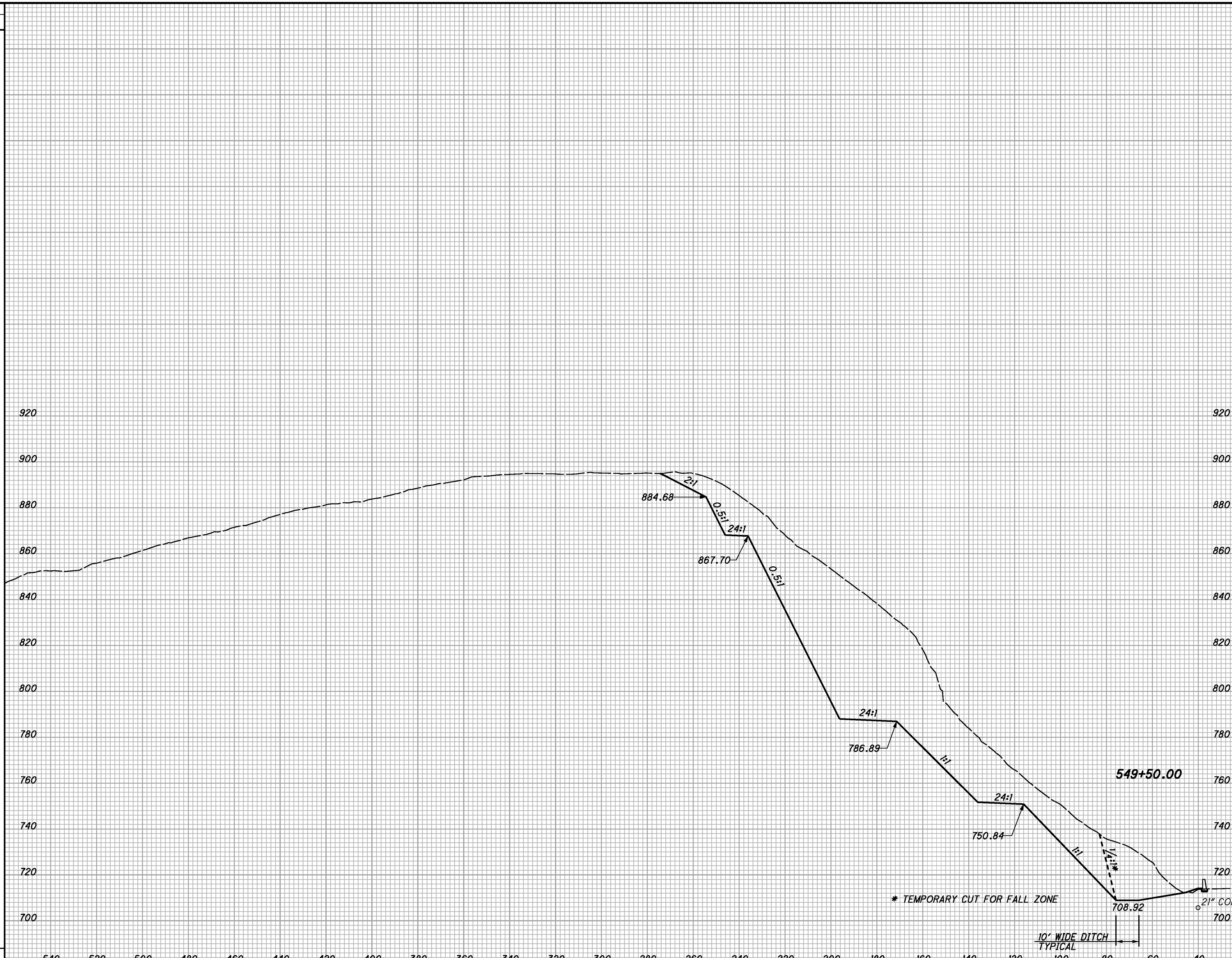
SEEDING	
END WIDTH	SQ. YDS.
70	
	431
	431



END AREA		VOLUME	
CUT	FILL	CUT	FILL
6059	4		
		10819	6
		10819	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 549+50.00

JEF-7-10.00

34
130

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SEEDING	
END WIDTH	SQ. YDS.
90	445
	445

END AREA		VOLUME	
CUT	FILL	CUT	FILL
7290	5		
		12783	8
		12783	8

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 550+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
70	445
	445

END AREA		VOLUME	
CUT	FILL	CUT	FILL
9144	6		
		15757	11
		15757	11

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 550+50.00

JEF-7-10.00

36
130

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SEEDING	
END WIDTH	SQ. YDS.
92	
	450
	450

END AREA		VOLUME	
CUT	FILL	CUT	FILL
10789	7		
		19154	12
		19154	12

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 551+00.00

JEF-7-10.00

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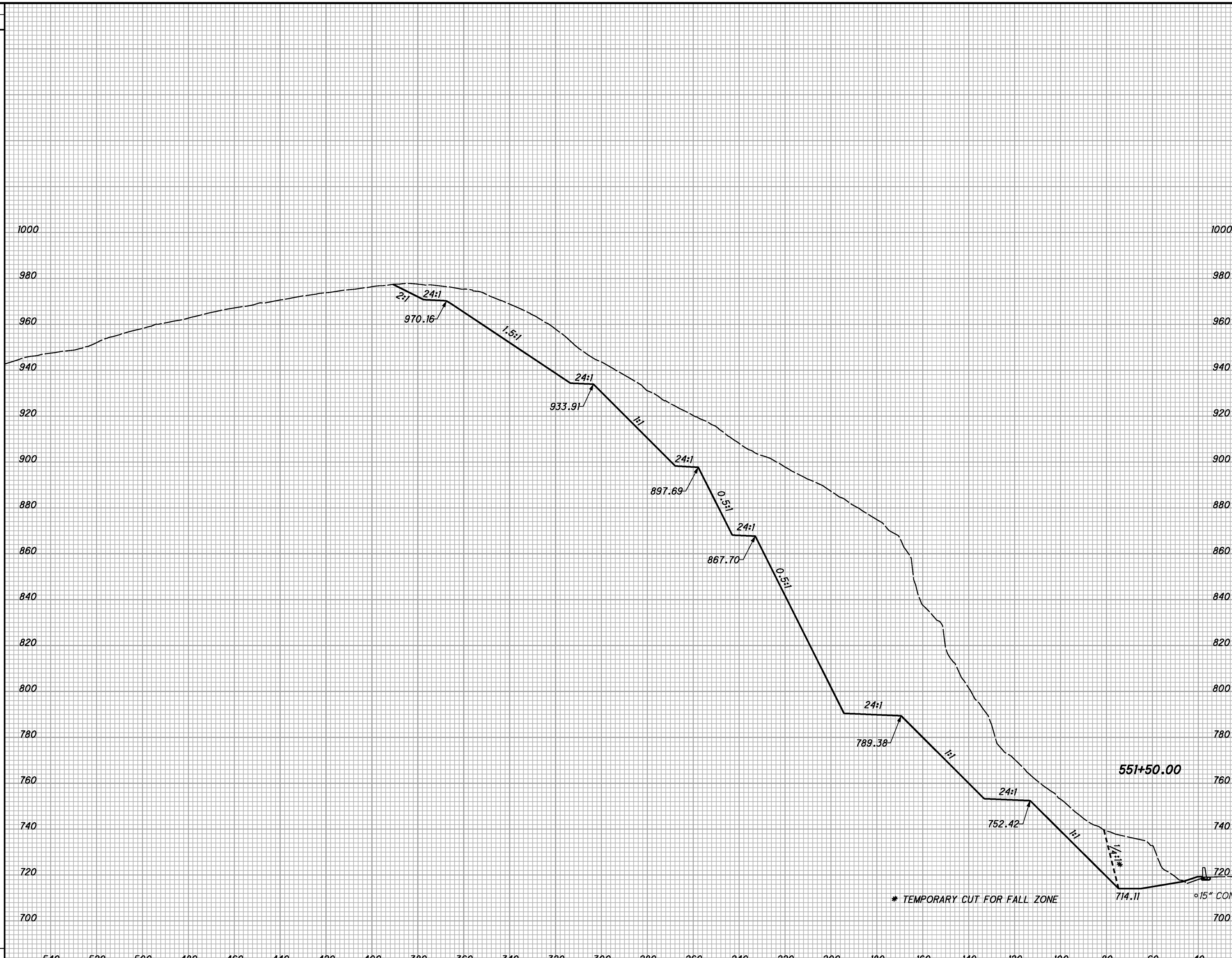
SEEDING	
END WIDTH	SQ. YDS.
67	442
	442



END AREA		VOLUME	
CUT	FILL	CUT	FILL
10907	9		
		20889	15
		20889	15

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS STA. 551+50.00

JEF-7-10.00

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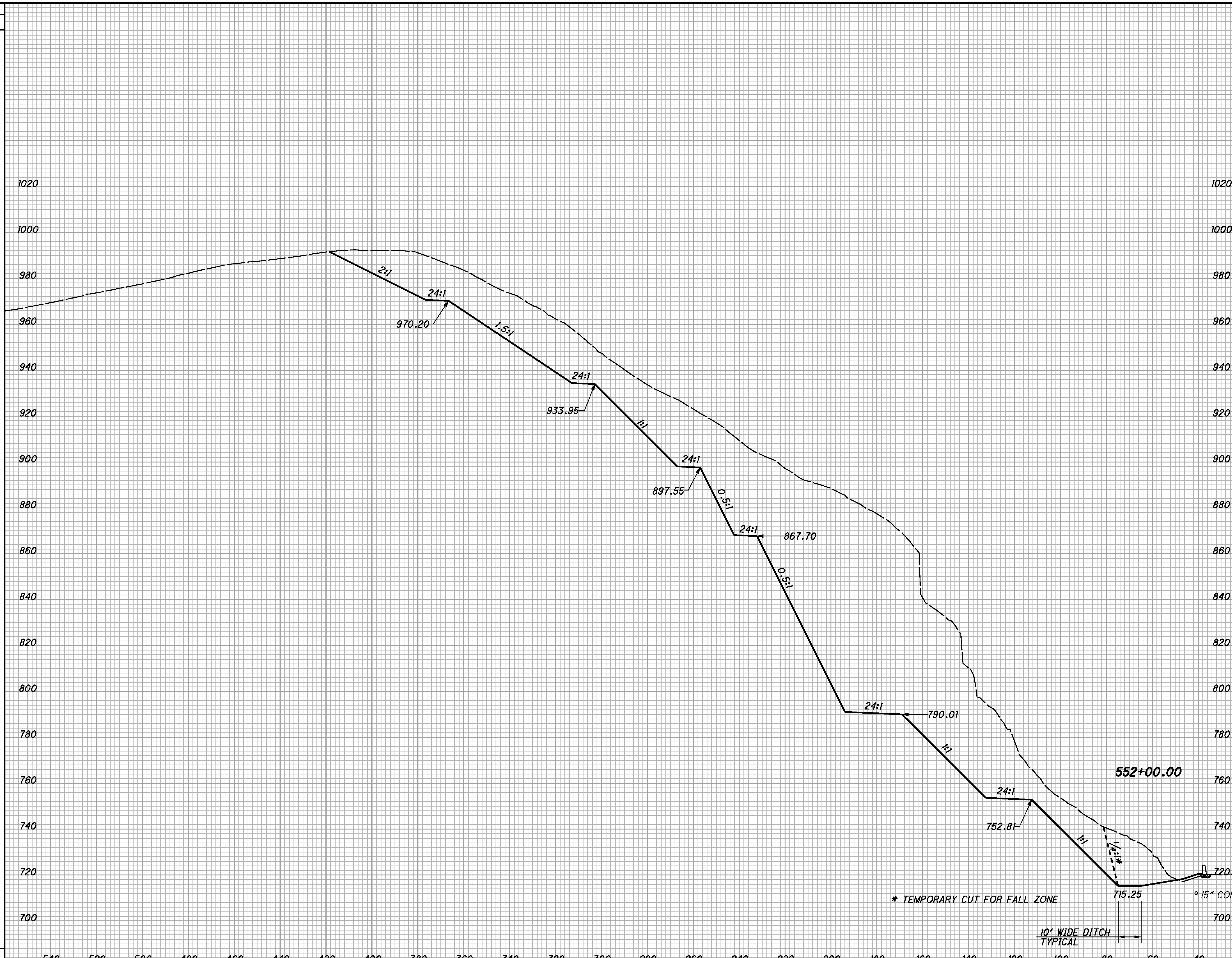
SEEDING	
END WIDTH	SQ. YDS.
100	
	464
	464



END AREA		VOLUME	
CUT	FILL	CUT	FILL
12226	11		
		22317	19
		22317	19

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 552+00.00

JEF-7-10.00

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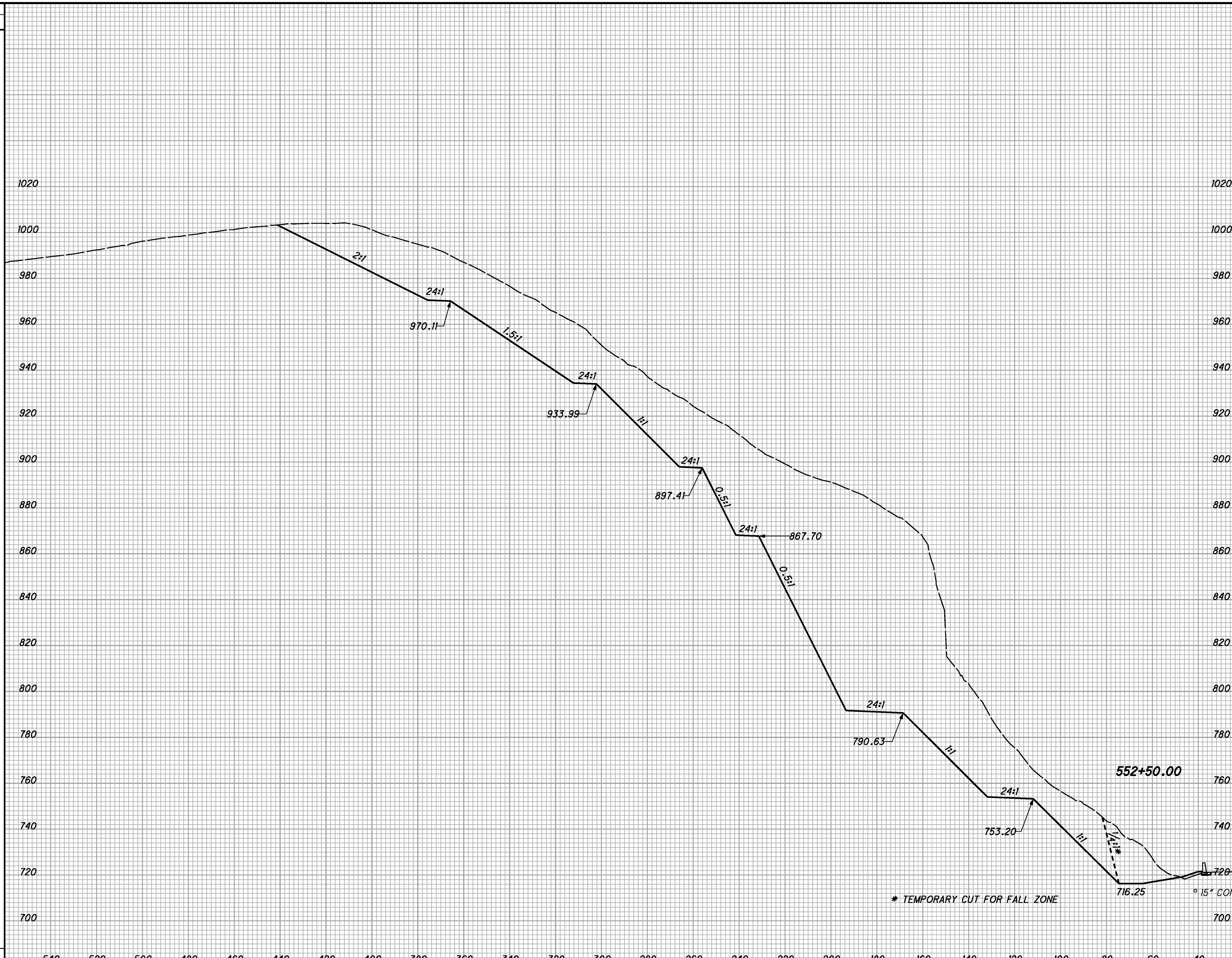
SEEDING	
END WIDTH	SQ. YDS.
125	
	625
	625



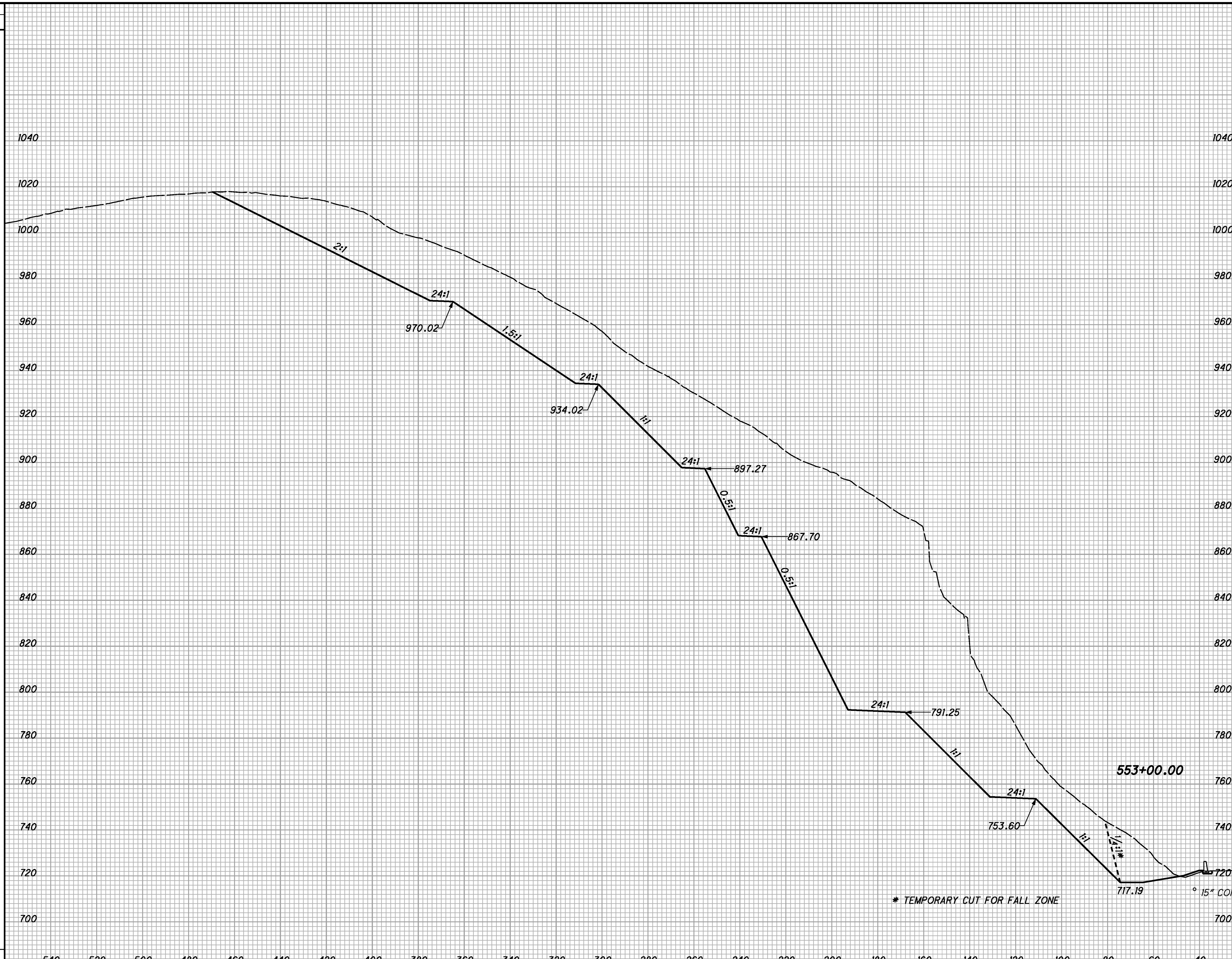
END AREA		VOLUME	
CUT	FILL	CUT	FILL
13176	10		
		24556	19
		24556	19

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 552+50.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
155	
	778
	778



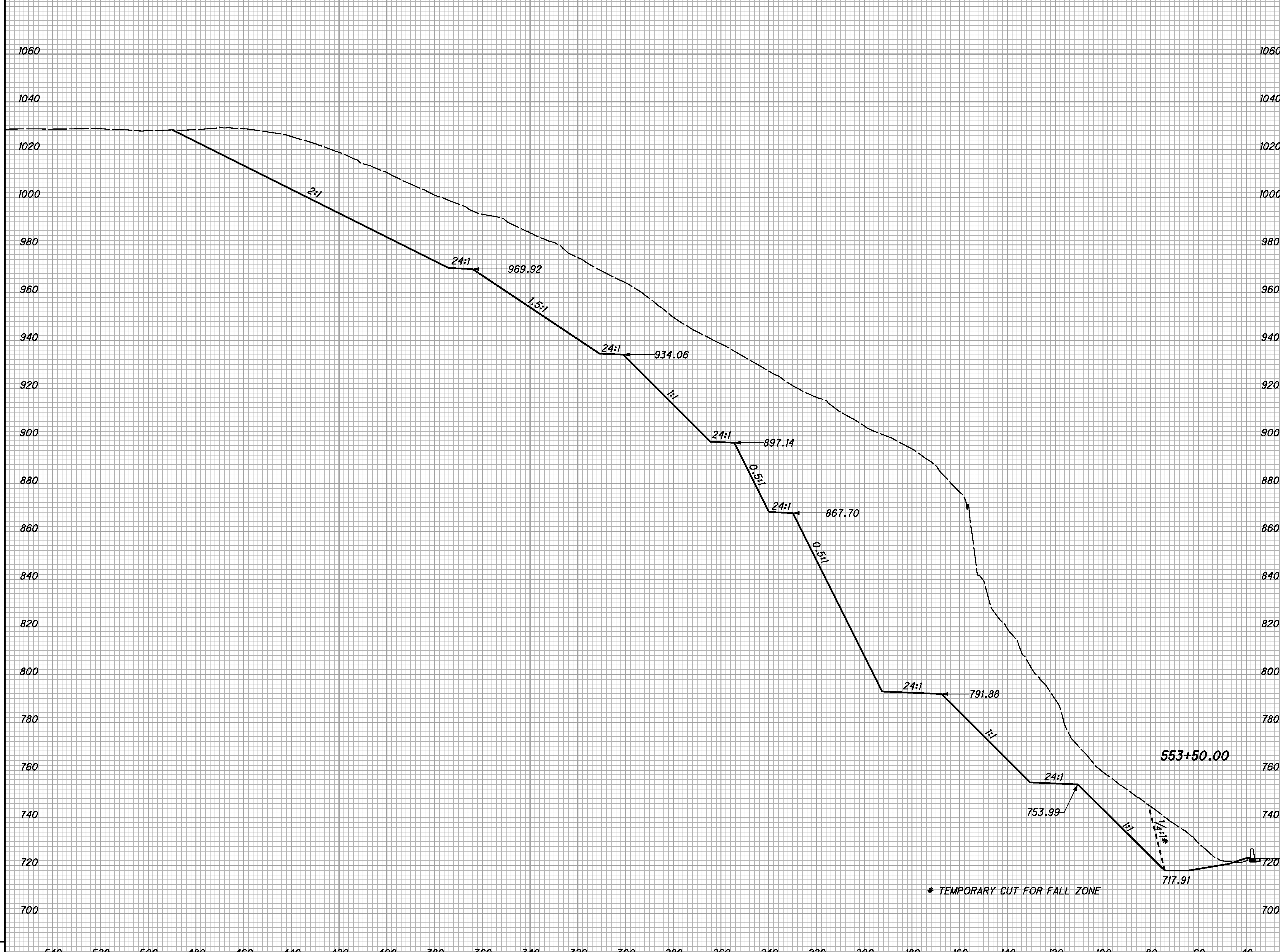
END AREA		VOLUME	
CUT	FILL	CUT	FILL
15165	8		
		27446	17
		27446	17

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 553+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
180	931
	931



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17351	6	31546	13
		31546	13

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 553+50.00

JEF-7-10.00

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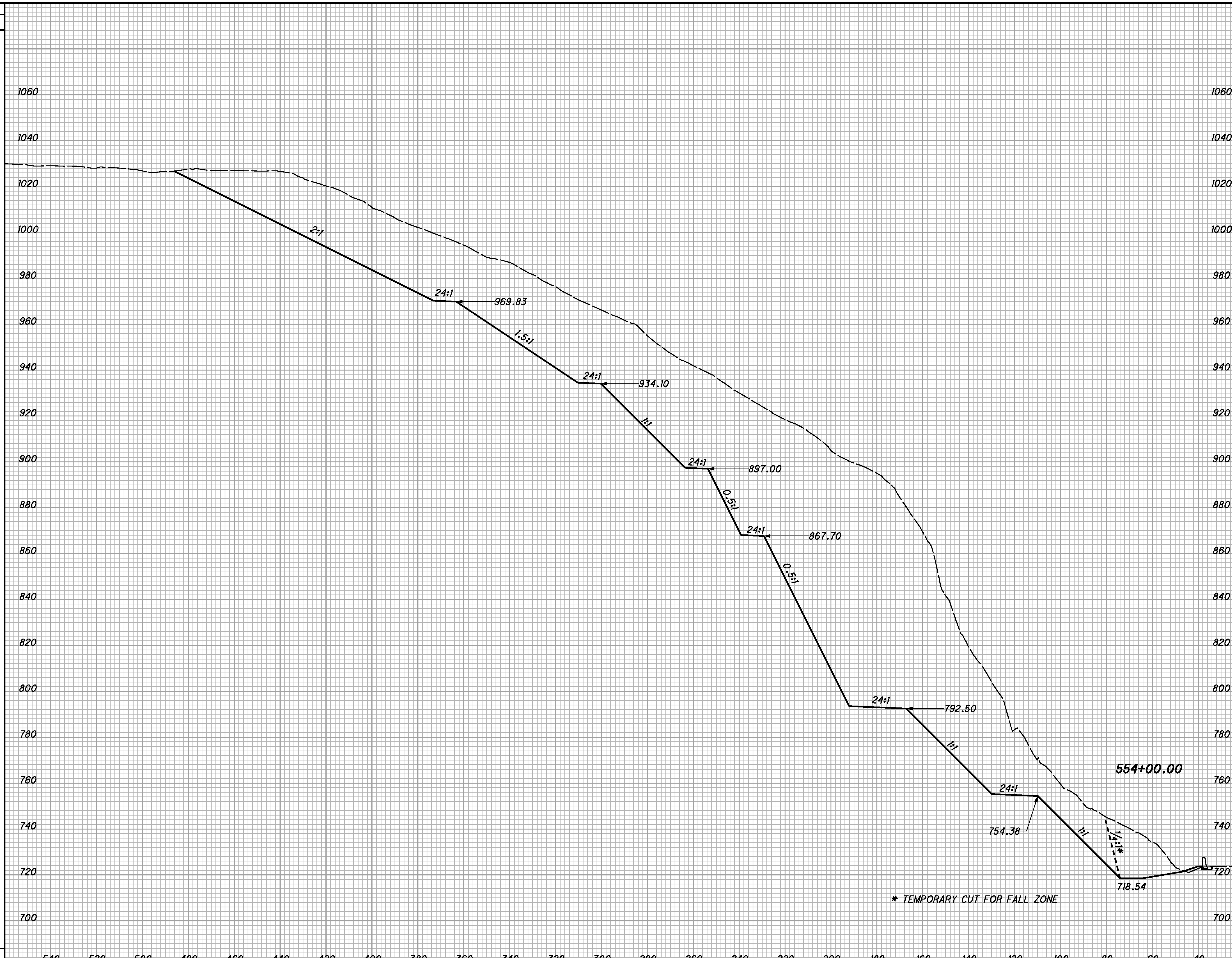
SEEDING	
END WIDTH	SQ. YDS.
178	995
	995



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17590	7		
		33933	12
		33933	12

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 554+00.00

JEF-7-10.00

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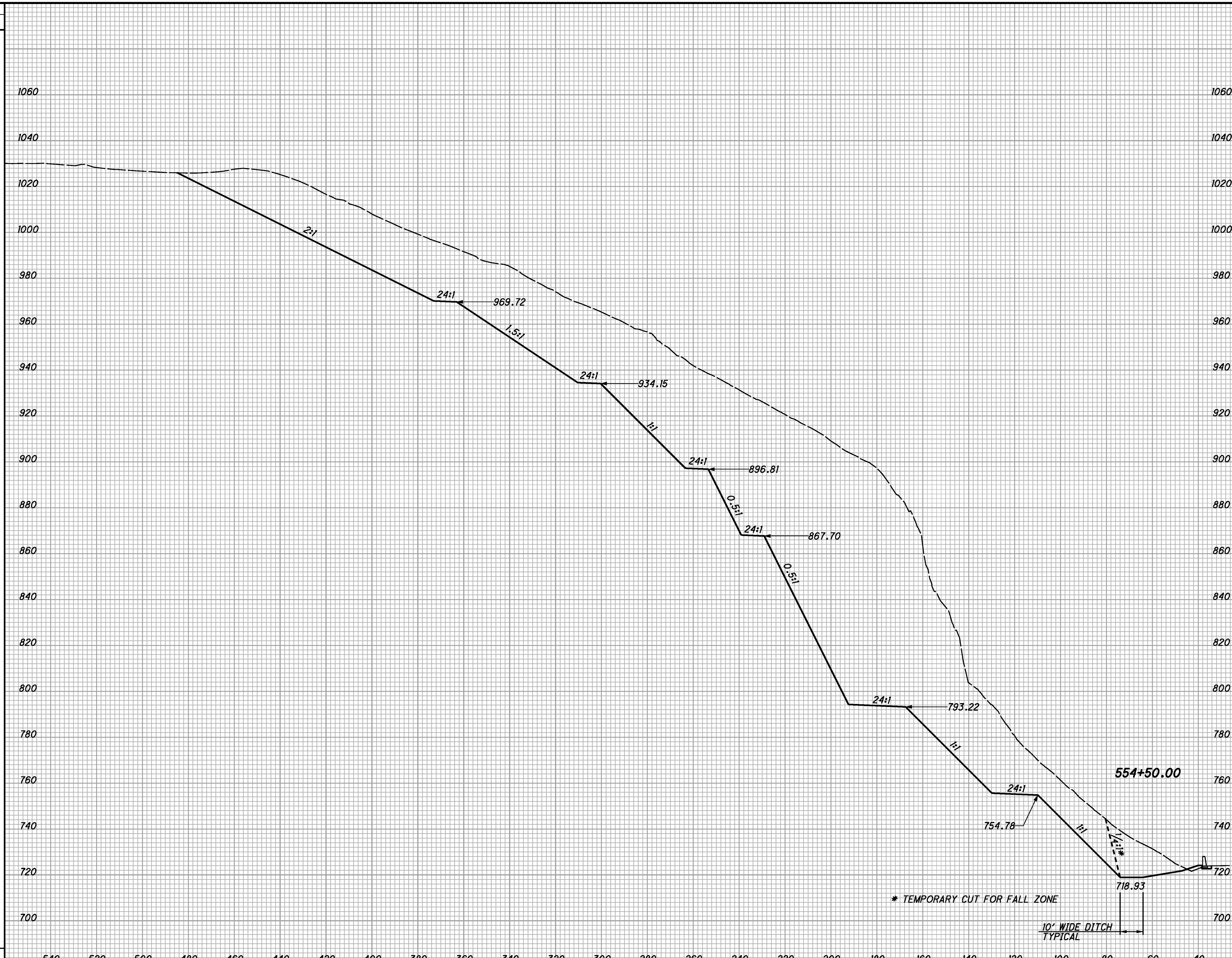
SEEDING	
END WIDTH	SQ. YDS.
177	
	986
	986



END AREA		VOLUME	
CUT	FILL	CUT	FILL
16874	8		
		33471	14
		33471	14

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 554+50.00

JEF-7-10.00

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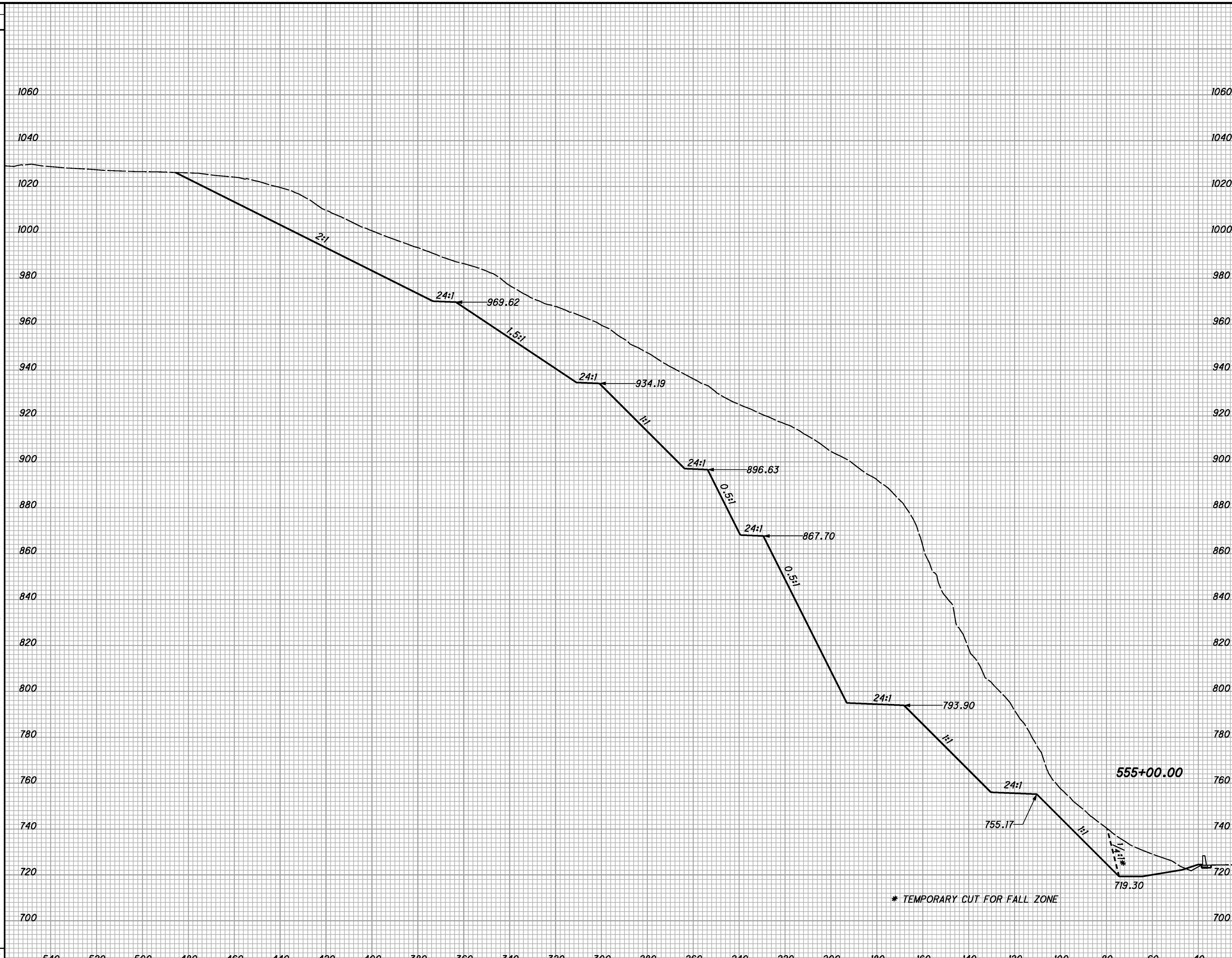
SEEDING	
END WIDTH	SQ. YDS.
177	
	983
	983



END AREA		VOLUME	
CUT	FILL	CUT	FILL
15488	7		
		30556	14
		30556	14

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 555+00.00

JEF-7-10.00

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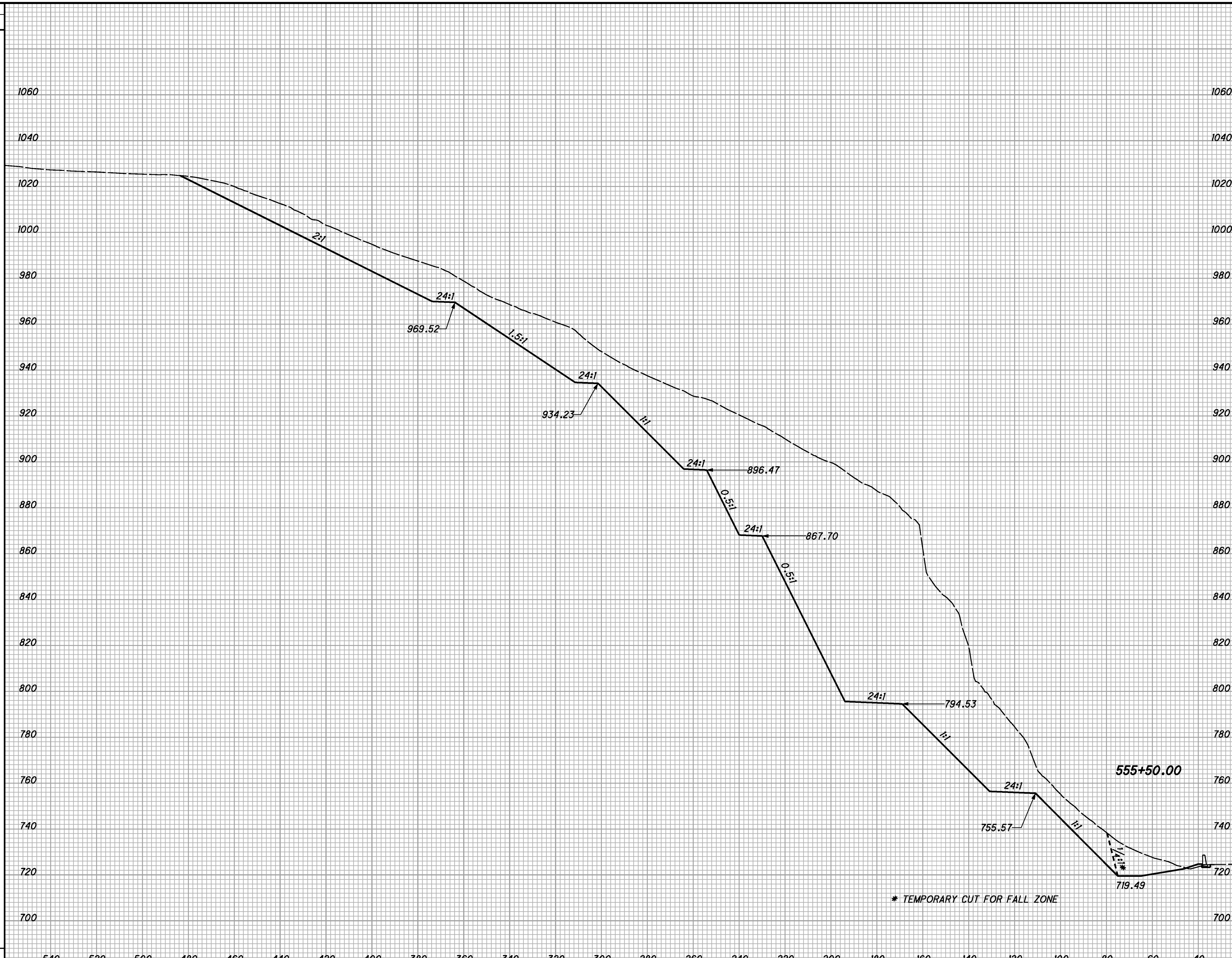
SEEDING	
END WIDTH	SQ. YDS.
178	
	986
	986



END AREA		VOLUME	
CUT	FILL	CUT	FILL
13169	6		
		26534	12
		26534	12

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 555+50.00

JEF-7-10.00

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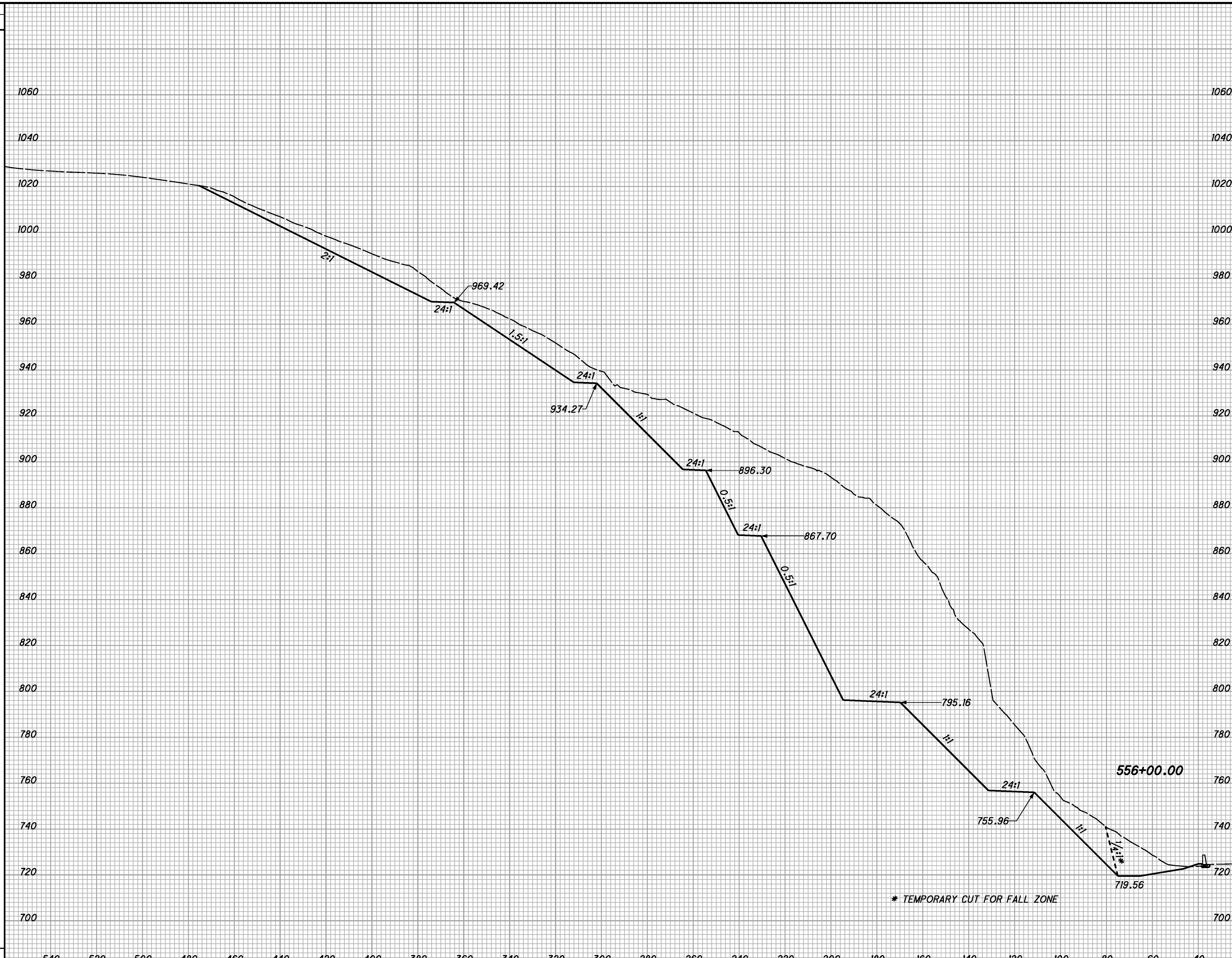
SEEDING	
END WIDTH	SQ. YDS.
168	
	961
	961



END AREA		VOLUME	
CUT	FILL	CUT	FILL
11320	4		
		22674	9
		22674	9

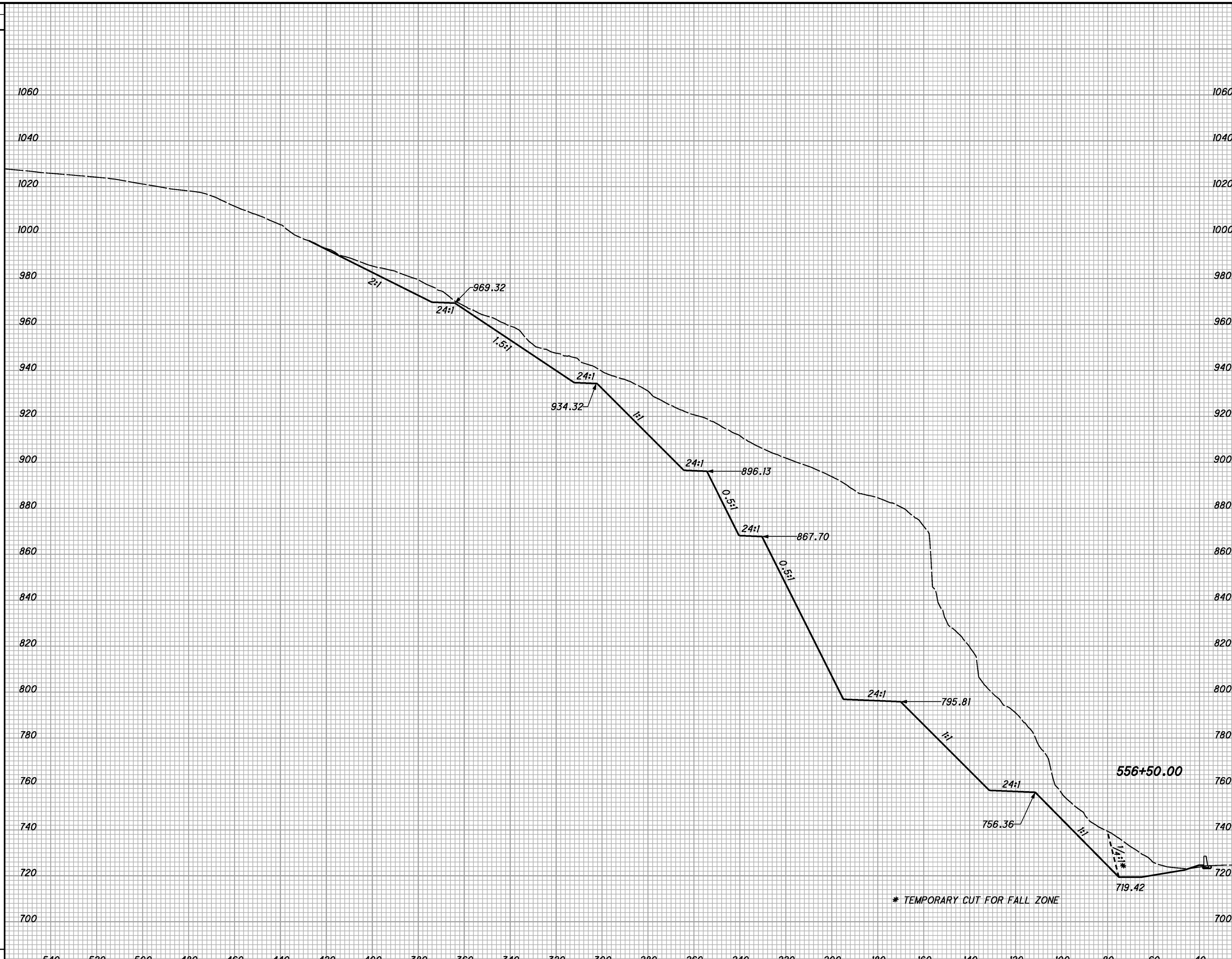
CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 556+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
113	781
	781



END AREA		VOLUME	
CUT	FILL	CUT	FILL
10827	3		
		20473	6
		20473	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 556+50.00

JEF-7-10.00

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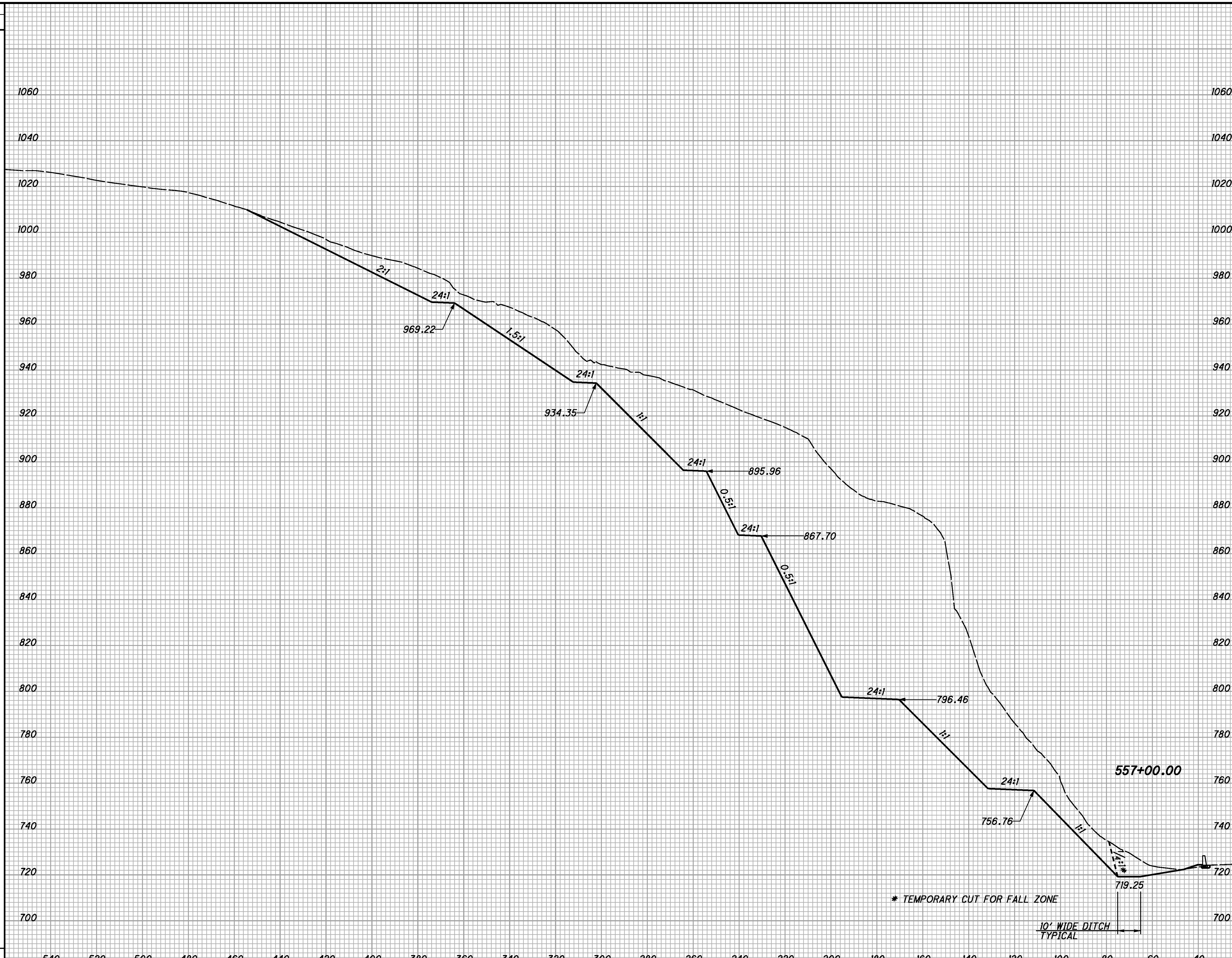
SEEDING	
END WIDTH	SQ. YDS.
144	
	714
	714



END AREA		VOLUME	
CUT	FILL	CUT	FILL
12752	5		
		21548	7
		21548	7

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 557+00.00

JEF-7-10.00

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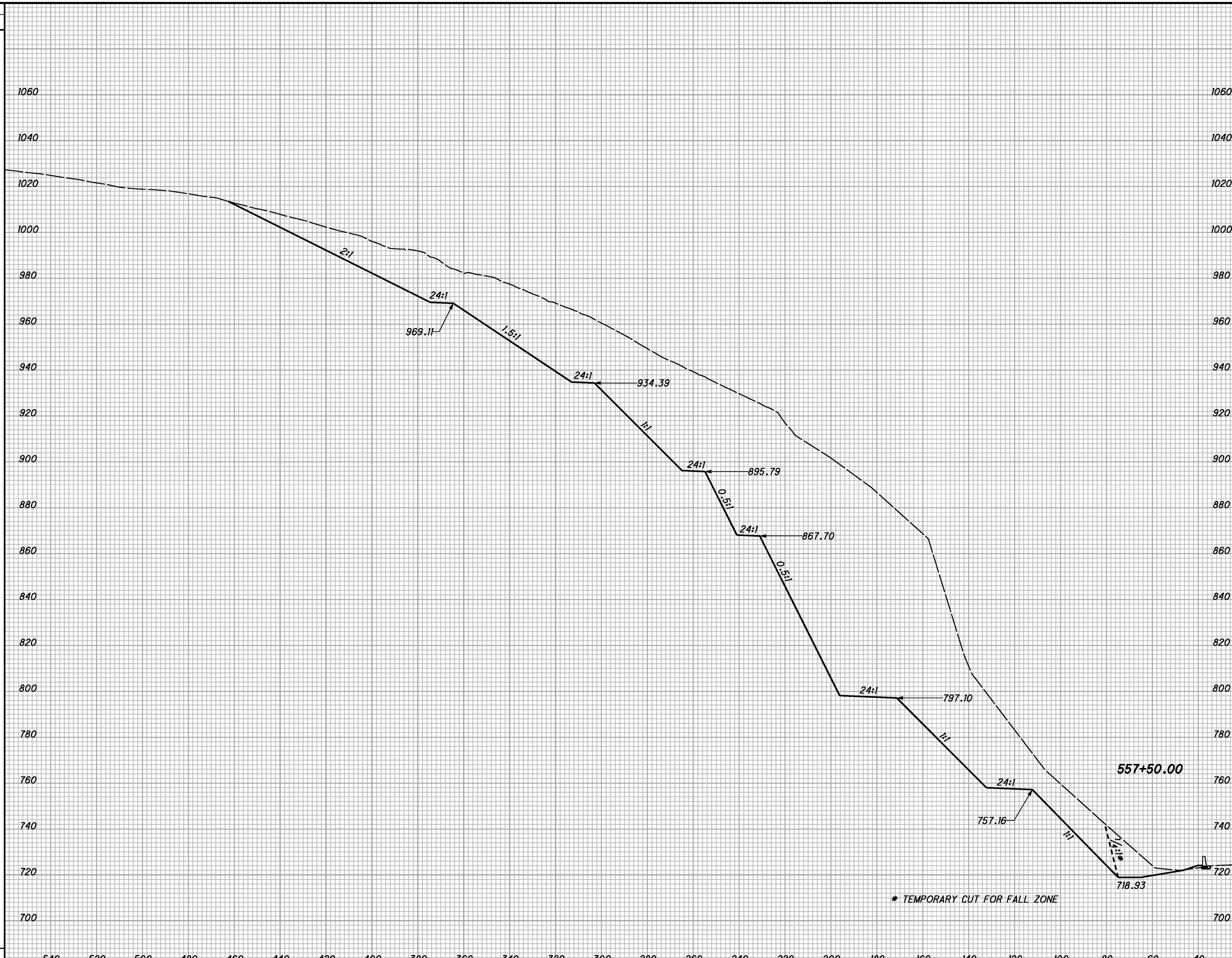
SEEDING	
END WIDTH	SQ. YDS.
152	822
	822



END AREA		VOLUME	
CUT	FILL	CUT	FILL
14740	5		
		24738	8
		24738	8

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 557+50.00

JEF-7-10.00

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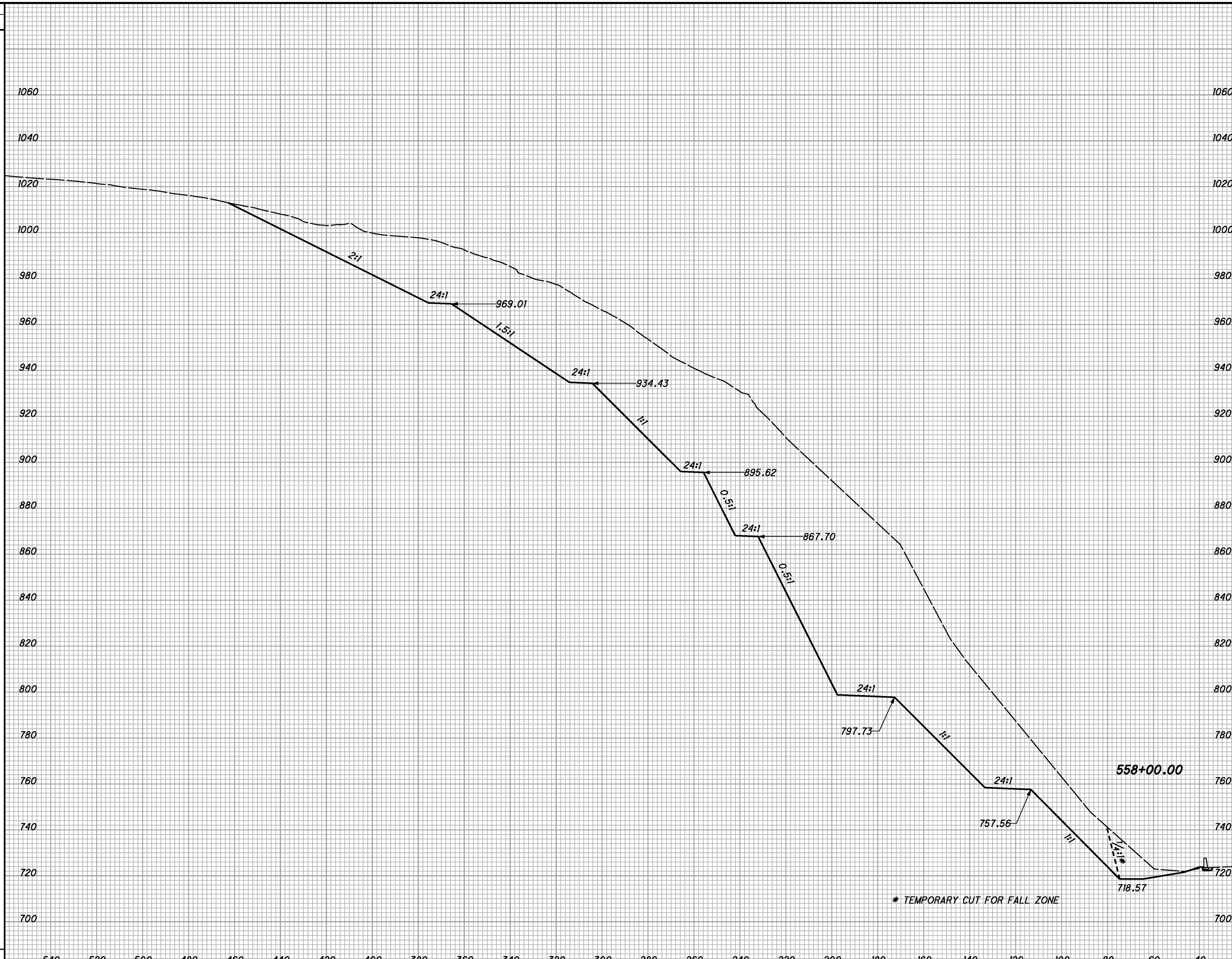
SEEDING	
END WIDTH	SQ. YDS.
152	
	844
	844



END AREA		VOLUME	
CUT	FILL	CUT	FILL
15098	2		
		26384	6
		26384	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 558+00.00

JEF-7-10.00

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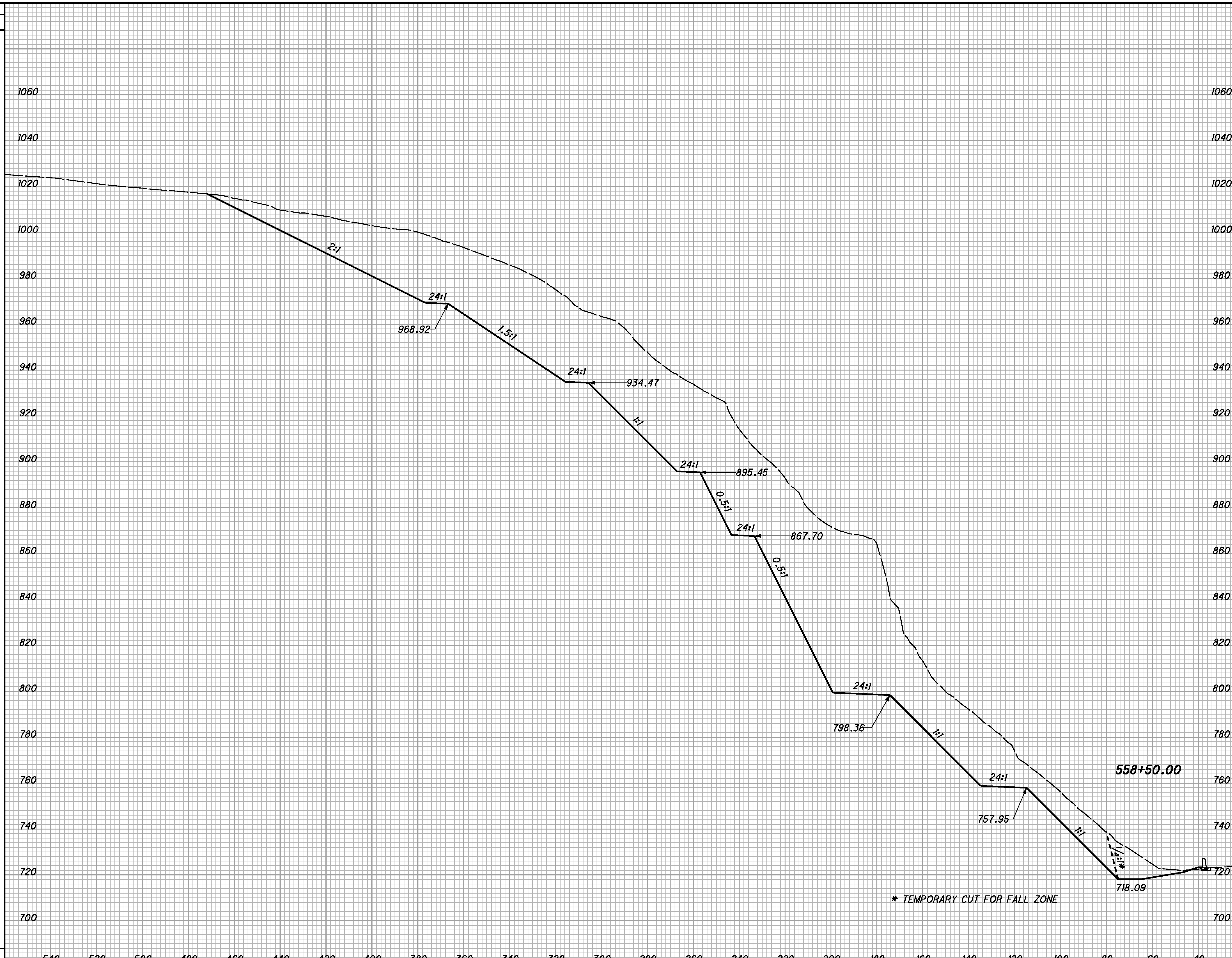
SEEDING END WIDTH	SEEDING SQ. YDS.
160	867
	867



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
12519	3		
		23941	4
		23941	4

CALCULATED EDA CHECKED SNS

CROSS SECTIONS STA. 558+50.00

JEF-7-10.00

52/130

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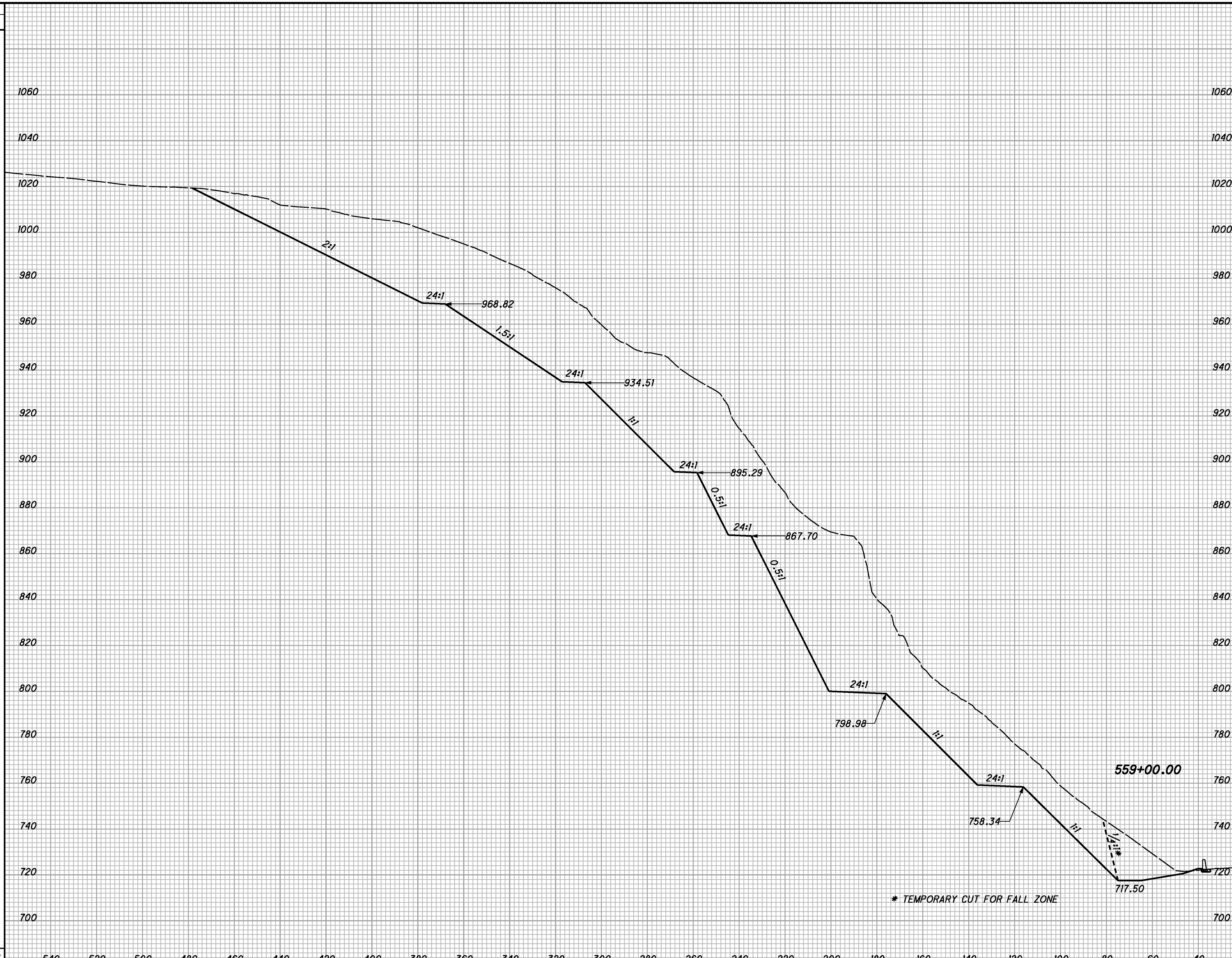
SEEDING	
END WIDTH	SQ. YDS.
167	908
	908



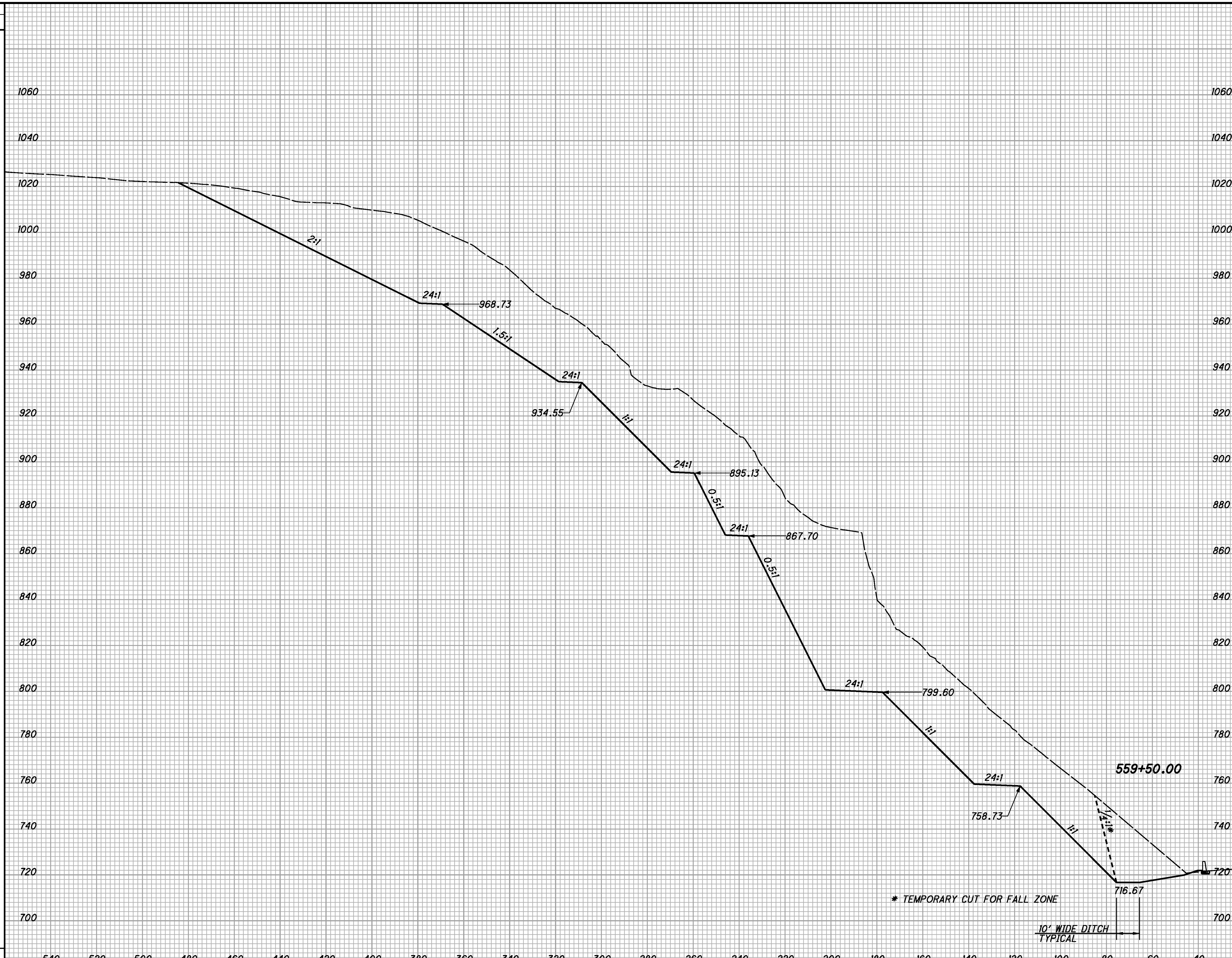
END AREA		VOLUME	
CUT	FILL	CUT	FILL
13137	2		
		21786	4
		21786	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 559+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
174	947
	947



END AREA		VOLUME	
CUT	FILL	CUT	FILL
13721	2		
		22415	4
		22415	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 559+50.00

JEF-7-10.00

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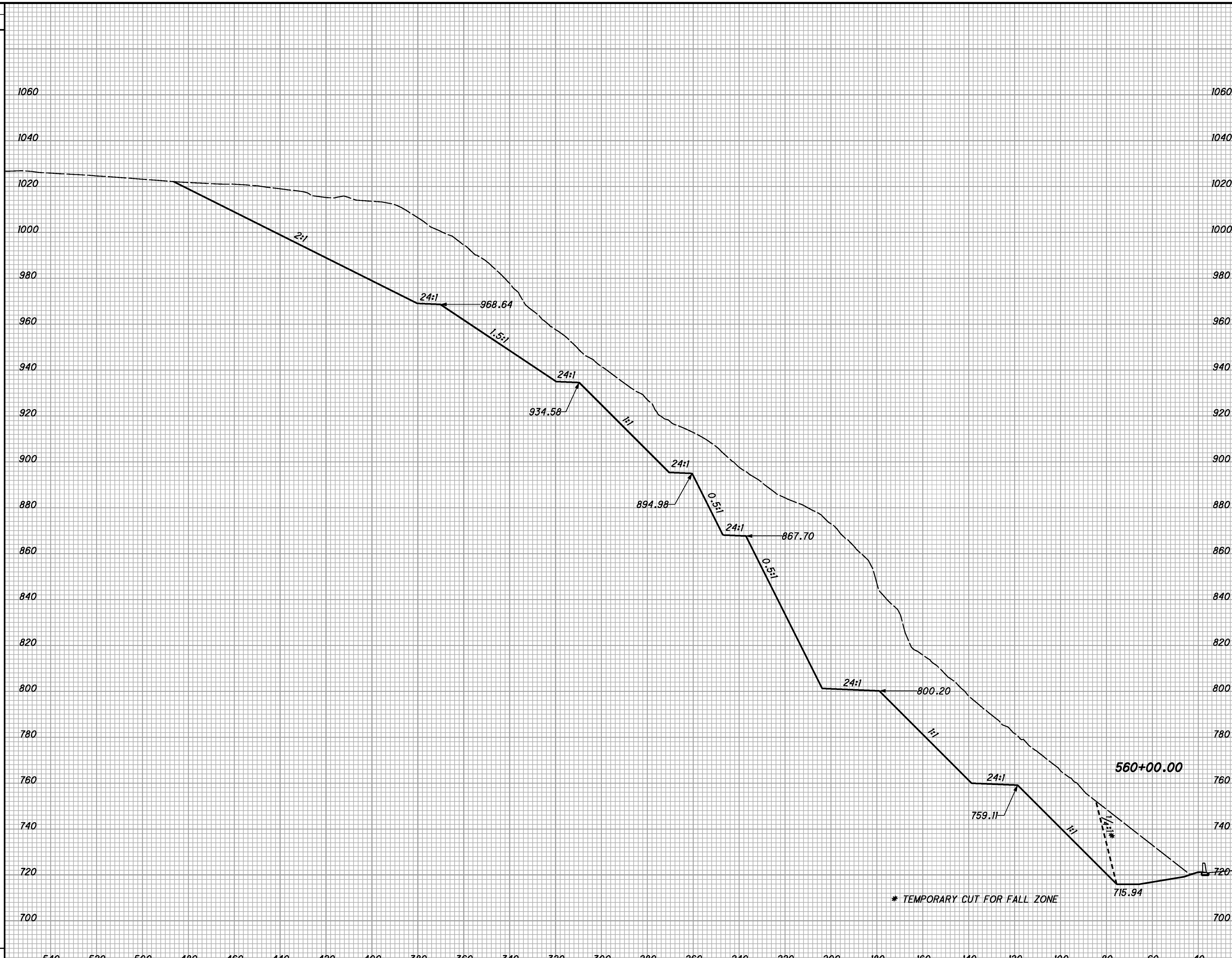
SEEDING	
END WIDTH	SQ. YDS.
172	
	961
	961



END AREA		VOLUME	
CUT	FILL	CUT	FILL
12884	0		
		21824	2
		21824	2

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 560+00.00

JEF-7-10.00

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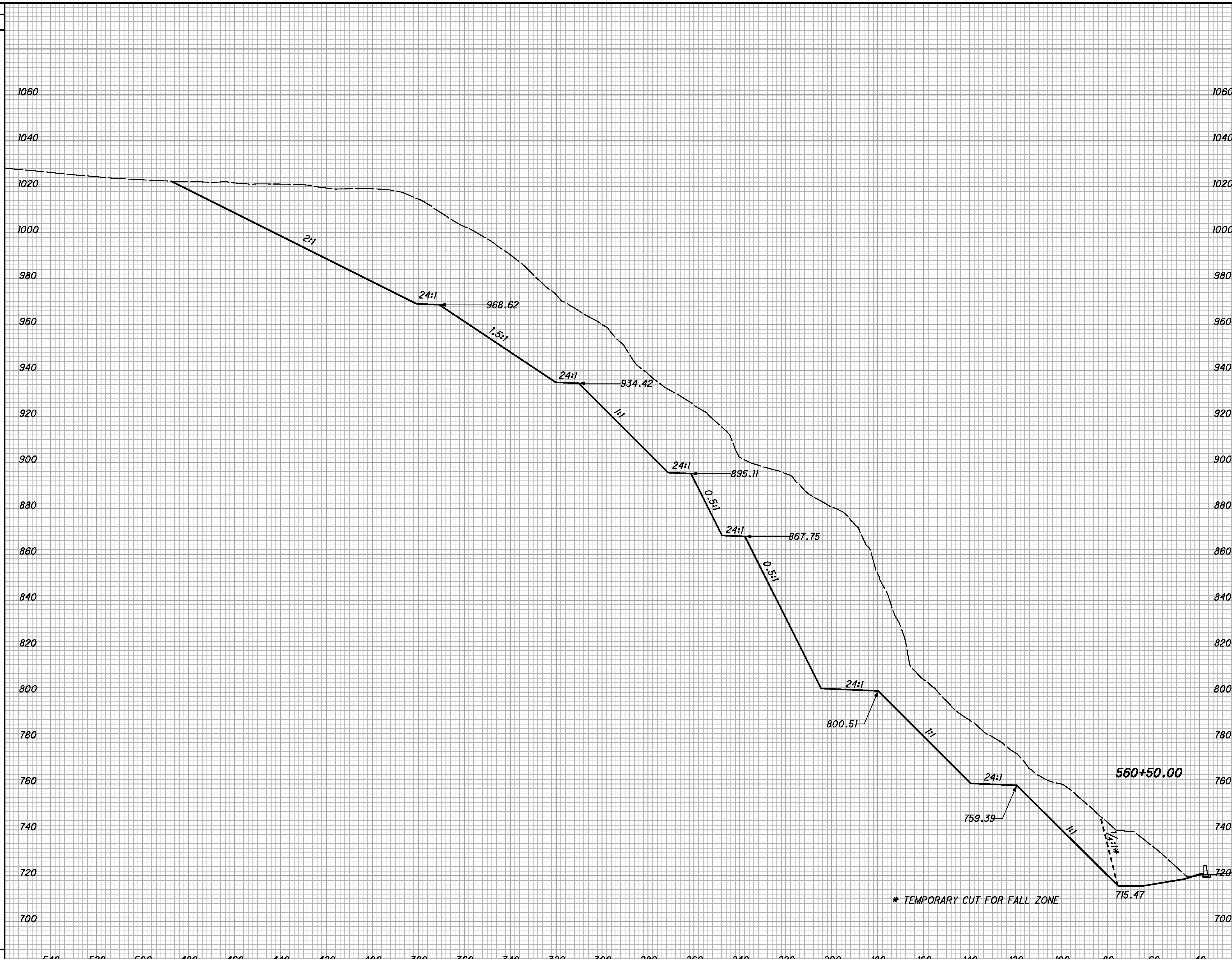
SEEDING	
END WIDTH	SQ. YDS.
173	
	958
	958



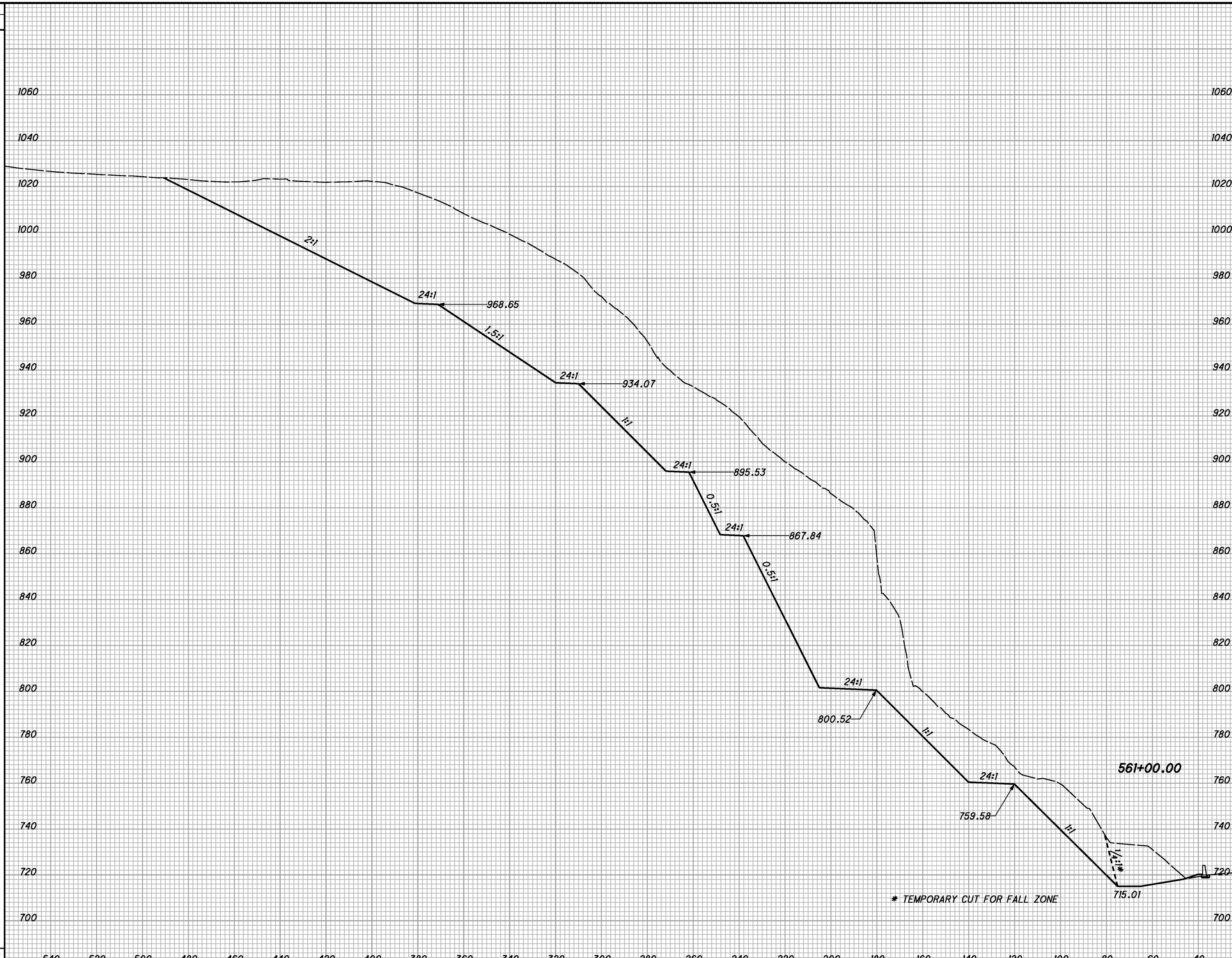
END AREA		VOLUME	
CUT	FILL	CUT	FILL
14798	2		
		22275	2
		22275	2

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 560+50.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
178	
	975
	975



END AREA		VOLUME	
CUT	FILL	CUT	FILL
16592	5		
		25470	5
		25470	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 561+00.00

JEF-7-10.00

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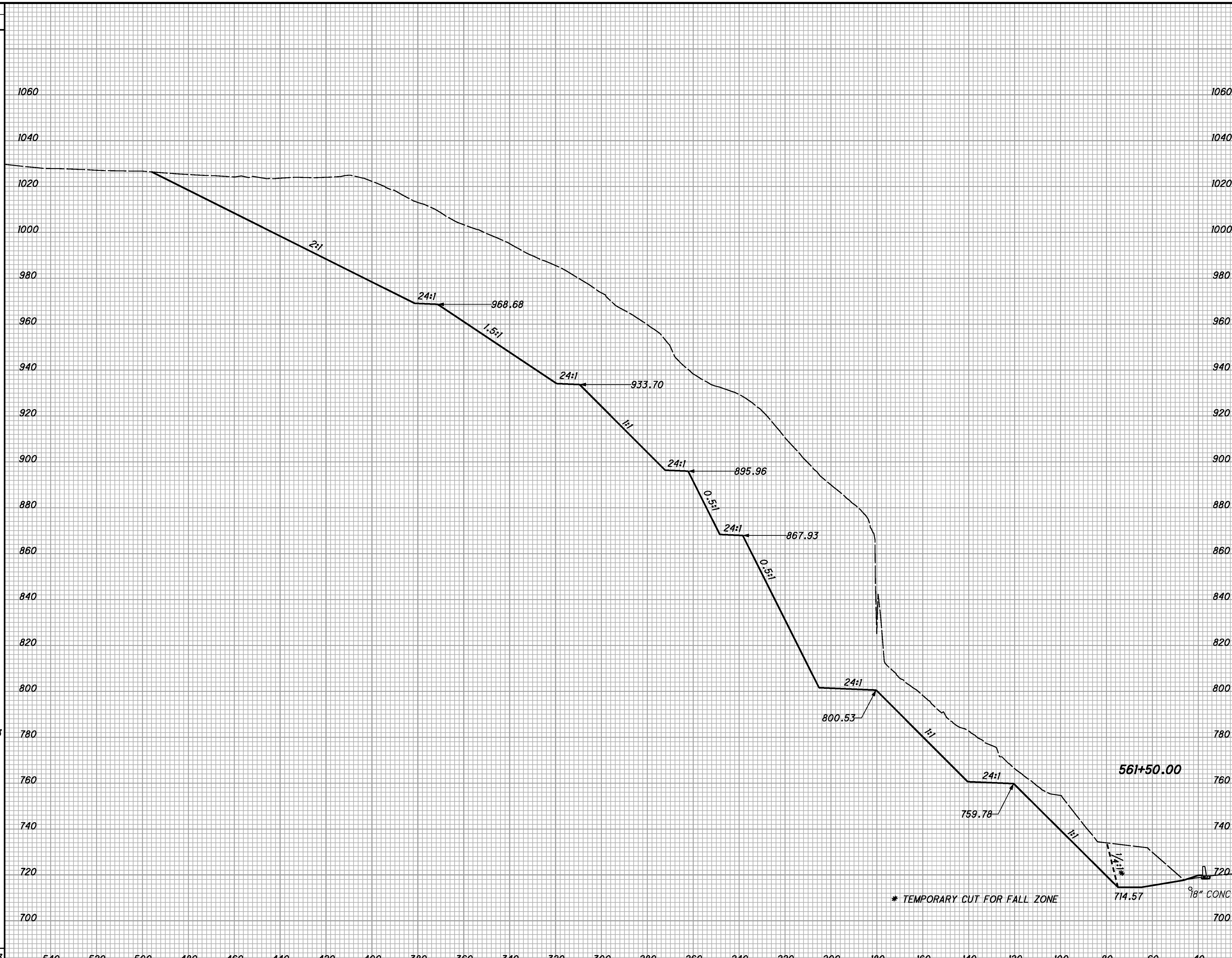
SEEDING	
END WIDTH	SQ. YDS.
183	
	1003
	1003



END AREA		VOLUME	
CUT	FILL	CUT	FILL
16631	4		
		27436	7
		27436	7

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 561+50.00

JEF-7-10.00

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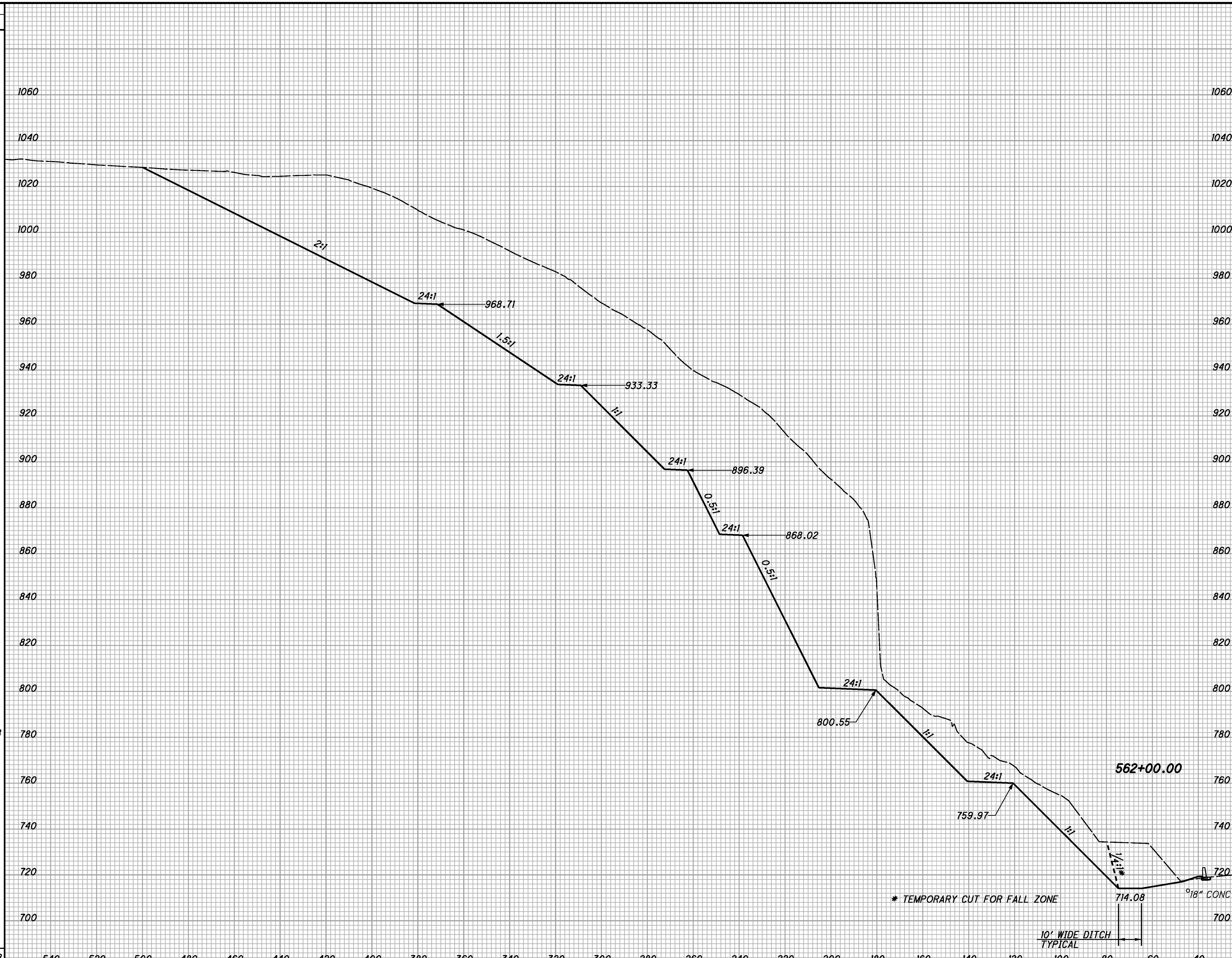
SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
187	1028	16257	3	27689	6
	1028			27689	6



CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 562+00.00

JEF-7-10.00

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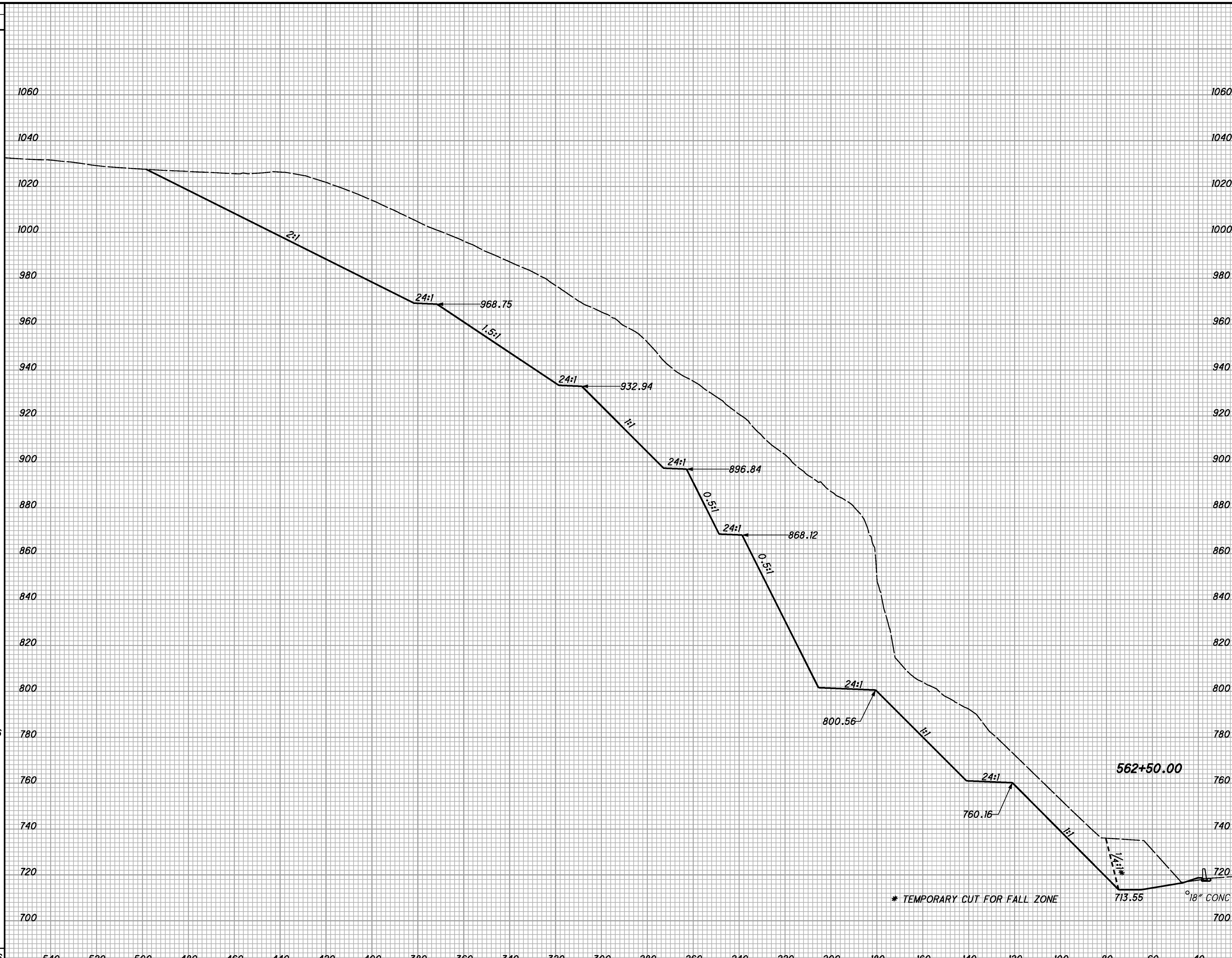
SEEDING	
END WIDTH	SQ. YDS.
186	1036
	1036



END AREA		VOLUME	
CUT	FILL	CUT	FILL
15768	4		
		27533	6
		27533	6

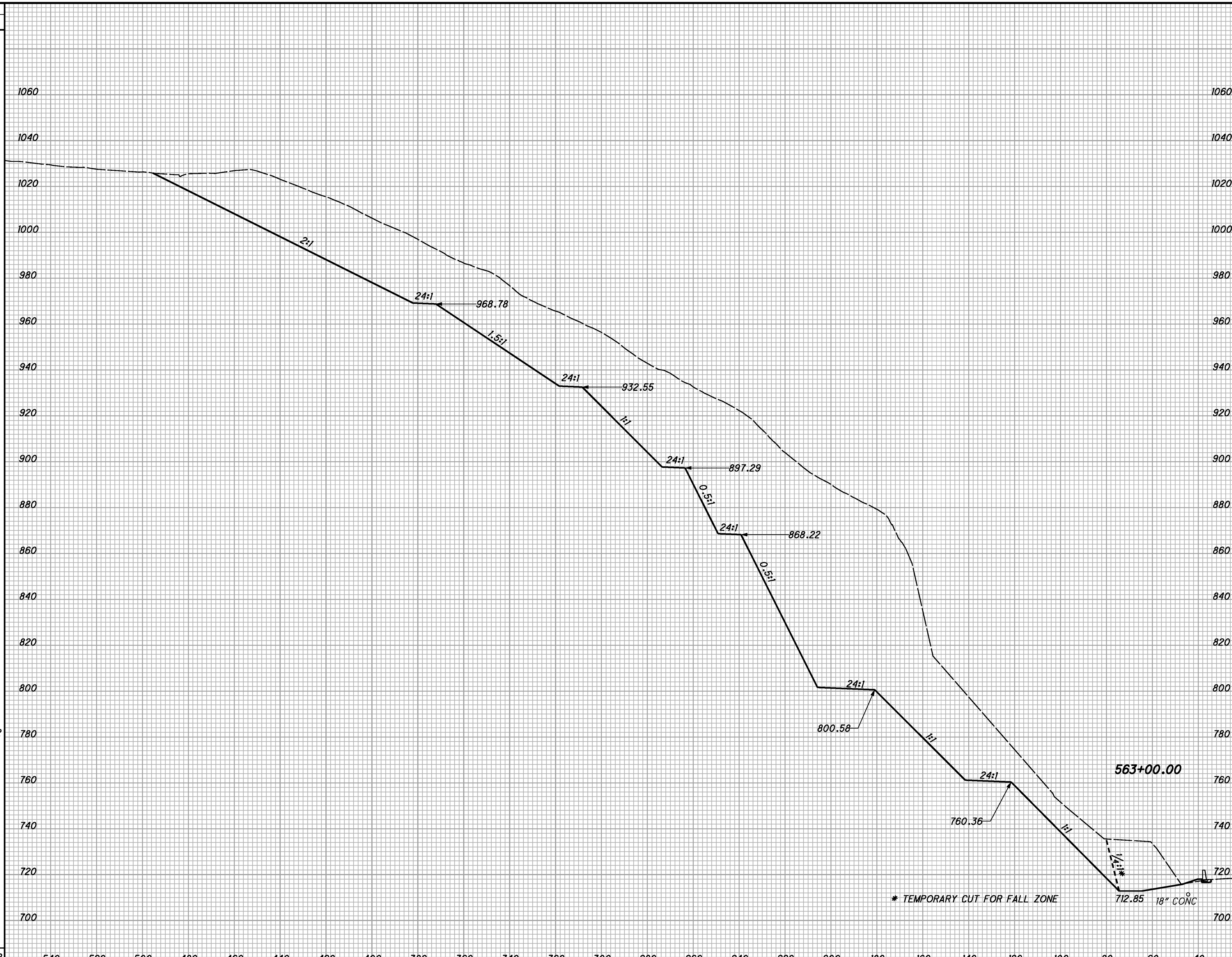
CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 562+50.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
182	
	1022
	1022



END AREA		VOLUME	
CUT	FILL	CUT	FILL
15856	4		
		27785	8
		27785	8

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 563+00.00

JEF-7-10.00

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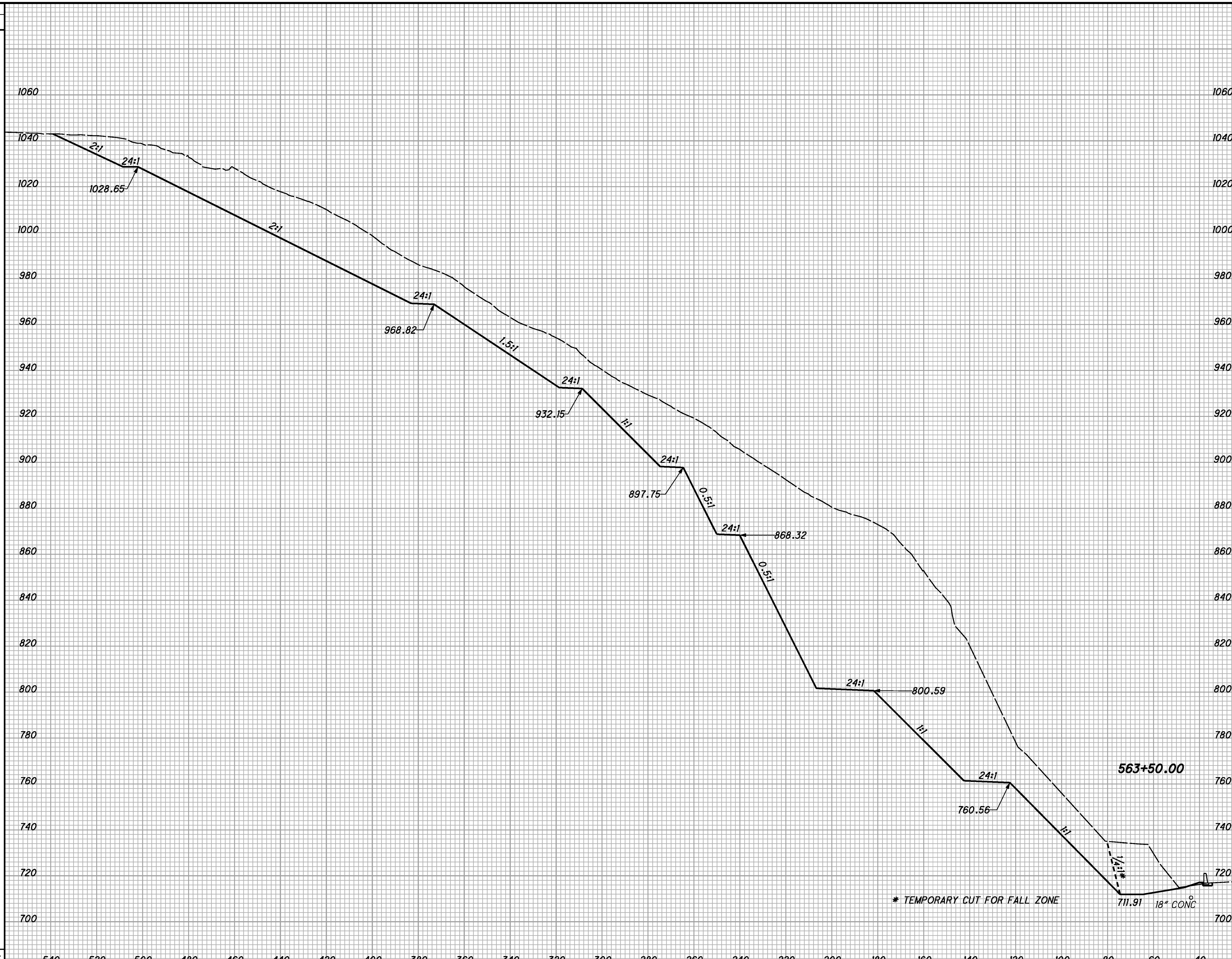

SEEDING	
END WIDTH	SQ. YDS.
227	
	1136
	1136

END AREA		VOLUME	
CUT	FILL	CUT	FILL
14580	3		
		27266	7
		27266	7

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 563+50.00

JEF-7-10.00

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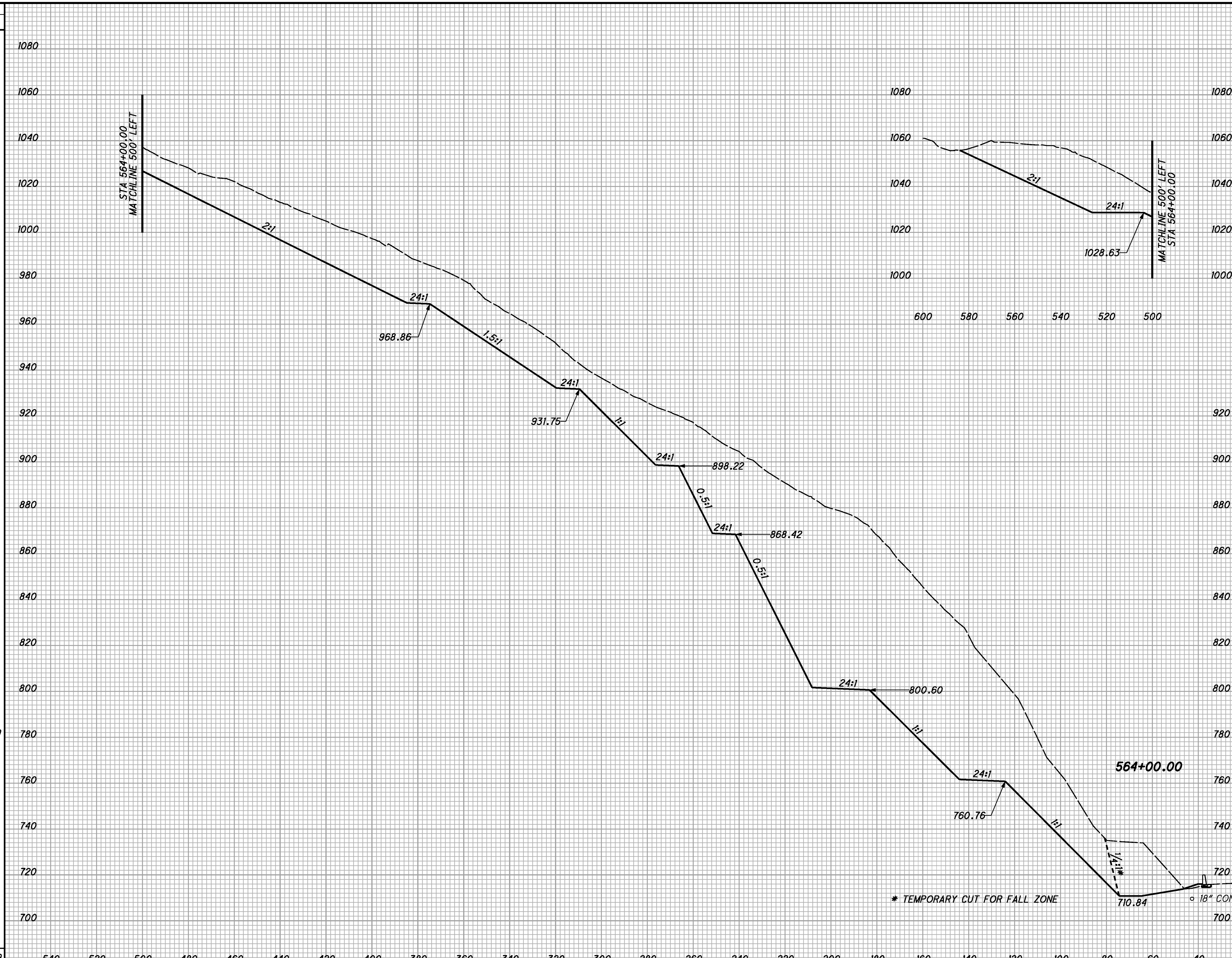
SEEDING	
END WIDTH	SQ. YDS.
273	1389
	1389



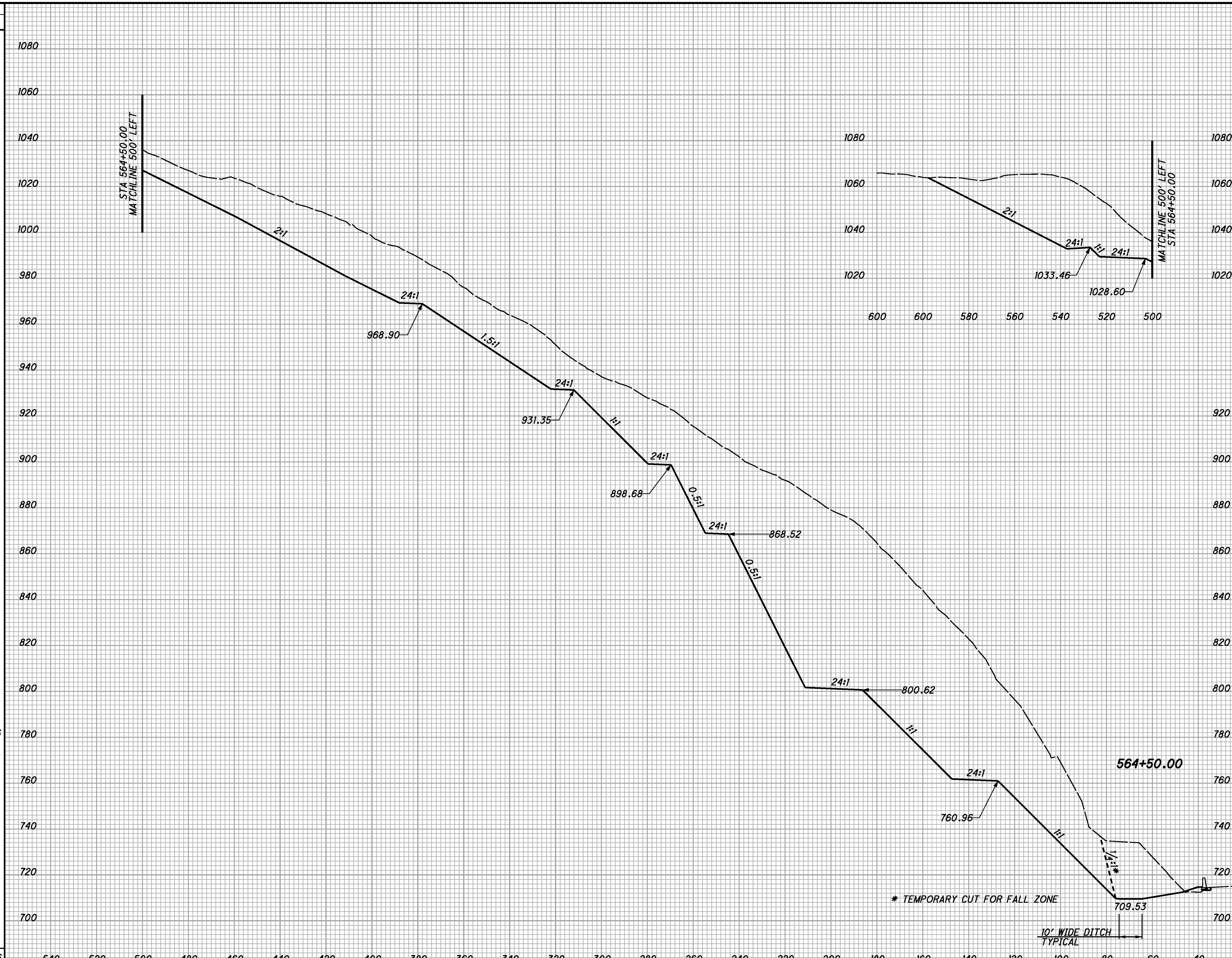
END AREA		VOLUME	
CUT	FILL	CUT	FILL
15766	7		
		27639	9
		27639	9

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 564+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
287	1556
	1556



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17027	11		
		30300	16
		30300	16

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 564+50.00

JEF-7-10.00

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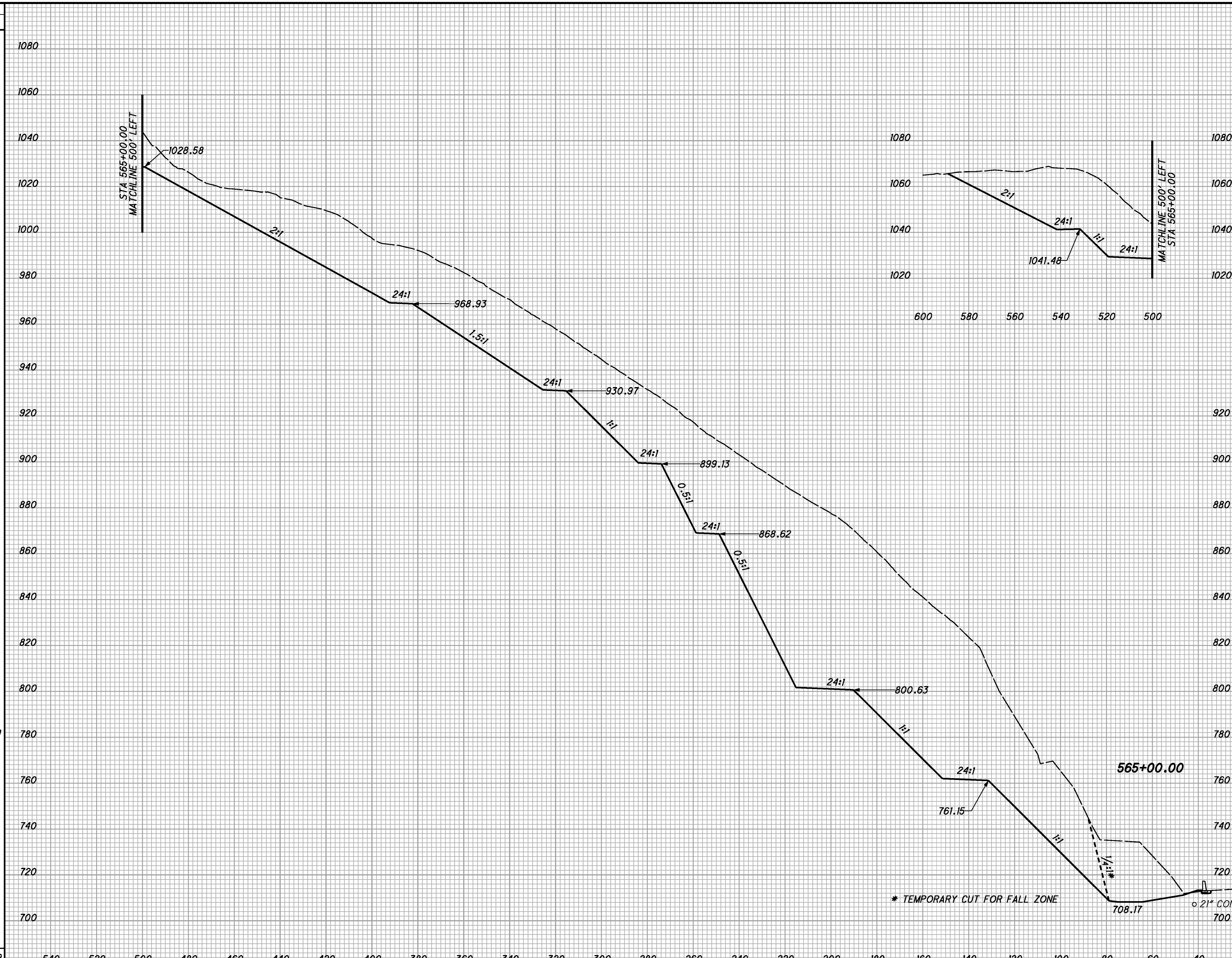
SEEDING	
END WIDTH	SQ. YDS.
267	
	1539
	1539



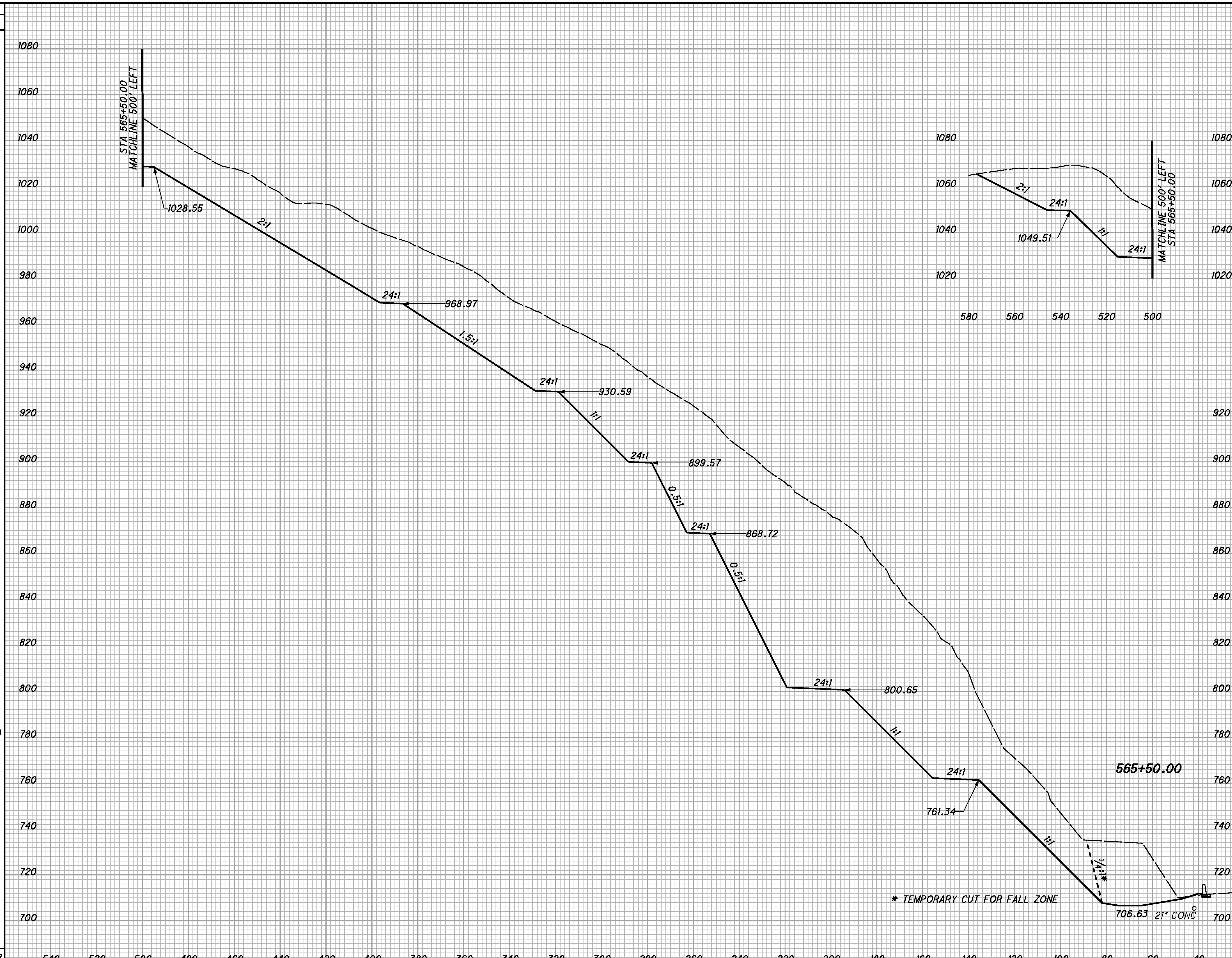
END AREA		VOLUME	
CUT	FILL	CUT	FILL
18362	2		
		32768	12
		32768	12

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 565+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
240	1408
	1408



END AREA		VOLUME	
CUT	FILL	CUT	FILL
19126	2		
		34711	4
		34711	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 565+50.00

JEF-7-10.00

66
130

22-OCT-2014 3:49PM tstillio
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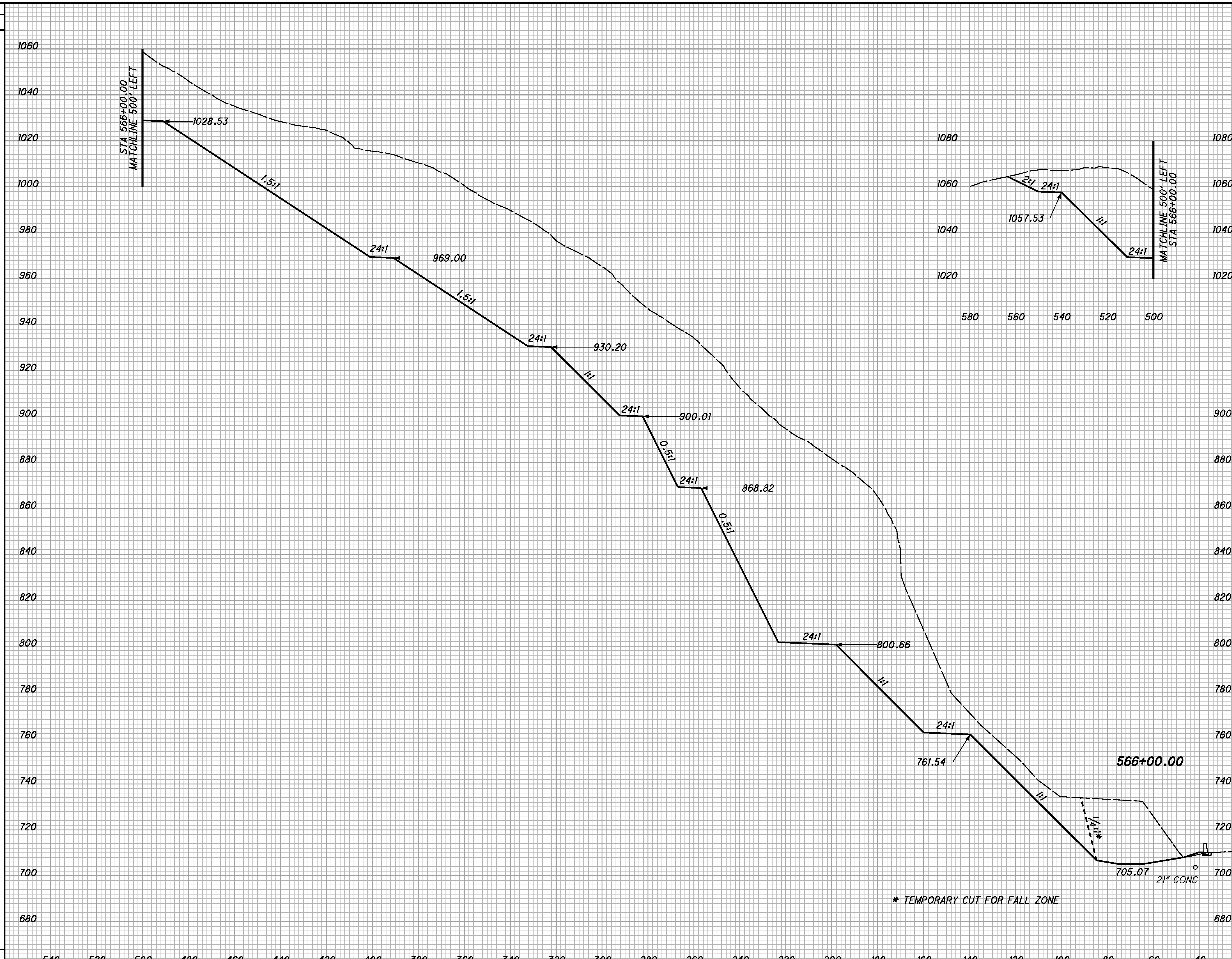
SEEDING	
END WIDTH	SQ. YDS.
78	
	884
	884



END AREA		VOLUME	
CUT	FILL	CUT	FILL
21734	5		
		37833	7
		37833	7

CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 566+00.00

JEF-7-10.00

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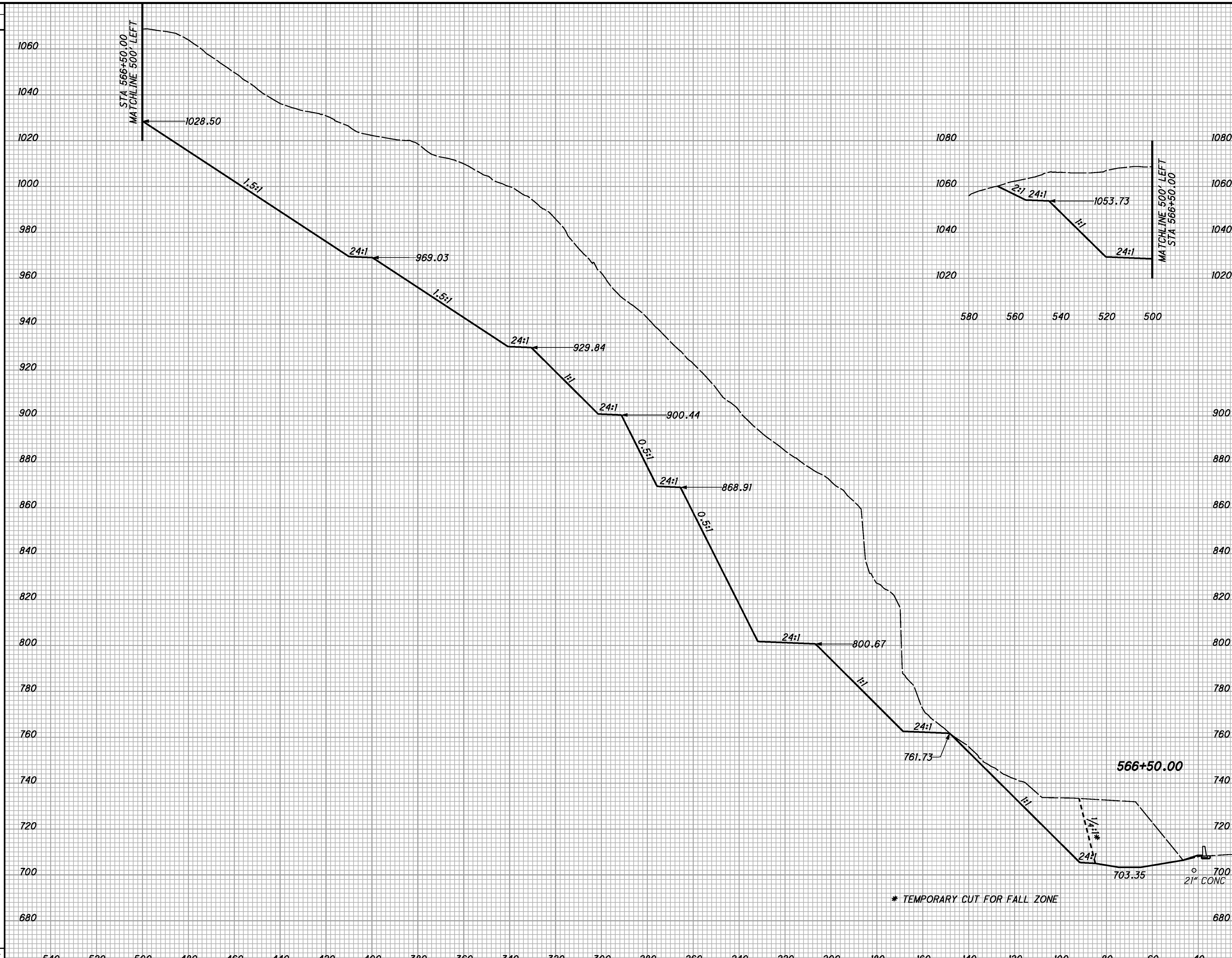
SEEDING	
END WIDTH	SQ. YDS.
85	
	453
	453



END AREA		VOLUME	
CUT	FILL	CUT	FILL
23942	3		
		42293	8
		42293	8

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 566+50.00

JEF-7-10.00

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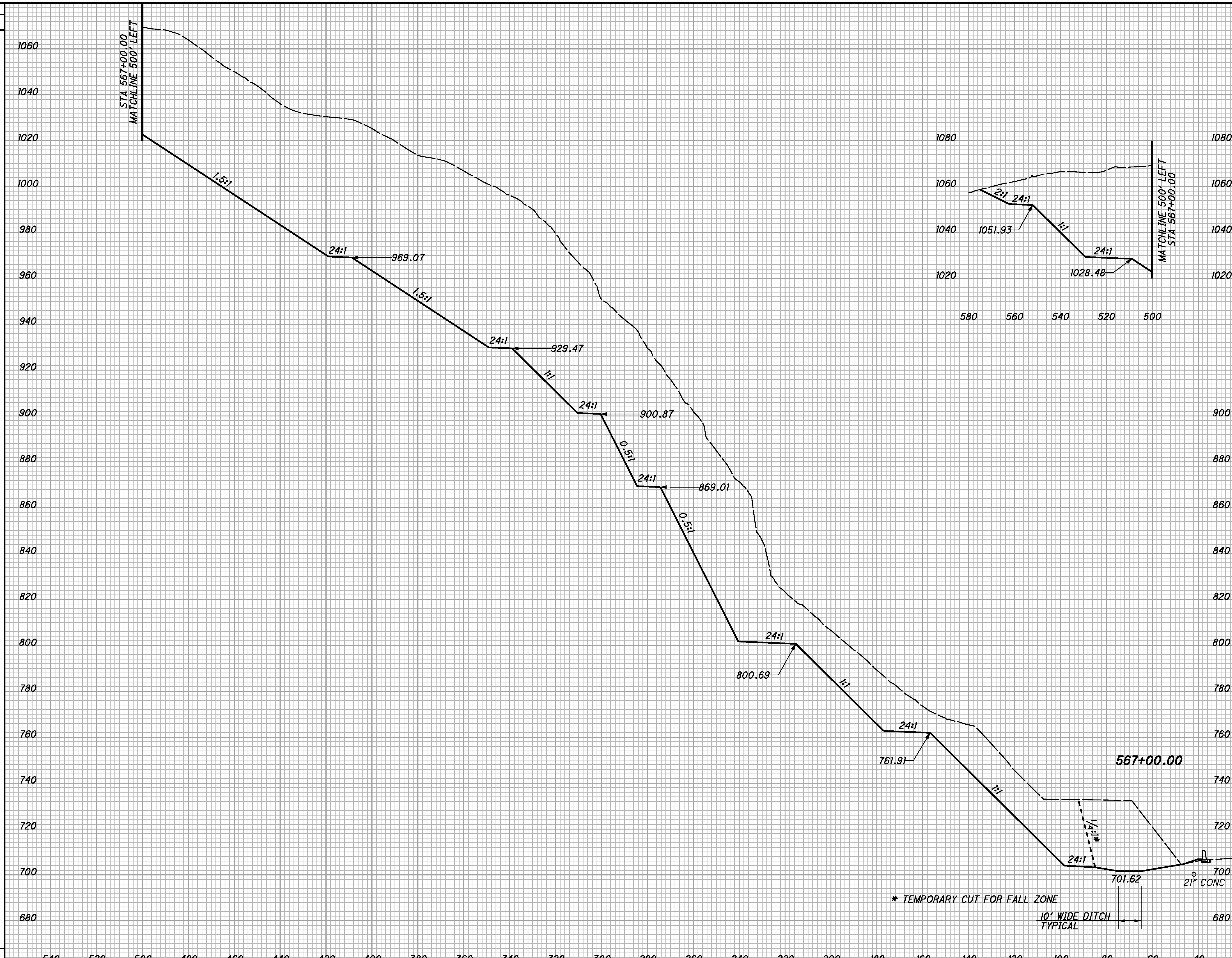
SEEDING	
END WIDTH	SQ. YDS.
92	492
	492



END AREA		VOLUME	
CUT	FILL	CUT	FILL
22214	4		
		42737	6
		42737	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 567+00.00

JEF-7-10.00

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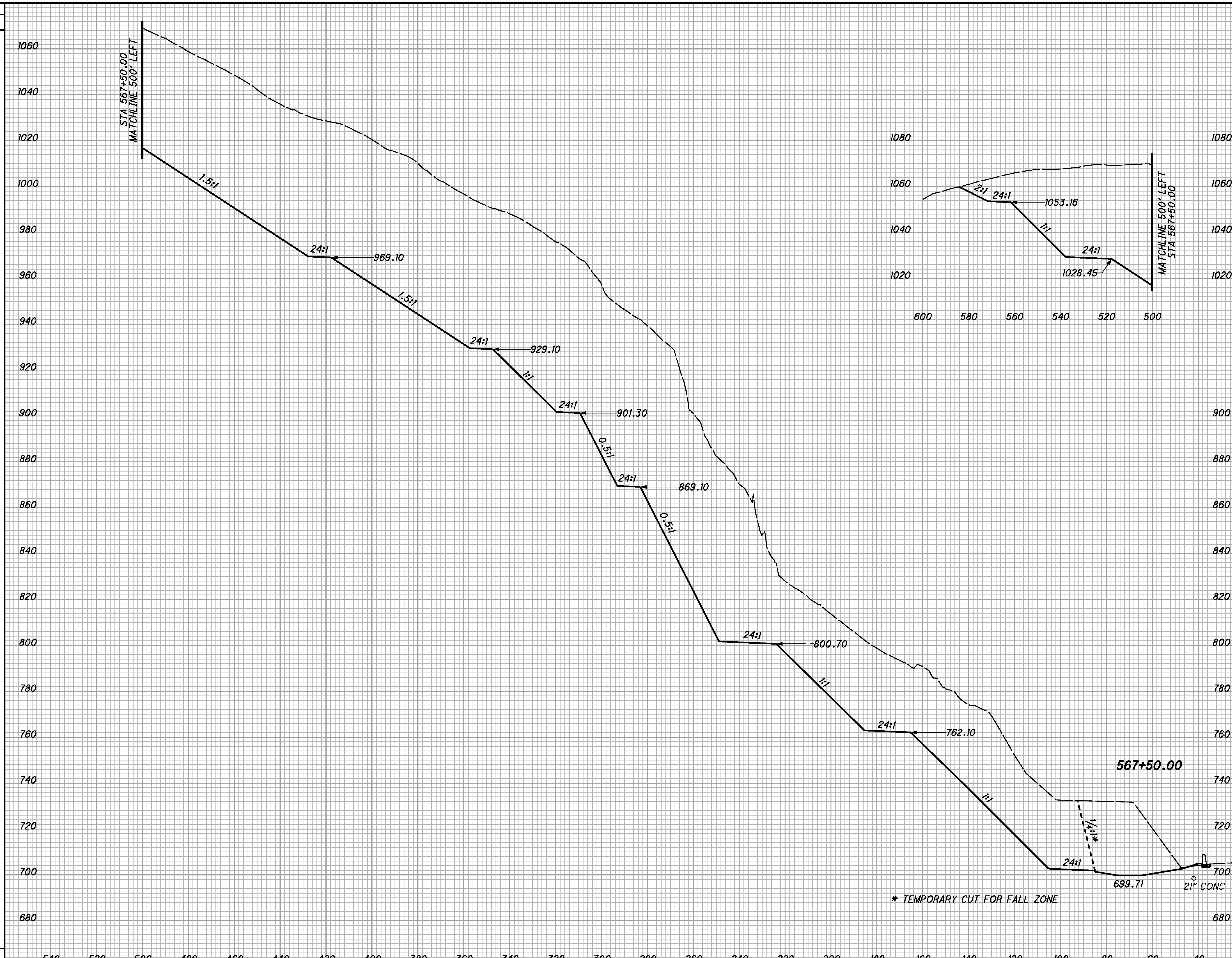
SEEDING	
END WIDTH	SQ. YDS.
97	525
	525

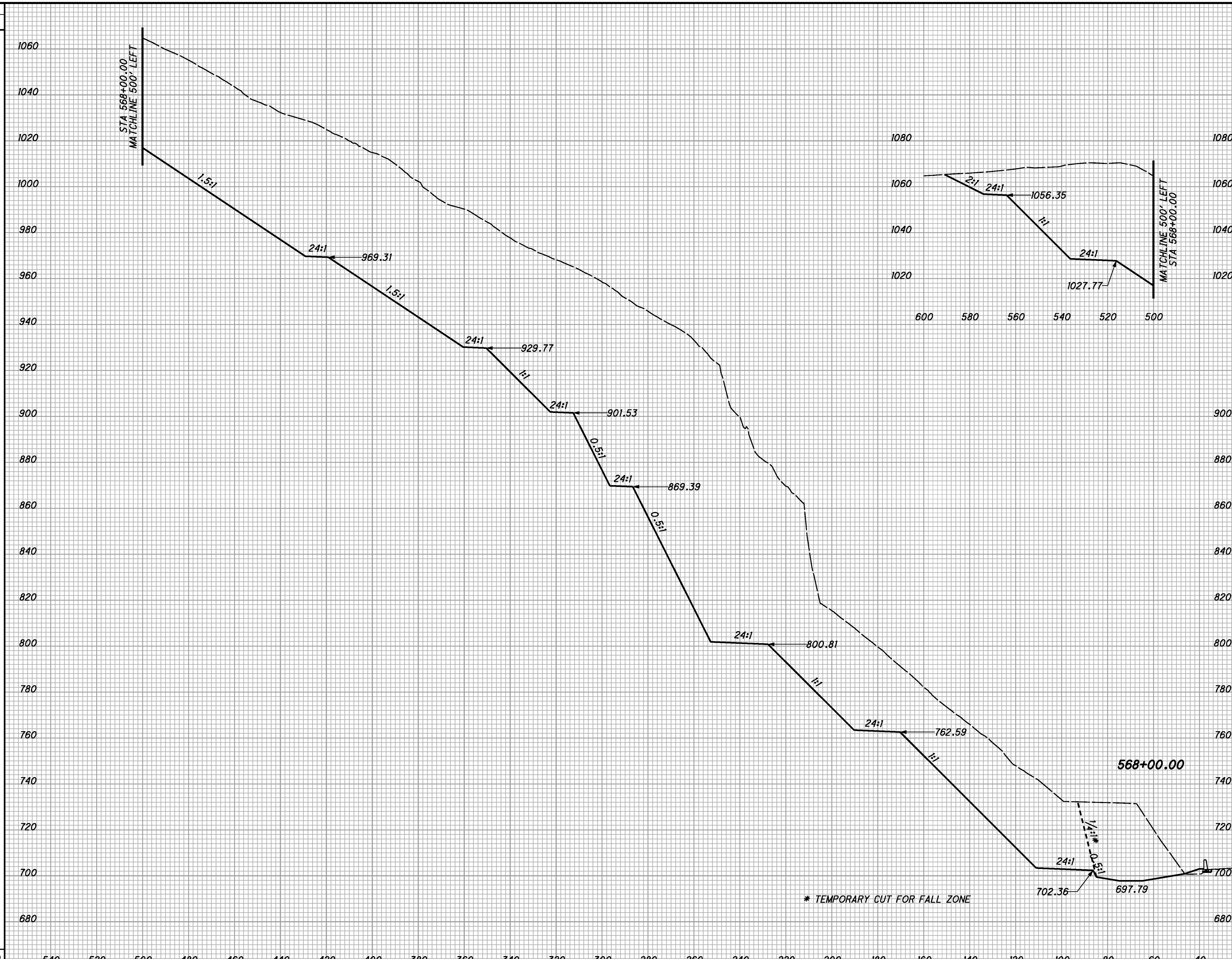


END AREA		VOLUME	
CUT	FILL	CUT	FILL
26118	3		
		44751	6
		44751	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 567+50.00

JEF-7-10.00



SEEDING	
END WIDTH	SQ. YDS.
83	
	500
	500

END AREA		VOLUME	
CUT	FILL	CUT	FILL
27846	11		
		49966	13
		49966	13

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 568+00.00

JEF-7-10.00

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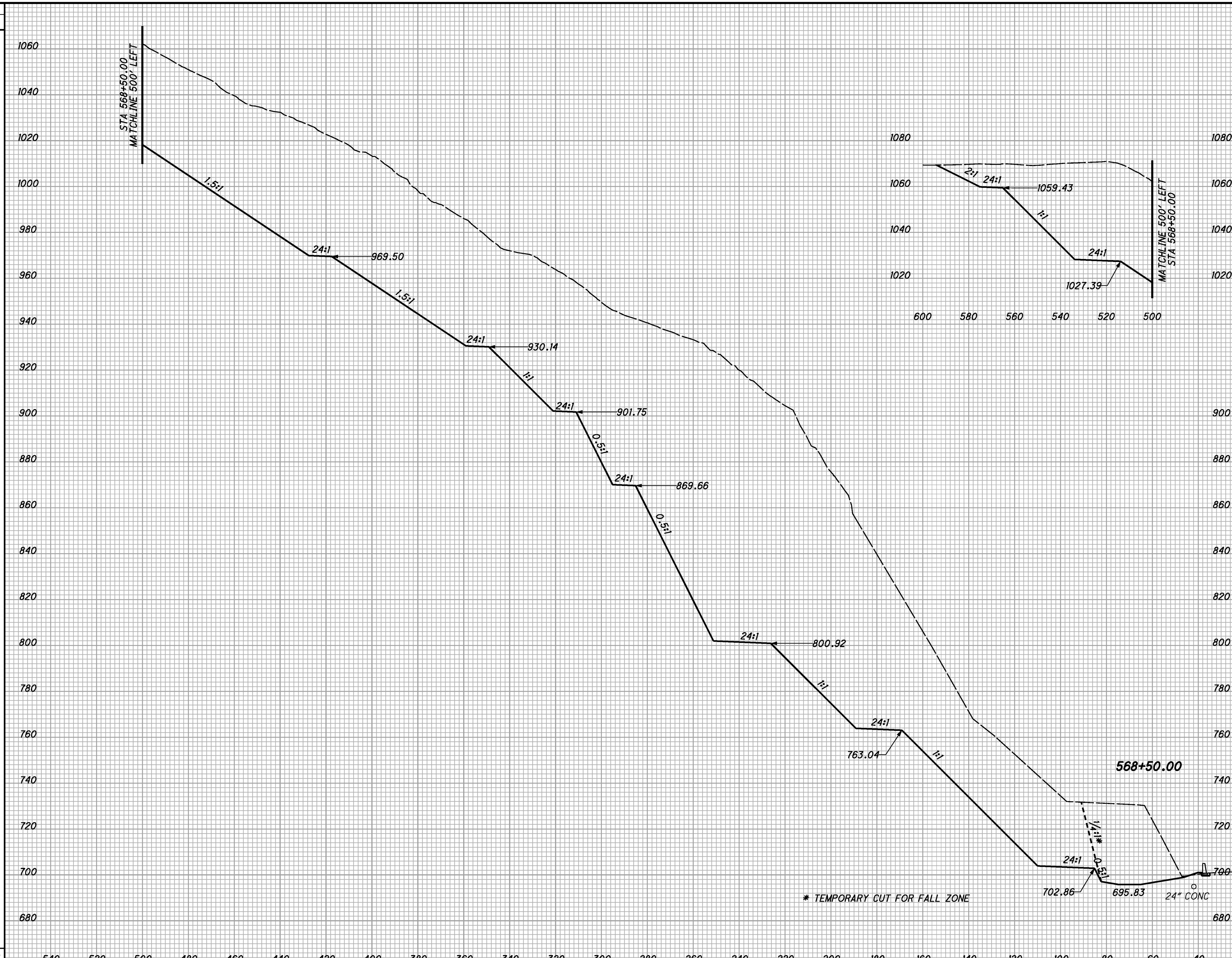

SEEDING	
END WIDTH	SQ. YDS.
81	
	456
	456

END AREA		VOLUME	
CUT	FILL	CUT	FILL
30201	3		
		53747	13
		53747	13

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 568+50.00

JEF-7-10.00

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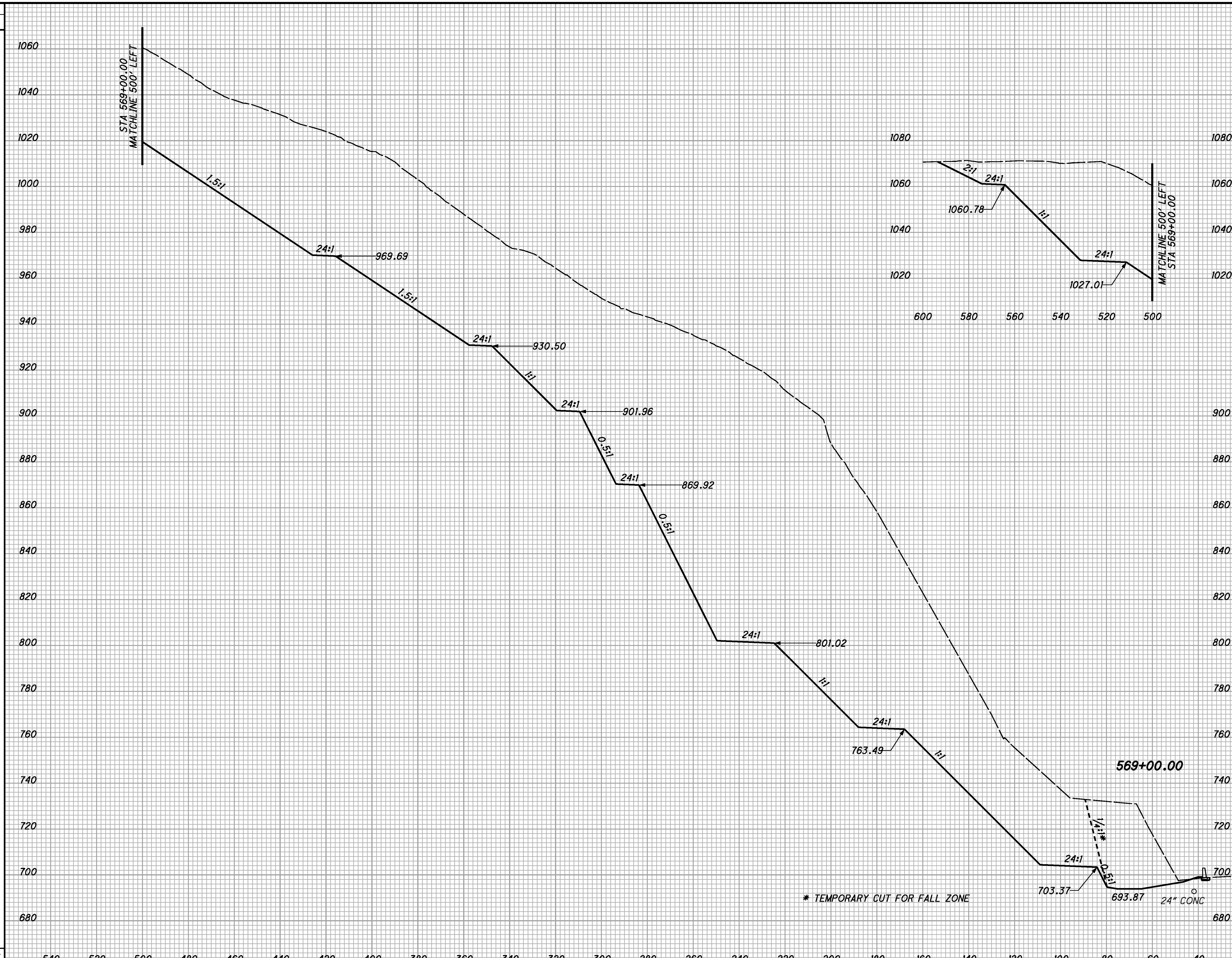
SEEDING			END AREA		VOLUME	
END WIDTH	SQ. YDS.	STATION	CUT	FILL	CUT	FILL
82	453	569+00.00	31439	2	57074	4
	453	TOTAL			57074	4

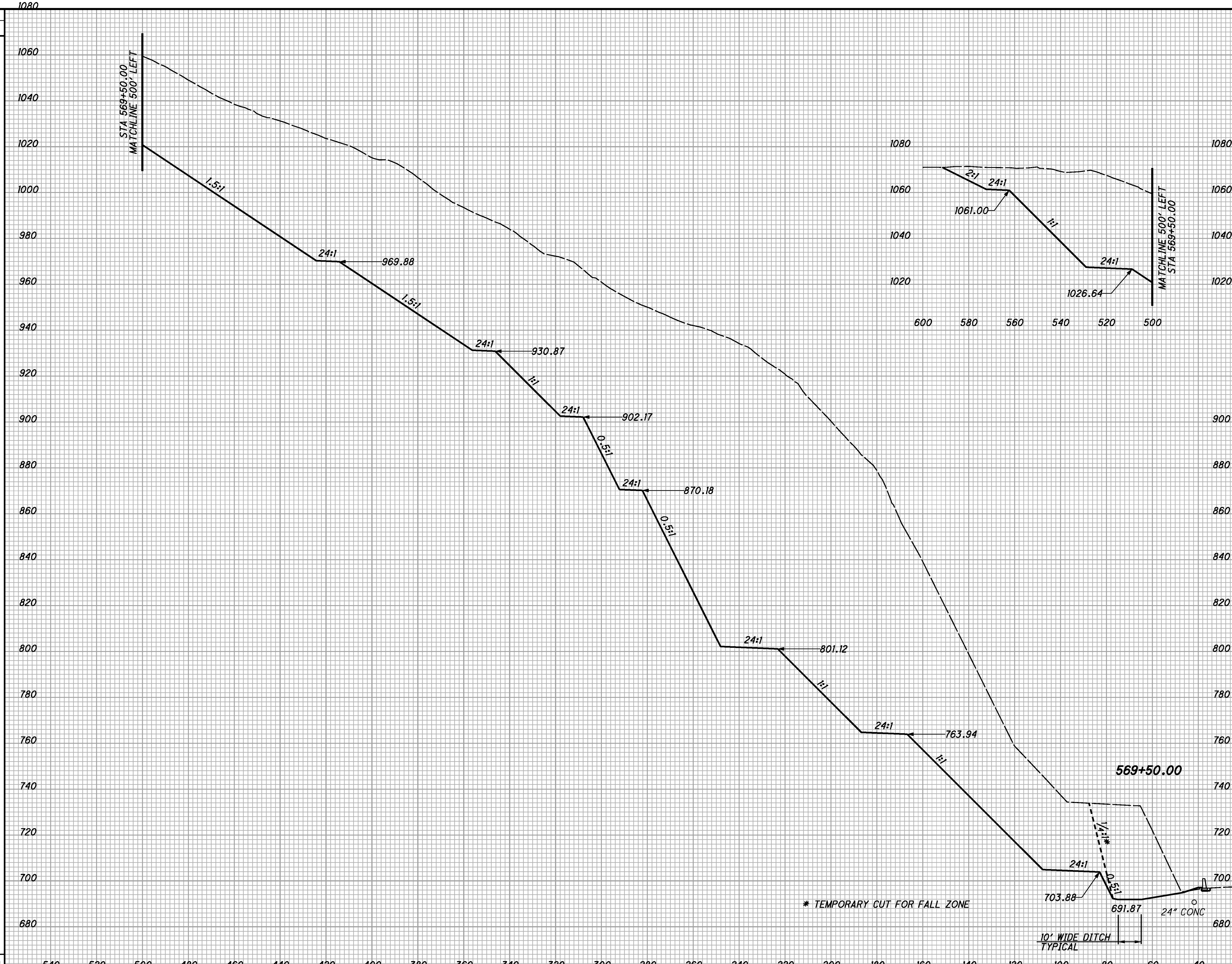


CALCULATED EDA
CHECKED SNS

CROSS SECTIONS STA. 569+00.00

JEF-7-10.00

SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
80	450	33445	3	60078	4
	450			60078	4



CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 569+50.00

JEF-7-10.00

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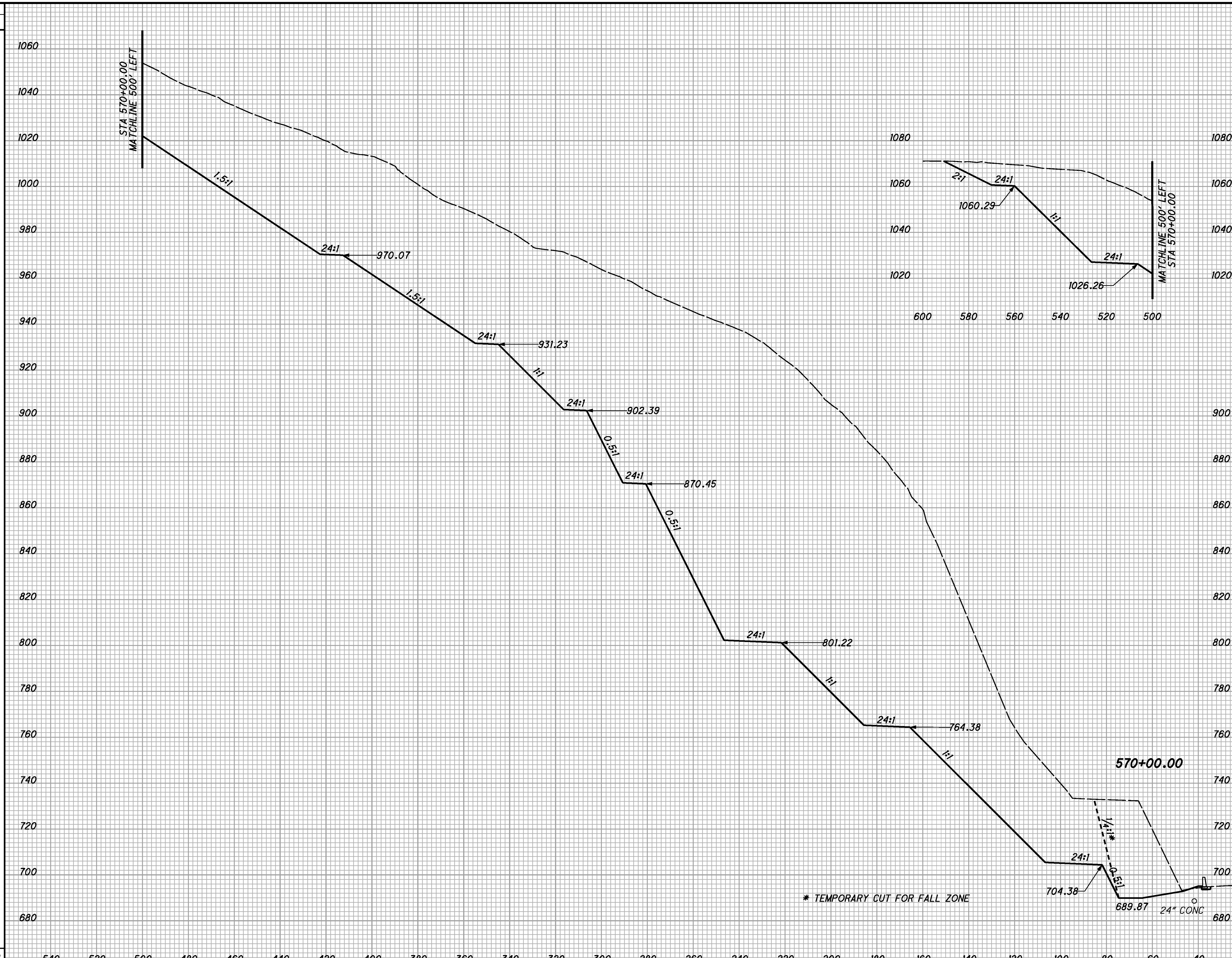
SEEDING	
END WIDTH	SQ. YDS.
78	439
	439



END AREA		VOLUME	
CUT	FILL	CUT	FILL
33221	3		
		61728	5
		61728	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 570+00.00

JEF-7-10.00

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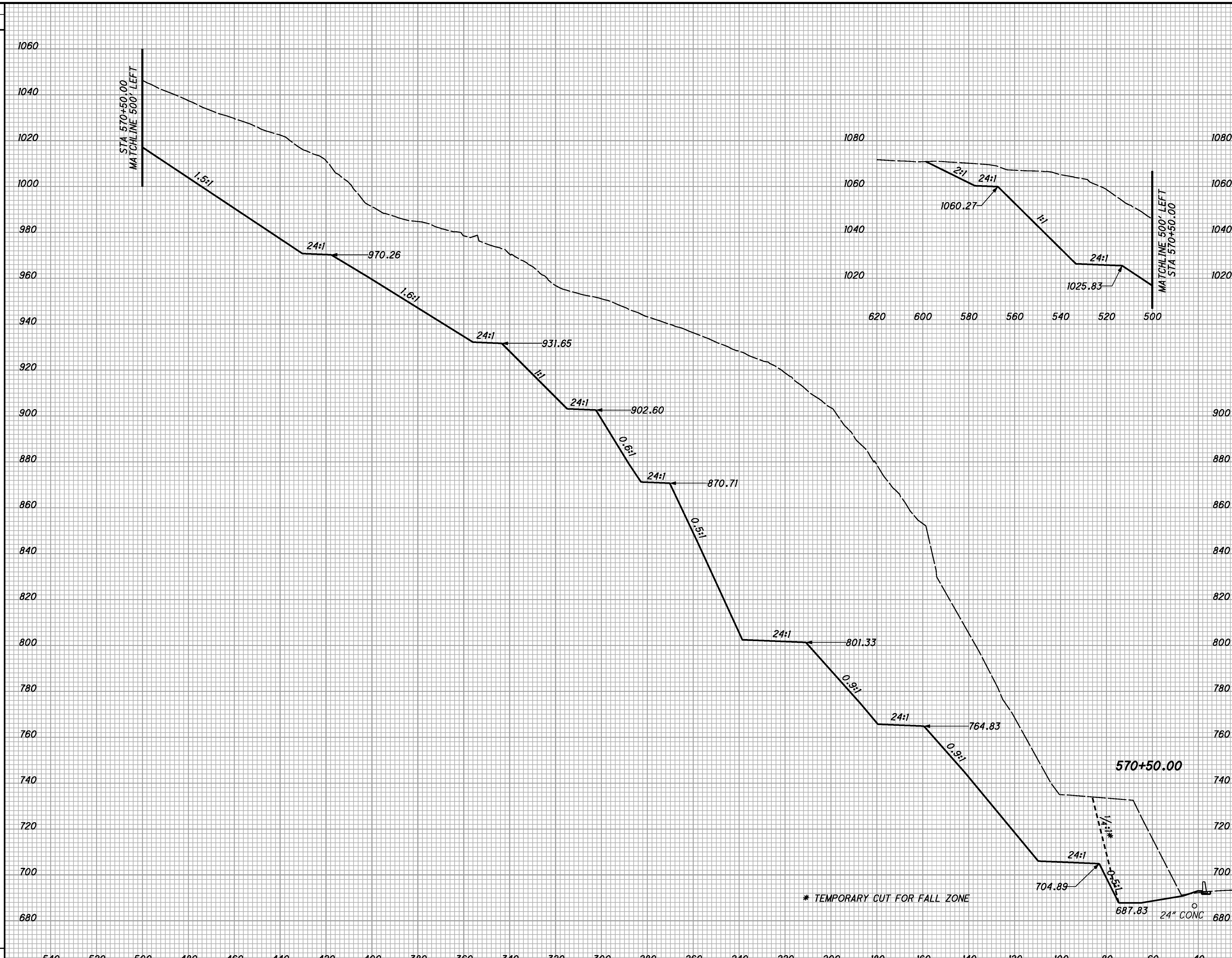
SEEDING	
END WIDTH	SQ. YDS.
77	
	431
	431



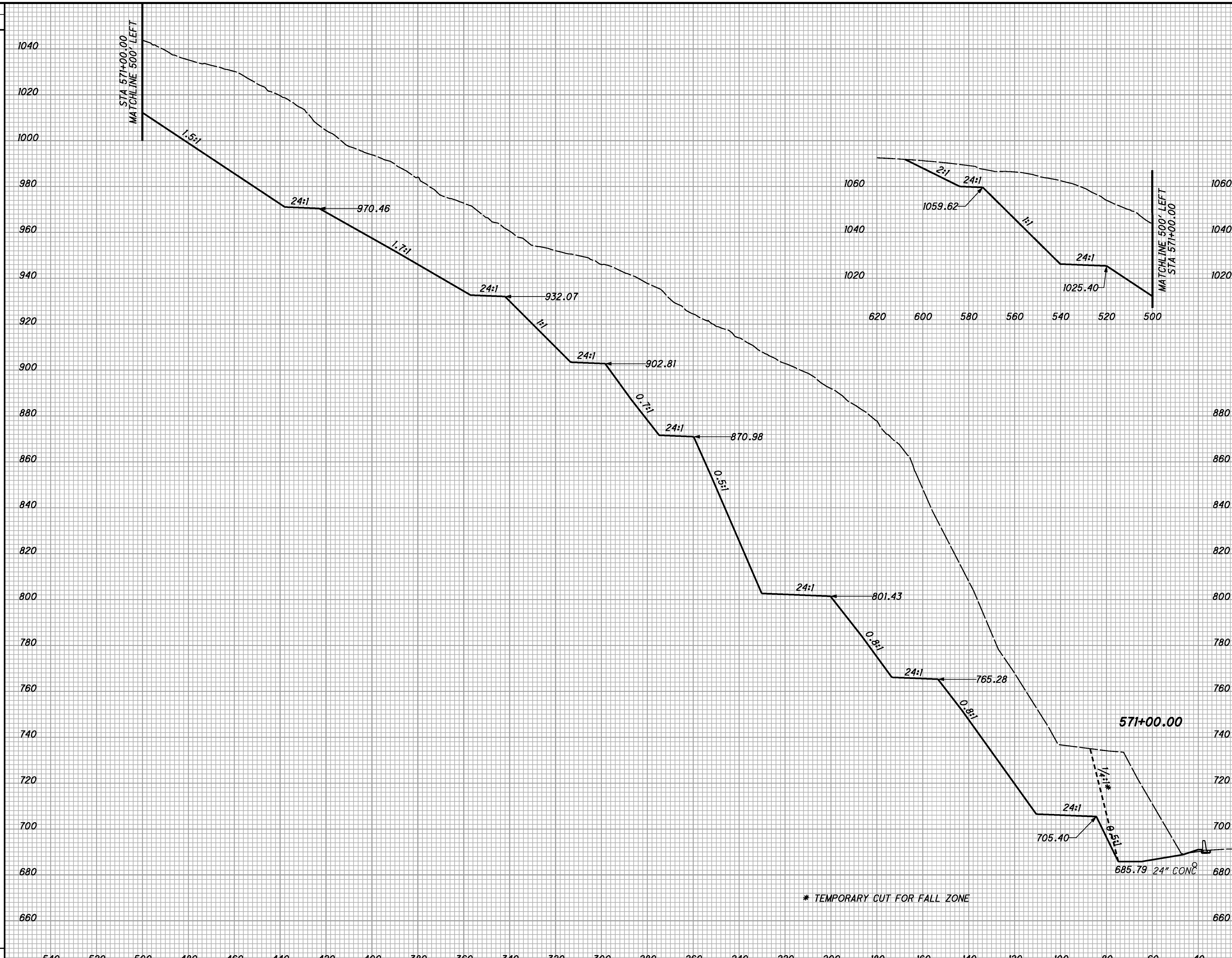
END AREA		VOLUME	
CUT	FILL	CUT	FILL
28937	3		
		57553	5
		57553	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 570+50.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
78	
	431
	431



END AREA		VOLUME	
CUT	FILL	CUT	FILL
26246	3		
		51095	6
		51095	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 571+00.00

JEF-7-10.00

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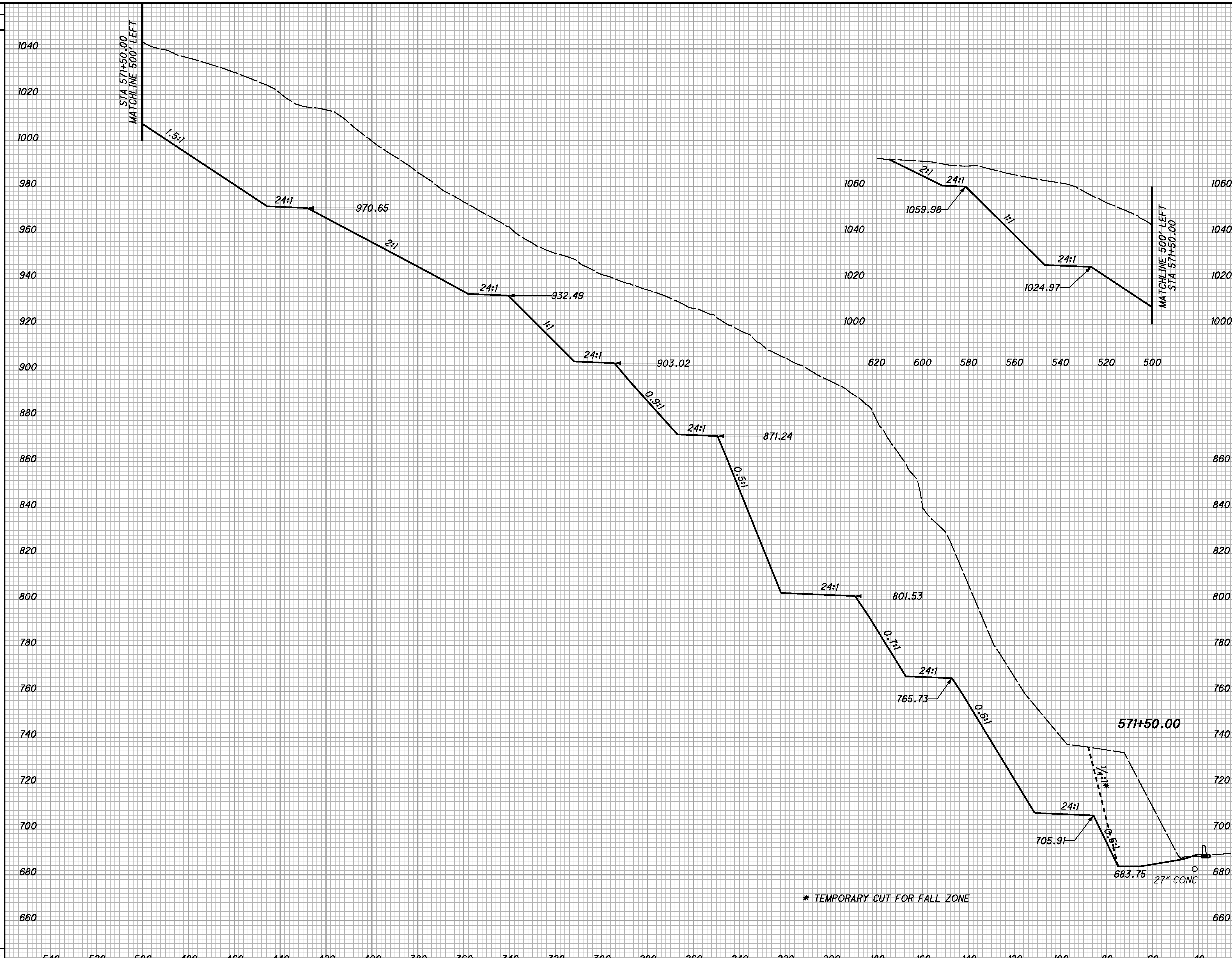
SEEDING	
END WIDTH	SQ. YDS.
80	
	439
	439



END AREA		VOLUME	
CUT	FILL	CUT	FILL
26017	3		
		48392	6
		48392	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 571+50.00

JEF-7-10.00

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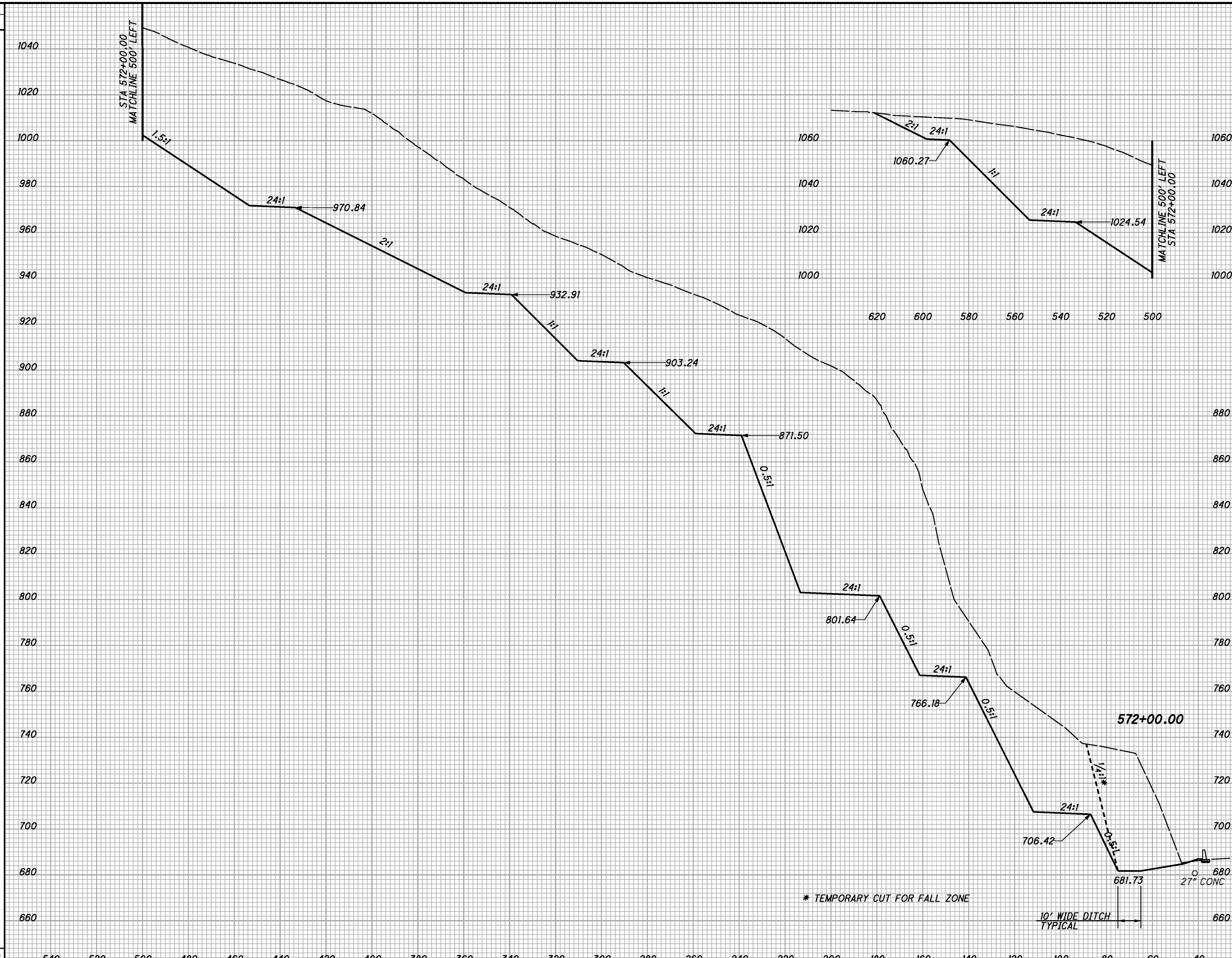
SEEDING	
END WIDTH	SQ. YDS.
78	439
	439



END AREA		VOLUME	
CUT	FILL	CUT	FILL
27902	3		
		49926	5
		49926	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 572+00.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
77	431
	431

END AREA		VOLUME	
CUT	FILL	CUT	FILL
29876	3		
		53499	5
		53499	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 572+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
78	
	431
	431

END AREA		VOLUME	
CUT	FILL	CUT	FILL
30844	2		
		56222	5
		56222	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 573+00.00

JEF-7-10.00

SEEDING END WIDTH	SEEDING SQ. YDS.
82	
	444
	444

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
28071	2		
		54551	4
		54551	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 573+50.00

JEF-7-10.00

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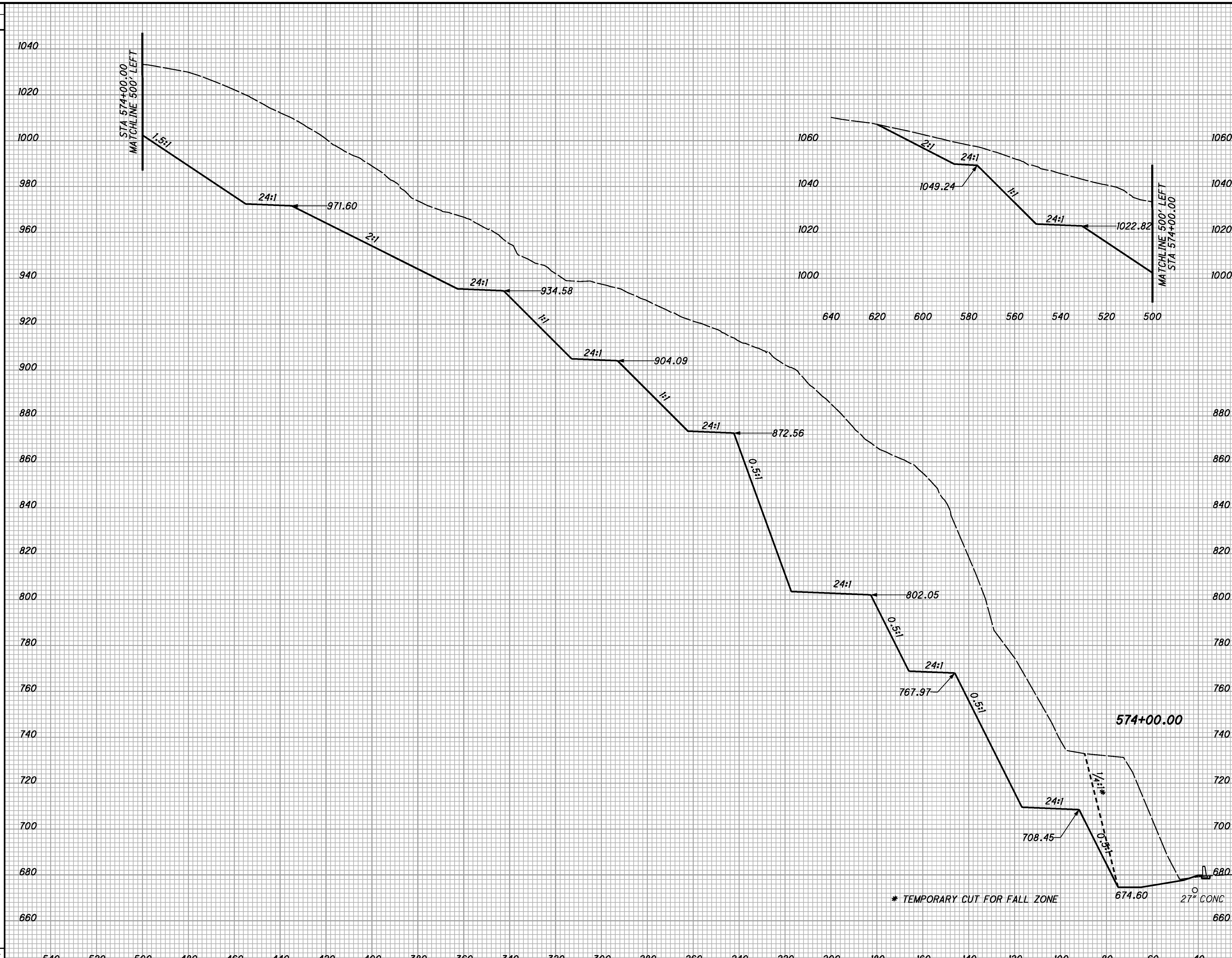
SEEDING	
END WIDTH	SQ. YDS.
92	
	483
	483



END AREA		VOLUME	
CUT	FILL	CUT	FILL
22996	2		
		47285	4
		47285	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 574+00.00

JEF-7-10.00

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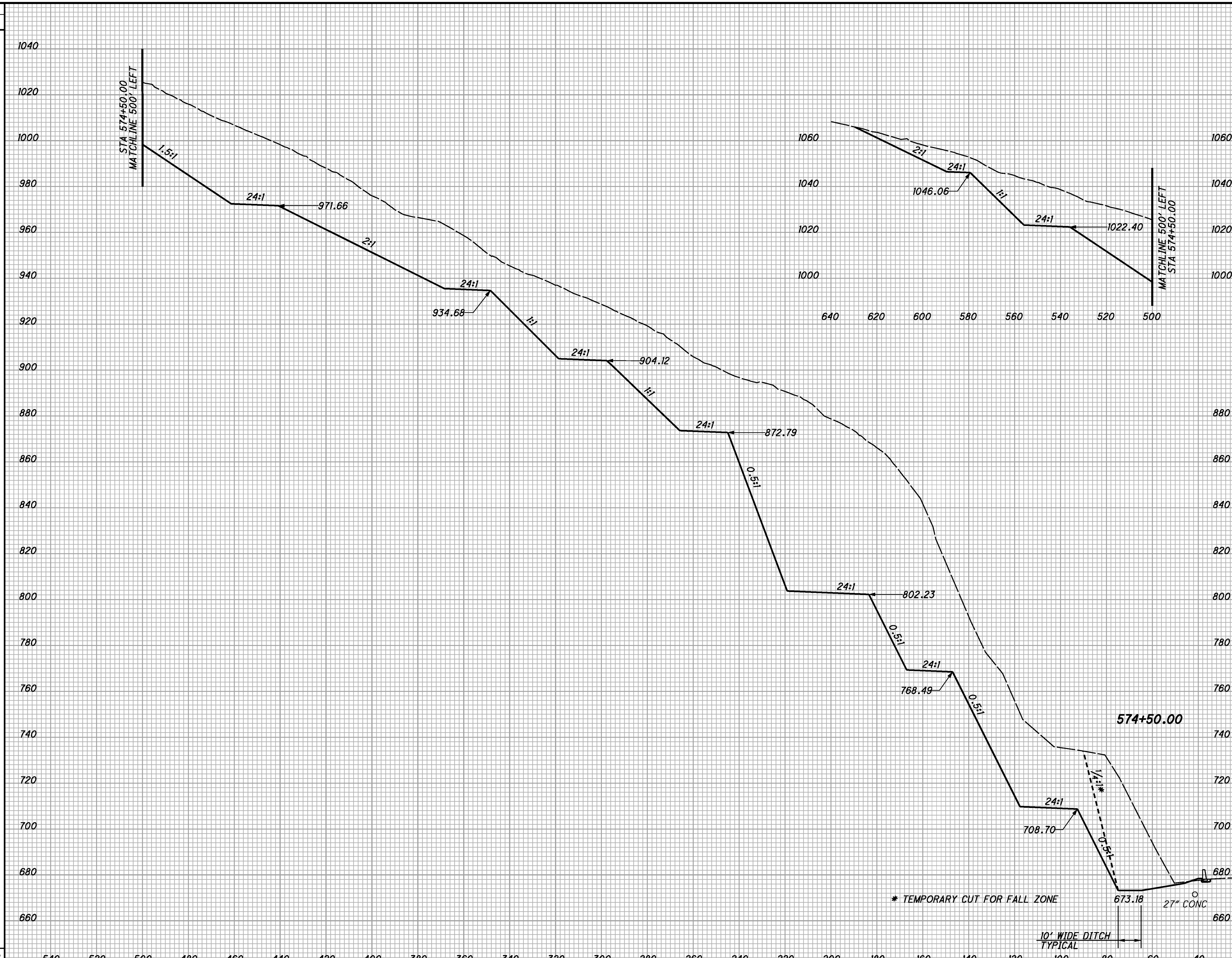
SEEDING	
END WIDTH	SQ. YDS.
96	
	522
	522



END AREA		VOLUME	
CUT	FILL	CUT	FILL
18699	3		
		38607	4
		38607	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 574+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
98	
	539
	539

END AREA		VOLUME	
CUT	FILL	CUT	FILL
17441	12		
		33463	13
		33463	13

CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 575+00.00

JEF-7-10.00

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SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
125	619	17340	3	32205	14
	619			32205	14

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 575+50.00

JEF-7-10.00

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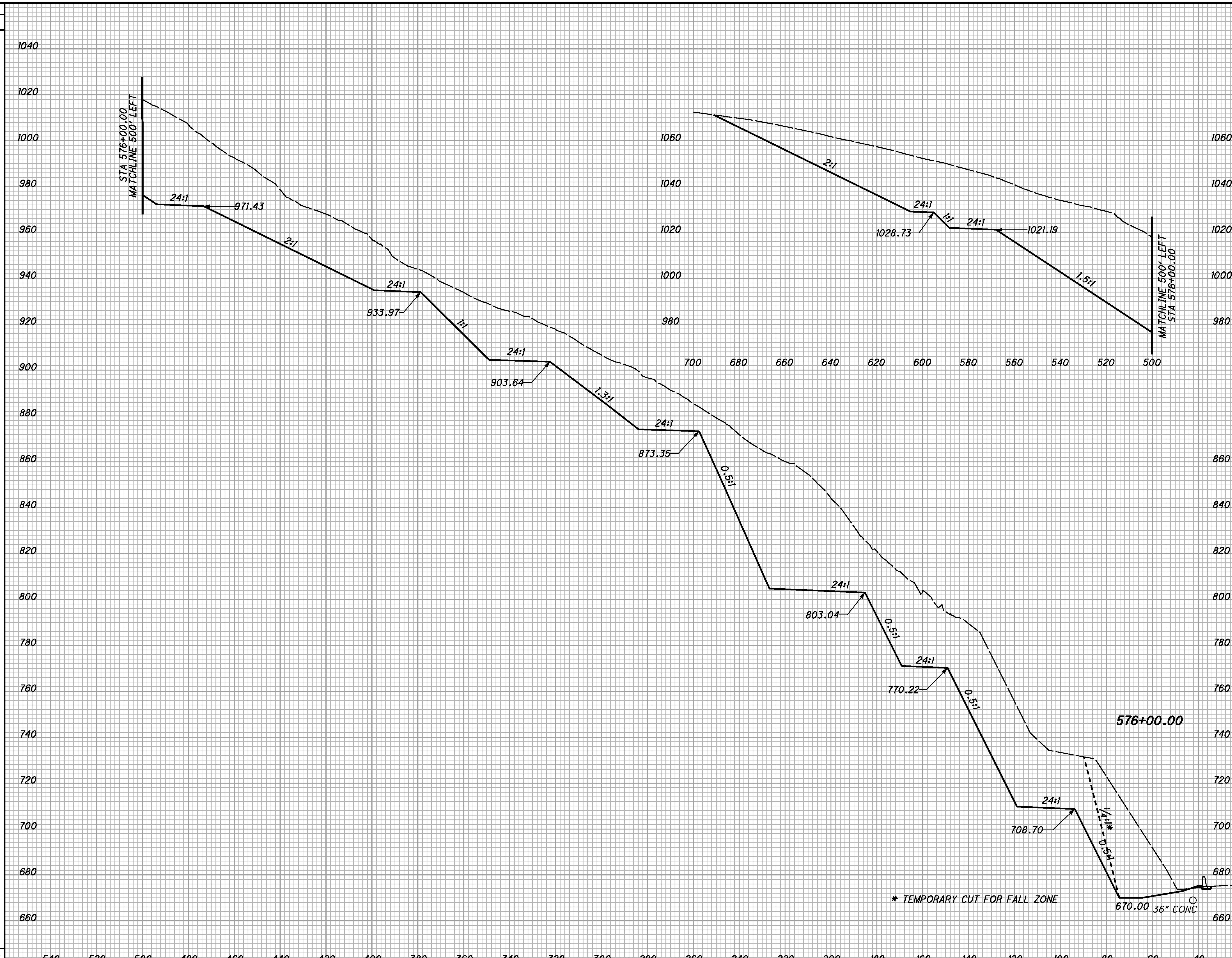
SEEDING	
END WIDTH	SQ. YDS.
148	
	758
	758



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17014	2		
		31810	5
		31810	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 576+00.00

JEF-7-10.00

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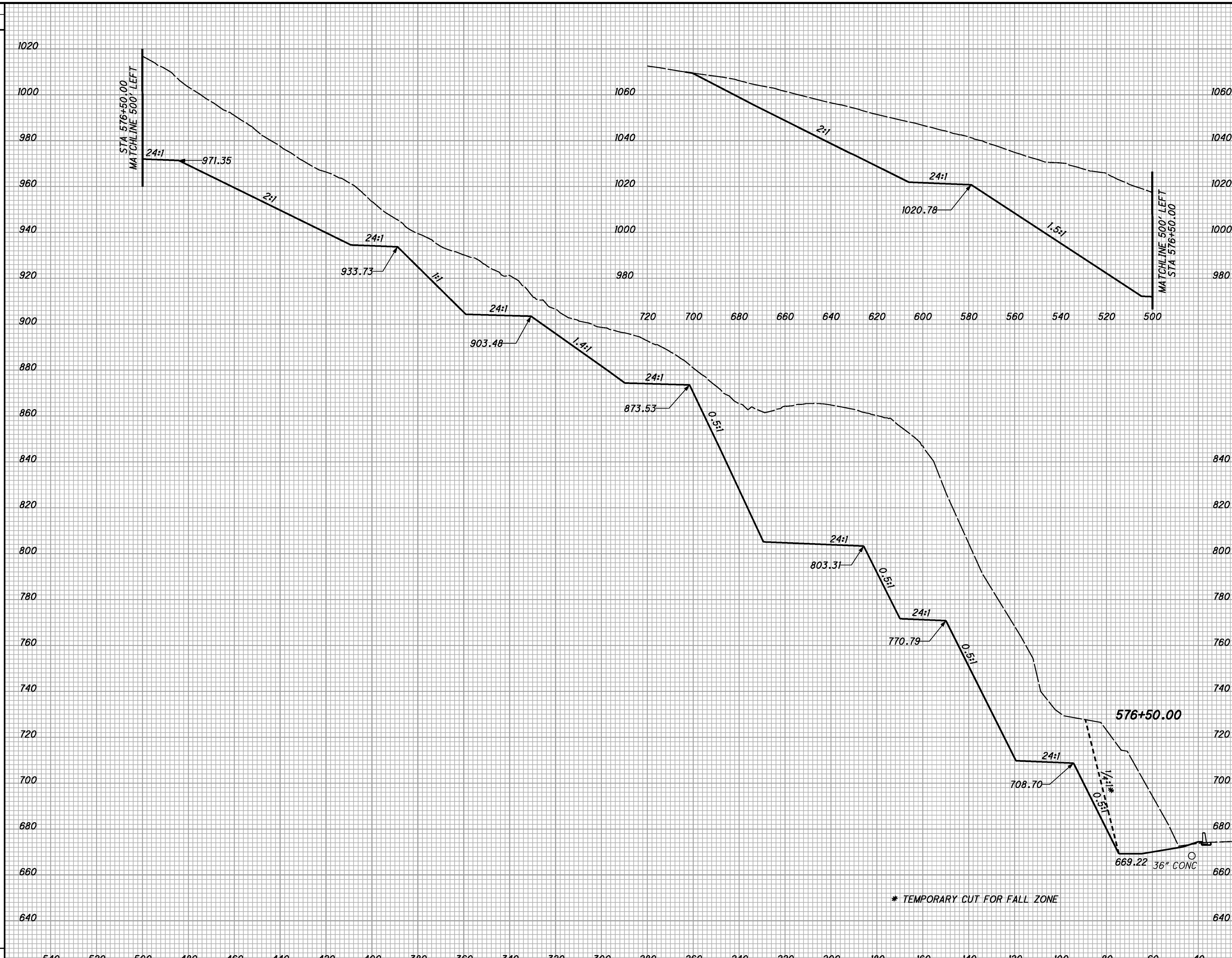
SEEDING	
END WIDTH	SQ. YDS.
180	911
	911



END AREA		VOLUME	
CUT	FILL	CUT	FILL
20150	2		
		34411	4
		34411	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 576+50.00

JEF-7-10.00

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SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
134					
	872	20130	3	37296	5
	872			37296	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 577+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
73	
	575
	575

END AREA		VOLUME	
CUT	FILL	CUT	FILL
18441	2		
		35714	5
		35714	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 577+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
73	406
	406

END AREA		VOLUME	
CUT	FILL	CUT	FILL
20703	3		
		36244	5
		36244	5

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 578+00.00

JEF-7-10.00

I:\PROJECTS\consult\93192\ProjectAdmin\PlanSubmission\Final\JEF-7-10.00__PID_93192__Electronic_Files\Electronic Files\93192XS001.dgn 22-OCT-2014 3:51PM tstillio

SEEDING	
END WIDTH	SQ. YDS.
70	397
	397

END AREA		VOLUME	
CUT	FILL	CUT	FILL
20136	18		
		37813	19
		37813	19

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 578+50.00

JEF-7-10.00

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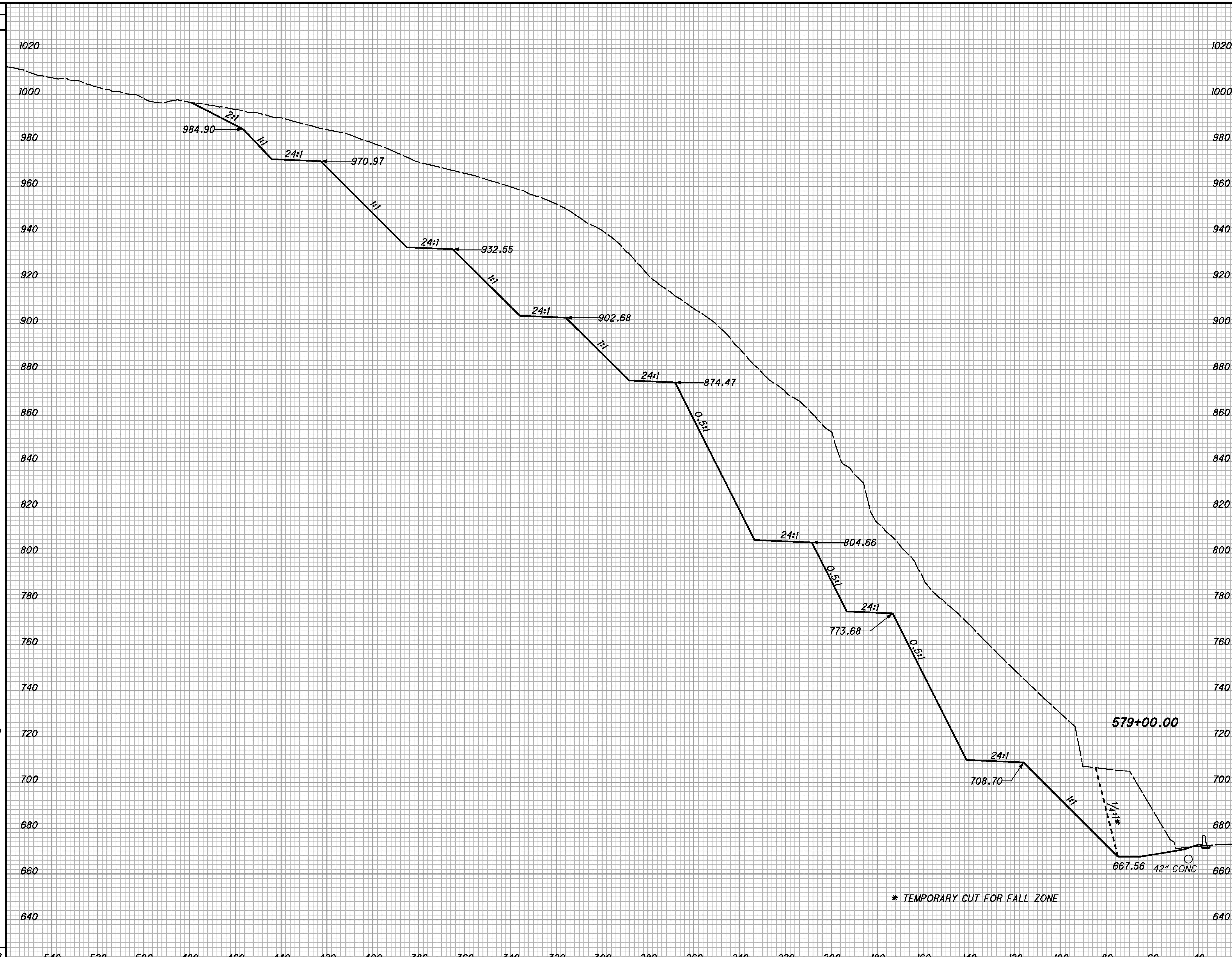
SEEDING	
END WIDTH	SQ. YDS.
70	
	389
	389



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17344	2		
		34704	18
		34704	18

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 579+00.00

JEF-7-10.00

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CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 579+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
63	
	347
	347

END AREA		VOLUME	
CUT	FILL	CUT	FILL
13736	2		
		26639	4
		26639	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 580+00.00

JEF-7-10.00

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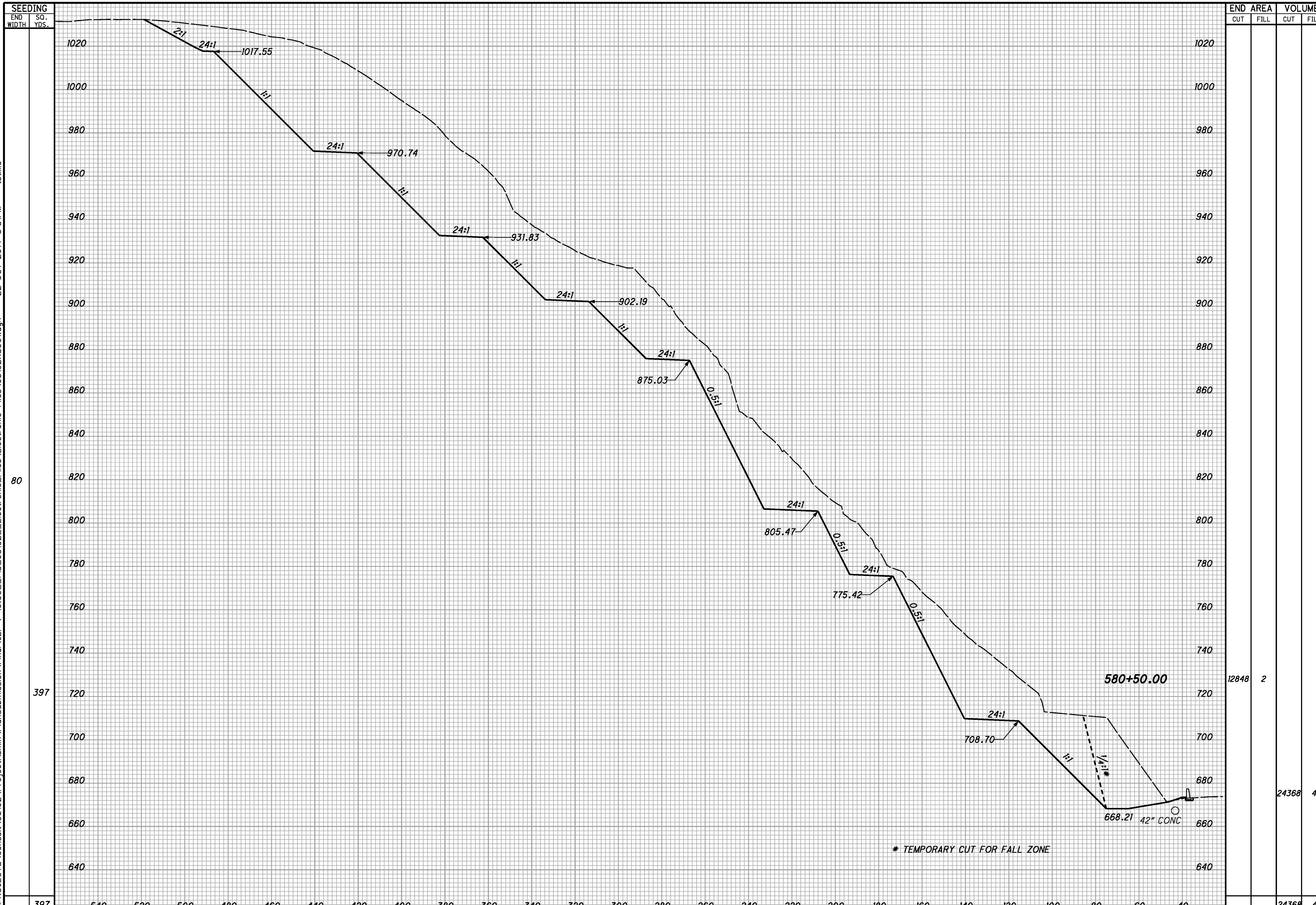

CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 580+50.00

JEF-7-10.00

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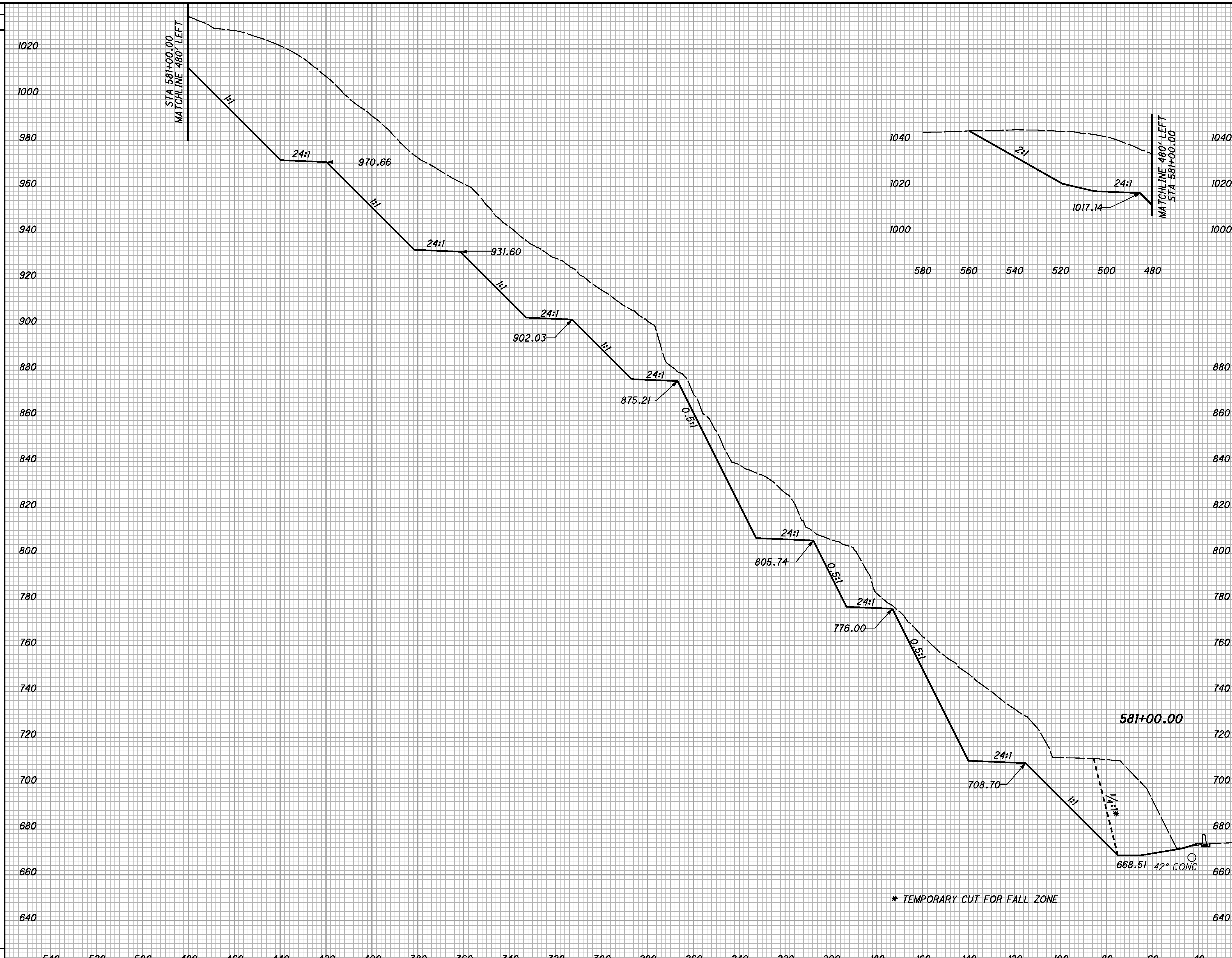
SEEDING	
END WIDTH	SQ. YDS.
127	
	575
	575



END AREA		VOLUME	
CUT	FILL	CUT	FILL
12847	3		
		23539	4
		23539	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 581+00.00

JEF-7-10.00

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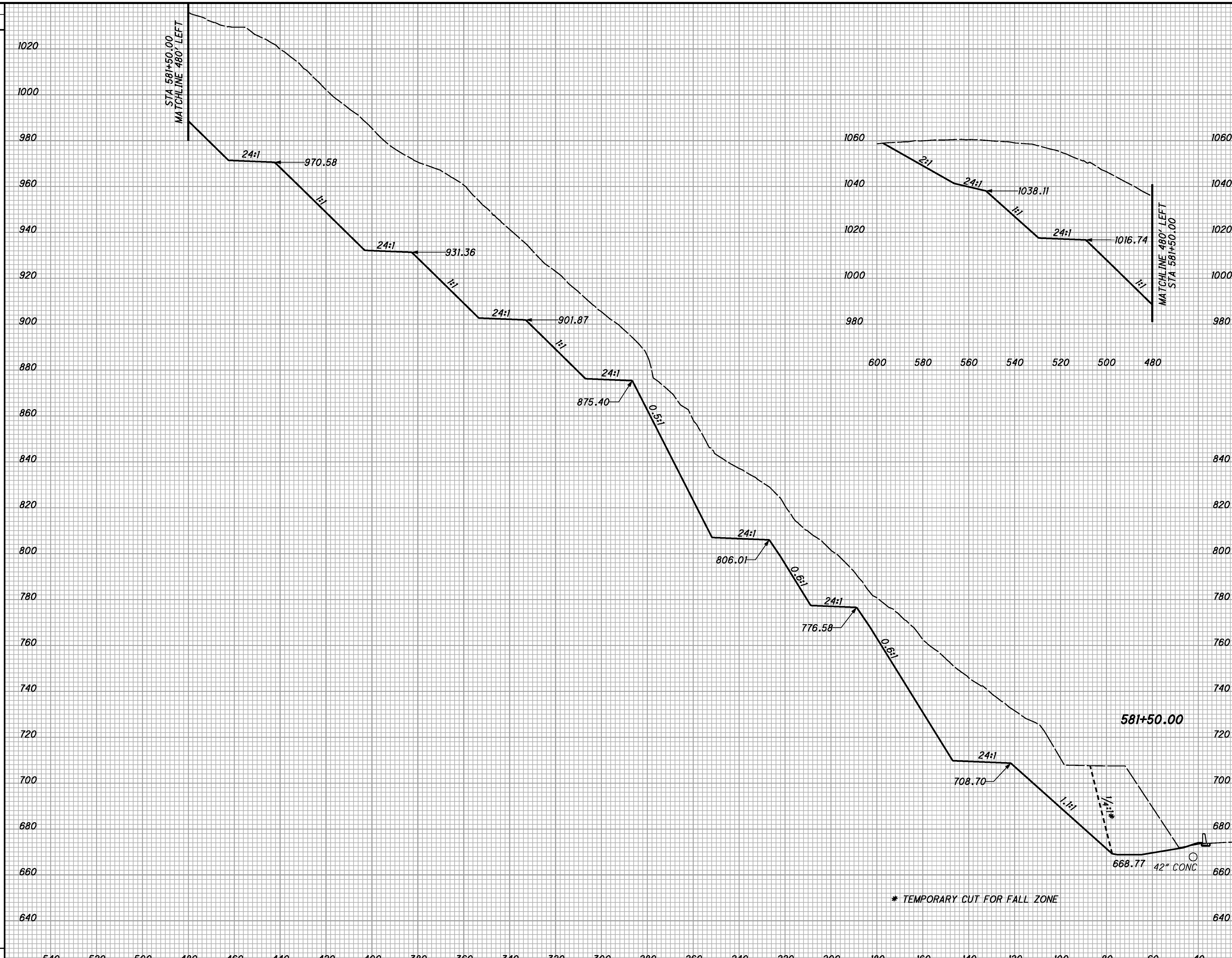
SEEDING	
END WIDTH	SQ. YDS.
95	617
	617



END AREA		VOLUME	
CUT	FILL	CUT	FILL
18598	2		
		28784	4
		28784	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 581+50.00

JEF-7-10.00

98
130

I:\PROJECTS\consult\93192\ProjectAdmin\PlanSubmission\Final\JEF-7-10.00__PID_93192__Electronic_Files\Electronic Files\93192XS001.dgn 22-OCT-2014 3:51PM tstilio

SEEDING	
END WIDTH	SQ. YDS.
77	478
	478

END AREA		VOLUME	
CUT	FILL	CUT	FILL
22090	9		
		37217	10
		37217	10

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 582+00.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
87	
	456
	456

END AREA		VOLUME	
CUT	FILL	CUT	FILL
24365	1		
		42467	10
		42467	10

CALCULATED	EDA
CHECKED	SNS

CROSS SECTIONS
STA. 582+50.00

JEF-7-10.00

SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
86	481	27639	3	47514	4
	481			47514	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 583+00.00

JEF-7-10.00

101
130

I:\PROJECTS\consult\93192\ProjectAdmin\PlanSubmission\Final\JEF-7-10.00__PID_93192__Electronic_Files\Electronic Files\93192XS001.dgn 22-OCT-2014 3:51PM tstilio

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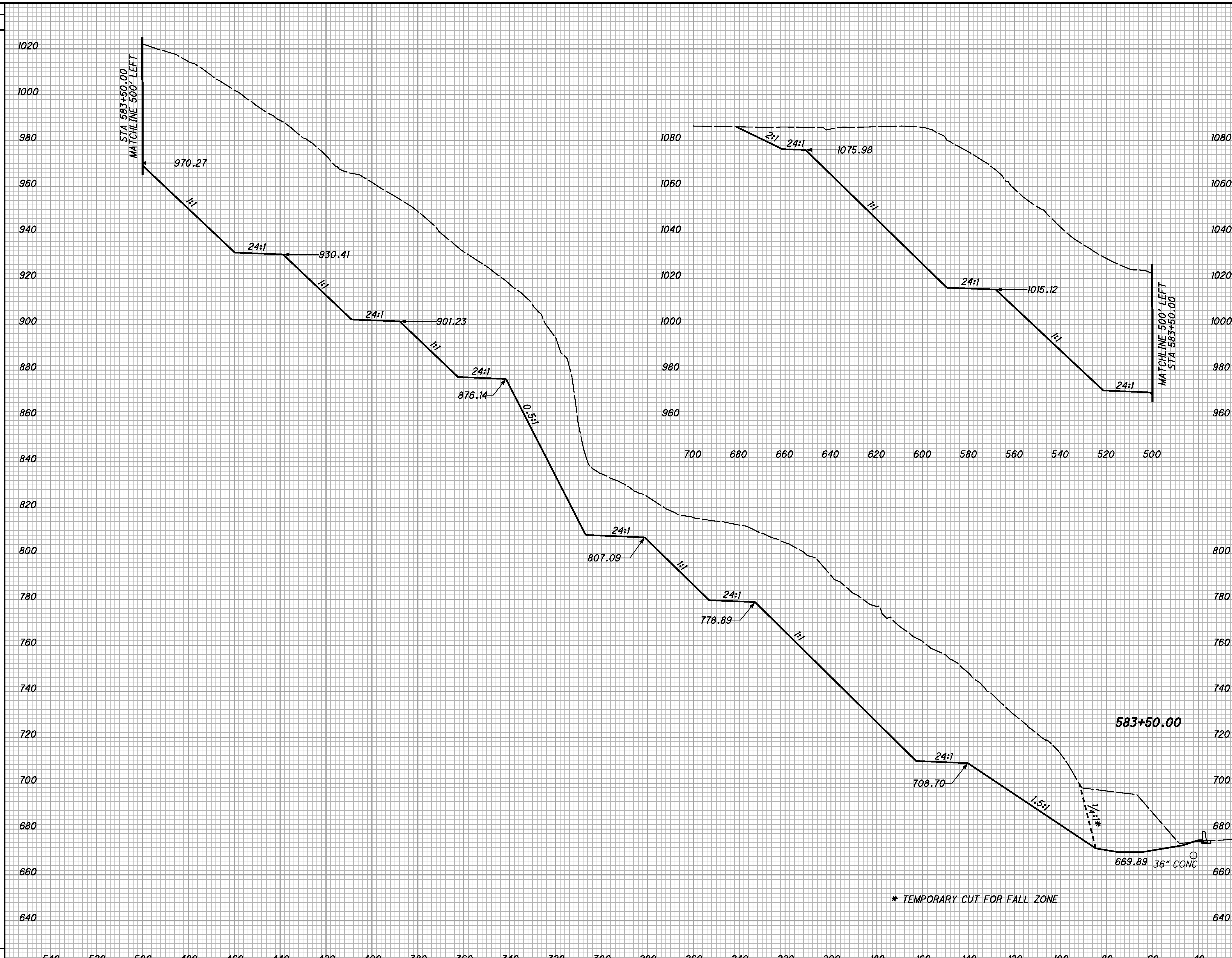
SEEDING	
END WIDTH	SQ. YDS.
86	478
	478



END AREA		VOLUME	
CUT	FILL	CUT	FILL
27497	2		
		50367	4
		50367	4

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 583+50.00

JEF-7-10.00

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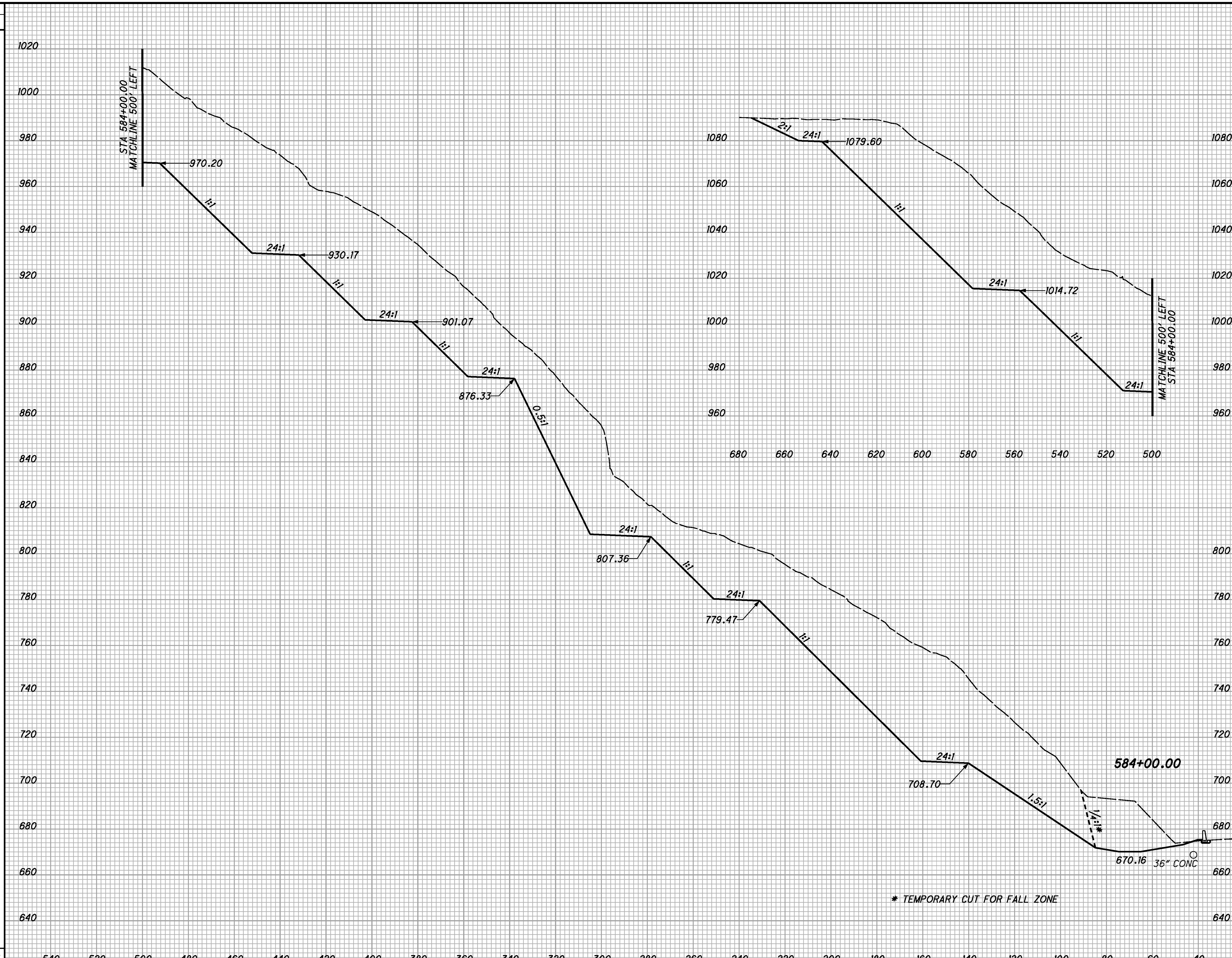
SEEDING	
END WIDTH	SQ. YDS.
86	478
	478



END AREA		VOLUME	
CUT	FILL	CUT	FILL
20697	2		
		44041	3
		44041	3

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 584+00.00

JEF-7-10.00

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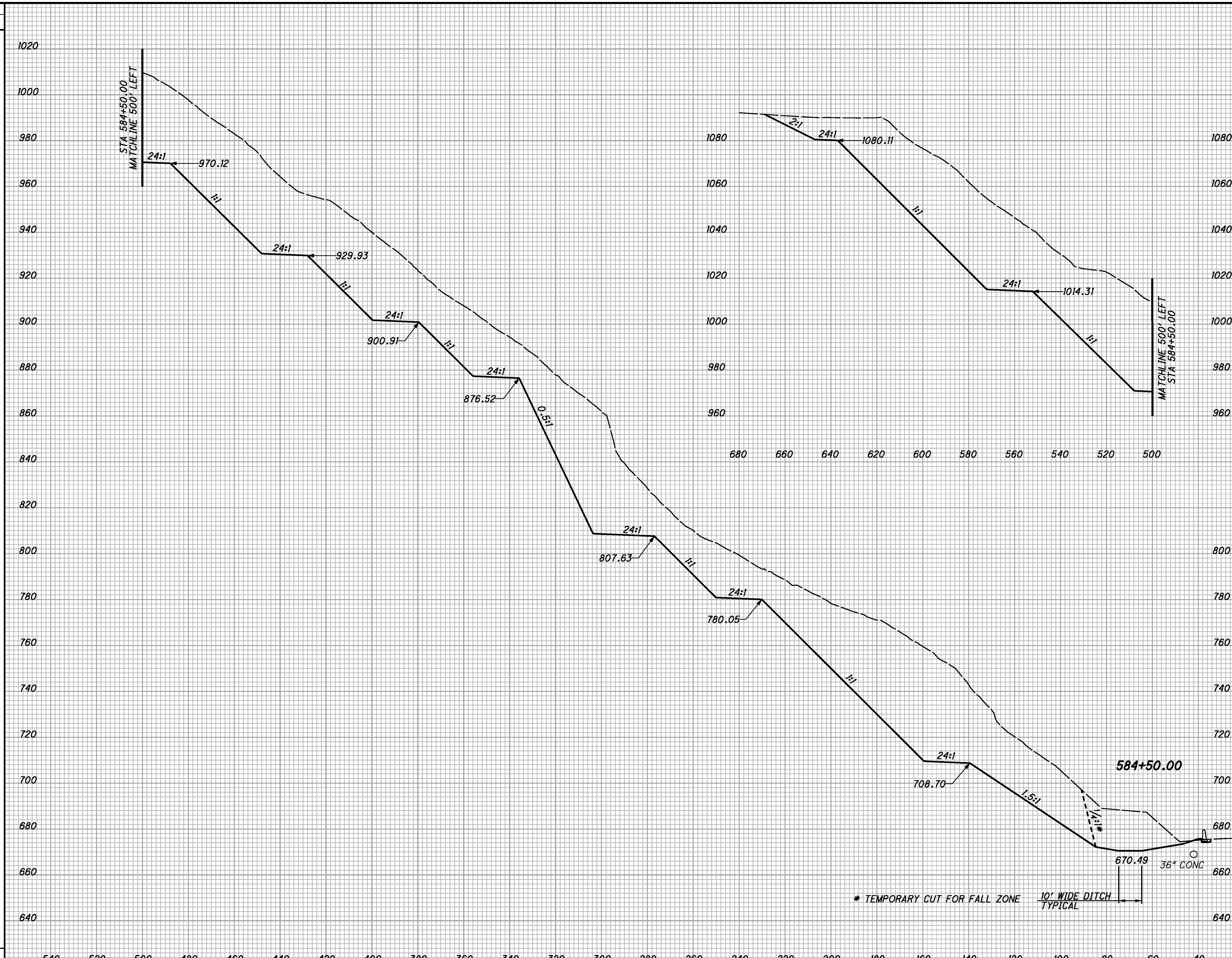
SEEDING	
END WIDTH	SQ. YDS.
87	481
	481



END AREA		VOLUME	
CUT	FILL	CUT	FILL
17829	2		
		35456	3
		35456	3

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 584+50.00

JEF-7-10.00

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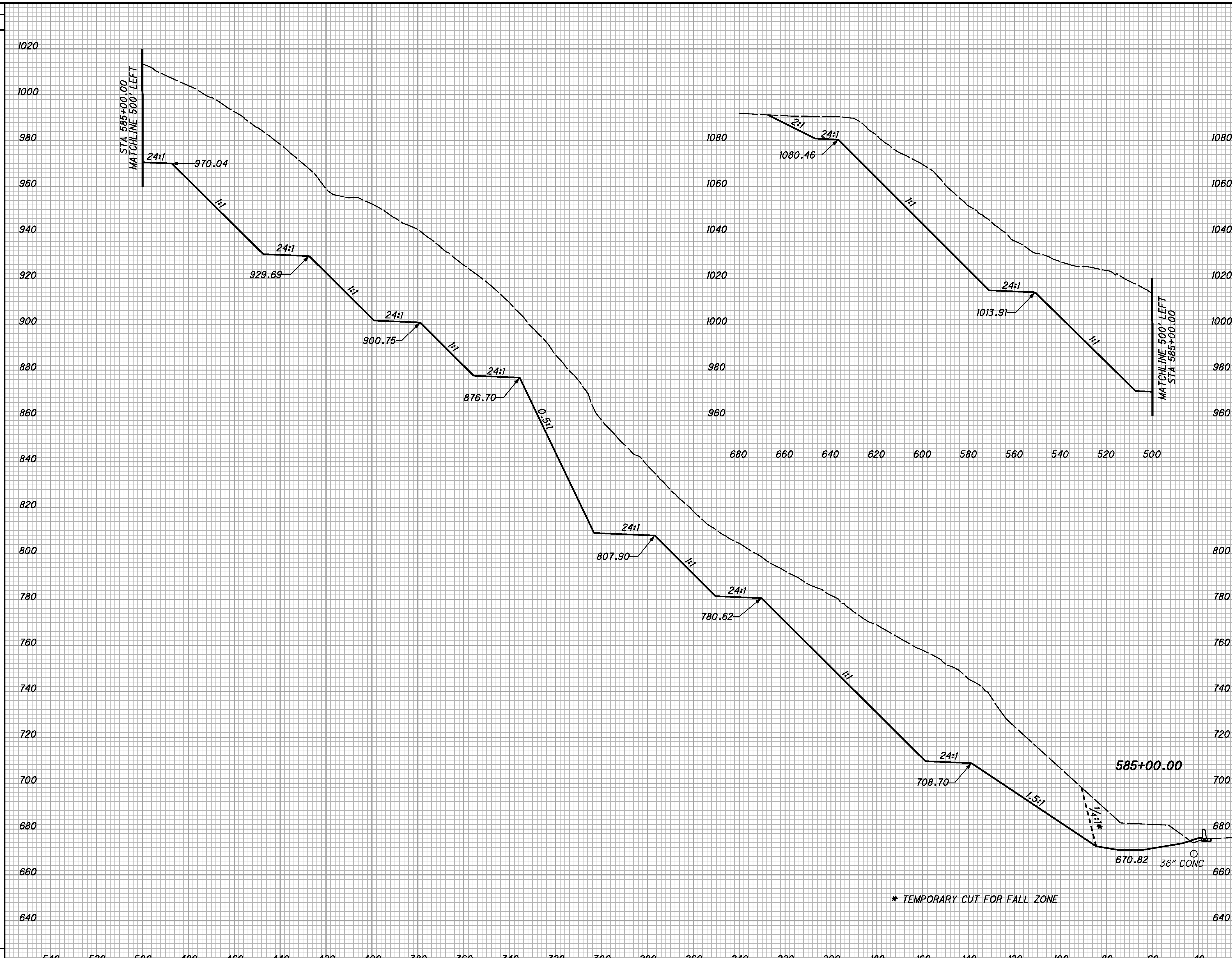
SEEDING	
END WIDTH	SQ. YDS.
86	
	481
	481



END AREA		VOLUME	
CUT	FILL	CUT	FILL
19742	5		
		34788	6
		34788	6

CALCULATED EDA

CHECKED SNS

CROSS SECTIONS
STA. 585+00.00

JEF-7-10.00

105/130

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SEEDING	
END WIDTH	SQ. YDS.
87	481
	481

END AREA		VOLUME	
CUT	FILL	CUT	FILL
16350	16		
		33418	19
		33418	19

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 585+50.00

JEF-7-10.00

106
130

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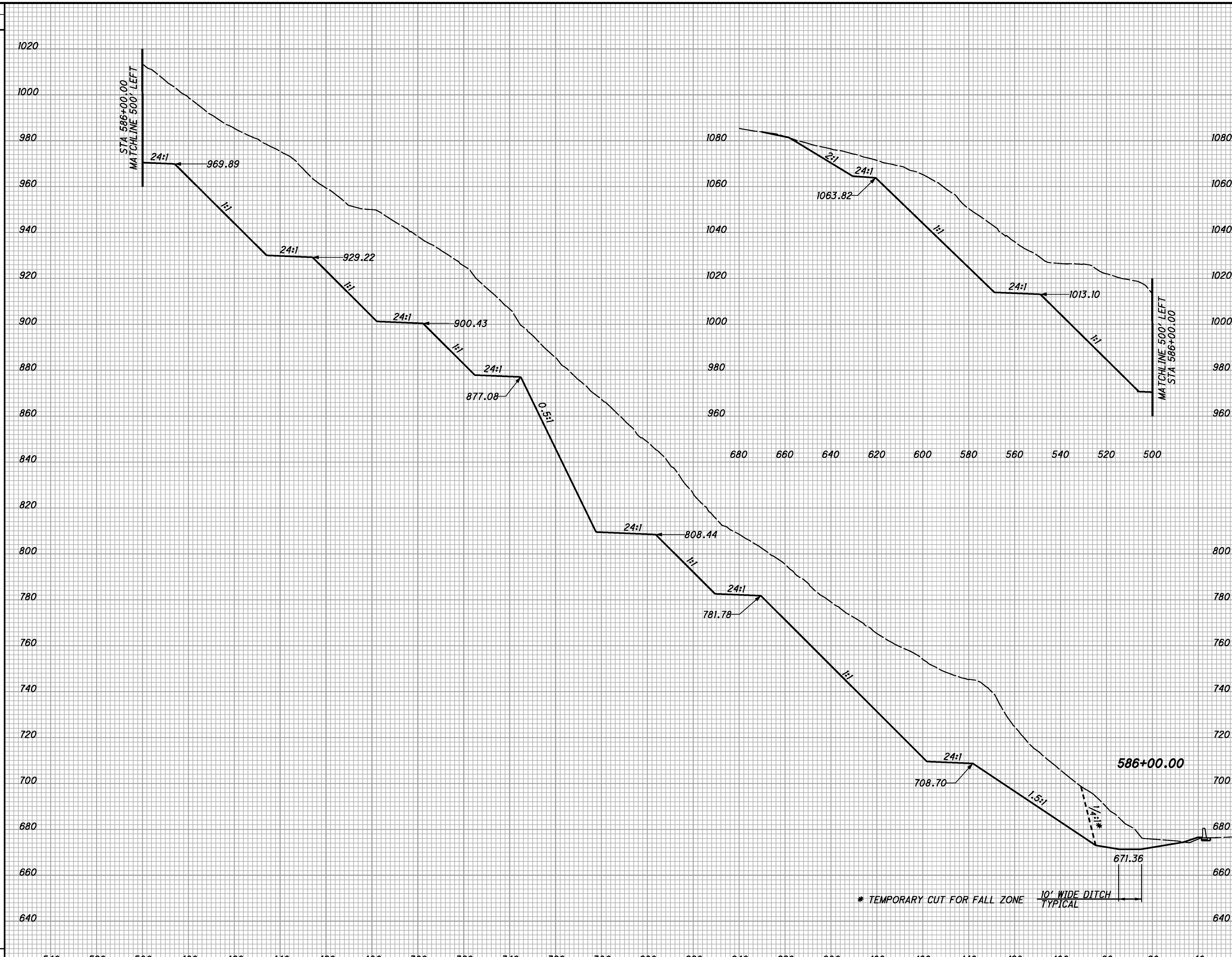
SEEDING	
END WIDTH	SQ. YDS.
97	511
	511



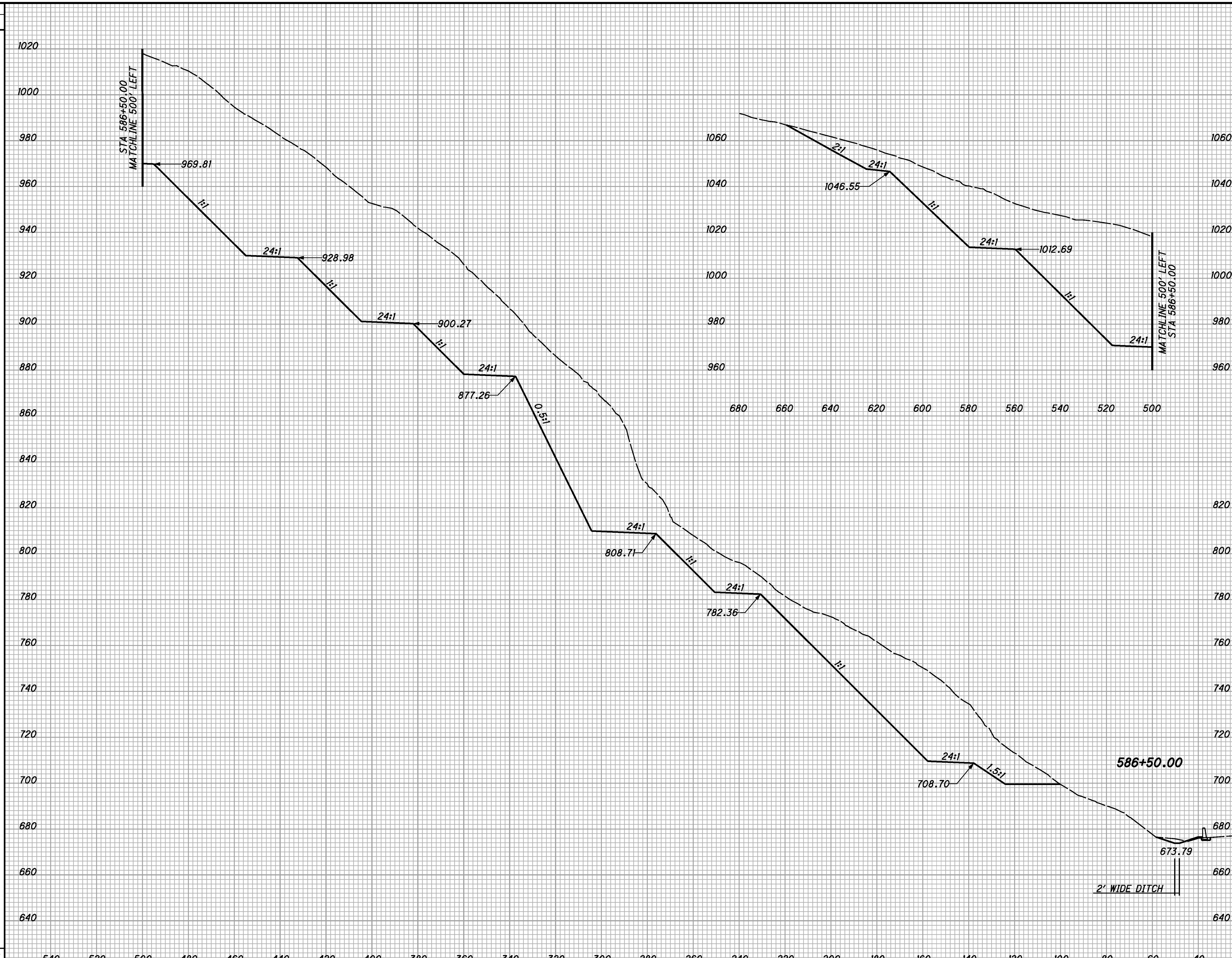
END AREA		VOLUME	
CUT	FILL	CUT	FILL
18744	6		
		32494	20
		32494	20

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 586+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
74	475
	475

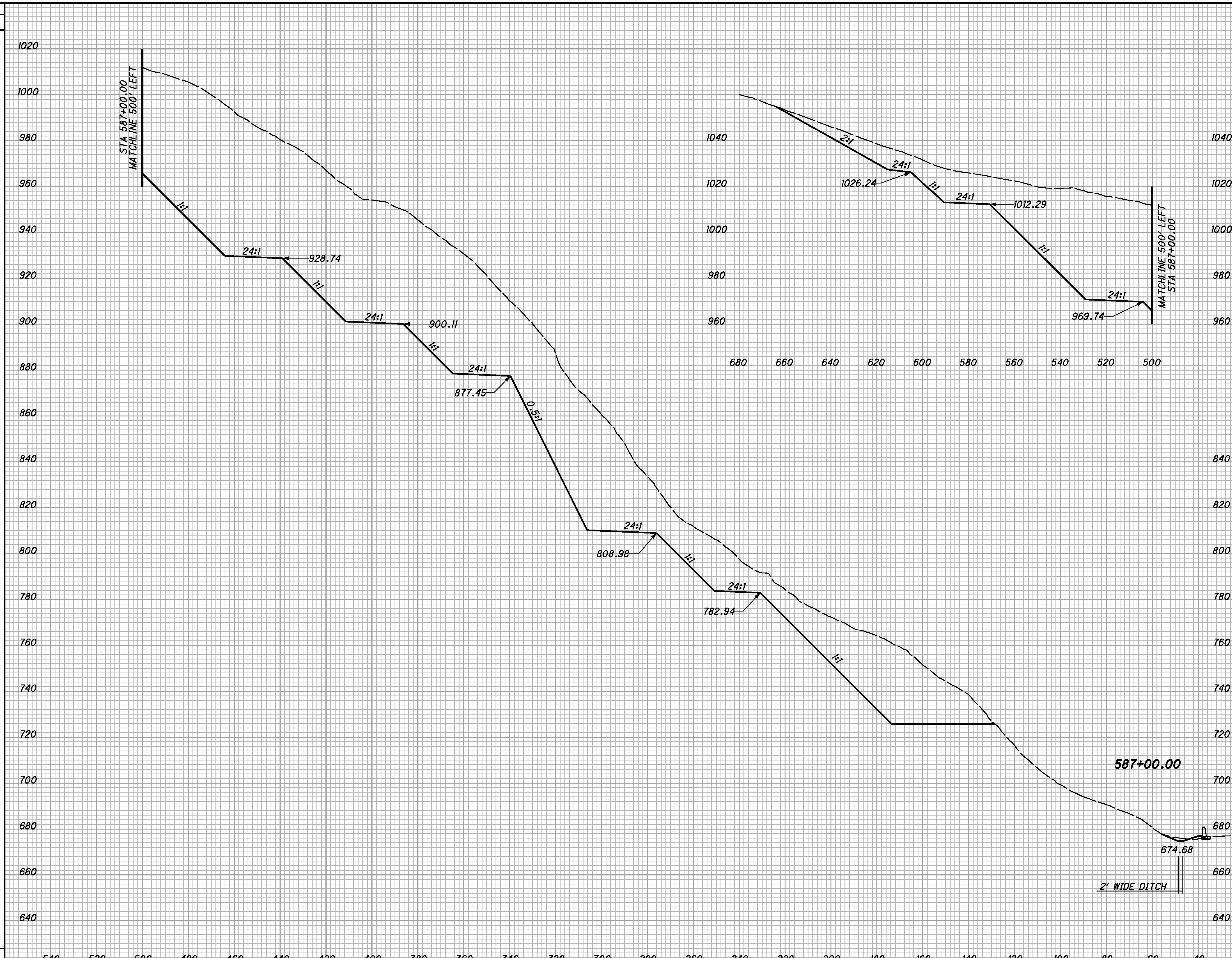


END AREA		VOLUME	
CUT	FILL	CUT	FILL
17942	3		
		33968	9
		33968	9

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 586+50.00

JEF-7-10.00



SEEDING	
END WIDTH	SQ. YDS.
92	
	461
	461

END AREA		VOLUME	
CUT	FILL	CUT	FILL
17503	5		
		32820	7
		32820	7

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 587+00.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
100	
	533
	533

END AREA		VOLUME	
CUT	FILL	CUT	FILL
14523	3		
		29654	7
		29654	7

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 587+50.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
65	458
	458

END AREA		VOLUME	
CUT	FILL	CUT	FILL
11568	4		
		24159	6
		24159	6

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 588+00.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
50	319
	319

END AREA		VOLUME	
CUT	FILL	CUT	FILL
6934	0		
		17132	3
		17132	3

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 588+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
30	222
	222

END AREA		VOLUME	
CUT	FILL	CUT	FILL
2996	0		
		9195	0
		9195	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 589+00.00

JEF-7-10.00

SEEDING	
END WIDTH	SQ. YDS.
35	
	181
	181

END AREA		VOLUME	
CUT	FILL	CUT	FILL
3703	0		
		6203	0
		6203	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 589+50.00

JEF-7-10.00

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SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
95	361	3207	0	6399	0
	361			6399	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 590+00.00

JEF-7-10.00

115
130

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SEEDING	
END WIDTH	SQ. YDS.
70	458
	458

END AREA		VOLUME	
CUT	FILL	CUT	FILL
2405	0		
		5197	0
		5197	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 590+50.00

JEF-7-10.00

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SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
80	417	2267	0	4326	0
	417			4326	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 591+00.00

JEF-7-10.00

SEEDING		END AREA		VOLUME	
END WIDTH	SQ. YDS.	CUT	FILL	CUT	FILL
150					
	639	1314	0		
				3315	0
	639			3315	0

CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 591+50.00

JEF-7-10.00

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SEEDING	
END WIDTH	SQ. YDS.
60	583
	583

END AREA		VOLUME	
CUT	FILL	CUT	FILL
34	0		
		1248	0
		1248	0

CALCULATED EDA
CHECKED SNS

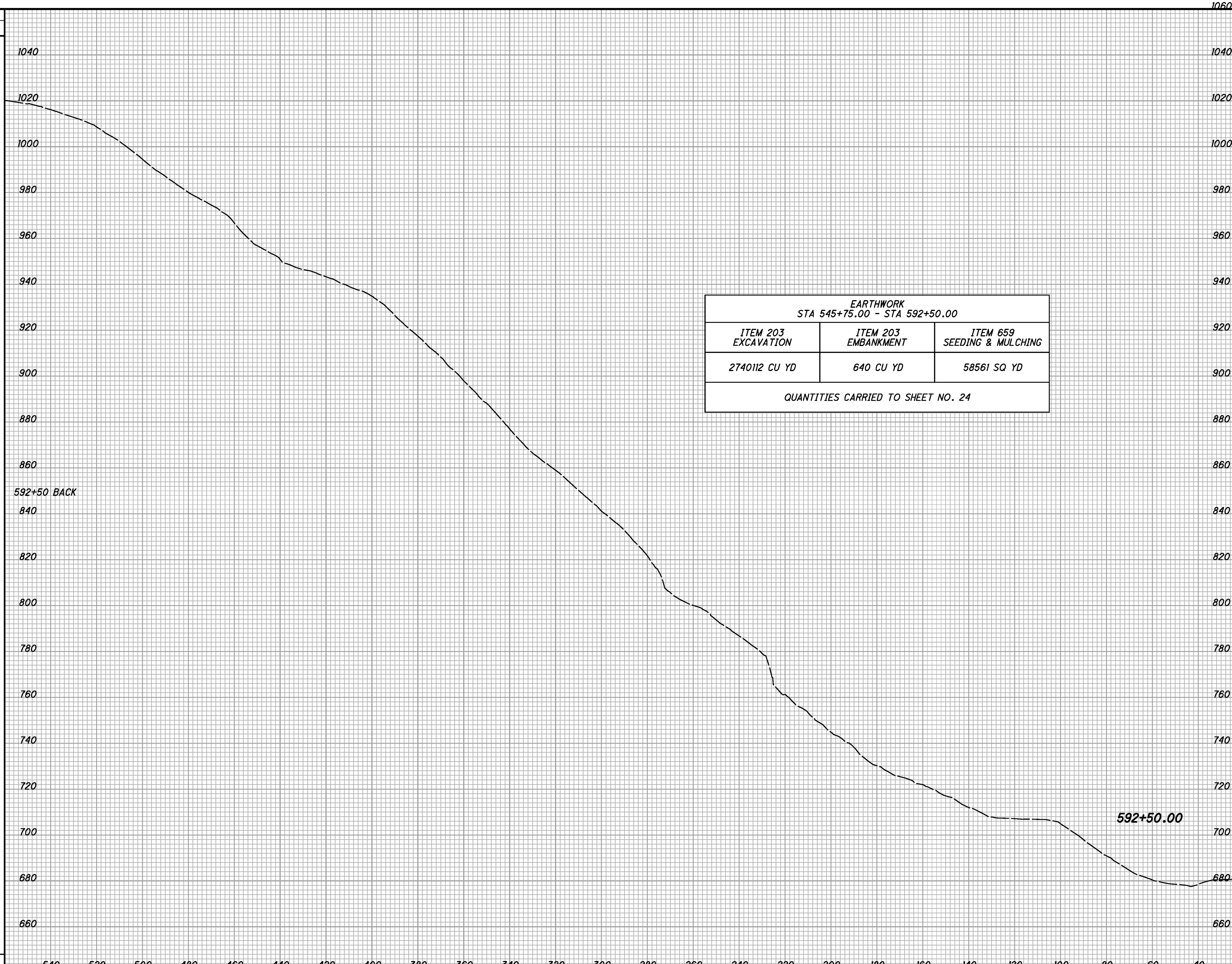
CROSS SECTIONS
STA. 592+00.00

JEF-7-10.00

119
130

I:\PROJECTS\consult\93192\ProjectAdmin\PlanSubmission\Final\JEF-7-10.00__PID_93192__Electronic_Files\Electronic Files\93192XS001.dgn 22-OCT-2014 3:52PM tstillio

SEEDING	
END WIDTH	SQ. YDS.
10	195
	195



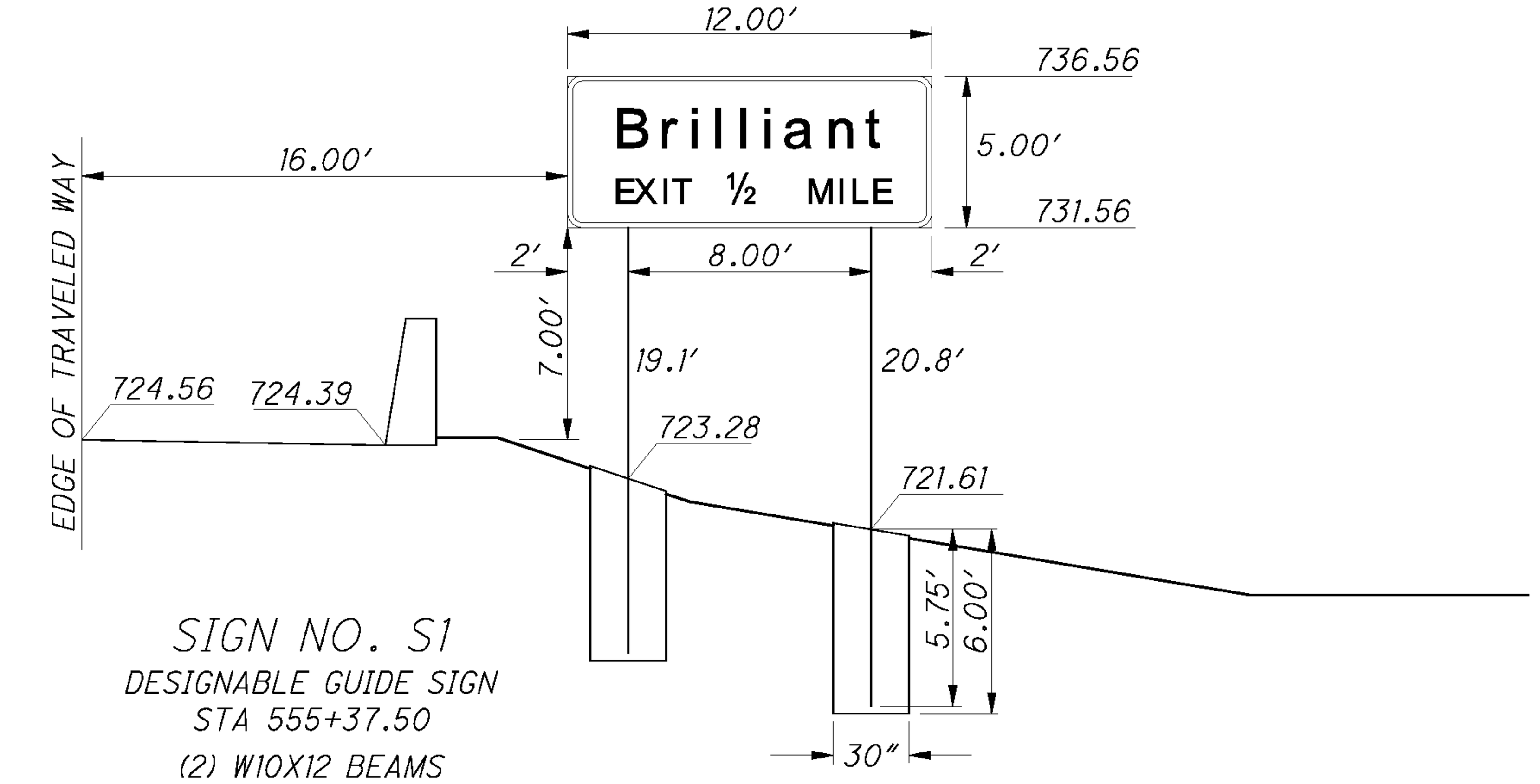
EARTHWORK STA 545+75.00 - STA 592+50.00		
ITEM 203 EXCAVATION	ITEM 203 EMBANKMENT	ITEM 659 SEEDING & MULCHING
2740112 CU YD	640 CU YD	58561 SQ YD
QUANTITIES CARRIED TO SHEET NO. 24		

END AREA		VOLUME	
CUT	FILL	CUT	FILL
0	0		
		31	0
		31	0

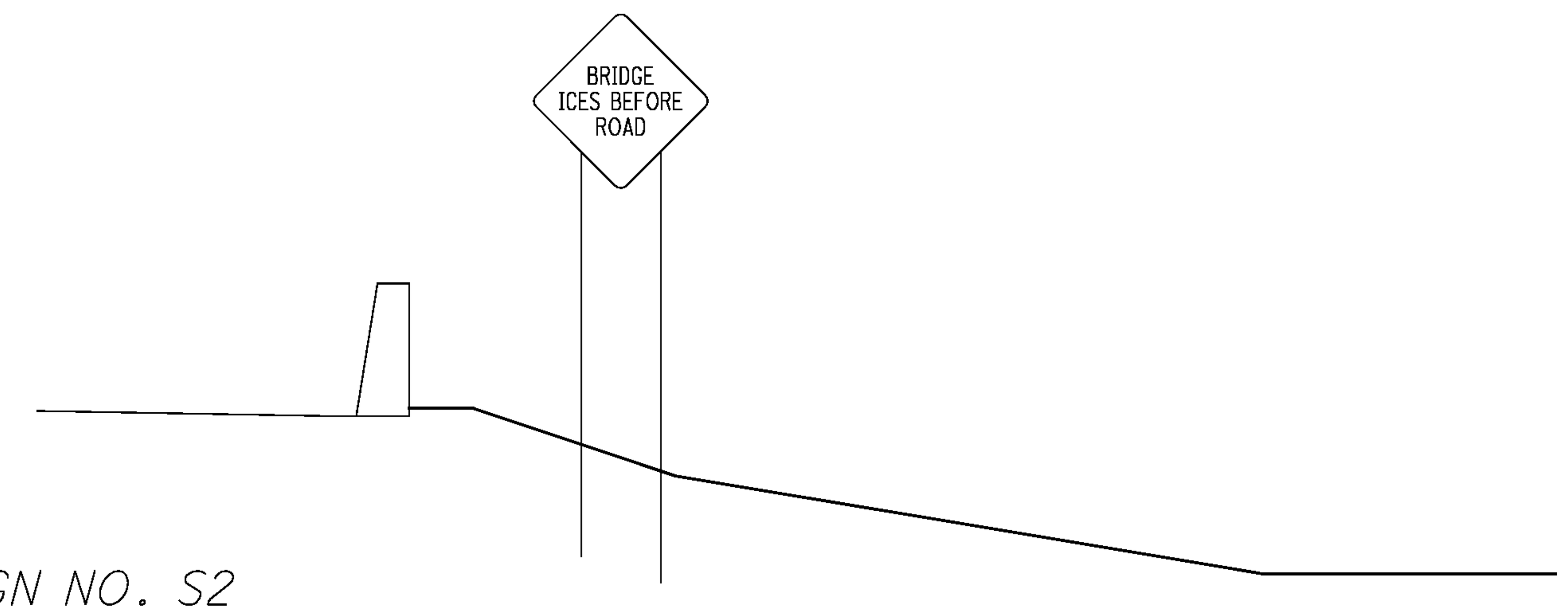
CALCULATED EDA
CHECKED SNS

CROSS SECTIONS
STA. 592+50.00

JEF-7-10.00



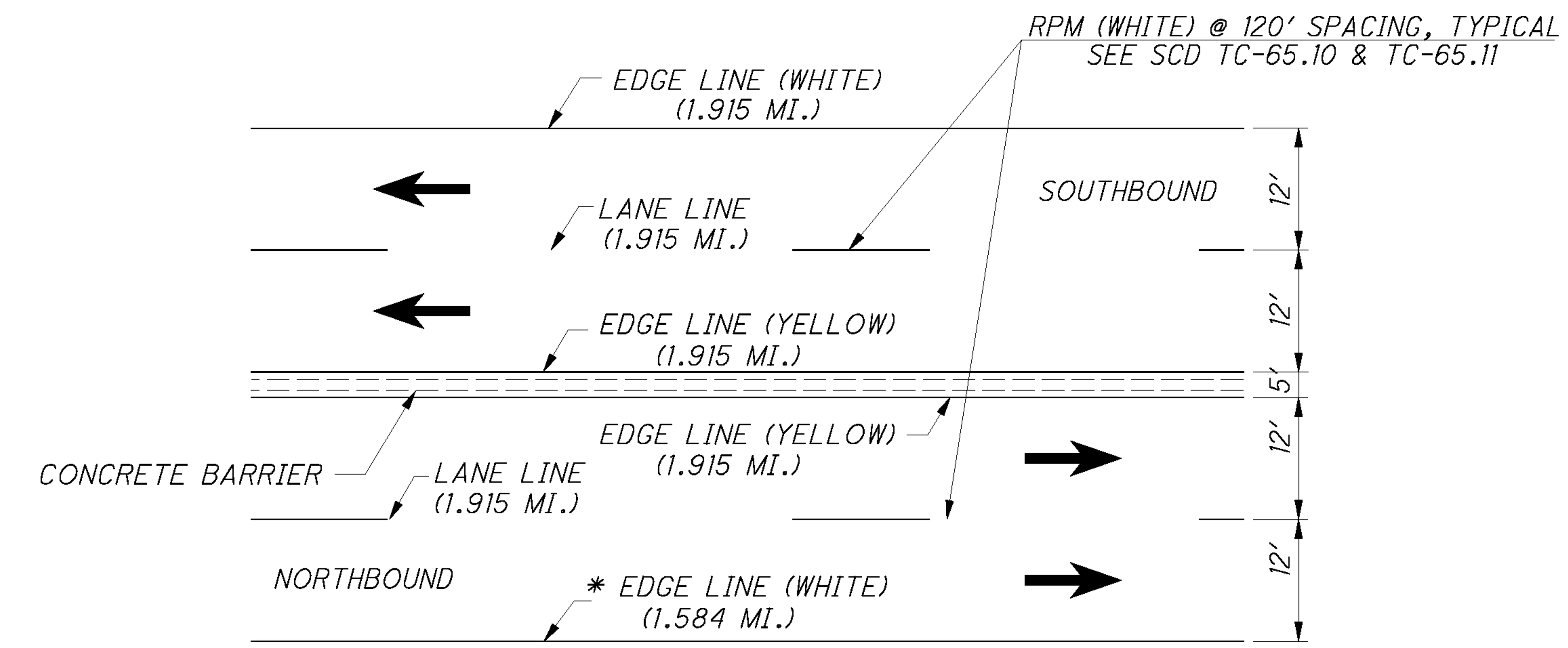
SIGN NO. S1
DESIGNABLE GUIDE SIGN
STA 555+37.50
(2) W10X12 BEAMS
(2) SIGN SUPPORT FOUNDATIONS
60 SQ FT SIGN AREA
(1) REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL
(2) REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL



SIGN NO. S2
STA 552+00.00
W8-13-36
SIGN FLAT SHEET 48"x48"
(2) NO. 4 YIELDING POST 15.6'/16.4'
(1) REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL (STA 555+34)
(2) REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL (STA 555+34)

FINAL PAVEMENT MARKING TYPICAL (PHASE 3)

S.R. 7

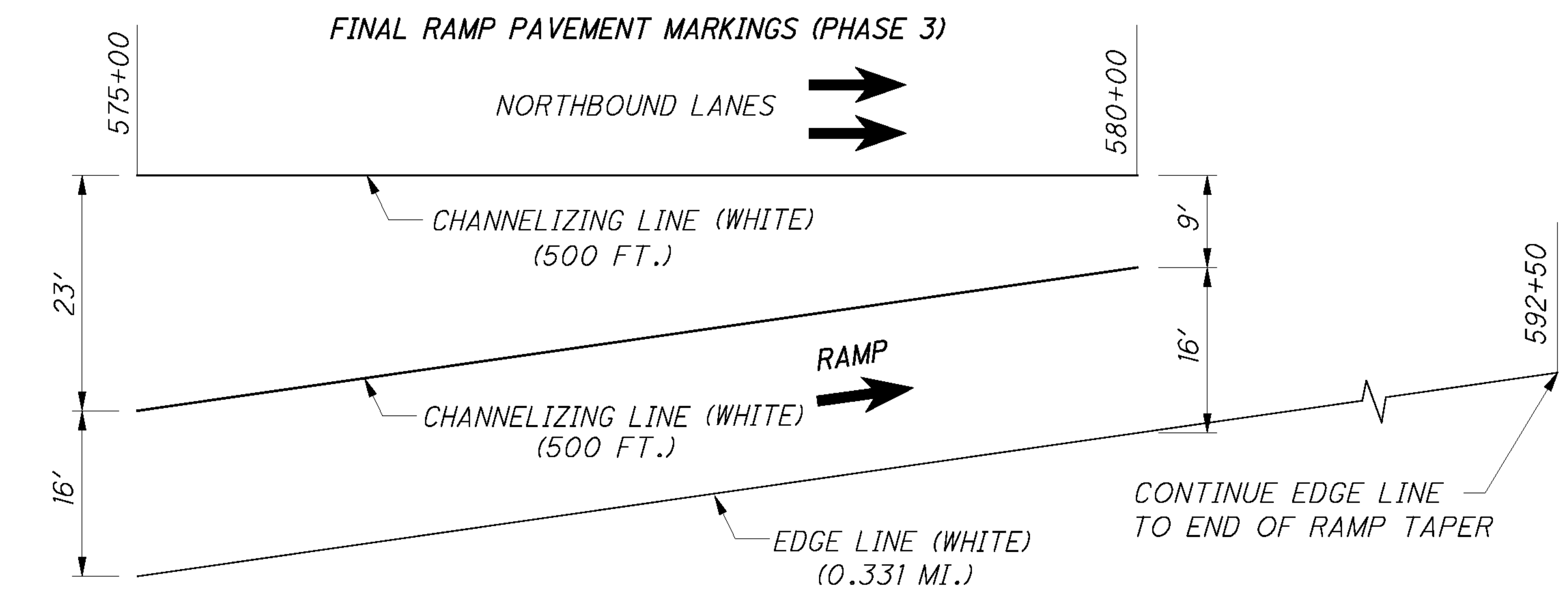


* NO EDGE LINE BETWEEN STA. 575+00 - STA. 592+50

NORTHBOUND/SOUTHBOUND

STA 513+00.00 - STA 595+00.00 (BACK)
STA 578+97.00 (AHEAD) - STA 598+00.00

FINAL RAMP PAVEMENT MARKINGS (PHASE 3)



RAMP LANES

STA 575+00.00± - STA 592+50.00±

TRAFFIC CONTROL QUANTITIES CARRIED TO GENERAL SUMMARY

ITEM	DESCRIPTION	QUANTITY	UNIT
ITEM 621	RPM	170	EACH
ITEM 630	GROUND MOUNTED SUPPORT, NO. 4 POST	32	FOOT
ITEM 630	GROUND MOUNTED STRUCTURAL BEAM SUPPORT W 10 x 12	39.9	FOOT
ITEM 630	SIGN, FLAT SHEET	16	SQ FT
ITEM 630	SIGN, GROUND MOUNTED EXTRUSHEET	60	SQ FT
ITEM 630	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION	2	EACH
ITEM 630	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	1	EACH
ITEM 630	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL	1	EACH
ITEM 630	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	2	EACH
ITEM 630	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL	2	EACH
ITEM 646	EDGE LINE, 6"	7.66	MILE
ITEM 646	LANE LINE, 6"	3.83	MILE
ITEM 646	CHANNELIZING LINE, 12"	1000	FOOT

CALCULATED PJD CHECKED LEH

TRAFFIC CONTROL PLAN

JEF-7-10.00

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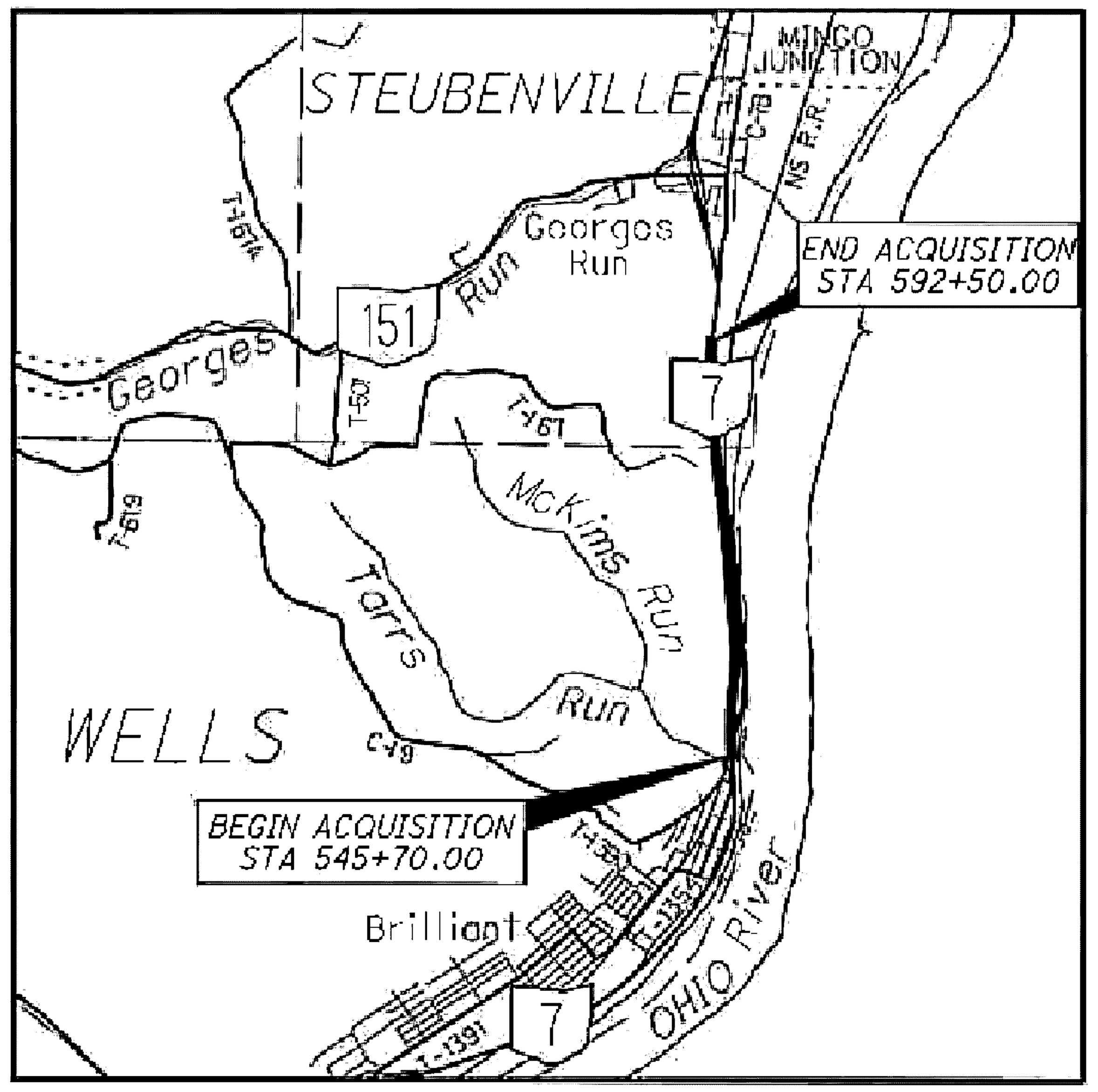

LOCATION MAP

LATITUDE: 40°16'30" N LONGITUDE: 80°39'05" W

SCALE IN MILES
0 1 2

N

RIGHT OF WAY LEGEND SHEET

JEF- 7-10.00

JEFFERSON COUNTY

F.K.A. VILLAGE OF BRILLIANT

WELLS TOWNSHIP SEC. 30, T. 1, R. 1

STEUBENVILLE TOWNSHIP SEC. 25, T. 2 R. 1

PROJECT DESCRIPTION

EMERGENCY PROJECT TO REPAIR 0.88 MILES OF FAILED ROCK FACE ON THE WEST SIDE OF STATE ROUTE 7. REMEDIATION INCLUDES REMOVAL OF ROCK, BENCHING OF SLOPES, DRAINAGE IMPROVEMENTS, INSTALLATION OF CONCRETE BARRIER AND PAVEMENT REHABILITATION ALONG S.R.7. PROJECT ALSO INCLUDES REMOVAL OF MOT FACILITIES CURRENTLY IN PLACE. FHWA DISASTER OH12-01 DSR JEF-001

PROJECT CONTROL

STATE PLANE GRID OHIO NORTH ZONE 3401 NAD83(2011)
PROJECT ADJUSTMENT FACTOR 1.00000545

PLANS PREPARED BY:

FIRM NAME : STANTEC CONSULTING SERVICES INC.
R/W DESIGNER: STEVE N. SHADIX
R/W REVIEWER: JOSEPH D. KUHLMANN
FIELD REVIEWER: NICHOLAS J. KLEINER
PRELIMINARY FIELD REVIEW DATE: 05-09-2013
TRACINGS FIELD REVIEW DATE: 05-09-2013
OWNERSHIP UPDATED BY: JOSEPH D. KUHLMANN
DATE COMPLETED: 11-11-2013
PLAN COMPLETION DATE: 11-11-2013

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

INDEX OF SHEETS:

STRUCTURE KEY

- RESIDENTIAL
- COMMERCIAL
- OUT-BUILDING

TYPES OF TITLE LEGEND:
WLR = FEE SIMPLE WITH LIMITATION OF ACCESS, RESERVING MINERAL RIGHTS

UTILITY OWNERS

ELECTRIC	AMERICAN ELECTRIC POWER (AEP) GIS DATA SERVICES & SUPPORT 850 TECH CENTER DR. GAHANNA, OHIO 43230-6605	WATER	BRILLIANT WATER & SEWER DIST. 740-598-4322 706 2nd ST BRILLIANT, OH 43913
NATURAL GAS	COLUMBIA GAS TRANSMISSION ATTEN: SHANE CURTIS 4115 CORK-BOCKTOWN RD CLINTON, PA 15026 PHONE:(724) 223-3943	CABLE	COMCAST CORPORATION CAMCAST CENTER 1701 JFK BOULEVARD PHILADELPHIA, PA 19103
TELEPHONE	FRONTIER COMMUNICATION ATTN: ASHLEY MORAN 9444 CAMPBELL STREET CAMBRIDGE, OH 43725 PHONE: (740) 432-5000		

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

CONVENTIONAL SYMBOLS

County Line	Ditch / Creek (Ex)
Township Line	Ditch / Creek (Pr)
Section Line	Tree Line (Ex)
Corporation Line or	Ownership Hook Symbol , Example
Fence Line (Ex) x x (Pr)	Property Line Symbol , Example
Center Line	Break Line Symbol , Example
Right of Way (Ex) Ex R/W	Tree (Pr) , Tree (Ex) , Shrub (Ex)
Right of Way (Pr) R/W	Tree (Remove) , Shrub (Remove)
Standard Highway Ease.(Ex) Ex SH	Evergreen (Ex) , Stump
Temporary Right of Way TMP	Evergreen (Remove) , Stump (Remove)
Channel Ease. (Pr) CH	Wetland (Pr) , Grass (Pr) , Aerial Target
Utility Ease. (Ex) Ex U	Post (Ex) , Mailbox (Ex) MB , Mailbox (Pr) MB
Railroad or	Light (Ex) , Telephone Marker (Ex) TEL
Guardrail (Ex) (Pr)	Fire Hydrant (Ex) , Water Meter (Ex)
Construction Limits	Water Valve (Ex) , Utility Valve Unknown (Ex.)
Edge of Pavement (Ex)	Telephone Pole (Ex) , Power Pole (Ex)
Edge of Pavement (Pr)	Light Pole (Ex)
Edge of Shoulder (Ex)	
Edge of Shoulder (Pr)	

I, Joseph D. Kuhlmann, P. S. have conducted a survey of the existing conditions for the Ohio Department of Transportation from 2012 thru 2013 The results of that survey are contained herein. The horizontal coordinates expressed herein are based on the Ohio State Plane Coordinates System North Zone on NAD 83 (2011) datum. The Project Coordinates (US Survey Feet) are relative to State Plane Grid Coordinates (Meters or US Survey Feet) by a Project Adjustment Factor of 1.00000545 As a part of this project I have reestablished the locations of the existing property lines and the existing centerline of Right of Way for property takes contained herein. As a part of this project I have established the proposed property lines, calculated the Gross Take, present roadway occupied (PRO), Net Take and Net Residue; as well as prepared the legal descriptions necessary to acquire the parcels as shown herein. As a part of this work I have set right of way monuments at the property corners, property line intersection, points along the right of way and/or angle points on the right of way, Section Corners and other points as shown herein. All of my work contained herein was conducted in accordance with Ohio Administrative Code 4733-37 commonly known as "Minimum Standards for Boundary Surveys in the State of Ohio" unless noted. The words I and my as used herein are to mean either myself or someone working under my direct supervision.

Joseph D. Kuhlmann
Joseph D. Kuhlmann, Professional Land Surveyor No. 6823
Stantec Consulting

Date: 11-11-2013

SURVEYORS SEAL

STATE OF OHIO
JOSEPH
D.
KUHLMANN
S-6823
REGISTERED
LAND SURVEYOR

PLAN PREPARED BY:

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, Ohio 45241
(513) 842-8200

Stantec

FEDERAL PROJECT NO. E120(445)

PID NO. 93192

CALCULATED SNS
CHECKED JDK

RIGHT OF WAY LEGEND SHEET

JEF-7-10.00

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JEF-7-10.00

JEFFERSON COUNTY
F.K.A. VILLAGE OF BRILLIANT
WELLS TOWNSHIP
SEC. 30, T. 1, R.1
STUEBENVILLE TOWNSHIP
SEC. 25, T.2, R.1

EX. CENTERLINE OF R/W AND CONSTRUCTION					
JEF-7-10.00 PID#93192					
STATION	**Grid North**	**Grid East**	**ODOT P.A.F.**	**Project North**	**Project East**
S.T. 541+77.51	226436.2323	2493428.7220	1.00000545	226434.9982	2493415.1329
P.C. 543+56.35	226613.9955	2493409.0821	1.00000545	226612.7605	2493395.4931
P.T. 554+70.64	227725.8922	2493412.8724	1.00000545	227724.6511	2493399.2834
T.S. 556+25.08	227879.2818	2493430.8789	1.00000545	227878.0399	2493417.2898
S.C. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
P.C. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
P.T. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
C.S. 560+25.08	228277.7473	2493463.6072	1.00000545	228276.5032	2493450.0179
S.T. 564+25.08	228676.8896	2493440.5588	1.00000545	228675.6433	2493426.9696
P.C. 579+44.59	230189.8981	2493300.0765	1.00000545	230188.6436	2493286.4881
P.T. 584+23.75	230666.6225	2493251.7883	1.00000545	230665.3654	2493238.2002
STA. EQ. 578+97.05 AH	231736.4500	2493134.3773	1.00000545	231735.1870	2493120.7898
STA. EQ. 595+00.00 BK	231736.4500	2493134.3773	1.00000545	231735.1870	2493120.7898
P.C. 581+55.42	231993.2839	2493106.1904	1.00000545	231992.0195	2493092.6030

BASIS FOR BEARINGS:

ALL BEARINGS SHOWN ARE FOR PROJECT USE ONLY. OHIO STATE PLANE, NORTH ZONE NAD83 (2011) CONTROL WAS DERIVED BY USING NGS's OPUS (ON LINE POSITIONING USER SERVICE) AND STATIC OBSERVATIONS.

BASIS OF EXISTING R/W

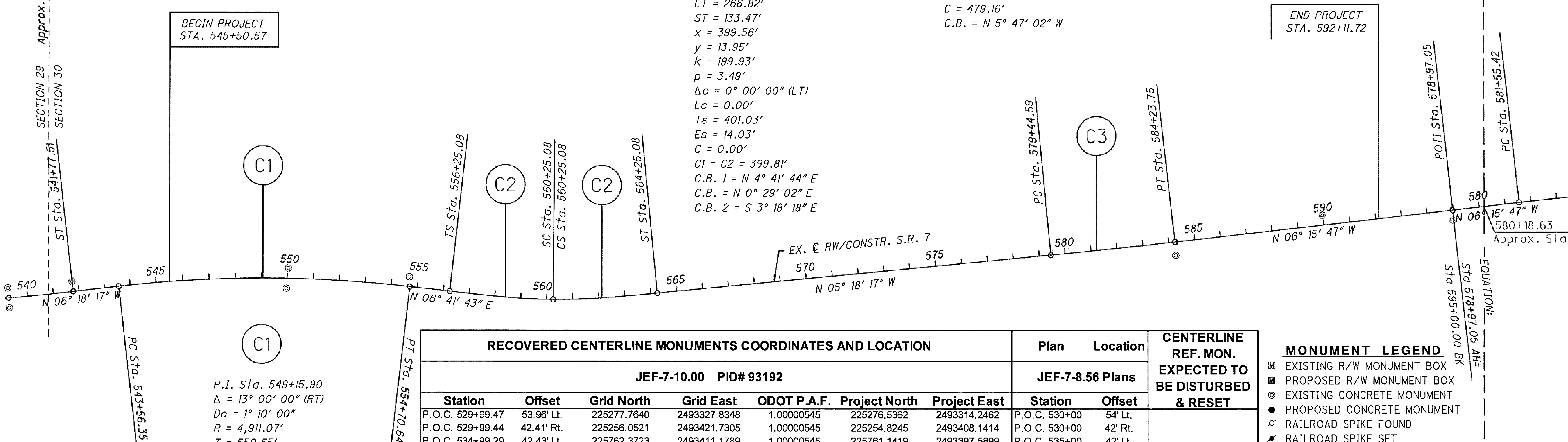
THE EXISTING R/W WIDTH AND LOCATION WERE DETERMINED USING EXISTING R/W PLANS FOR JEF-7-(8.22-10.35), JEF-7-11.35, JEF-7-(4.63-8.99), AND JEF-7-8.56. ON FILE AT ODOT DISTRICT 11.

C2

P.I. Sta. 560+26.11
Δ = 12° 00′ 00″ (LT)
Dc = 3° 00′ 00″
R = 1,909.86′
Ls = 400.00′
θs = 6° 00′ 00″
LT = 266.82′
ST = 133.47′
x = 399.56′
y = 13.95′
k = 199.93′
p = 3.49′
Δc = 0° 00′ 00″ (LT)
Lc = 0.00′
Ts = 401.03′
Es = 14.03′
C = 0.00′
Cl = C2 = 399.81′
C.B. 1 = N 4° 41′ 44″ E
C.B. = N 0° 29′ 02″ E
C.B. 2 = S 3° 18′ 18″ E

C3

P.I. Sta. 581+84.18
Δ = 0° 57′ 30″ (LT)
Dc = 0° 12′ 00″
R = 28,647.89′
T = 239.59′
L = 479.16′
E = 1.00′
C = 479.16′
C.B. = N 5° 47′ 02″ W



C1

P.I. Sta. 549+15.90
Δ = 13° 00′ 00″ (RT)
Dc = 1° 10′ 00″
R = 4,911.07′
T = 559.55′
L = 1,114.29′
E = 31.77′
C = 1,111.90′
C.B. = N 0° 11′ 43″ E

RECOVERED CENTERLINE MONUMENTS COORDINATES AND LOCATION							Plan Location		CENTERLINE REF. MON. EXPECTED TO BE DISTURBED & RESET
JEF-7-10.00 PID# 93192							JEF-7-8.56 Plans		
Station	**Offset**	**Grid North**	**Grid East**	**ODOT P.A.F.**	**Project North**	**Project East**	**Station**	**Offset**	
P.O.C. 529+99.47	53.96' Lt.	225277.7640	2493327.8348	1.00000545	225276.5362	2493314.2462	P.O.C. 530+00	54' Lt.	
P.O.C. 529+99.44	42.41' Rt.	225256.0521	2493421.7305	1.00000545	225254.8245	2493408.1414	P.O.C. 530+00	42' Rt.	
P.O.C. 534+99.29	42.43' Lt.	225762.3723	2493411.1789	1.00000545	225761.1419	2493397.5899	P.O.C. 535+00	42' Lt.	
C.S. 539+27.28*	38.09' Lt.	226184.5227	2493414.8737	1.00000545	226183.2900	2493401.2847	C.S. 539+27.51	38' Lt.	
C.S. 539+27.73*	38.10' Rt.	226190.3054	2493490.8468	1.00000545	226189.0727	2493477.2573	C.S. 539+27.51	38' Rt.	
S.T. 541+77.40	38.28' Lt.	226431.9226	2493390.6869	1.00000545	226430.6886	2493377.0980	S.T. 541+77.51	38' Lt.	
P.O.C. 550+03.67	39.75' Lt.	227261.0837	2493340.8205	1.00000545	227259.8451	2493327.2319	P.O.C. 550+00	39' Lt.	1
P.O.C. 549+97.07	38.07' Rt.	227252.8386	2493418.4695	1.00000545	227251.6001	2493404.8804	P.O.C. 550+00	38' Rt.	
P.T. 554+65.14	37.36' Lt.	227724.7448	2493375.1241	1.00000545	227723.5037	2493361.5353	P.T. 554+70.64	37' Lt.	1
P.T. 584+21.89	51.10'Rt.	230670.3417	2493302.7865	1.00000545	230669.0846	2493289.1981	P.T. 584+23.75	51'Rt.	
P.O.T. 589+98.99	37.09' Lt.	231234.3773	2493152.1699	1.00000545	231233.1171	2493138.5823	P.O.T. 590+00	37' Lt.	
TOTAL CARRIED TO GENERAL SUMMARY									2

* Held split of these two monuments for project Stationing

MONUMENT LEGEND

- EXISTING R/W MONUMENT BOX
- PROPOSED R/W MONUMENT BOX
- EXISTING CONCRETE MONUMENT
- PROPOSED CONCRETE MONUMENT
- RAILROAD SPIKE FOUND
- RAILROAD SPIKE SET
- I.P.F. IRON PIN FOUND
- I.P.F. IRON PIN FOUND W/ ID CAP
- I.P.S. IRON PIN SET W/ ID CAP
- P.F. IRON PIPE FOUND
- P.S. IRON PIPE SET
- P.K.F. P.K. NAIL FOUND
- P.K.S. P.K. NAIL SET

MONUMENT NOTE:

REFERENCE STANDARD DRAWING RM 1.1, MONUMENT TYPE A, CAP DESIGN 6. CENTERLINE REFERENCE MONUMENTS WILL BE RESET AFTER CONSTRUCTION IS COMPLETE BY ODOT AS SHOWN ON STANDARD CONSTRUCTION DRAWING RM 1.1 MONUMENT TYPE A, CAP DESIGN 6.

I, Joseph D. Kuhlmann, P. S., as Stantec Consulting's Right of Way and Survey Manager, have conducted a survey of the existing conditions for the Ohio Department of Transportation from October 2012 thru May 2013. The results of that survey are contained herein. The horizontal coordinates expressed herein are based on the Ohio State Plane Coordinate System, North Zone (3401), NAD 83 (2011) datum. The Project Coordinates (US Survey feet) are relative to State Plane Grid Coordinates US Survey feet by a Project Adjustment Factor multiplier of 1.00000545. As a part of this project I have reestablished the locations of the existing property lines and centerline of existing Right of Way for property takes contained herein. All of my work contained herein was conducted in accordance with Ohio Administrative Code 4733-37 commonly known as "A Minimum Standards for Boundary Surveys in the State of Ohio" unless noted. The words I and my as used hereinare to mean either myself or someone working under my direct supervision.

Joseph D. Kuhlmann

Joseph D. Kuhlmann, Professional Land Surveyor No. 6823,

Date: 11-11-2013

PLAN PREPARED BY:

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, Ohio 45241
(513) 842-8200

Stantec

RECEIVED ____________, 20____
RECORDED ____________, 20____
BOOK ____________ PAGE ________
COUNTY RECORDER

SURVEYORS SEAL

STATE OF OHIO
JOSEPH D. KUHLMANN
S-6823
REGISTERED
LAND SURVEYOR

HORIZONTAL SCALE IN FEET
0 100 200 400

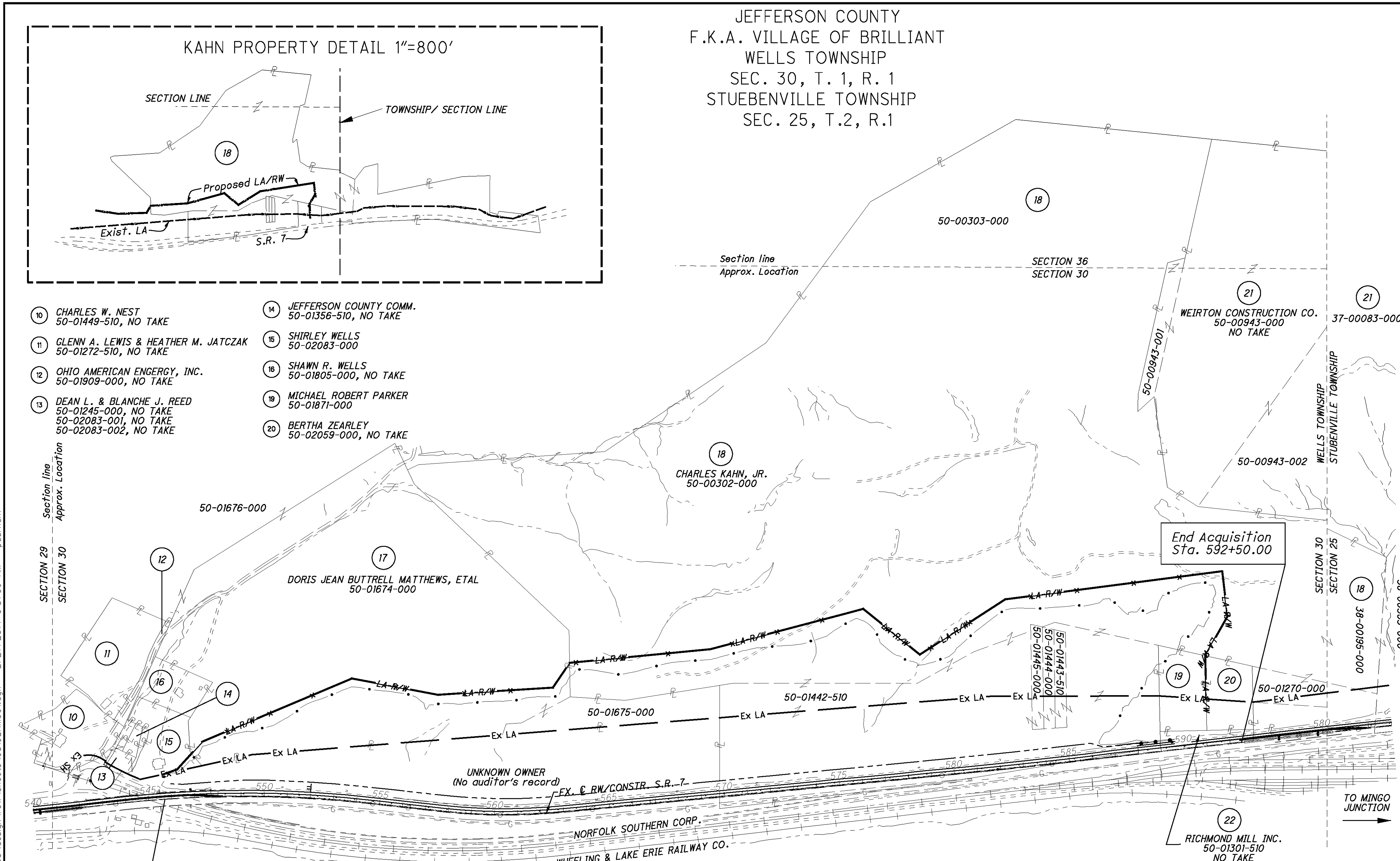
PID NO. 93192

R/W DESIGNER SNS
R/W REVIEWER JDK

CENTERLINE PLAT

JEF-7-10.00

2 / 9



REV. BY	DATE	DESCRIPTION
JDK	2-26-14	Indicated Contiguous ownership Parcel 17
JDK	2-26-14	Revised Owners Name Parcel 17

DATE COMPLETED 11-11-2013

HORIZONTAL SCALE IN FEET 0 100 200 400

PID NO. 93192

R/W DESIGNER S.N.S.
R/W REVIEWER J.D.K.

PROPERTY MAP

JEF-7-10.00

3/9

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TOTAL NUMBER OF :

4 OWNERSHIPS — 1 TOTAL TAKES

4 PARCELS — 0 OWNERSHIPS W/ STRUCTURES INVOLVED

NET RESIDUE = RECORD AREA - TOTAL PRO - NET TAKE
NET TAKE = GROSS TAKE - PRO IN TAKE
ALL AREAS IN ACRES

PARCEL NO.	OWNER	SHEET NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	AUDITOR'S PARCEL	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUCTURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS	AS ACQUIRED BOOK	AS ACQUIRED PAGE
1-9	NOT USED													80% FEDERAL & 20% STATE			
10	CHARLES W. NEST	5	604	822	50-01449-510	2.000									NO TAKE		
11	GLENN A. LEWIS &	5	872	298	50-01272-510	2.820									NO TAKE		
	HEATHER M. JATCZAK																
12	OHIO AMERICAN ENERGY, INC	5	747	346	50-01909-000	0.345									NO TAKE		
13	DEAN L. & BLANCHE J. REED	5	92	89	50-01245-000	0.500									NO TAKE		
			228	397	50-02083-001	0.129											
			228	397	50-02083-002	0.089											
	TOTALS					0.718											
14	JEFFERSON COUNTY COMM.	5	493	540	50-01356-510	0.149											
15-WLR	SHIRLEY WELLS	5	542	389	50-02083-000	1.711	0.000	0.088	0.000	0.088	NO	1.623					
16	SHAWN R. WELLS	5	920	165	50-01805-000	1.087									NO TAKE		
17 WLR	DORIS JEAN BUTTRELL MATTHEWS, (1/4)		792	913	50-01674-000	45.020	0.000	7.039	0.000	7.039	NO	37.981					
	JUDITH M. JONES NKA JUDITH TURNAGE, (1/12)		30	88	50-01675-000	2.371(c)	0.000	2.371	0.000	2.371	NO	0.000			Auditor's Record Area 2.662 Ac. (Total Take)		
	JOYCE M. RAIDLE, (1/12) TOTALS					47.391	0.000	9.410	0.000	9.410		37.981			Due to extensive contiguous ownership only affected		
	JANICE LEE MATTHEWS NKA JANICE WRIGHT, (1/12)														parcels have been shown.		
	ROBERT K. MATTHEWS & BEVERLY G. MATTHEWS,(1/2)																
	Trustees of the Matthews Living Trust dated																
	March 14,1990																
18 WLR	CHARLES KAHN, JR.	6,7,8 & 9	814	674	50-00302-000	114.910	0.000	13.303	0.000	13.303	NO	101.607					
					50-01442-510	21.109(c)	14.216	21.109	14.216	6.893		0.000			Auditor's Record Area 21.490 Ac. (Total Take)		
					50-01445-000	0.514(c)	0.164	0.514	0.164	0.350		0.000			Auditor's Record Area 0.522 Ac. (Total Take)		
					50-01444-000	0.497(c)	0.160	0.497	0.160	0.337		0.000			Auditor's Record Area 0.504 Ac. (Total Take)		
					50-01443-510	0.480(c)	0.157	0.480	0.157	0.323		0.000			Auditor's Record Area 0.484 Ac. (Total Take)		
					50-01270-000	1.720	1.110	0.000	0.000	0.000		0.610			NO TAKE		
					38-00195-000	4.280	0.787	0.000	0.000	0.000		3.493			NO TAKE		
					38-00353-000	39.630	12.400	0.000	0.000	0.000		27.230			NO TAKE		
					50-00303-000	15.550	0.000	0.000	0.000	0.000		15.550			NO TAKE		
	TOTALS					198.690	28.994	35.903	14.697	21.206	NO	148.490					
19 WLR	MICHAEL ROBERT PARKER	8 & 9	557	800	50-01871-000	1.615(c)	0.671	1.615	0.671	0.944	NO	0.000			Auditor's Record Area 1.690 Ac. (Total Take)		
20	BERTHA ZEARLEY	9	199	376	50-02059-000	1.390									NO TAKE		
21	WEIRTON CONSTRUCTION CO.	9	417	480	50-00943-000	18.730									NO TAKE		
			417	480	50-00943-001	1.000									NO TAKE		
			417	480	50-00943-002	5.350									NO TAKE		
			417	479	37-00083-000	15.880									NO TAKE		
	TOTALS					40.960											
22	RICHMOND MILL INC.	8 & 9	564	635	50-01301-510	0.590									NO TAKE		

(c) = CALCULATED AREA

* DENOTES RIGHT OF WAY ENCROACHMENT

TYPES OF TITLE LEGEND:
WLR = FEE SIMPLE WITH LIMITATION OF ACCESS, RESERVING MINERAL RIGHTS

GRANTEE:

ALL RIGHT OF WAY ACQUIRED IN THE NAME OF
THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION
UNLESS OTHERWISE SHOWN.

REV. BY	DATE	DESCRIPTION
JDK	2-26-14	Added contiguous ownership note Par. 17
JDK	2-26-14	Revised owners names Parcel 17
JDK	2-26-14	Revised typo PRO in Take Parcel 18

FIELD REVIEW BY Nick Kleiner — DATE: 05-09-2013
OWNERSHIP VERIFIED BY Joseph Kuhlmann — DATE: 11-11-2013
DATE COMPLETED 11-11-2013

FEDERAL PROJECT NO. E 120(445)

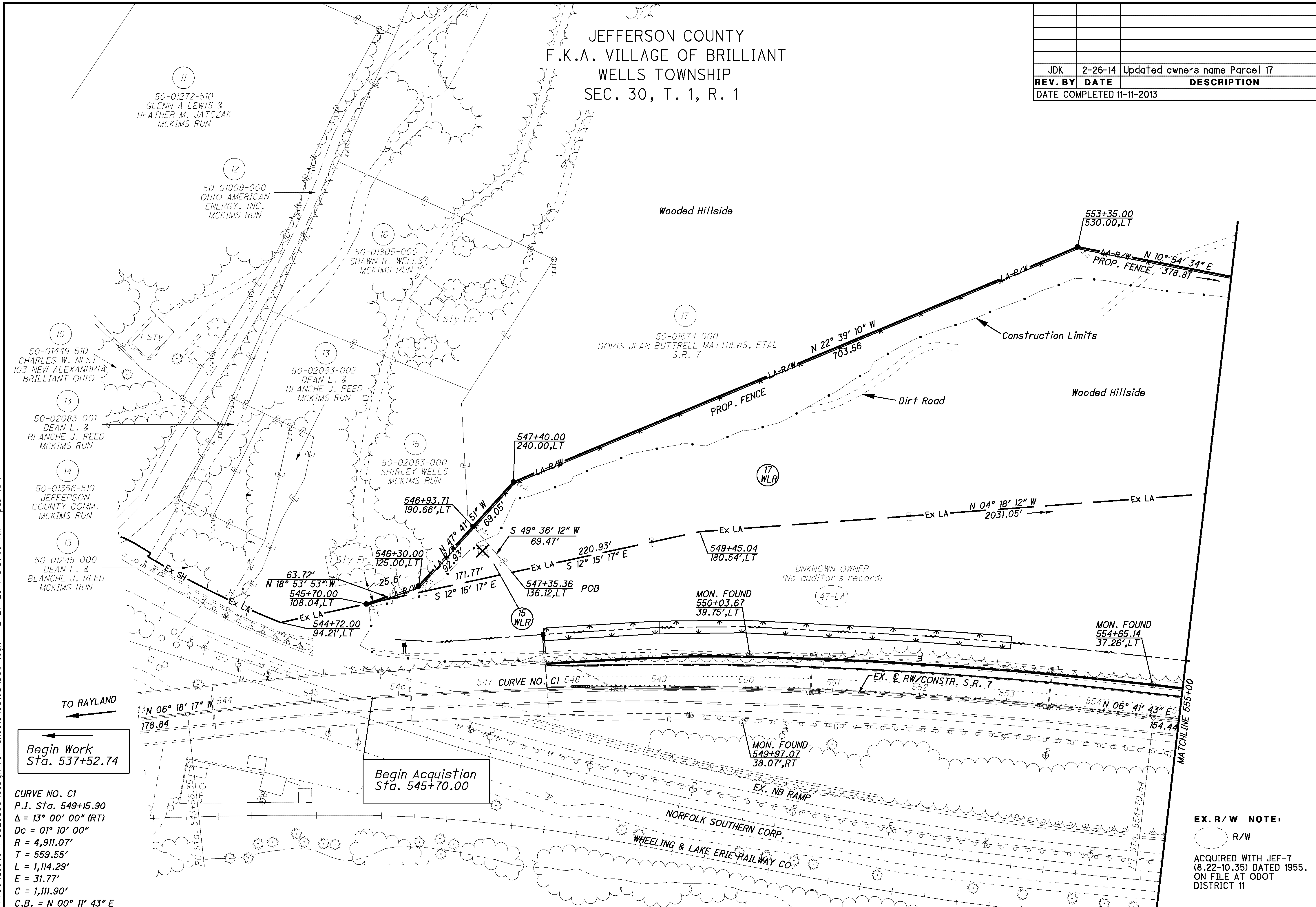
PID NO. 93192

STATE JOB NO. 519769

R/W DESIGNER SNS — R/W REVIEWER JDK

SUMMARY OF ADDITIONAL RIGHT OF WAY

JEF-7-10.00



REV. BY	DATE	DESCRIPTION
JDK	2-26-14	Updated owners name Parcel 17

DATE COMPLETED 11-11-2013

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PID NO. 93192

R/W DESIGNER SNS

R/W REVIEWER JDK

RIGHT OF WAY PLAN
STA. 543+00 TO STA. 555+00

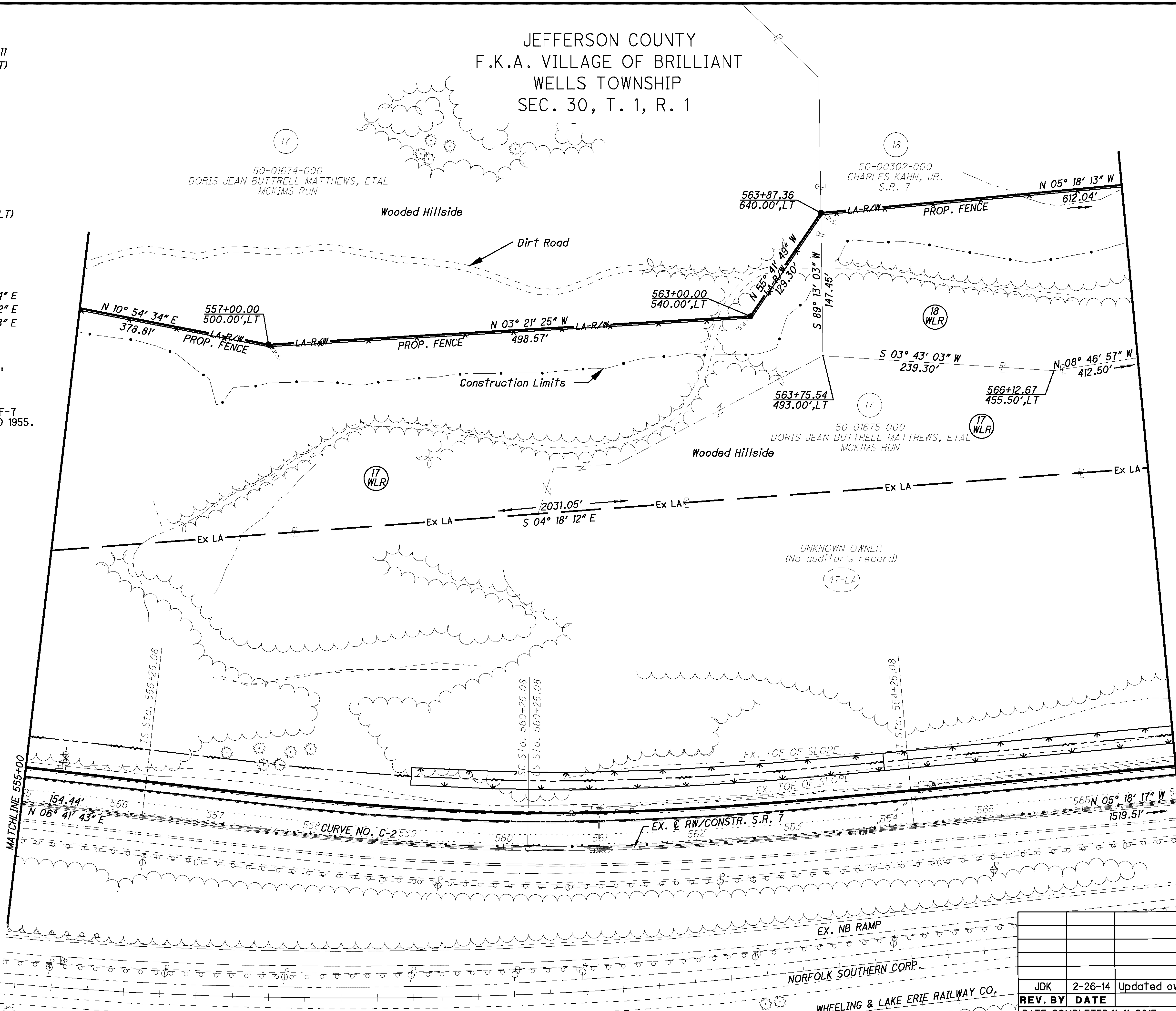
JEF-7-10.00

CURVE NO. C-2
P.I. Sta. 560+26.11
Δ = 12° 00′ 00″ (LT)
Dc = 3° 00′ 00″
R = 1,909.86′
Ls = 400.00′
θs = 6° 00′ 00″
LT = 266.82′
ST = 133.47′
x = 399.56′
y = 13.95′
k = 199.93′
p = 3.49′
Δc = 0° 00′ 00″ (LT)
Lc = 0.00′
Ts = 401.03′
Es = 14.03′
C = 0.00′
Cl = C2 = 399.81′
C.B.1 = N 4° 41′ 44″ E
C.B. = N 0° 29′ 02″ E
C.B.2 = S 3° 18′ 18″ E

EX. R/W NOTE:

R/W

ACQUIRED WITH JEF-7 (8.22-10.35) DATED 1955. ON FILE AT ODOT DISTRICT 11



JDK	2-26-14	Updated owners name Parcel 17
REV. BY	**DATE**	**DESCRIPTION**

DATE COMPLETED 11-11-2013

R/W DESIGNER SNS
R/W REVIEWER JDK

PID NO. 93192

RIGHT OF WAY PLAN
STA. 555+00 TO STA. 567+00

JEF-7-10.00

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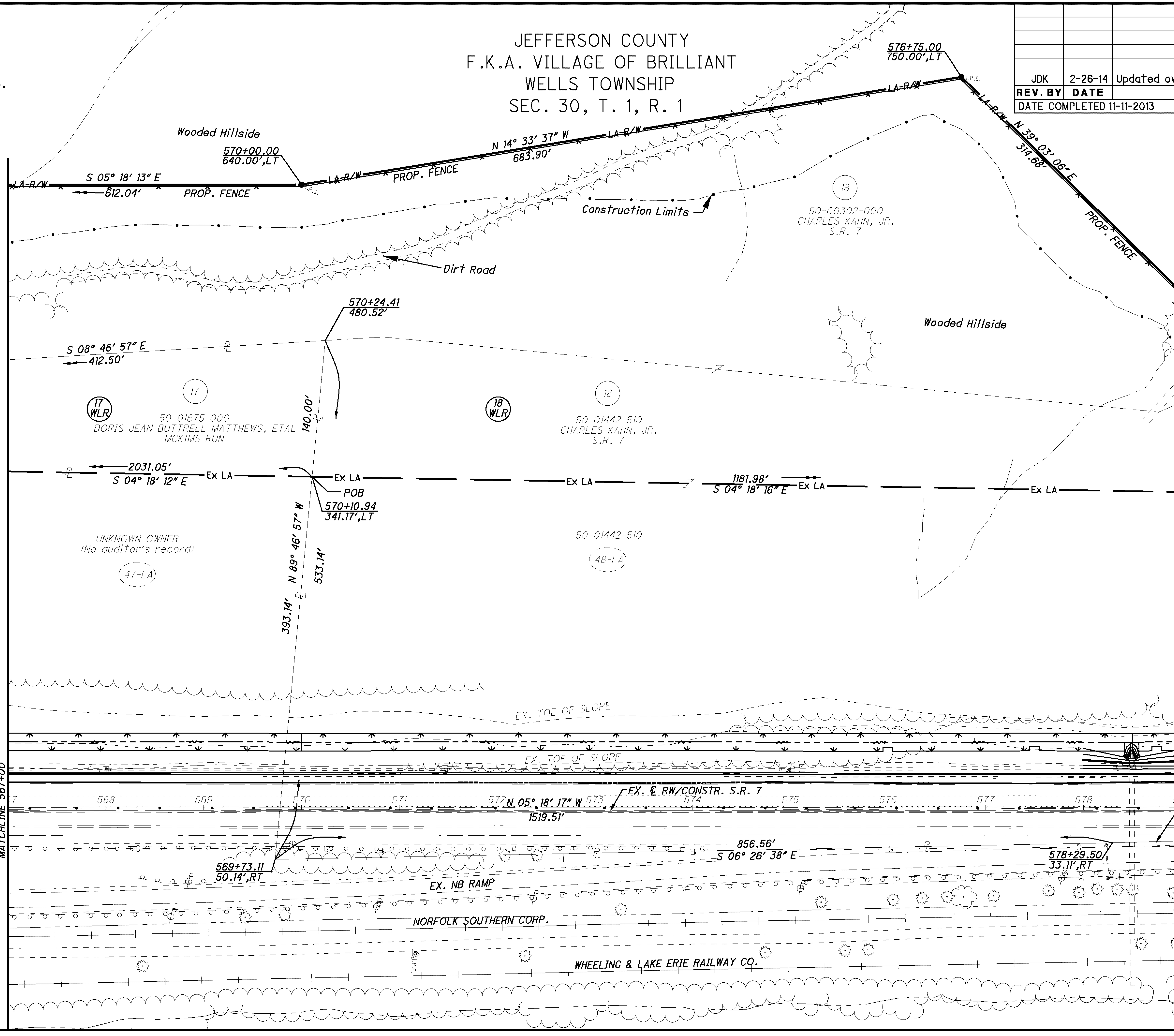
EX. R/W NOTE:

R/W

ACQUIRED WITH JEF-7 (8.22-10.35) DATED 1955. ON FILE AT ODOT DISTRICT 11

JDK	2-26-14	Updated owners name Parcel 17
REV. BY	DATE	DESCRIPTION

DATE COMPLETED 11-11-2013



0 25 50 100
HORIZONTAL SCALE IN FEET

PID NO. 93192

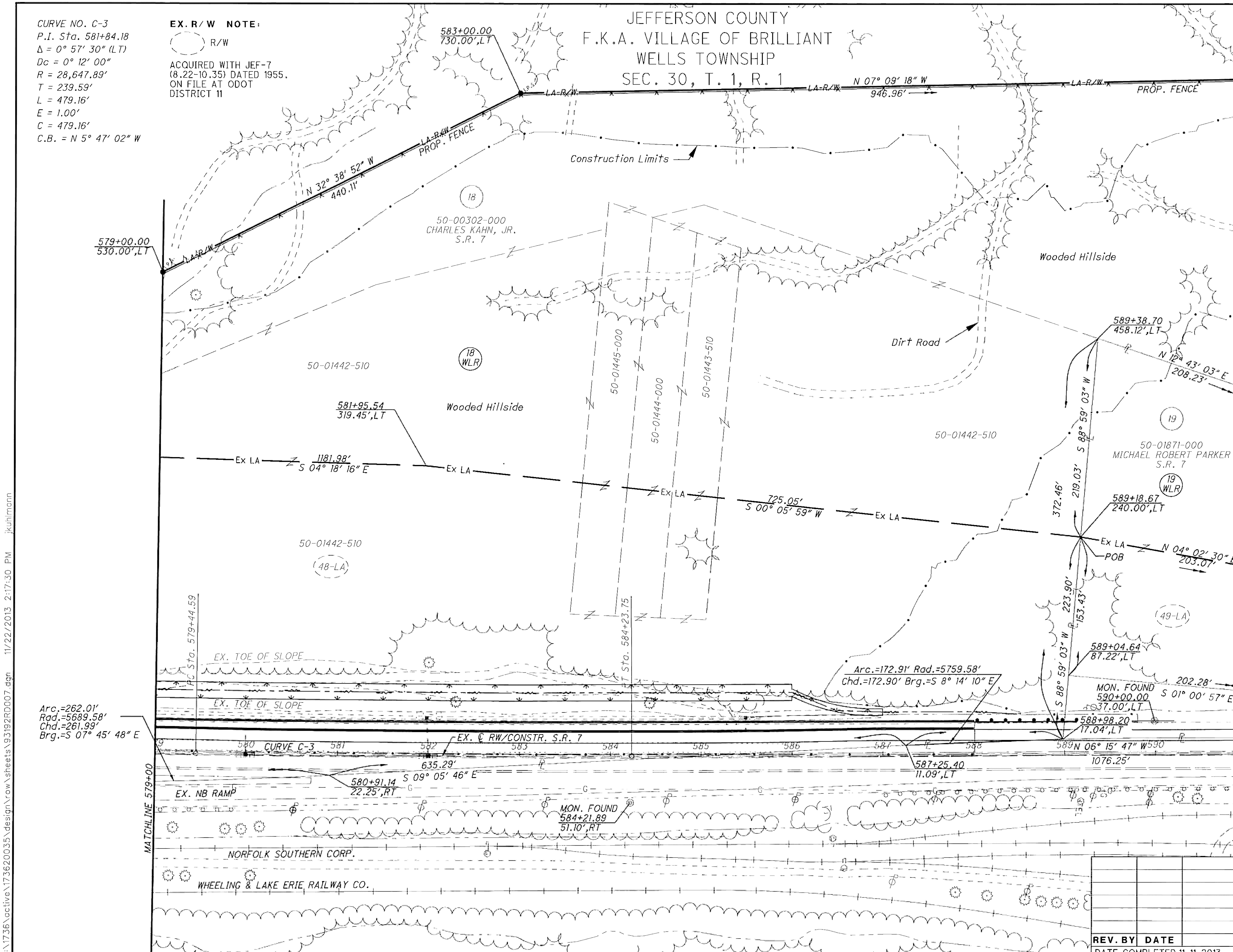
R/W DESIGNER SNS

R/W REVIEWER JDK

RIGHT OF WAY PLAN
STA. 567+00 TO STA. 579+00

JEF-7-10.00

7 / 9



REV. BY	DATE	DESCRIPTION

DATE COMPLETED 11-11-2013

HORIZONTAL SCALE IN FEET 0 25 50 100

PID NO. 93192

R/W DESIGNER SNS
R/W REVIEWER JDK

RIGHT OF WAY PLAN
STA. 579+00 TO STA. 591+00

JEF-7-10.00

8/9

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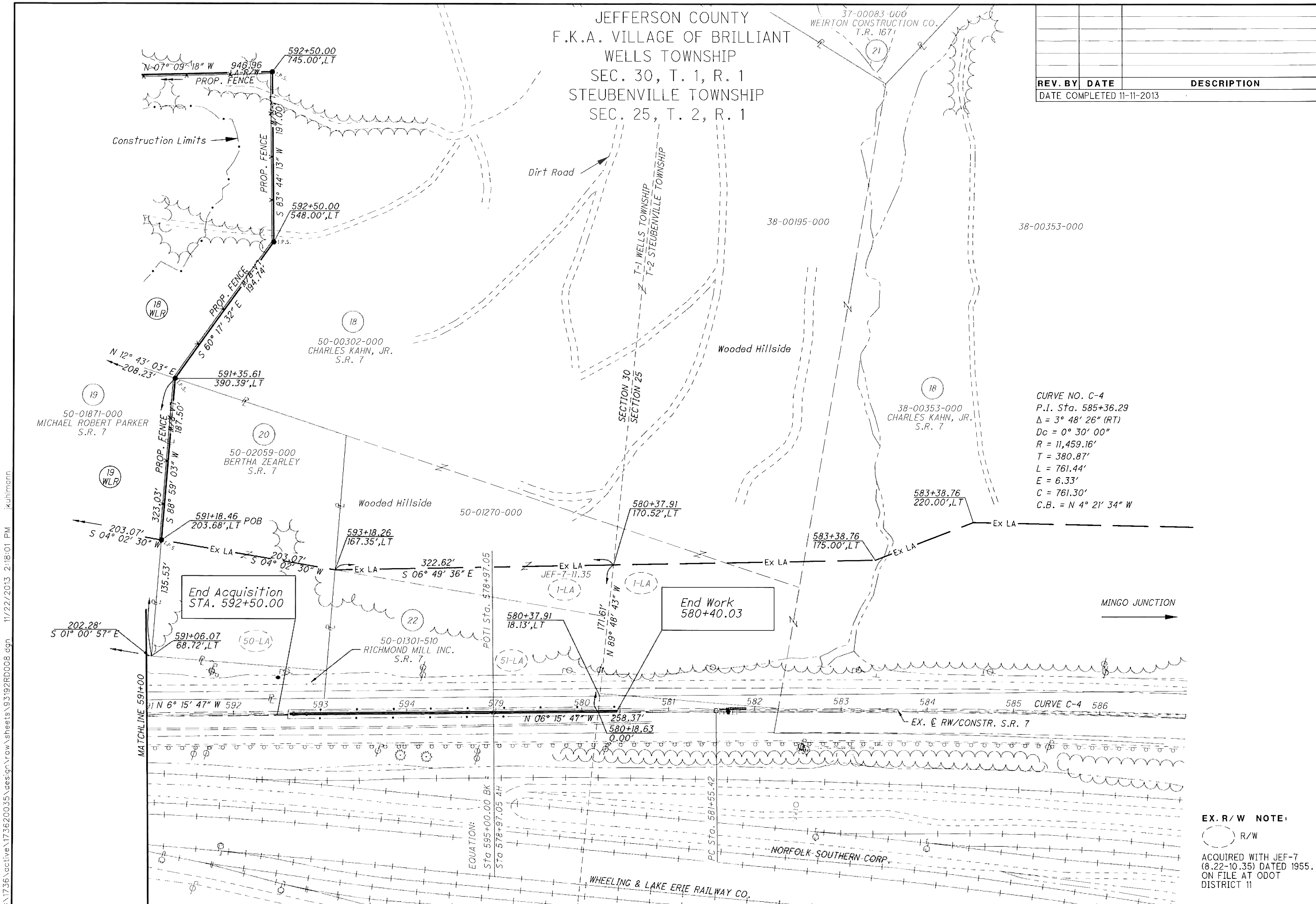

REV. BY	DATE	DESCRIPTION
DATE COMPLETED 11-11-2013		

HORIZONTAL SCALE IN FEET 0 25 50 100

PID NO. 93192

R/W DESIGNER SNS
R/W REVIEWER JDK

RIGHT OF WAY PLAN
STA. 591+00 TO STA. 587+00

JEF-7-10.00

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PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 4/7/12 END: 4/16/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" OD CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 553+92, 467 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1025.8 (MSL) EOB: 312.0 ft. COORD: 40.276136040, -80.620404880

EXPLORATION ID B-001-1-12 — PAGE 6 OF 6

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SEE PREVIOUS SHEET FOR ROCK DESCRIPTION @ 270.1', Qu = 2842 psi	755.8 754.3	270 – 271																
COAL, BLACK, SLIGHTLY WEATHERED, WEAK, VERY THIN BEDDED, PYRITIC, HIGHLY FRACTURED TO FRACTURED, TIGHT, SLICKENSIDED; RQD 0%, REC 100%.	753.0	272																
CLAYSTONE, GRAY, MODERATELY WEATHERED, WEAK, VERY THICK BEDDED, CALCAREOUS THROUGHOUT, HIGHLY TO MODERATELY FRACTURED, TIGHT, OCCASIONAL SLICKENSIDED, LIMESTONE NODULES THROUGHOUT; RQD 76%, REC 100%. @ 279.4'-280.0', SDI (Id_2)=29.6% @ 281.9'-282.0' - CLAY SEAM	743.8	273 – 282	70		100	NQ-28											CORE	
SILTSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, THICK BEDDED, OCCASIONALLY CALCAREOUS, FRACTURED TO MODERATELY FRACTURED; RQD 78%, REC 100%.	741.5	282 – 284																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY FINE TO FINE GRAINED, THICK BEDDED, CALCAREOUS STRINGERS, SLIGHTLY FRACTURED TO INTACT, OCCASIONAL INTERBEDDED SILTSTONE LAYERS; RQD 100%, REC 100%. @ 291.0'- 293.2' - BECOMING FINE GRAINED @ 291.6', Qu = 5,779 psi @ 293.2'-295.2' - SHALE LAYER	719.1	284 – 306	95 100		100 100	NQ-29 NQ-30											CORE CORE	
SANDSTONE, BROWN, HIGHLY WEATHERED, MODERATELY STRONG, COARSE GRAINED, VERY THICK BEDDED, MICACEOUS, SLIGHTLY FRACTURED, VERY ROUGH; RQD 100%, REC 100%.	713.8	306 – 312 EOB	100		100	NQ-31											CORE	

NOTES: 50 LBS BENTONITE PELLETS ADDED @ 44.0 FT DURING GROUTING/BACKFILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 300 LB. BENTONITE POWDER; 1692 LB. CEMENT; 180 GAL. WATER

ROCKFALL EXPLORATION
BORING LOG B-001-1-12 (CONT.)

DRAWN MSJ CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 560+23, 482 LT
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
PID: 92855 BR ID:	DRILLING METHOD: 3.0" STEEL CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1021.3 (MSL) EOB: 312.0 ft.
START: 5/1/12 END: 5/9/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.277743930, -80.620209110

EXPLORATION ID B-002-0-12

PAGE 1 OF 6

MATERIAL DESCRIPTION AND NOTES	ELEV. 1021.3	DEPTHS
MEDIUM STIFF TO STIFF, BROWN, **SILTY CLAY**, TRACE TO LITTLE COAL/CARBONACEOUS FRAGMENTS, TRACE STONE FRAGMENTS, WET*, FILL, COAL/CARBONACEOUS FRAGMENTS RANDOMLY ORIENTED IN SILTY CLAY * WATER CONTENT MAY BE IMPACTED BY WATER USED DURING CASEMENT ADVANCEMENT	1011.8	
HARD, GRAY, **SANDY SILT**, DRY (WEATHERD SHALE)	1009.3	TR
INTERBEDDED SANDSTONE AND SILTSTONE, GRAY/BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, INDISTINCT BEDDING, OCCASIONAL CALCAREOUS NODULES, FINE GRAINED SANDSTONE, HIGHLY TO SLIGHTLY FRACTURED, OCCASIONAL SHALE LAYERS; RQD 91%, REC 100%. @ 12.8'-13.0' - 90° FRACTURE @ 14.8'-14.9' - SHALE @ 19.1'-20.0' - CALCAREOUS	1001.3	
LIMESTONE, GRAY, UNWEATHERED TO HIGHLY WEATHERED, VERY WEAK TO VERY STRONG, HIGHLY TO MODERATELY FRACTURED; RQD 68%, REC 100%. @ 20.4'-20.6' - CLAY SEAM @ 21.6' - 45° FRACTURE @ 23.2'-23.3' - BROWN, HIGHLY WEATHERED CLAY	997.5	
CLAYSTONE, GRAY, HIGHLY TO SEVERELY WEATHERED, VERY WEAK, HIGHLY TO MODERATELY FRACTURED, OCCASIONAL SILTSTONE LAYERS; RQD 59%, REC 100%. @25.0'-26.0', SDI (Id_2)=0.1% @ 26.7', Qu = 167 psi @ 27.2'-27.5' - 90° FRACTURE	993.8	
INTERBEDDED SANDSTONE AND SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, FINE GRAINED, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 79%, REC 100%. @ 28.0'-28.2' - 90° FRACTURE	991.9	
SHALE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 95%, REC 100%. @30.0'-30.6' , SDI (Id_2)=83.7%	989.7	
LIMESTONE, GRAY/BROWN, SLIGHTLY WEATHERED, STRONG, UNFRACTURED, OCCASIONAL SILTSTONE LAYERS; RQD 100%, REC 100%.	988.0	
INTERBEDDED SANDSTONE AND SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, INDISTINCT BEDDING, CALCAREOUS NODULES; RQD 100%, REC 100%.	984.4	
SHALE, GRAY, SEVERELY WEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, HIGHLY FRACTURED TO MODERATELY FRACTURED; RQD 25%, REC 100%. @ 37.0'-38.0', SDI (Id_2)=8.8% @ 37.5'-38.9' - SEVERELY WEATHERED	982.4	
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, ALGAL, HIGHLY TO MODERATELY FRACTURED, CLAY SEAMS THROUGHOUT, OCCASIONAL CALCAREOUS SILTSTONE LAYERS; RQD 75%, REC 100%.	979.2	
SILTSTONE WITH INTERBEDDED SHALE LAYERS, GRAY/GREEN GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THIN TO INDISTINCT BEDDED, OCCASIONAL CALCAREOUS NODULES, HIGHLY FRACTURED TO UNFRACTURED, ZONES ARENACEOUS; RQD 98%, REC 100%	970.8	
SANDSTONE, GRAY, SLIGHTLY TO UNWEATHERED, MODERATELY STRONG, FINE GRAINED, INDISTINCT BEDDING, UNFRACTURED; RQD 100%, REC 100%. @ 50.8' - CLAY LAYER	968.6	

DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
2–3	2 2 2	6	67	SS-1	-	-	-	-	-	-	-	-	-	-	A-6b (V)	
4–5	1 2 3	7	100	SS-2	-	-	-	-	-	-	-	-	-	-	A-6b (V)	
6–7	2 2 3	7	93	SS-3	-	-	-	-	-	-	-	-	-	-	A-6b (V)	
9–10	1 1 4	7	67	SS-4	-	-	-	-	-	-	-	-	-	-	A-6b (V)	
11	57 50/0"	-	100	SS-5	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
12–22	87		100	NQ-1											CORE	
22–32	70		100	NQ-2											CORE	
32–42	77		100	NQ-3											CORE	
42–52	98		100	NQ-4											CORE	

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 560+23, 482 LT	EXPLORATION ID B-002-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.0" STEEL CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1021.3 (MSL) EOB: 312.0 ft.	PAGE 2 OF 6
START: 5/1/12 END: 5/9/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.277743930, -80.620209110	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	968.6	53																
SHALE, GRAY/GREEN GRAY, HIGHLY WEATHERED TO UNWEATHERED, VERY WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 70%, REC100%. @ 54.0'-54.5', SDI (Id_2)=88.7% @ 57.6'-57.8' - CLAY SEAM	963.3	53–62	70		100	NQ-5											CORE	
LIMESTONE, GRAY, SLIGHTLY TO UNWEATHERED, STRONG, INDISTINCT BEDDING, HIGHLY TO MODERATELY FRACTURED; RQD 94%, REC 100%. @ 58.4'-59.6' - 90° FRACTURE, VERY ROUGH	961.7																	
CLAYSTONE, GRAY/GREEN GRAY/PURPLE, HIGHLY TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, INDISTINCT BEDDING, SLICKENSIDED, HIGHLY TO MODERATELY FRACTURED, OCCASIONAL CALCAREOUS LAYERS; RQD 585, REC 100%. @ 62.0'-62.6', SDI (Id_2)=16.1% @ 62.6'-63.2' - LIMESTONE	958.1																	
INTERBEDDED SILTSTONE AND SANDSTONE, GRAY, SLIGHTLY TO UNWEATHERED, MODERATELY STRONG, INDISTINCT BEDDING, CALCAREOUS NODULES, MICACEOUS, FINE GRAINED SANDSTONE, SLIGHTLY FRACTURED TO INTACT, OCCASIONAL SHALE LAYERS; RQD 100%, REC 100%. @ 66.3' - 30° MODERATELY WEATHERED, FRACTURE	950.7	62–72	98		100	NQ-6											CORE	
SHALE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, UNFRACTURED, ZONES ARENACEOUS; RQD 100%, REC 100%. @ 72.1', Qu = 5,029 psi @ 76.0'-76.6', SDI (Id_2)=97.5%	943.8	72–82	76		100	NQ-7											CORE	
CLAYSTONE, GRAY/PURPLE, UNWEATHERED TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED; RQD 55%, REC 100%.	938.5																	
SILTSTONE, GRAY GREEN/GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, INDISTINCT BEDDING, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH, ZONES ARENACEOUS; RQD 54%, REC 100%. @ 85.1'-85.9' - 90° FRACTURE @ 85.0' - LOST PARTIAL WATER RETURN	934.6	82–92	72		100	NQ-8											CORE	
CLAYSTONE, GRAY/PURPLE, HIGHLY TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, INDISTINCT BEDDING, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED; RQD 74%, REC 100%. @ 86.6'-86.7' - CLAY SEAM @ 90.4' - CLAY SEAM	930.8																	
INTERBEDDED VARIOUS ROCK TYPES*, GRAY/GREEN GRAY, UNWEATHERED TO MODERATELY WEATHERED, VERY WEAK TO VERY STRONG, INDISTINCT BEDDING, FOSSILIFEROUS, SLICKENSIDED, CALCAREOUS ZONES; RQD 96%, REC 100%. * ROCK TYPES INCLUDE: LIMESTONE, CLAYSTONE, SILTSTONE AND SHALE @ 90.5'-97.5' - PRIMARILY LIMESTONE @ 97.5'-99.6' - CLAYSTONE @ 100.7'-101.2' - BRECCIATED LIMESTONE		92–102	100		100	NQ-9											CORE	
		102–106																

ROCKFALL EXPLORATION
BORING LOG B-002-0-12 (CONT.)

DRAWN MSJ CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 5/1/12 END: 5/9/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" STEEL CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 560+23, 482 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1021.3 (MSL) EOB: 312.0 ft. COORD: 40.277743930, -80.620209110

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
INTERBEDDED VARIOUS ROCK TYPES*, GRAY/GREEN GRAY, UNWEATHERED TO MODERATELY WEATHERED, VERY WEAK TO VERY STRONG, INDISTINCT BEDDING, FOSSILIFEROUS, SLICKENSIDED, CALCAREOUS ZONES; RQD 96%, REC 100%. * ROCK TYPES INCLUDE: LIMESTONE, CLAYSTONE, SILTSTONE AND SHALE @ 106.3'-107.7' - CLAYSTONE @ 107.7'-108.7' - BRECCIATED LIMESTONE @ 111.5'-112.0' - SILTSTONE	915.3 909.3	106–112	94		100	NQ-10											CORE	
SHALE, GRAY, UNWEATHERED, WEAK TO SLIGHTLY STRONG, INDISTINCT BEDDING, FISSILE, INTACT, SLIGHTLY ROUGH JOINT, TIGHT; RQD 98%, REC 100%.	898.3	112–122	97		100	NQ-11											CORE	
CLAYSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK, INDISTINCT BEDDING, CALCAREOUS, SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%.	894.9	122–132	97		100	NQ-12											CORE	
INTERBEDDED LIMESTONE AND CLAYSTONE, MEDIUM TO LIGHT GRAY, UNWEATHERED TO MODERATELY WEATHERED, WEAK CLAYSTONE, STRONG LIMESTONE, INDISTINCT BEDDING, CALCAREOUS ZONES, FOSSILIFEROUS, INTACT TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH, OCCASIONAL SLICKENSIDES AT BREAKS, SMALL AMOUNT OF PYRITE THROUGHOUT RUN, OCCASIONAL CALCAREOUS SILTSTONE LAYERS, BRECCIATED ZONES; RQD 98%, REC 100%. @ 127.5'-129.0' - STRONG LIMESTONE @ 127.7-128.4' - SLIGHTLY HEALED FRACTURE @ 127.5'-132.0' - BRECCIATED ZONES @ 133.7'-136.5' - MODERATELY STRONG LIMESTONE @ 134.5', Qu = 24,890 psi @ 139.7'-140.2', SDI (Id_2)=88.6%		132–142	93		100	NQ-13											CORE	
@ 146.5'-148.6' - STRONG LIMESTONE @ 149.2'-150.0' - MODERATELY STRONG LIMESTONE @ 149.5', Qu = 6,979 psi @ 153.0'-153.6', SDI (Id_2)=90.6%	867.7	142–152	97		100	NQ-14											CORE	
SHALE, GRAY, UNWEATHERED, WEAK, INDISTINCT BEDDING, FISSILE, UNFRACTURED; RQD 100%, REC 100%.	864.2	152–160	90		100	NQ-15											CORE	
SANDSTONE, GRAY/BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK, VERY FINE TO MEDIUM GRAINED, LAMINATED TO THIN BEDDED, SHALEY, FRACTURED TO MODERATELY FRACTURED; RQD 95%, REC 100%.	860.5																	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-002-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF A GEOTECHNICAL EXPLORATION OF A ROCKFALL-PRONE SLOPE WEST OF SR 7 IN JEFFERSON COUNTY NEAR BRILLIANT, OHIO.

HISTORIC RECORDS

TWO GEOTECHNICAL EXPLORATIONS WERE PERFORMED FOR BRIDGE CONSTRUCTION AT MILE POINTS 10.26 AND 10.30 ON SR 7 IN 1956. DOCUMENTATION FOR TWENTY-TWO GEOTECHNICAL BORINGS AND FIFTEEN SOUNDINGS WERE OBTAINED FOR THESE PROJECTS FROM THE FALCON/WEBSUITE SEARCH ENGINE OF THE ODOT WEBSITE. BEDROCK WAS ENCOUNTERED AT AN ELEVATION OF 592 TO 676 FEET AND WAS DESCRIBED AS SHALE, INTERBEDDED SHALE AND LIMESTONE, OR INTERBEDDED SHALE AND SANDSTONE.

GEOLOGY

THE PROJECT SITE IS LOCATED IN THE UNGLACIATED, HIGHLY DISSECTED, HIGH RELIEF LITTLE SWITZERLAND PLATEAU OF THE ALLEGHENY PLATEAUS. SOILS ARE PRIMARILY COLLUVIUM DERIVED FROM LOCAL BEDROCK. THE UNDERLYING BEDROCK IS COMPOSED OF SEDIMENTARY BEDROCK OF THE MONONGAHELA AND CONEMAUGH GROUPS OF THE PENNSYLVANIAN SYSTEM. SHALE, MUDSTONE, SILTSTONE, LIMESTONE, SANDSTONE, AND COAL ARE TYPICAL FOR THESE FORMATIONS. THERE ARE TWO ABANDONED UNDERGROUND COAL MINES LOCATED WEST OF THE PROJECT SITE.

RECONNAISSANCE

THE SOUTHBOUND LANES OF SR 7 HAVE BEEN CLOSED AND TRAFFIC HAS BEEN SHIFTED TO ONE LANE FOR EACH DIRECTION ON THE NORTHBOUND SIDE OF THE ROUTE. TRIM BLASTING AND SCALING HAVE BEEN PERFORMED TO REDUCE UNDERCUTTING AND RELEASE OF OVERHANGING MATERIAL ONTO THE ROADWAY. A TEMPORARY CONSTRUCTION BERM CONSISTING OF AGGREGATE WRAPPED IN WELDED WIRE MESH HAS BEEN INSTALLED ON THE SOUTHBOUND SHOULDER TO PREVENT ADDITIONAL ROCKFALL OCCURRENCES FROM REACHING THE TRAVELLING PUBLIC.

THE PAVEMENT WAS GENERALLY IN GOOD CONDITION WITH SPORADIC LONGITUDINAL CRACKING IN THE WHEEL RUTS IN THE ASPHALT PAVEMENT. THERE IS A BRIDGE NEAR THE SOUTH END OF THE PROJECT SITE OVERLYING RAILWAY TRACKS AND A RAMP TO NORTHBOUND SR 7. THERE WERE AREAS OF POSSIBLE SUBSIDENCE NEAR THE TOP OF THE CUT OBSERVED AT TWO LOCATIONS. AREAS OF PONDING WERE OBSERVED ON TOP OF THE EXISTING CUT; HOWEVER, THESE AREAS WERE MOST LIKELY THE RESULT OF RECENT RAINFALL. TWO SEEPS WERE ENCOUNTERED AT THE BASE OF THE EXISTING ROCK FACE AT APPROXIMATE STATIONS 565+00 AND 567+00. BEDROCK EXPOSURES WERE OBSERVED ON THE LOWER 75 TO 150 FEET OF THE ROCK CUT FACE. A COMBINATION OF INCOMPETENT AND COMPETENT BEDDING WAS OBSERVED ALONG THE LENGTH OF THE SITE. THE INCOMPETENT BEDS INCLUDED CLAYSTONE, COAL, LIMESTONE, SANDSTONE, SHALE, AND SILTSTONE. THE COMPETENT BEDS INCLUDED LIMESTONE, SANDSTONE, AND SILTSTONE.

THE LAND USAGE FOR THE PROJECT SITE IS WOODED. SIGNS OF CULTIVATION, PASTURE LAND, RESIDENTIAL STRUCTURES, COMMERCIAL STRUCTURES, AND INDUSTRIAL STRUCTURES WERE NOT OBSERVED.

SUBSURFACE EXPLORATION

SIX BORINGS WERE COMPLETED FROM THE TOP OF THE ROCK SLOPE AS PART OF THE EXPLORATION. THE BORINGS WERE DRILLED USING A TRACK-MOUNTED ROTARY DRILL RIG AND 3¼-INCH I.D. HOLLOW-STEM AUGERS TO ADVANCE THE BORINGS THROUGH THE SOIL. THE HAMMER SYSTEM USED WAS LAST CALIBRATED ON APRIL 1, 2011 AND THE AVERAGE DRILL ROD ENERGY RATIO (ER) WAS 88.4%. DISTURBED SAMPLES WERE COLLECTED IN ACCORDANCE WITH THE STANDARD PENETRATION TEST (AASHTO T206) AT CONTINUOUS INTERVALS FOR THE FULL SOIL DEPTH OF THE BORINGS. ALL BORINGS WERE ADVANCED INTO BEDROCK AND SAMPLED (AASHTO T225) USING AN N SERIES WIRELINE CORE BARREL, WATER METHOD.

EXPLORATION FINDINGS

SOIL CONDITIONS CONSISTED PRIMARILY OF COHESIVE MATERIAL: SANDY SILT (A-4A), SILT (A-4B), SILTY CLAY (A-6B), AND CLAY (A-7-6). SOIL THICKNESS RANGED FROM 7 TO 15 FEET.

ABOVE APPROXIMATELY ELEVATION 860 FEET, LAYERS OF INCOMPETENT UNITS (CLAYSTONE, COAL, LIMESTONE, SANDSTONE, SILTSTONE, AND SHALE) INTERBEDDED WITH LAYERS OF COMPETENT UNITS (LIMESTONE, SANDSTONE, AND SILTSTONE) WERE ENCOUNTERED WITH NO PARTICULAR PATTERN OBSERVED.

COMPETENT SANDSTONE UNDERLIES THE MATERIAL IN THE UPPER HORIZON FROM ELEVATION 860 TO 800 FEET. MINOR STRATA OF SILTSTONE, SHALE, AND LIMESTONE WERE OBSERVED WITHIN THE SANDSTONE.

UNDERLYING THE SANDSTONE, LAYERS OF INCOMPETENT UNITS (CLAYSTONE, COAL, LIMESTONE, SANDSTONE, SILTSTONE, AND SHALE) INTERBEDDED WITH LAYERS OF COMPETENT UNITS (LIMESTONE, SANDSTONE, AND SILTSTONE) WERE ENCOUNTERED TO BORING TERMINATION DEPTHS. NORTH OF APPROXIMATE STA. 570+00, SANDSTONE IN THIS LOWER BEDROCK HORIZON WAS SIGNIFICANTLY MORE PREVALENT.

SPECIFICATIONS

THIS GEOTECHNICAL EXPLORATION WAS PERFORMED IN ACCORDANCE WITH THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, OFFICE OF GEOTECHNICAL ENGINEERING, SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS, DATED JANUARY 2012 AND ODOT GEOTECHNICAL BULLETIN GB3, DATED APRIL 2011, RESPECTIVELY.

AVAILABLE INFORMATION

ALL AVAILABLE SOIL AND BEDROCK INFORMATION THAT CAN BE CONVENIENTLY SHOWN ON THE PROFILE SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE EXPLORATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE OFFICE OF GEOTECHNICAL ENGINEERING AT 1600 WEST BROAD STREET.

LEGEND

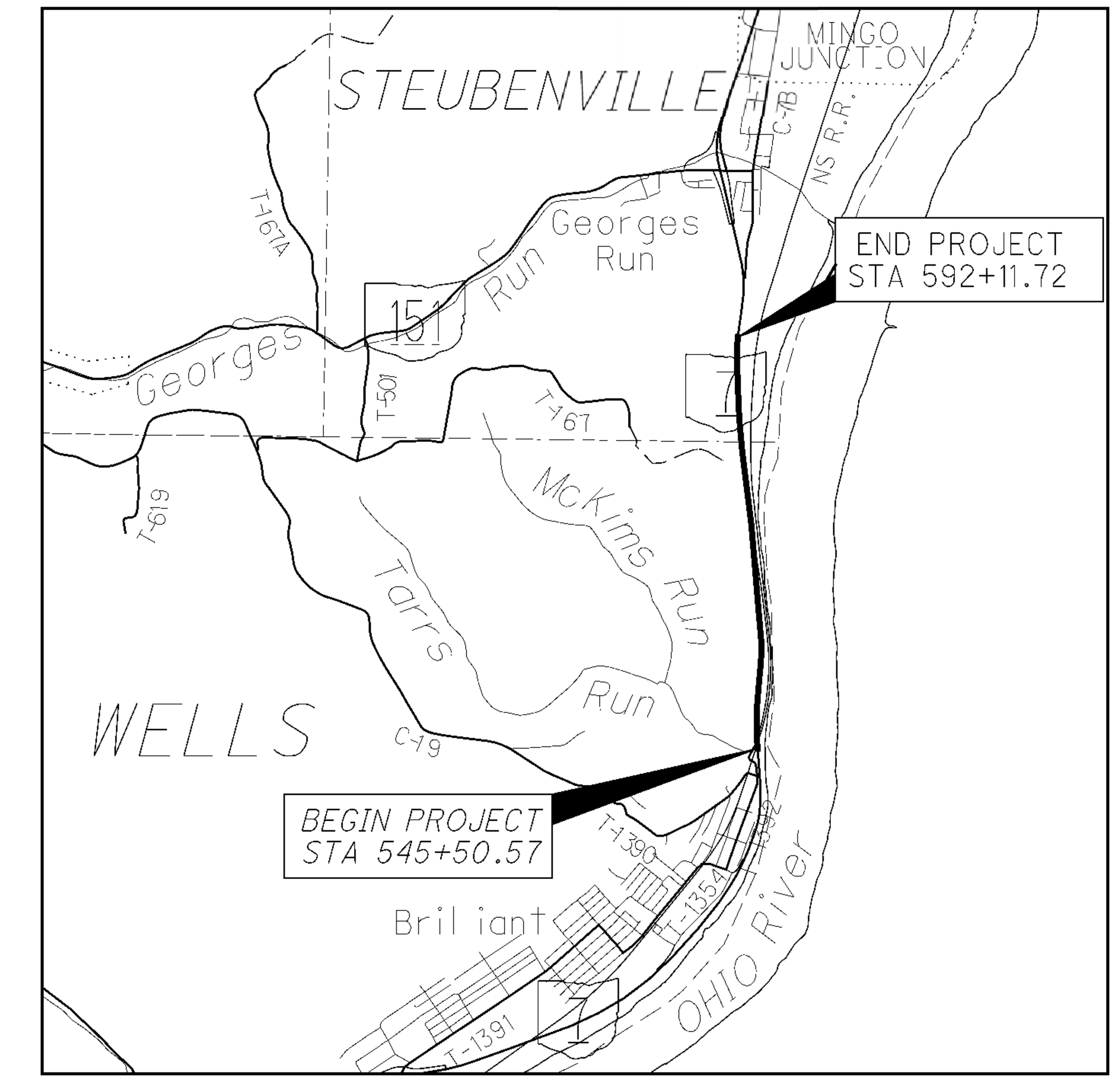
DESCRIPTION	ODOT CLASS	CLASSIFIED MECH.	CLASSIFIED VISUAL
FINE SAND	A-3	0	1
GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT AND CLAY	A-2-4	0	4
SANDY SILT	A-4a	0	6
SILT	A-4b	0	4
SILTY CLAY	A-6b	0	5
CLAY	A-7-6	0	2
	TOTAL	0	22
FILL	VISUAL		
COAL	VISUAL		
LIMESTONE	VISUAL		
SHALE	VISUAL		
SANDSTONE	VISUAL		
SILTSTONE	VISUAL		
CLAYSTONE	VISUAL		

BORING LOCATION - PLAN VIEW.

DRIVE SAMPLE AND/OR ROCK CORE BORING PLOTTED TO VERTICAL SCALE ONLY. HORIZONTAL BAR INDICATES A CHANGE IN STRATIGRAPHY.

TR INDICATES TOP OF ROCK.

RECON. - J.R.S., C.N., E.M.K. (STANTEC), SEPTEMBER 12-13, 2012
DRILLING - ODOT, MARCH 2012
DRAWN - M.S.J. JULY, SEPTEMBER, 2013
REVIEWED - E.M.K. JULY, SEPTEMBER, 2013



LOCATION MAP

LATITUDE: 40°16'30" N LONGITUDE: 80°39'05" W

SCALE IN MILES: 0 1 2

N

PARTICLE SIZE DEFINITIONS

BOULDERS	COBBLES	GRAVEL	COARSE SAND	FINE SAND	SILT	CLAY
12"	3"	2.0 mm	0.42 mm	0.074 mm	0.005 mm	
		No. 10 SIEVE	No. 40 SIEVE	No. 200 SIEVE		

INDEX OF SHEETS		
LOCATION FROM STA. TO STA.	PLAN VIEW SHEET	CROSS-SECTION SHEET
S.R. 7 537+00 551+00	2	
S.R. 7 551+00 565+00	3	
S.R. 7 565+00 579+50	4	
S.R. 7 579+50 594+00	5	
S.R. 7 554+00		6
S.R. 7 560+00		7
S.R. 7 567+50		8
S.R. 7 574+50		9
S.R. 7 582+00		10

DESIGN AGENCY
STANTEC CONSULTING SERVICES INC.
CINCINNATI, OHIO

PID NO. 93192

GEOHAZARD EXPLORATION-ROCKFALL
JEF-7-10.00

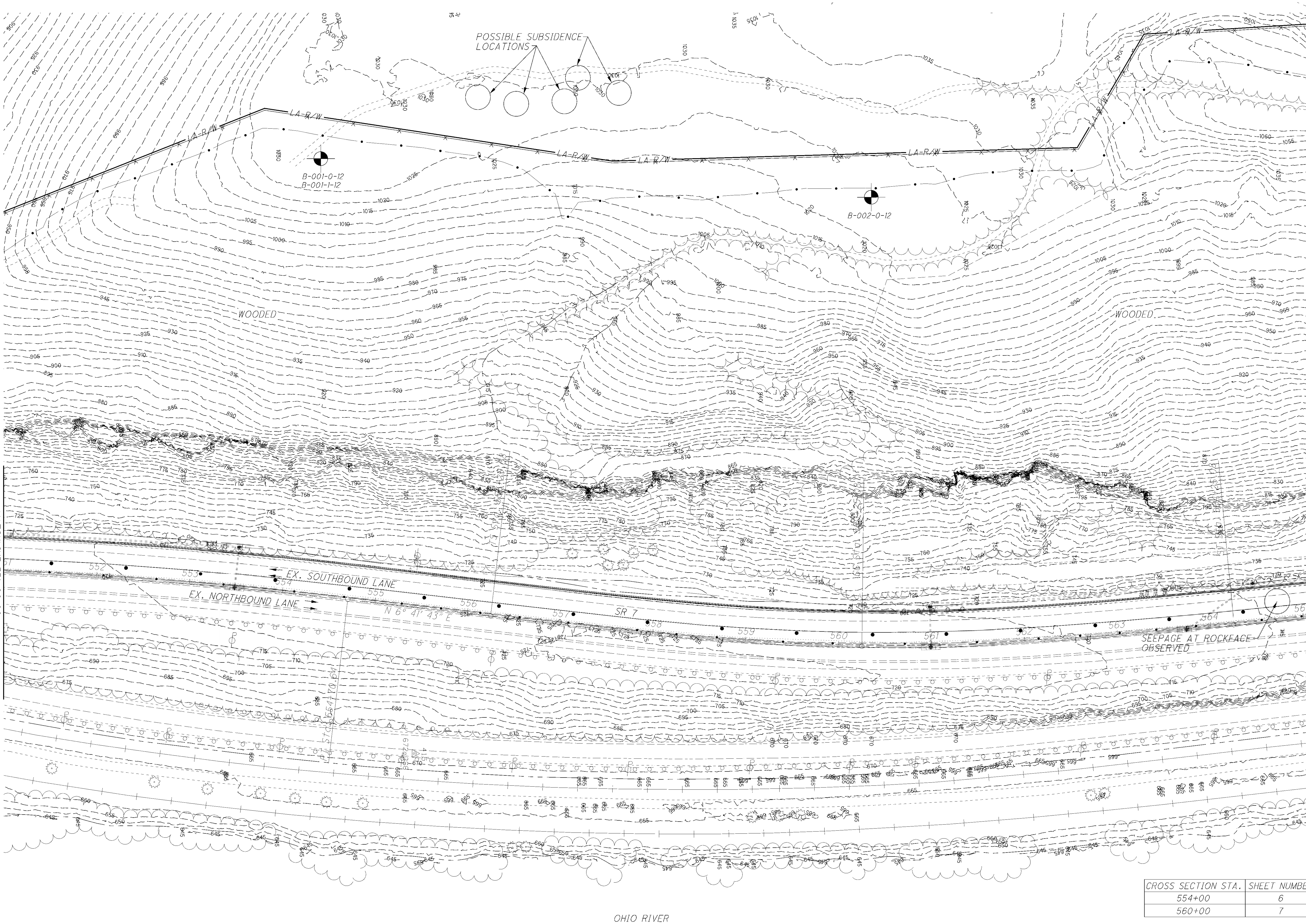
JEF-7-10.00

DRAWN MSJ
CHECKED EMK

0 25 50 100
HORIZONTAL SCALE IN FEET

GEOHAZARD EXPLORATION-ROCKFALL
STA. 537+00.00 TO STA. 551+00.00

JEF-7-10.00



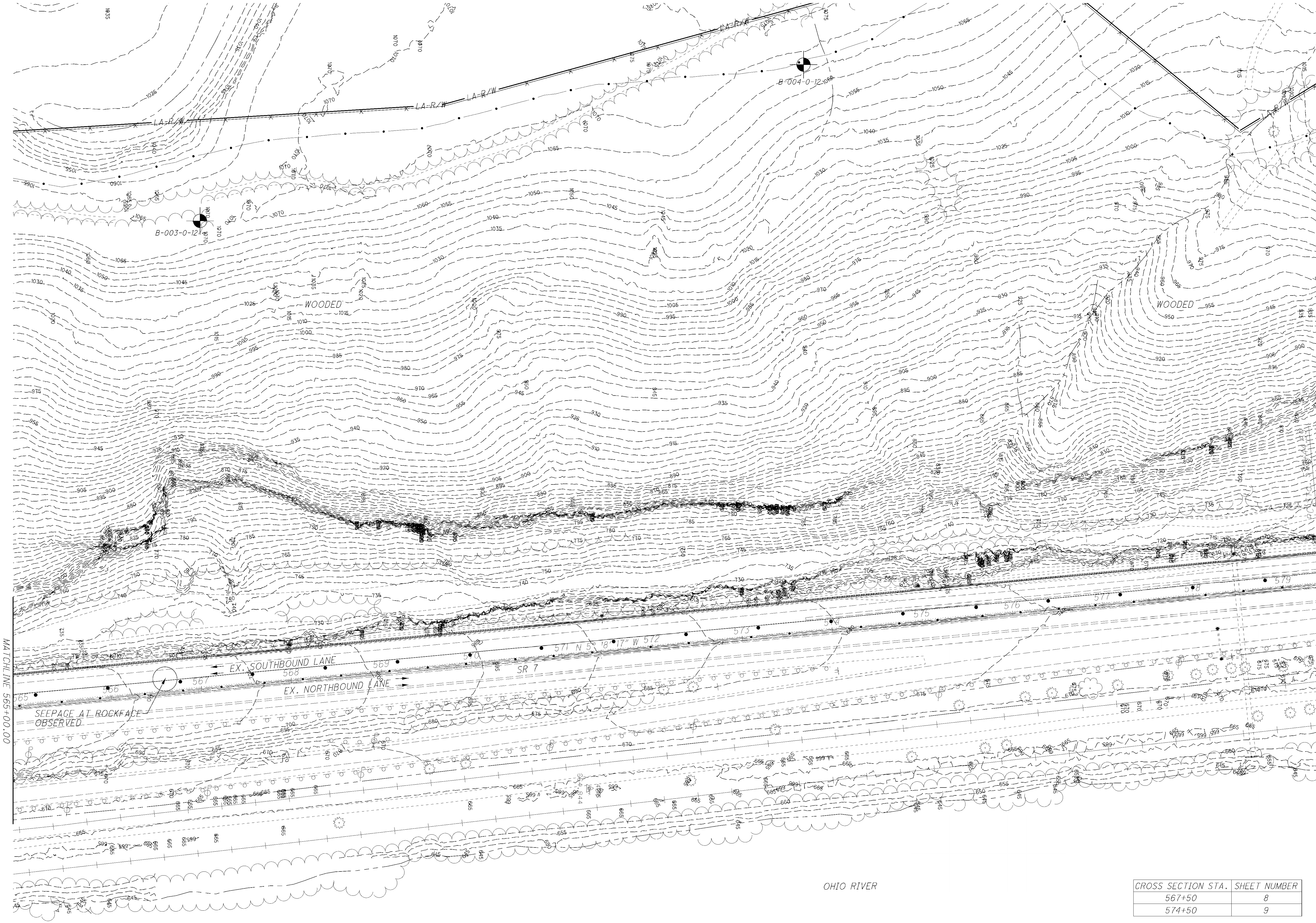
CROSS SECTION STA.	SHEET NUMBER
554+00	6
560+00	7

HORIZONTAL SCALE IN FEET: 0, 25, 50, 100

DRAWN MSJ
CHECKED EMK

GEOHAZARD EXPLORATION-ROCKFALL
STA. 551+00.00 TO STA. 565+00.00

JEF-7-10.00



CROSS SECTION STA.	SHEET NUMBER
567+50	8
574+50	9

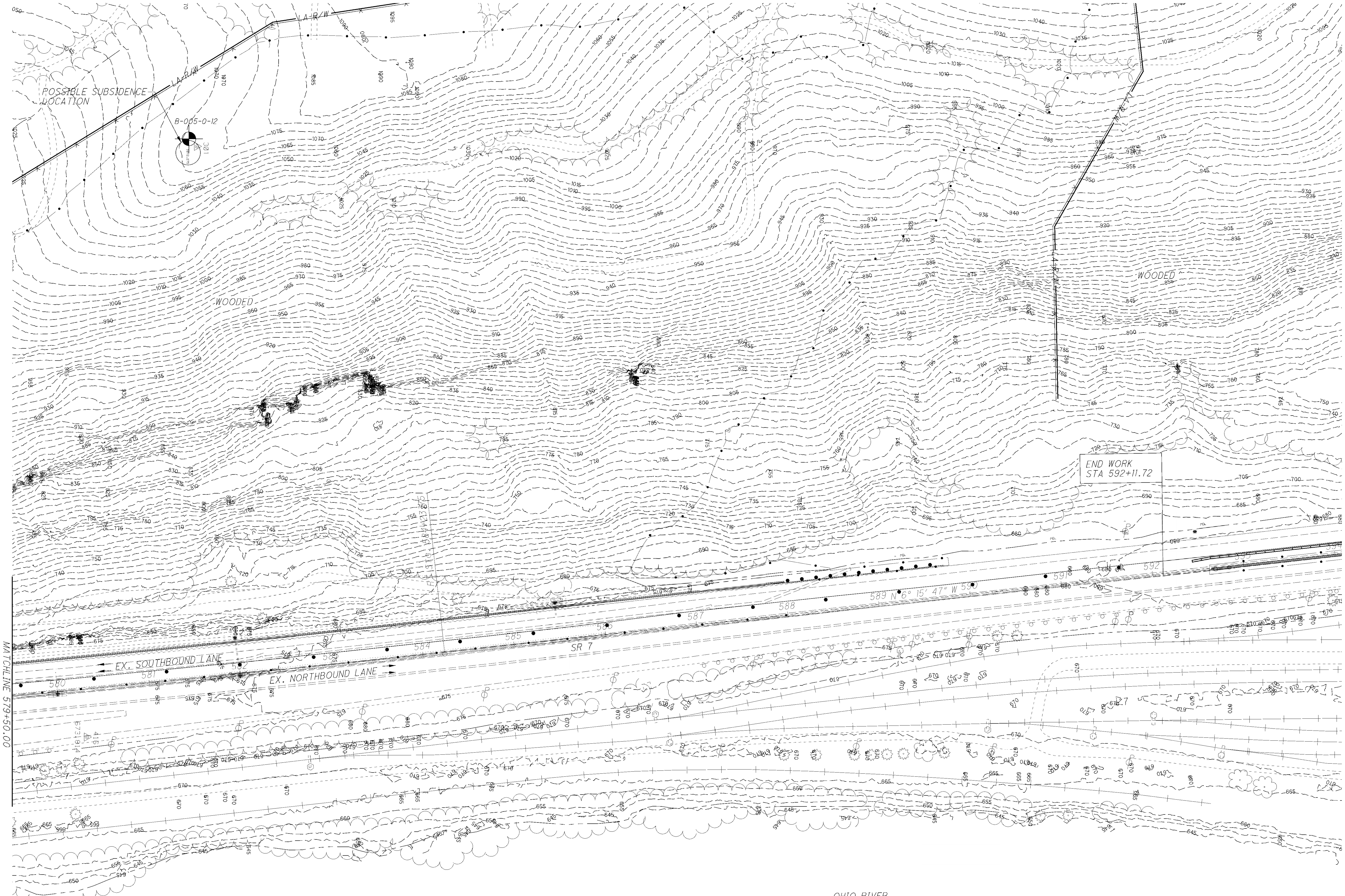
N

0 25 50 100
HORIZONTAL SCALE IN FEET

DRAWN MSJ
CHECKED EMK

GEOHAZARD EXPLORATION-ROCKFALL
STA. 565+00.00 TO STA. 579+50.00

JEF-7-10.00



CROSS SECTION STA.	SHEET NUMBER
582+00	10

HORIZONTAL SCALE IN FEET

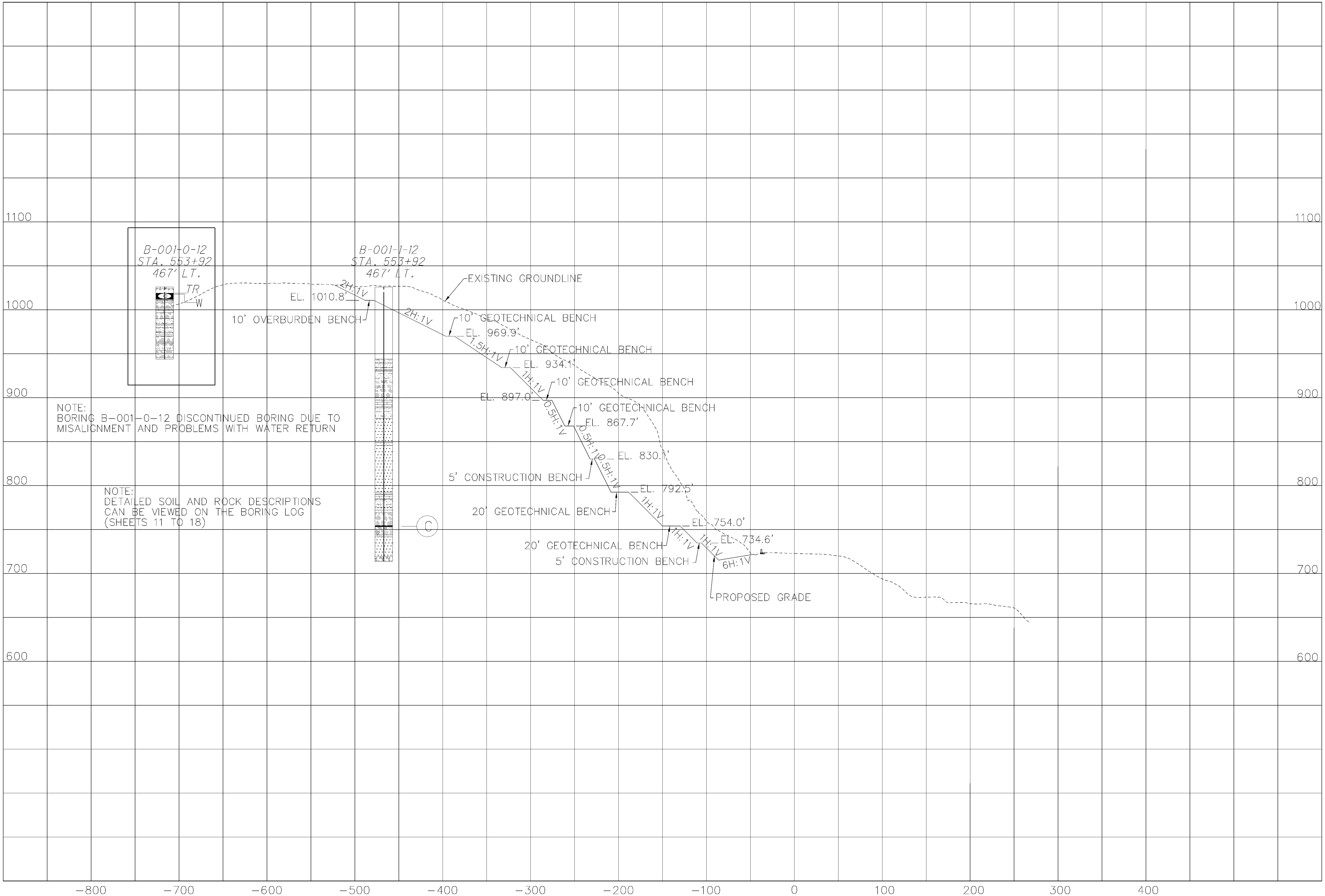
0 25 50 100

DRAWN MSJ

CHECKED EMK

GEOHAZARD EXPLORATION-ROCKFALL
STA. 579+50.00 TO STA. 594+00.00

JEF-7-10.00

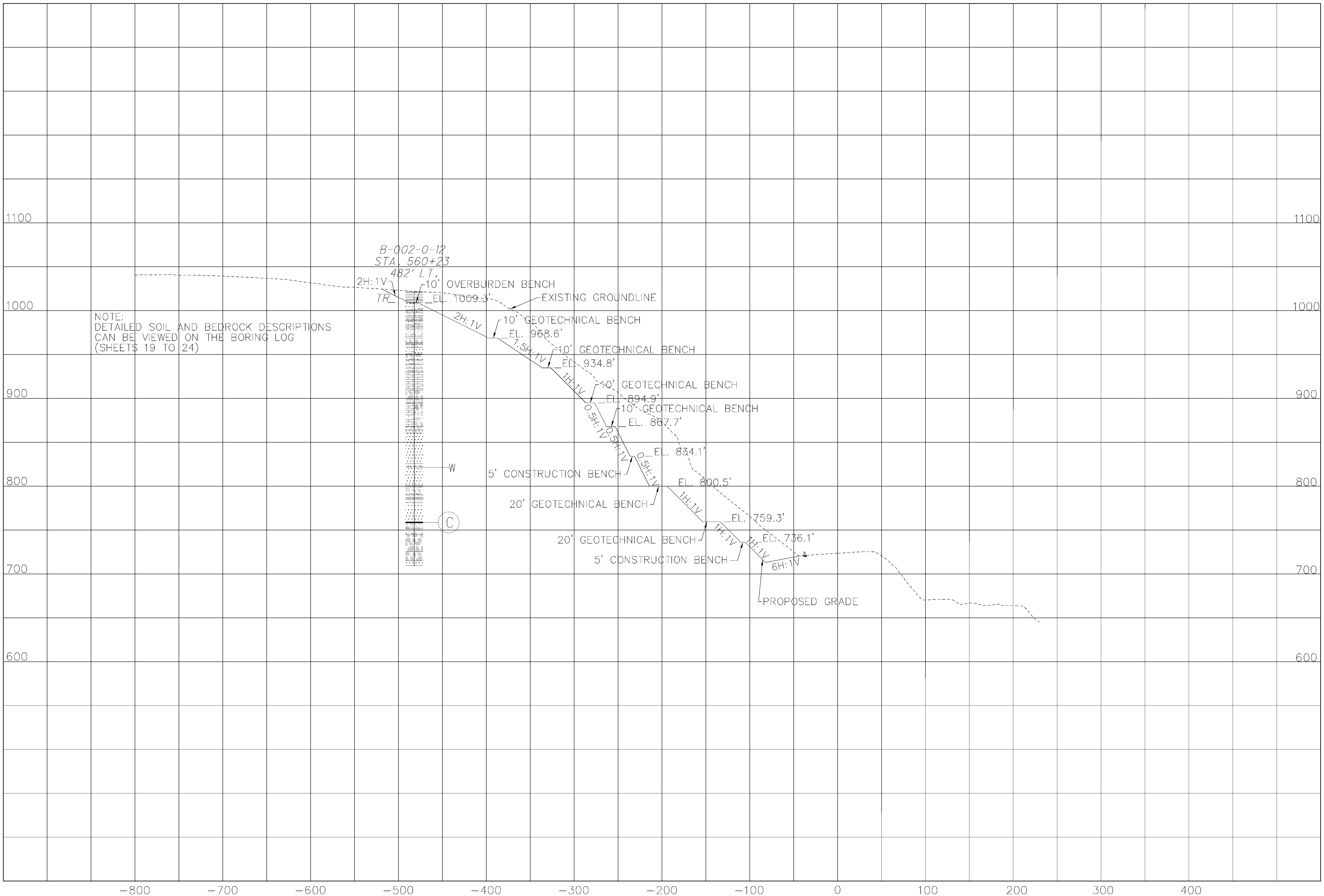


0 25 50 100
HORIZONTAL SCALE IN FEET

DRAWN MSJ
CHECKED EMK

CUT STABILITY SECTION STATION 554+00

JEF-7-10.00



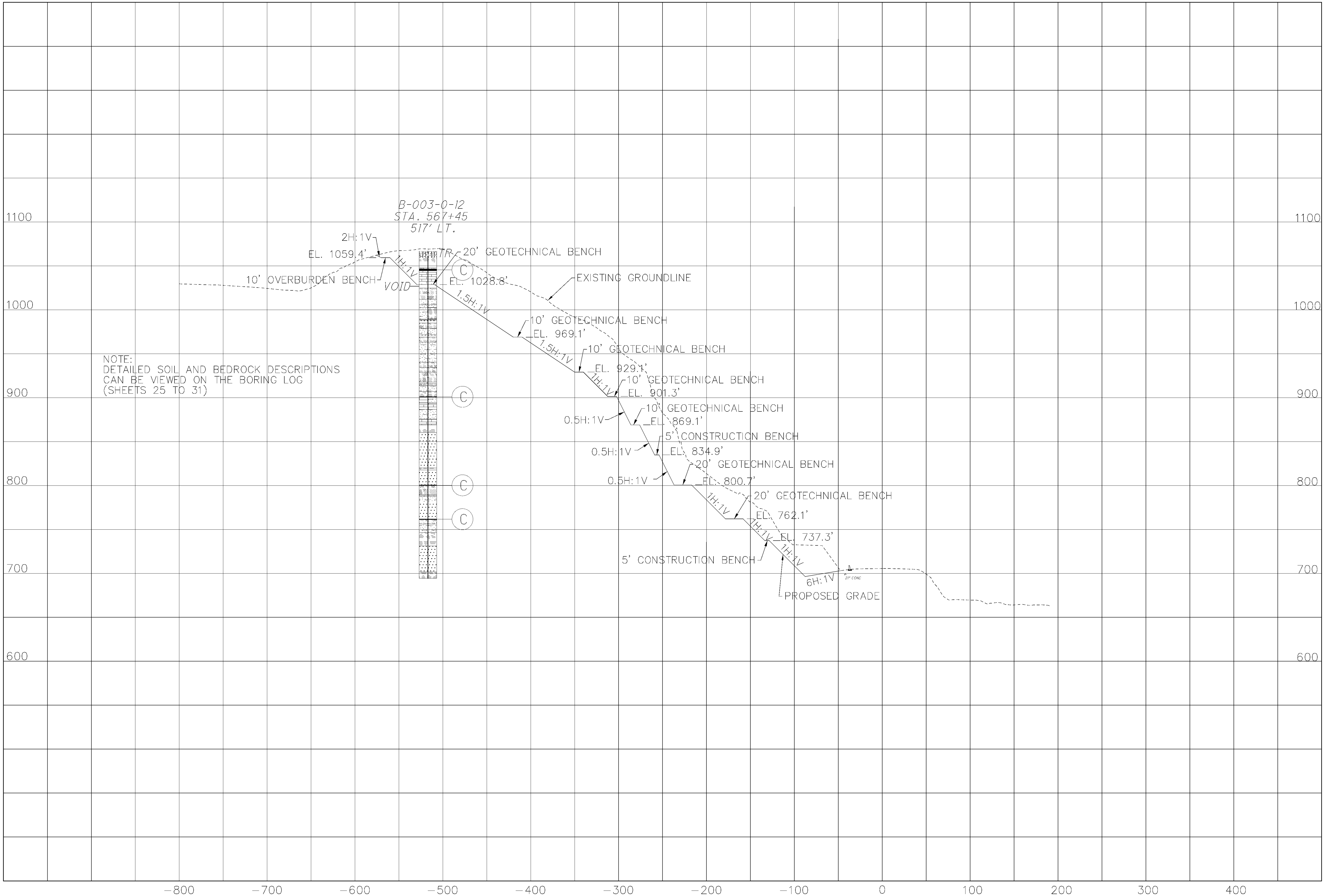
0 25 50 100
HORIZONTAL SCALE IN FEET

DRAWN MSJ
CHECKED EMK

CUT STABILITY SECTION
STATION 560+00

JEF-7-10.00

7/47

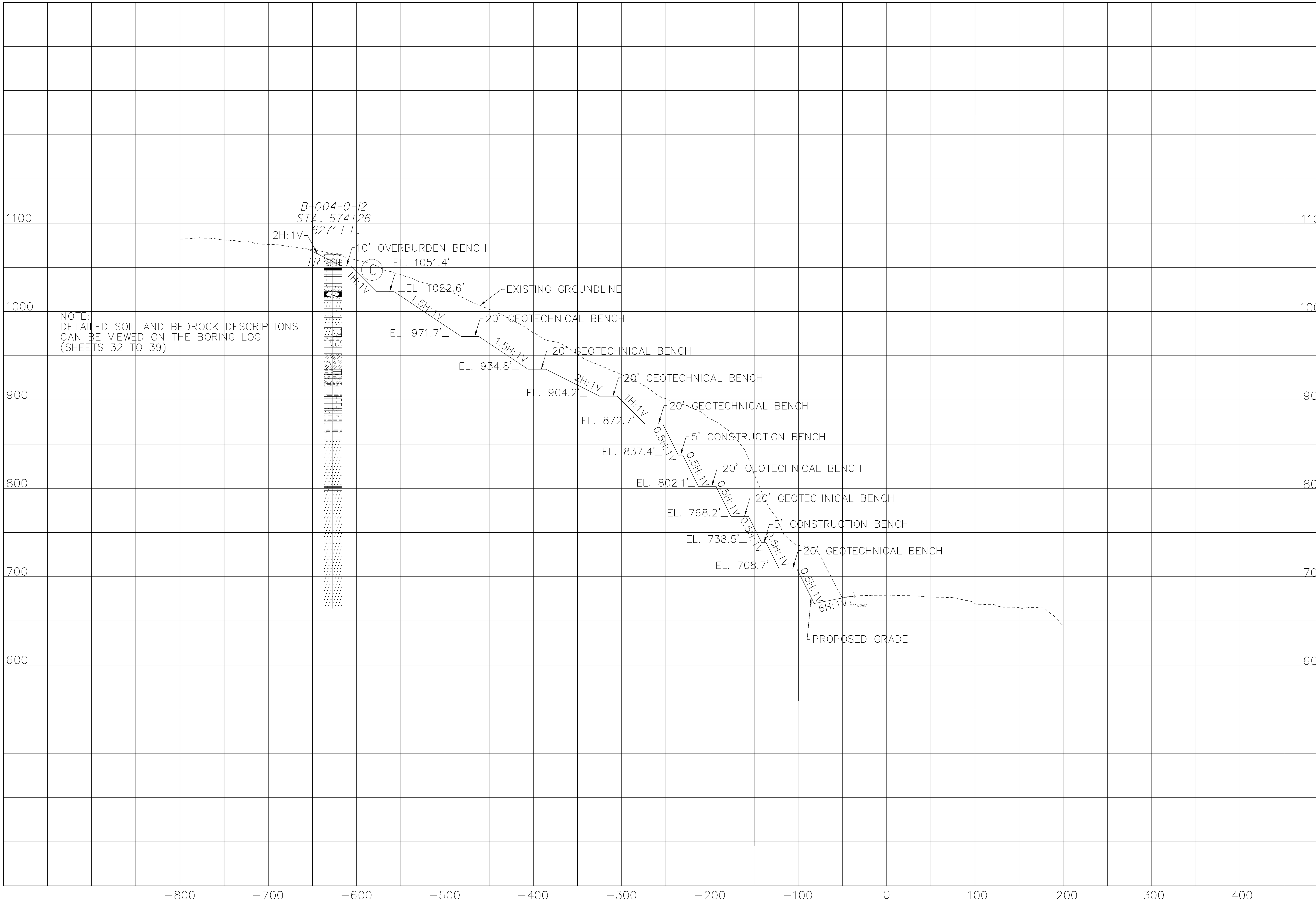


0 25 50 100
HORIZONTAL
SCALE IN FEET

DRAWN MSJ
CHECKED EMK

CUT STABILITY SECTION
STATION 567+50

JEF-7-10.00

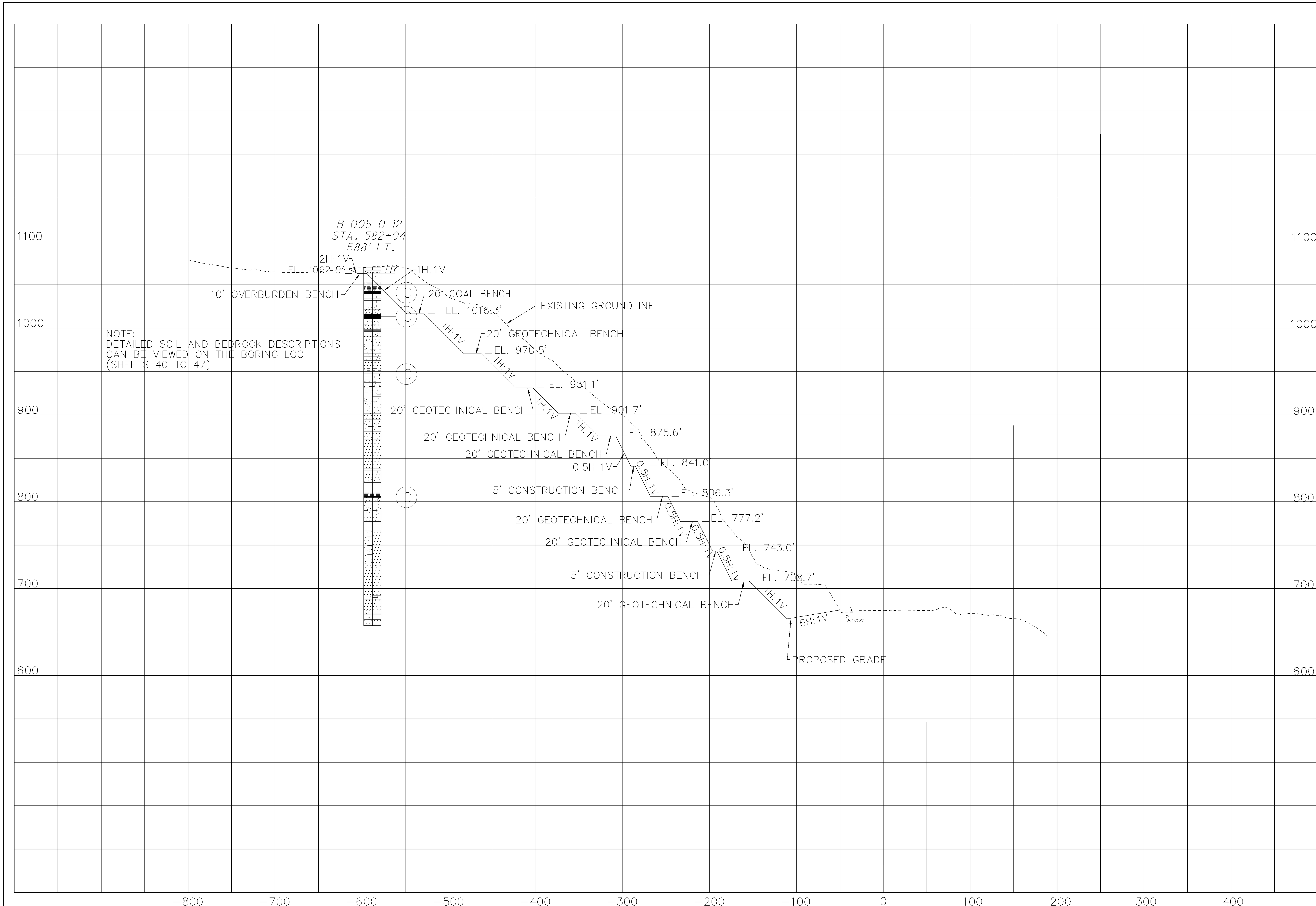


0 50 100
HORIZONTAL
SCALE IN FEET

DRAWN MSJ
CHECKED EMK

CUT STABILITY SECTION
STATION 574+50

JEF-7-10.00



0 25 50 100
HORIZONTAL SCALE IN FEET

DRAWN MSJ
CHECKED EMK

CUT STABILITY SECTION
STATION 582+00

JEF-7-10.00

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. PROCTOR	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 553+92, 467 LT
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1025.8 (MSL) EOB: 82.0 ft.
START: 3/23/12 END: 3/28/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.276136040, -80.620404880

EXPLORATION ID B-001-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV. (top 1025.8)
MEDIUM DENSE, OLIVE GRAY, SAND WITH SOME SILT, SOME STONE FRAGMENTS (FILL), DRY	1024.0
STIFF, OLIVE GRAY TO BROWN, **SILT**, TRACE STONE FRAGMENTS, SOME CLAY (WEATHERED SHALE), DRY	1019.0
COAL, BLACK, DENSE TO VERY DENSE, DRY (RESIDUAL).	1012.2
MEDIUM STIFF, BROWN, **CLAY**, TRACE SAND, WET	1011.7
VERY DENSE, GRAY/BROWN, **GRAVEL AND/OR STONE FRAGMENTS**, (WEATHERED SHALE), DRY	1010.8
LIMESTONE, BROWN/GRAY, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, THICK BEDDED, CALCAREOUS, JOINTING, HIGHLY TO MODERATELY FRACTURED, TIGHT, SLIGHTLY ROUGH, OCCASIONAL SHALE LAYERS; RQD 54%, REC 100%.	1008.2
SHALE, GRAY/BROWN, UNWEATHERED TO HIGHLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, SILTY, CALCAREOUS, OCCASIONAL JOINT, HIGHLY TO MODERATELY FRACTURED, TIGHT, SLIGHTLY ROUGH; RQD 11%, REC 100%. @ 18.4'-18.6'; 18.7'-18.9'; 20.0'-20.2'; 21.8'-22.0' - 90° FRACTURE LOST WATER RETURN @ 20.0'; WATER RETURNED @ 20.6' @22.0'-23.0', SDI (Id_2)=86.8%	1002.8
SANDSTONE, GRAY/BROWN, SLIGHTLY WEATHERED, STRONG, MEDIUM GRAINED, MEDIUM BEDDED, MICACEOUS, JOINT, FRACTURED TO MODERATELY FRACTURED, TIGHT, ROUGH; RQD 35%, REC 100%.	1001.1
LIMESTONE, GRAY/BROWN, UNWEATHERED TO SEVERELY WEATHERED, VERY WEAK TO EXTREMELY STRONG, VERY THICK BEDDED, JOINT, HIGHLY TO MODERATELY FRACTURED; RQD 51%, REC 100%. @ 24.7'-25.6' - SEVERELY WEATHERED CLAY @ 27.0'-27.8' - VERTICAL FRACTURES @ 27.9'-28.1' - CLAY @ 28.6'-28.7' - 30° CLAY FILLED FRACTURES	996.6
SHALE, BROWN/GRAY, SEVERELY WEATHERED, VERY WEAK, VERY THIN BEDDED, ARGILLACEOUS, HIGHLY FRACTURED, TIGHT, OCCASIONAL CLAYSTONE LAYERS, OCCASIONAL SANDY LAYERS; RQD 56%, REC 87%. @34.5'-35.5', SDI (Id_2)=47.4% @ 35.1', Qu = 142 psi	989.8
SILTSTONE WITH INTERBEDDED LIMESTONE/SHALE LAYERS, BROWN/GRAY, SLIGHTLY TO MODERATELY WEATHERED, VERY THIN TO MEDIUM BEDDING, CALCAREOUS, JOINT, MODERATELY FRACTURED, TIGHT, SLIGHTLY ROUGH, SANDY LAYERS; RQD 98%, REC 100%. @ 36.0'-36.4' - LIMESTONE @ 36.5'; 37.2' - CLAY LAYERS	983.8
SHALE, DARK GRAY, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, FRIABLE, JOINT, HIGHLY FRACTURED, SLICKENSIDED; RQD 0%, REC 75%.	982.6
SILTSTONE, GRAY/BROWN, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, THICK BEDDED, JOINT, FRACTURED TO MODERATELY FRACTURED; RQD 28%, REC 100%. 45.1'-46.0' - 85° FRACTURES	979.8
CLAYSTONE, GRAY/BROWN, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, ZONES ARENACEOUS, JOINT, HIGHLY FRACTURED TO MODERATELY FRACTURED, OCCASIONAL SILTSTONE LAYERS, (VERY BROKEN WITH CLAY); RQD 28%, REC 67%.	973.8

DEPTHS: TR (6.5'); W (8.0')

DEPTH	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
1.5-3.0	3-4-8	18	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-4b (V)	
3.5-5.0	3-7-9	24	67	SS-2	-	-	-	-	-	-	-	-	-	-	A-4b (V)	
6.0-7.5	9-13-24	55	100	SS-3	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
8.5-10.0	30-46-46	136	100	SS-4	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
11.0-12.5	32-36-32	100	100	SS-5	-	-	-	-	-	-	-	-	-	-	A-4a (V)	
13.5-14.2	3-50/2"	-	100	SS-6	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	
15.0-22.0	29		100	NQ-1											CORE	
22.0-32.0	29		91	NQ-2											CORE	
32.0-42.0	97		100	NQ-3											CORE	
42.0-52.0	26		77	NQ-4											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-001-0-12

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/23/12 END: 3/28/12	DRILLING FIRM / OPERATOR: ODOT / M. PROCTOR SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 553+92, 467 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1025.8 (MSL) EOB: 82.0 ft. COORD: 40.276136040, -80.620404880

EXPLORATION ID B-001-0-12

PAGE 2 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	973.8	52																
SILTSTONE, OLIVE GREEN/BROWN, SLIGHTLY TO MODERATELY WEATHERED, SLIGHTLY STRONG, THICK BEDDED, CALCAREOUS NODULES, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 79%, REC 100%.	971.4	52–54																
SANDSTONE, GRAY, SLIGHTLY WEATHERED, STRONG, FINE TO MEDIUM GRAINED, THICK BEDDED, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 60%, REC 100%. @ 54.7'-55.0' - 90° FRACTURE	969.9	55–56																
SHALE, OLIVE GREEN/BROWN, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, SILTY, JOINT, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 21%, REC 97%. @ 62.0'-62.2' - GRAY AND CALCAREOUS	963.6	57–62	41		98	NQ-5											CORE	
LIMESTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, SLIGHTLY TO MODERATELY STRONG, THIN BEDDED, OCCASIONALLY SHALY, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 35%, REC 100%.	961.3	63–64																
CLAYSTONE, GRAY/PURPLE, MODERATELY TO HIGHLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THICK BEDDED, OCCASIONALLY CALCAREOUS, SHEAR, FRACTURED TO SLIGHTLY FRACTURED, SLICKENSIDED, OCCASIONAL SILTSTONE LAYERS; RQD 71%, REC 100%. @ 65.0'-65.6', SDI (Id_2)=45.2%	955.0	65–70	65		100	NQ-6											CORE	
SILTSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, MEDIUM BEDDED, SANDY LAYERS, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 92%, REC 100%.	953.7	71–72																
SHALE, OLIVE GREEN/GRAY, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO MODERATELY STRONG, VERY THIN BEDDED, SILTY, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH, OCCASIONAL WATER STAINED FRACTURES; RQD 64%, REC 100%. @ 73.2'-73.7' SDI (Id_2)=98.2% @ 77.7', Qu = 822 psi @ 78.0'-79.5' - HIGHLY FRACTURED WITH WATER STAINED JOINTS	945.7	73–80	67		100	NQ-7											CORE	
CLAYSTONE, DARK GRAY, SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, INDISTINCT, JOINT, HIGHLY TO MODERATELY FRACTURED, TIGHT, SLICKENSIDED; RQD 84%, REC 100%.	943.8	81–82 EOB																

> Abandoned Boring Due to Crooked Hole and Trouble with Water Return. Refer to Boring B-001-1-12 for Description Greater than 82.0 FT.

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: NOT RECORDED

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 553+92, 467 LT	EXPLORATION ID B-001-1-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1025.8 (MSL) EOB: 312.0 ft.	PAGE
START: 4/7/12 END: 4/16/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.276136040, -80.620404880	1 OF 6

MATERIAL DESCRIPTION AND NOTES	ELEV. 1025.8	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
UNSAMPLED CASING ADVANCEMENT FROM 0-82.0 FT. REFER TO BORING LOG B-001-0-12 FOR MATERIAL DESCRIPTION. OFFSET 5.0' FROM B-001-0-12 DUE TO ABANDONMENT OF B-001-0-12.		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55																

ROCKFALL EXPLORATION
BORING LOG B-001-1-12

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 | DRILLING FIRM / OPERATOR: ODOT / M. LEWIS | DRILL RIG: CME 850 TRACKED | STATION / OFFSET: 553+92, 467 LT | EXPLORATION ID B-001-1-12
TYPE: ROCKFALL | SAMPLING FIRM / LOGGER: HDR / R. KANITH | HAMMER: AUTOMATIC HAMMER | ALIGNMENT: CL S.R. 7
PID: 92855 BR ID: | DRILLING METHOD: 3.0" OD CASING / NQ | CALIBRATION DATE: 4/1/11 | ELEVATION: 1025.8 (MSL) EOB: 312.0 ft. | PAGE 2 OF 6
START: 4/7/12 END: 4/16/12 | SAMPLING METHOD: SPT | ENERGY RATIO (%): 88.4 | COORD: 40.276136040, -80.620404880

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	970.8	55																
UNSAMPLED CASING ADVANCEMENT FROM 0-82.0 FT. REFER TO BORING LOG B-001-0-12 FOR MATERIAL DESCRIPTION. OFFSET 5.0' FROM B-001-0-12 DUE TO ABANDONMENT OF B-001-0-12.	943.8	56–81, TR 82																
CLAYSTONE, PURPLE/GRAY, MODERATELY TO SLIGHTLY WEATHERED, WEAK, VERY THICK BEDDED, CALCAREOUS ZONES, SLICKENSIDES, FRACTURED TO MODERATELY FRACTURED, SILTSTONE LAYERS; RQD 38%, REC 100%.	939.3	83–86																
SILTSTONE, GREEN GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THICK BEDDED, FRACTURED TO SLIGHTLY FRACTURED, JOINTS MODERATELY WEATHERED; RQD 69%, REC 100%. @ 90.6'-92.0' - HIGH ANGLE FRACTURES 70°-90° WITH MODERATE WEATHERING	934.1	87–91	53		100	NQ-8											CORE	
CLAYSTONE, PURPLE/GRAY, UNWEATHERED TO MODERATELY WEATHERED, WEAK, THICK BEDDED, SLICKENSIDED WITH CALCAREOUS NODULES, HIGHLY FRACTURED TO MODERATELY FRACTURED; RQD 74%, REC 100%. @ 93.8'-94.0' - CONGLOMERATE	931.8	92–94																
LIMESTONE, GRAY, SLIGHTLY WEATHERED, STRONG, THICK BEDDED, HIGHLY TO MODERATELY FRACTURED; RQD 82%, REC 100%.	930.1	95																
INTERBEDDED SILTSTONE, LIMESTONE AND CLAYSTONE, GRAY, SLIGHTLY WEATHERED, WEAK TO STRONG, THIN TO MEDIUM BEDDED, FOSSILIFEROUS, CALCAREOUS NODULES, HIGHLY TO MODERATELY FRACTURED; RQD 70%, REC 100%. @ 98.3'-100.5' - OCCASIONALLY CONGLOMERATIC @ 103.9'-104.3' - MODERATELY WEATHERED, HIGH ANGLE FRACTURES 70°-90°	921.5	96–104	75		100	NQ-9											CORE	

14/47

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-001-1-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 553+92, 467 LT
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1025.8 (MSL) EOB: 312.0 ft.
START: 4/7/12 END: 4/16/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.276136040, -80.620404880

EXPLORATION ID B-001-1-12

MATERIAL DESCRIPTION AND NOTES	ELEV.
	921.5
CLAYSTONE, BROWN/PURPLE GRAY, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, CALCAREOUS ZONES, SILTY WITH OCCASIONAL SLICKENSIDES, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED OCCASIONALLY WITH OCCASIONAL ARGILLACEOUS SHALE LAYERS; RQD 62%, REC 100%. @ 109.0'-109.6' - 80° FRACTURE @ 112.9' - SLICKENSIDED @ 114.0'-114.3' - 90° FRACTURE, MODERATELY WEATHERED @ 114.0'-114.8' - SILTSTONE LAYER	911.0
SHALE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, OCCASIONAL CALCAREOUS LENSES, SILTY, FRACTURED TO INTACT; RQD 93%, REC 100%. @ 115.2'-115.6' - 45°-90° FRACTURE, MODERATELY WEATHERED @ 117.4' - 30° FRACTURE, MODERATELY WEATHERED @ 118.1', Qu = 1,326 psi @ 124.7' - CLAY SEAM	900.3
CLAYSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, VERY WEAK TO WEAK, THICK BEDDED, OCCASIONAL CALCAREOUS LENSES, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 79%, REC 100%.	897.0
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG TO STRONG, THICK BEDDED, FOSSILIFEROUS, BRECCIATED ZONES, HIGHLY TO MODERATELY FRACTURED WITH OCCASIONAL SILTSTONE LAYERS, OCCASIONAL PYRITE; RQD 76%, REC 100%. @ 129.1'-130.3' - BRECCIATED LIMESTONE @ 130.3'-131.7' - SILTSTONE LAYER @ 130,6'-131.0', SDI (Id_2)=45.8% @ 131.7-132.0' - 90° FRACTURE @ 135.5', Qu = 3,445 psi	888.3
SILTSTONE WITH LIMESTONE INTERBEDS, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, STRINGERS, HIGHLY FRACTURED TO INTACT, OCCASIONAL FINE GRAINED SANDSTONE LAYERS, OCCASIONAL SHALE LAYERS; RQD 81%, REC 100%. @ 137.5'-137.7' - CLAYSTONE LAYER	876.4
SANDSTONE, GRAY TO BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG TO STRONG, FINE GRAINED TO MEDIUM GRAINED, VERY THICK BEDDED, WITH LAMINATIONS, MICACEOUS, BLACK LAMINATIONS, SLIGHTLY FRACTURED, OCCASIONAL SHALE LAYERS; RQD 100%, REC 100%. @ 155.5', Qu = 4,347 psi	

DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
107	63		100	NQ-10											CORE	
117	88		100	NQ-11											CORE	
127	80		100	NQ-12											CORE	
137	64		100	NQ-13											CORE	
147	100		100	NQ-14											CORE	
157	100		100	NQ-15											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-001-1-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 553+92, 467 LT	EXPLORATION ID B-001-1-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1025.8 (MSL) EOB: 312.0 ft.	PAGE 4 OF 6
START: 4/7/12 END: 4/16/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.276136040, -80.620404880	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, GRAY TO BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG TO STRONG, FINE GRAINED TO MEDIUM GRAINED, VERY THICK BEDDED, WITH LAMINATIONS, MICACEOUS, BLACK LAMINATIONS, SLIGHTLY FRACTURED; RQD 100%, REC 100%. @ 161.7'-162.0' - 80° FRACTURE, MODERATELY WEATHERED @ 162.0' - BECOMING STRONG @ 169.9'-171.1' - CARBONACEOUS LAMINATIONS @ 174.0'-177.0' - HIGHLY STAINED @ 174.9'-176.9' - CARBONACEOUS SEAMS	865.8	160																
		162–172	100		100	NQ-16											CORE	
	848.7	172–182	100		100	NQ-17											CORE	
SILTSTONE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, THICK BEDDED, INTACT, WHITE STRINGERS; RQD 100%, REC 100%.	845.7																	
SANDSTONE, GRAY TO BROWN, UNWEATHERED TO HIGHLY WEATHERED, WEAK TO STRONG, FINE TO MEDIUM GRAINED, VERY THICK BEDDED, WITH LAMINATIONS, MICACEOUS, SLIGHTLY FRACTURED, CARBONACEOUS STRINGERS; RQD 95%, REC 98%. @ 189.9'-192.0' - HEAVILY STAINED @ 191.6'-192.0' - 80° FRACTURE, MODERATELY WEATHERED @ 192.9'-193.1' - CARBONACEOUS SEAM @ 194.0' - LOSS OF CIRCULATION @ 194.1'-194.8' - SILTSTONE @ 194.8'-196.7' - CARBONACEOUS SEAMS, VERY WEAK @ 197.0' - CHANGES TO REDDISH ORANGE		182–192	100		100	NQ-18											CORE	
		192–197	100		100	NQ-19											CORE	
		197–202	95		100	NQ-20											CORE	
@ 202.0'-206.7' - VERY WEAK, HIGHLY WEATHERED ZONE, CARBONACEOUS STRINGERS AND INCLUSIONS, VUGGY @ 205.3', Qu = 3,215 psi @ 206.7' - COLOR CHANGES TO GRAY @ 206.7'-207.8' - CARBONACEOUS STRINGERS AND SILTSTONE INCLUSIONS @ 207.8' - TRANSITIONS TO FINE GRAIN WITH LAMINATIONS		202–212	91		91	NQ-21											CORE	
		215																

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-001-1-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 4/7/12 END: 4/16/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" OD CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 553+92, 467 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1025.8 (MSL) EOB: 312.0 ft. COORD: 40.276136040, -80.620404880

EXPLORATION ID B-001-1-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, GRAY TO BROWN, UNWEATHERED TO HIGHLY WEATHERED, WEAK TO STRONG, FINE TO MEDIUM GRAINED, VERY THICK BEDDED, WITH LAMINATIONS, MICACEOUS, SLIGHTLY FRACTURED, CARBONACEOUS STRINGERS; RQD 95%, REC 100%. @ 212.0'-213.0' - COLOR IS REDDISH ORANGE, HIGHLY WEATHERED ZONES @ 214.0' -215.5' - MODERATELY WEATHERED AND FRACTURED @ 215.5' - TRANSITIONS TO GRAY COLOR WITH CARBONACEOUS LAMINATIONS @ 220.7'-221.3' - HIGHLY FRACTURED	810.8	215–222	93		100	NQ-22											CORE	
@ 230.0'-233.3' - BRECCIATED WITH SILTSTONE AND CARBONACEOUS LAYERS, CALCAREOUS	792.5	222–232	94		99	NQ-23											CORE	
SILTSTONE, GRAY, SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THICK BEDDED, SLIGHTLY FRACTURED; RQD 100%, REC 100%.	790.3																	
SHALE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, VERY WEAK, HIGHLY FRACTURED; RQD 0%, REC 40%.	789.8																	
INTERBEDDED LIMESTONE, SHALE AND SILTSTONE, GRAY, SLIGHTLY WEATHERED, SLIGHTLY STRONG, CALCAREOUS, FOSSILIFEROUS, SLIGHTLY TO MODERATELY FRACTURED; RQD 78%, REC 100%. @ 237.0' - CLAY SEAM @ 239.3'-241.2' - FOSSILIFEROUS	784.1	232–242	82		97	NQ-24											CORE	
SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY FINE TO FINE GRAINED SAND, INDISTINCT BEDDING, SLIGHTLY FRACTURED, ZONES ARENACEOUS; RQD 91%, REC 100%. @ 242.0'-242.5' - VERY FRACTURED @ 242.5', Qu = 4,928 psi @ 244.8'-245.3', SDI (Id_2)=94.5%	775.3	242–252	88		100	NQ-25											CORE	
SANDSTONE, GRAY, UNWEATHERED, SLIGHTLY STRONG, FINE TO MEDIUM GRAINED, VERY THICK BEDDED, SLIGHTLY FRACTURED; RQD 84%, REC 100%.	772.1																	
SILTSTONE, GRAY, UNWEATHERED, WEAK TO SLIGHTLY STRONG, THICK BEDDED, SLIGHTLY FRACTURED, WHITE STRINGERS; RQD 100%, REC 100%.	769.2	252–262	87		100	NQ-26											CORE	
SHALE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, CARBONACEOUS SEAMS, SLIGHTLY TO MODERATELY FRACTURED, TIGHT; RQD 65%, REC 99%. @ 260.0'-265.0' - OCCASIONAL COAL PARTINGS @ 266.0'-266.6', SDI (Id_2)=95.7%		262–270	68		98	NQ-27											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-001-1-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 5/1/12 END: 5/9/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" STEEL CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 560+23, 482 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1021.3 (MSL) EOB: 312.0 ft. COORD: 40.277743930, -80.620209110

EXPLORATION ID: B-002-0-12
PAGE 4 OF 6

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, BROWN/GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, MODERATELY STRONG, MEDIUM GRAINED, LAMINATED TO THICK BEDDED, MICACEOUS, OCCASIONAL CARBONACEOUS LAMINATIONS, HIGHLY FRACTURED TO UNFRACTURED, OCCASIONAL CARBONACEOUS LAMINATIONS; RQD 94% REC 100%.	860.5	161																
@ 160.8'-162.0 - BROWN		162–172	87		100	NQ-16											CORE	
		172–182	100		100	NQ-17											CORE	
@ 189.8'-192.0' - SPHERICAL FRACTURING		182–192	94		100	NQ-18											CORE	
	825.5	195.0																
SHALE, DARK GRAY, UNWEATHERED, MODERATELY STRONG, THIN BEDDED, ARENACEOUS, UNFRACTURED; RQD 100%, REC 100%. @ 197.0'-197.7', SDI (Id_2)=98.4% @ 198.7', Qu = 4,875 psi @ 199.4'-199.7' - BRECCIATED/CONGLOMERATE ZONE		192–202	100		100	NQ-19											CORE	
	821.9	198.6																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO COARSE GRAINED, LAMINATED TO THICK BEDDED, MICACEOUS, CARBONACEOUS LAMINATIONS, UNFRACTURED, OCCASIONAL CARBONACEOUS STRINGERS; RQD 100%, REC 100%.		W 200																
@ 207.4', Qu = 6,805 psi		202–212	100		100	NQ-20											CORE	
		212–216																

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-002-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 5/1/12 END: 5/9/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" STEEL CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 560+23, 482 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1021.3 (MSL) EOB: 312.0 ft. COORD: 40.277743930, -80.620209110	EXPLORATION ID B-002-0-12 PAGE 5 OF 6

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	805.3	216																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO COARSE GRAINED, LAMINATED TO THICK BEDDED, MICACEOUS, CARBONACEOUS LAMINATIONS, UNFRACTURED, OCCASIONAL CARBONACEOUS STRINGERS; RQD 100%, REC 100%.	800.5	216 - 221	100		100	NQ-21											CORE	
CARBONACEOUS SHALE/COAL, DARK GRAY/BLACK, UNWEATHERED, WEAK, VERY THIN BEDDED, SLICKENSIDED; RQD 100%, REC 100%.	799.1	222																
CLAYSTONE, GRAY, MODERATELY TO HIGHLY WEATHERED, VERY WEAK, VERY THICK BEDDED, HIGHLY TO SLIGHTLY FRACTURED, SLICKENSIDED, TIGHT; RQD 90%, REC 100%.	790.2	222 - 231	91		100	NQ-22											CORE	
SILTSTONE, GRAY/GREEN GRAY, UNWEATHERED TO MODERATELY WEATHERED, MODERATELY STRONG TO WEAK, OCCASIONAL CALCAREOUS LAYERS, HIGHLY TO MODERATELY FRACTURED, WITH CLAYSTONE AND SHALE LAYERS; RQD 30%, REC 100%.	787.2	232 - 234																
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG, INDISTINCT BEDDING, FOSSILIFEROUS, FRACTURED TO MODERATELY FRACTURED, TIGHT; RQD 59%, REC 100%.	785.0	234 - 236	59		100	NQ-23											CORE	
SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, ARENACEOUS, HIGHLY TO SLIGHTLY FRACTURED; RQD 73%, REC 100%.	781.0	236 - 240																
SANDSTONE, GRAY/GREEN GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, VERY FINE TO FINE GRAINED, SLIGHTLY FRACTURED TO MODERATELY FRACTURED, OCCASIONAL SILSTONE LAYERS; RQD 100%, REC 100%. @ 242.1'-245.6' - BRECCIATED ZONE	775.7	240 - 246	95		100	NQ-24											CORE	
SANDSTONE, GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, STRONG, MEDIUM GRAINED, LAMINATED TO THICK BEDDED, CARBONACEOUS STRINGERS, MICACEOUS, FRACTURED TO INTACT FRACTURING, OCCASIONAL SHALE LAYERS, CARBONACEOUS STRINGERS THROUGHOUT, OCCASIONAL PLANT/STEM FOSSIL IN PARTINGS; RQD 95%, REC 100%. @ 251.7-257.8' - SHALE GRAY @ 252.3', 253.3', 255.7', 257.5' - COAL/CARBONACEOUS LENSES ON BREAKS @ 253.4', Qu = 7,995 psi @ 261.2'-262.0' - GRAY TO DARK GRAY, CARBONACEOUS SHALE	759.3	246 - 262	97		100	NQ-25											CORE	
COAL, BLACK, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK, VERY THIN BEDDED, PYRITE, HIGHLY TO MODERATELY FRACTURED; RQD 31%, REC 100%.	758.0	262 - 263																
CLAYSTONE, GRAY, MODERATELY TO HIGHLY WEATHERED, WEAK, VERY THICK BEDDED, CALCAREOUS OCCASIONALLY, FRACTURED TO SLIGHTLY FRACTURED, SLICKENSIDED; RQD 88%, REC 100%. @ 267.0' - 30° FRACTURES	751.3	263 - 270	83		100	NQ-26											CORE	
SILTSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, MODERATELY STRONG TO WEAK, ARENACEOUS, OCCASIONAL CALCAREOUS NODULES, UNFRACTURED; RQD 100%, REC 100%.		270 - 272																

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 5/1/12 END: 5/9/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" STEEL CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 560+23, 482 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1021.3 (MSL) EOB: 312.0 ft. COORD: 40.277743930, -80.620209110

EXPLORATION ID B-002-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SILTSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, MODERATELY STRONG TO WEAK, ARENACEOUS, OCCASIONAL CALCAREOUS NODULES, UNFRACTURED; RQD 100%, REC 100%.	749.3 / 745.0	272–276																
SHALE, GREEN GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THIN BEDDED, OCCASIONAL CALCAREOUS STRINGERS, UNFRACTURED, OCCASIONAL SILTSTONE LAYERS; RQD 100%, REC 100%. @ 284.1'-284.6' - LIMESTONE	736.7	276–284.6	100		100	NQ-27											CORE	
SHALE, PURPLE GRAY/RED, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, ARGILLACEOUS, HIGHLY FRACTURED TO INTACT, FRIABLE, OCCASIONAL SANDY SILTSTONE ZONES; RQD 90%, REC 100%. @ 286.0'-286.6', SDI (Id_2)=9.3% @ 288.8'-288.9' - HIGHLY FRACTURED @ 290.6'-291.3', SDI (Id_2)=4.4% @ 293.4' - 30° CALCITE FILLED FRACTURE	725.3	284.6–296	99		100	NQ-28											CORE	
SHALE, DARK GRAY TO BLACK, UNWEATHERED TO HIGHLY WEATHERED, WEAK TO MODERATELY STRONG, VERY THIN BEDDED, FRIABLE, OCCASIONAL CARBONACEOUS, HIGHLY FRACTURED TO INTACT, OCCASIONAL SILTSTONE LAYERS THROUGHOUT; RQD 82%, REC 100%. @ 297.7-298.4' - HIGHLY WEATHERED, CLAY LIKE @ 300.1', Qu = 3,315 psi @ 302.1', Qu = 4,116 psi @ 302.8'-306.5' - BECOMING ARENACEOUS @ 305.0' - LOST WATER RETURN	714.8	296–306.5	71		100	NQ-29											CORE	
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, LAMINATED TO THICK BEDDED, BLACK LAMINATIONS, UNFRACURED; RQD 100%, REC 100%.	709.3	306.5–312 EOB	100		100	NQ-30											CORE	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 100 LB. BENTONITE POWDER; 564 LB. CEMENT; 60 GAL. WATER

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-002-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 567+45, 517 LT
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1066.9 (MSL) EOB: 372.5 ft.
START: 3/29/12 END: 4/5/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.279572570, -80.620461880

EXPLORATION ID B-003-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV. 1066.9	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
OLIVE GREEN, **SILTY SAND**, DRY	1066.4																	
MEDIUM DENSE TO VERY DENSE, OLIVE GREEN, GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, (WEATHERED SHALE), DRY		2	6 9 17	38	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
		4	20 36 40	112	100	SS-2	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
	1059.4	6–7	28 48 50/3"	-	100	SS-3	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
SHALE, GRAY TO BROWN, SLIGHTLY TO MODERATELY WEATHERED, WEAK, VERY THIN BEDDED, SILTY, JOINT, FRACTURED TO MODERATELY FRACTURED, TIGHT, SLIGHTLY ROUGH, OCCASIONAL VERTICAL FRACTURES; RQD 41%, REC 95%. @ 8.7' - CLAY SEAM		TR 10	44		100	NQ-1											CORE	
@ 13.2'-13.6'; 15.8'-16.8' - 90° FRACTURE	1047.8	17	29		91	NQ-2											CORE	
CLAYSTONE, GRAY, HIGHLY WEATHERED, VERY WEAK, MEDIUM BEDDED, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 33%, REC 75%. @ 19.6'-19.8' - COAL	1046.6																	
COAL, BLACK, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK, VERY THIN BEDDED, PYRITIC, BANDING, FRACTURED, TIGHT, SLICKENSIDED; RQD 0%, REC 100%.	1044.4																	
SHALE, GRAY TO BROWN, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, CALCAREOUS, BEDDING, HIGHLY FRACTURED TO FRACTURED, SLIGHTLY ROUGH; RQD 35%, REC 88%. 22.5'-22.7' - UNDER CLAY 23.6'-24.2' - SILSTONE LAYER	1042.7																	
LIMESTONE, GRAY TO BROWN, UNWEATHERED TO SEVERELY WEATHERED, WEAK TO VERY STRONG, OCCASIONALLY FOSSILIFEROUS, FRACTURED TO HIGHLY FRACTURED; RQD 72%, REC 100%. @ 25.9' - 45° FRACTURE @ 27.0'-27.1' - 45°-90° FRACTURE @ 27.4'-27.9' - WEAK ZONE		27	64		98	NQ-3											CORE	
@ 33.0'-33.2'; 36.5'-37.6' - SEVERELY WEATHERED @ 35.9'-36.5' - VERTICAL FRACTURE @ 37.6'-38.1' - UNWEATHERED	1028.8	37	42		60	NQ-4											CORE	
VOID OR SOFT ZONE, RQD 0%, REC 0%. @ 38.1'-42.1' - TOOLS DROPPED (4.0')	1024.8																	
CLAYSTONE, BROWN, SEVERELY WEATHERED, VERY WEAK, CALCAREOUS, CLAY-LIKE, INDISTINCT FRACTURING/BEDDING, TRACE ROCK FRAGMENTS, POSSIBLE MATERIAL FROM MINE COLLAPSE; RQD 0%, REC 27%. @ 47.5'-48.5' - SOFT	1018.4	45	0		26	NQ-5											CORE	
CLAYSTONE, GRAY TO DARK GRAY, SEVERELY WEATHERED, OCCASIONALLY CARBONACEOUS, INDISTINCT FRACTURING/BEDDING; RQD 0%, REC 54%. @ 54.3 - LIMESTONE NODULES	1012.1	50	0		40	NQ-6											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-003-0-12

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/29/12 END: 4/5/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 567+45, 517 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.9 (MSL) EOB: 372.5 ft. COORD: 40.279572570, -80.620461880	EXPLORATION ID B-003-0-12 PAGE 2 OF 7

MATERIAL DESCRIPTION AND NOTES	ELEV. 1012.1	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, FRACTURED TO SLIGHTLY FRACTURED, TIGHT, SLIGHTLY ROUGH; RQD 89%, REC 100%. @ 55.7' - LIMESTONE NODULES	1005.8	55–61	65		95	NQ-7											CORE	
SILTSTONE WITH LIMESTONE INTERBEDS, GRAY, SLIGHTLY TO MODERATELY WEATHERED, WEAK TO STRONG, INDISTINCT BEDDING, SHALE LAYERS, HIGHLY TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 41%, REC 100%.	1002.6	61–64	26		95	NQ-8											CORE	
SILTSTONE AND SHALE INTERBEDS, GRAY, UNWEATHERED TO HIGHLY WEATHERED, VERY WEAK TO MODERATELY STRONG, VERY THIN TO MEDIUM BEDDING, HIGHLY TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH TO SLICKENSIDED; RQD 31%, REC 95%. @ 65.1', Qu = 432 psi @ 66.4' - CLAY @ 66.9' - CLAY @ 67.0'-67.1' - CLAY SEAM @ 68.7'-69.6' - SHALE WITH CLAY @ 72.9'-73.4' - CLAY SEAM @ 70.5'-71.0', SDI (Id_2)=95.1% @ 76.9'-77.1' - SEVERELY WEATHERED, CLAY LAYER	989.6	64–77	70		100	NQ-9											CORE	
LIMESTONE, GRAY TO BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG, MEDIUM BEDDED, INDISTINCT FRACTURING, VERY ROUGH, TRACE FOSSILS; RQD 100%, REC 100%.	988.3	77–79																
SANDSTONE, GRAY, SLIGHLY WEATHERED, MODERATELY STRONG, FINE GRAINED, LAMINATED TO THIN BEDDED, CALCAREOUS NODULES, SILTY, FRACTURED TO SLIGHTLY FRACTURED, TIGHT, SLIGHTLY ROUGH; RQD 88%. @ 78.6' - 40° Fracture	984.9	79–82																
CLAYSTONE, GRAY, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, OCCASIONAL CALCAREOUS, SLICKENSIDED, HIGHLY TO MODERATELY FRACTURED, TIGHTLY SLICKENSIDED; RQD 38%, REC 90%. @ 84.4'-84.5'; 85.0' - SLICKENSIDE @ 86.3'-86.8', SDI (Id_2)=67.6%	978.9	82–88	64		94	NQ-10											CORE	
SILTSTONE, GRAY, SLIGHTLY TO UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, OCCASIONAL CALCAREOUS NODULES, MODERATELY TO SLIGHTLY FRACTURED, TIGHT, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 90.3', Qu = 3,049 psi @ 93.3'-93.8' - 90° FRACTURE, WATER STAINED	971.6	88–95																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, MEDIUM GRAINED, LAMINATED TO MEDIUM BEDDED, FRACTURED TO SLIGHTLY FRACTURED, TIGHT, SLIGHTLY ROUGH; RQD 92%, REC 100%.	969.1	95–98	90		100	NQ-11											CORE	
CLAYSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THICK BEDDED, OCCASIONALLY CALCAREOUS, UNFRACTURED,OCCASIONAL ARGILLACEOUS SHALE LAYERS; RQD 100%, REC 100%. @ 102.6'-103.6', SDI (Id_2)=50.1%	963.2	98–104																
SILTSTONE, GREENISH GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, ARENACEOUS, INTACT TO UNFRACTURED, SLIGHTLY ROUGH; RQD 95%, REC 100%. @ 103.8'-104.8' - LIMESTONE		104–110	87		100	NQ-12											CORE	

GRADATION (%): GR, CS, FS, SI, CL; ATTERBERG: LL, PL, PI

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 567+45, 517 LT	EXPLORATION ID B-003-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1066.9 (MSL) EOB: 372.5 ft.	PAGE 3 OF 7
START: 3/29/12 END: 4/5/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.279572570, -80.620461880	

MATERIAL DESCRIPTION AND NOTES	ELEV.
	956.9
SILTSTONE, GREENISH GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, ARENACEOUS, INTACT TO UNFRACTURED, SLIGHTLY ROUGH, OCCASIONAL CALCAREOUS NODULES, SANDY LAYERS THROUGHOUT, OCCASIONAL SHALE LAYERS; RQD 95%, REC 100%.	940.5
CLAYSTONE, GRAY/PURPLE, MODERATELY TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THICK BEDDED, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 70%, REC 100%.	934.4
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, THIN BEDDED, OCCASIONAL SHALY LAYERS, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 81%, REC 100%.	929.1
CLAYSTONE, GRAY/PURPLE, SLIGHTLY TO MODERATELY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, VERY THICK BEDDED, CALCAREOUS, FRACTURED TO SLIGHTLY FRACTURED, SLICKENSIDED, INTERBEDDED LIMESTONE AND SILTSTONE LAYERS; RQD 65%, REC 96%. @ 138.5', Qu = 320 psi @ 142.7'-143.3'; 143.8'-144.0'; 146.2'-146.5' - LIMESTONE	917.8
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, THICK BEDDED, UNFRACTURED; RQD 100%, REC 100%.	915.9
CLAYSTONE, GRAY, MODERATELY WEATHERED, WEAK, THICK BEDDED, FRACTURED TO MODERATELY FRACTURED; RQD 53%, REC 100%.	914.0
SILTSTONE, GREENISH GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, UNFRACTURED; RQD 100%, REC 100%. @ 158.2', Qu = 539 psi	906.9
SHALE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THIN BEDDED, LAMINATED, UNFRACTURED; RQD 100%, REC 100%. @ 162.5'-163.5', SDI (Id_2)=96.0%	901.3

DEPTHS: 110 – 165

SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
100		100	NQ-13											CORE	
82		100	NQ-14											CORE	
70		96	NQ-15											CORE	
76		100	NQ-16											CORE	
100		100	NQ-17											CORE	

ROCKFALL EXPLORATION
BORING LOG B-003-0-12 (CONT.)

DRAWN MSJ CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/29/12 END: 4/5/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 567+45, 517 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.9 (MSL) EOB: 372.5 ft. COORD: 40.279572570, -80.620461880

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	901.3																	
COAL, BLACK, UNWEATHERED, VERY WEAK, VERY THIN BEDDED, HIGHLY FRACTURED; RQD 0%, REC 100%.	900.8	166																
INTERBEDDED LIMESTONE AND SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, OCCASIONAL FOSSILS, HIGHLY TO SLIGHTLY FRACTURED; RQD 86%, REC 100%.	893.8	167–173	91		100	NQ-18											CORE	
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO VERY STRONG, VERY THICK BEDDED, FOSSILIFEROUS, FRACTURED TO SLIGHTLY FRACTURED, OCCASIONAL SHALE LAYERS; RQD 97%, REC 100%. @ 179.2'-179.4' - SHALE	886.8	173–180	90		100	NQ-19											CORE	
SILTSTONE, GREENISH GRAY, SLIGHTLY WEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS, SANDY, PYRITIC, CALCITE VEINS, FRACTURED TO UNFRACTURED, SLICKENSIDED, OCCASIONAL LIMESTONE AND CLAYSTONE LAYERS; RQD 98%, REC 100%. @ 181.6' - PYRITE IN 45° FRACTURE @ 181.8'-182' - CALCITE ON 45° FRACTURES @ 182.7'-183.1' - LIMESTONE	875.8	180–191	100		100	NQ-20											CORE	
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, FOSSILIFEROUS, HIGHLY TO SLIGHTLY FRACTURED, SLICKENSIDED, OCCASIONAL SILTSTONE/CLAYSTONE LAYERS; RQD 91%, REC 100%. @ 194.1' - SLICKENSIDE IN CLAYSTONE LAYER @ 195.4'-195.8' - VERTICAL WATER STAINED FRACTURE	869.1	191–198	94		100	NQ-21											CORE	
SHALE, GRAY TO DARK GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, CARBONACEOUS, UNFRACTURED, BECOMING MORE CARBONACEOUS WITH DEPTH; RQD 100%, REC 100%. @ 198.7'-199.1 - LIMESTONE LAYER @ 200.9', Qu = 1,083 psi @ 201.5' - COAL STRINGER @ 200.3'-200.8', SDI (Id_2)=82.3%	860.2	198–207	100		100	NQ-22											CORE	
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, LAMINATED TO THICK BEDDED, CARBONACEOUS STRINGERS, MICACEOUS, UNFRACTURED; RQD 100%, REC 100%.		207–221	100		100	NQ-23											CORE	

28/47

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-003-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 | DRILLING FIRM / OPERATOR: ODOT / M. LEWIS | DRILL RIG: CME 850 TRACKED | STATION / OFFSET: 567+45, 517 LT | EXPLORATION ID B-003-0-12

TYPE: ROCKFALL | SAMPLING FIRM / LOGGER: HDR / R. KANITH | HAMMER: AUTOMATIC HAMMER | ALIGNMENT: CL S.R. 7

PID: 92855 BR ID: | DRILLING METHOD: 3.25" HSA / NQ | CALIBRATION DATE: 4/1/11 | ELEVATION: 1066.9 (MSL) EOB: 372.5 ft. | PAGE 5 OF 7

START: 3/29/12 END: 4/5/12 | SAMPLING METHOD: SPT | ENERGY RATIO (%): 88.4 | COORD: 40.279572570, -80.620461880

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS
	845.9	221
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, LAMINATED TO THICK BEDDED, CARBONACEOUS STRINGERS THROUGHOUT, MICACEOUS THROUGHOUT, UNFRACTURED; RQD 100%, REC 100%.	820.0	221–247
SHALE, DARK GRAY, UNWEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, CARBONACEOUS, UNFRACTURED; RQD 100%, REC 100%. @ 248.5', Qu = 3,092 psi	817.8	247–249
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, MEDIUM TO COARSE GRAINED, LAMINATED TO VERY THICK BEDDED, OCCASIONAL CARBONACEOUS LAMINATIONS, UNFRACTURED, OCCASIONAL CALCAREOUS ZONES; RQD100%, REC 100%. @ 252.8'-254.9' - OCCASIONAL LIMESTONE LAYERS @ 257.0'-258.3' - CONGLOMERATE LENSES (ROUNDED) @ 264.5'-266.2' - CONGLOMERATE LIMEY LENSES @ 265.0'-265.5' - COAL/CARBONACEOUS SEAM	800.7	249–266
COAL, BLACK, UNWEATHERED, WEAK, VERY THIN BEDDED, PYRITIC, UNFRACTURED; RQD 100%, REC 100%.	799.9	266–267
CLAYSTONE, GREENISH GRAY, SLIGHTLY TO MODERATELY WEATHERED, WEAK, VERY THICK BEDDED, CALCAREOUS NODULES, INTACT TO MODERATELY FRACTURED, SLICKENSIDED; RQD 100%, REC 100%. @ 267.0'-267.6' - SHALE @ 273.3'-273.5'; 273.9'-274.2' - LIMESTONE LAYERS @ 274.9'-275.4', SDI (Id_2)=8.5%		267–276

SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
100		100	NQ-24											CORE	
100		100	NQ-25											CORE	
100		100	NQ-26											CORE	
100		100	NQ-27											CORE	
100		100	NQ-28											CORE	

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ
START: 3/29/12 END: 4/5/12	SAMPLING METHOD: SPT

DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 567+45, 517 LT
HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
CALIBRATION DATE: 4/1/11	ELEVATION: 1066.9 (MSL) EOB: 372.5 ft.
ENERGY RATIO (%): 88.4	COORD: 40.279572570, -80.620461880

EXPLORATION ID B-003-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	790.4																	
SEE PREVIOUS SHEET FOR ROCK DESCRIPTION	789.8	277																
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, THICK BEDDED, FOSSILIFEROUS, UNFRACTURED; RQD 100%, REC 100%.	787.7	277–279	100		100	NQ-29											CORE	
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS NODULES, UNFRACTURED, SLICKENSIDED, CLAYSTONE LAYERS; RQD 100%, REC 100%.	781.6	279–285																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, THICK BEDDED, MICACEOUS, CROSS BEDDING WITH LAMINATIONS, UNFRACTURED; RQD 98%, REC 100%.		285–292	100		100	NQ-30											CORE	
@ 285.3'-289.2' - GRADES FROM SILTSTONE INTO SANDSTONE																		
		293–302	100		100	NQ-31											CORE	
@304.0'-304.6' - 70° FRACTURE																		
@ 304.6'-304.8' - SHALE	762.1																	
COAL, BLACK, SLIGHTLY WEATHERED, VERY WEAK, VERY THIN BEDDED, PYRITIC, HIGHLY FRACTURED; RQD 0%, REC 100%.	761.3	305																
CLAYSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, WEAK, VERY THICK BEDDED, CALCAREOUS, MODERATELY TO SLIGHTLY FRACTURED, SLICKENSIDED; RQD 100%, REC 100%.	756.2	303–312	88		100	NQ-32											CORE	
SILTSTONE, GREENISH GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, MODERATELY STRONG, CALCAREOUS NODULES, UNFRACTURED, OCCASIONAL CLAYSTONE LAYER; RQD 100%, REC 100%.																		
@ 316.0', Qu = 667 psi		313–322	100		100	NQ-33											CORE	
@ 320.5'-320.9' - LIMESTONE	746.4																	
SHALE, GRAY/PURPLE/GREEN, SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, SILTY AND ARGILLACEOUS INTERBEDS, JOINTS, HIGHLY FRACTURED TO INTACT, OCCASIONAL CLAYSTONE LAYER; RQD 99%, REC 100%.																		
@ 322.1'-322.5', SDI (Id_2)=3.9%		323–332	100		100	NQ-34											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-003-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/29/12 END: 4/5/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 567+45, 517 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.9 (MSL) EOB: 372.5 ft. COORD: 40.279572570, -80.620461880	EXPLORATION ID B-003-0-12 PAGE 7 OF 7

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	734.9	332																
SHALE, GRAY/PURPLE/GREEN, SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, SILTY AND ARGILLACEOUS INTERBEDS, JOINTS, HIGHLY FRACTURED TO INTACT; RQD 99%, REC 100%.	731.1	333–335.8																
SANDSTONE, GRAY, UNWEATHERED, STRONG TO VERY STRONG, COARSE GRAINED, VERY THICK BEDDED, MICACEOUS, UNFRACTURED; RQD 100%, REC 100%.		333–343	99		100	NQ-35											CORE	
		343–353	100		100	NQ-36											CORE	
@ 359.9'-360.8' - SILTY SHALE LAYER	701.8	353–363	100		100	NQ-37											CORE	
SHALE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, SILTY WITH ARENACEOUS LAYERS*, UNFRACTURED; RQD 80%, REC 90%. DRILLER BELIEVES CORE SLIPPED DURING RETRIEVAL AND COULD NOT GET BACK; CAUSED LOW RECOVERY AND STRATA RQD.	694.4	363–372 EOB	85		85	NQ-38											CORE	

NOTES: 50 LBS BENTONITE PELLETS ADDED @ 40.0 FT DURING GROUTING/BACKFILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 175 LB. BENTONITE POWDER; 1316 LB. CEMENT; 109 GAL. WATER

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 574+26, 627 LT
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1066.4 (MSL) EOB: 402.0 ft.
START: 4/17/12 END: 4/28/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.281415000, -80.621029130

EXPLORATION ID B-004-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV. (bottom of layer)
(top of hole)	1066.4
VERY LOOSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, DRY	1064.4
MEDIUM STIFF TO STIFF, BROWN, **SILT**, TRACE TO LITTLE STONE FRAGMENTS, DRY, WEATHERED SHALE	1059.4
MEDIUM DENSE TO VERY DENSE, BROWN TO GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, DRY, DECOMPOSED SHALE	1051.4
SHALE, DARK GRAY/BROWN, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, SILTY TO ARGILLACEOUS, HIGHLY FRACTURED; RQD 0%, REC 100%. 15.6'-15.7' - CLAY SEAM 17.5'-17.6' - CLAY SEAM	1048.8
COAL, BLACK, SLIGHTLY WEATHERED TO UNWEATHERED, VERY WEAK, VERY THIN BEDDED, PYRITIC, SLICKENSIDED, HIGHLY FRACTURED; RQD 0%, REC 100%.	1046.7
LIMESTONE, GRAY TO DARK GRAY, HIGHLY WEATHERED TO UNWEATHERED, VERY WEAK TO EXTREMELY STRONG, VERY THICK BEDDED, OCCASIONALLY FOSSILIFEROUS, FRACTURED TO INTACT, OCCASIONAL LIMESTONE NODULES IN CALCAREOUS SILTSTONE LAYERS; RQD 73%, REC 100%. @ 20.2'-20.3' - CLAY SEAM @ 21.0'-21.5' - 90° FRACTURE @ 22.3'-22.5' - 90° FRACTURE @ 23.1'-23.3' - CLAY SEAM @ 27.6', Qu = 2,371 psi @ 28.1' - 70° WATER STAINED JOINT @ 31.5' - 45° WATER STAINED FRACTURE @ 36.2'-36.8' - OCCASIONAL SILTSTONE (CALCAREOUS) LAYERS	1030.1
SILTSTONE, GRAY/GREEN, SLIGHTLY WEATHERED, WEAK, THICK BEDDED, CALCAREOUS, MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%. @37.2'-37.8', SDI (Id_2)=89.8%	1028.1
CLAYSTONE, GRAY, SLIGHTLY TO UNWEATHERED, VERY WEAK TO WEAK, THICK BEDDED, MODERATELY FRACTURED TO FRACTURED, OCCASIONAL SILTSTONE LAYERS; RQD 71%, REC 100%. @ 39.3' - 45° FRACTURE @ 39.3'-40.1' - SHALE @ 41.5' - 45° FRACTURE	1022.6
COAL, BLACK, SLIGHTLY TO UNWEATHERED, VERY WEAK, VERY THIN BEDDED, PYRITIC, HIGHLY TO MODERATELY FRACTURED, OCCASIONAL CARBONACEOUS SHALE LAYERS; RQD 90%, REC 100%.	1016.6
CLAYSTONE, GRAY TO DARK GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK, VERY THICK BEDDED, SILTY, UNFRACTURED, OCCASIONAL SILTSTONE/LIMESTONE/SHALE LAYERS; RQD 100%, REC 100%. @ 50.0'-51.2' - CALCAREOUS @ 51.2'-53.7' - SILTSTONE LAYERS	1012.7

DEPTHS: TR at 15

DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
1.5-3	2 2 3	7	53	SS-1	-	-	-	-	-	-	-	-	-	-	A-4b (V)	
3.5-5	6 6 5	16	80	SS-2	-	-	-	-	-	-	-	-	-	-	A-4b (V)	
6-7.5	6 9 20	43	87	SS-3	-	-	-	-	-	-	-	-	-	-	A-4b (V)	
8.5-10	17 26 39	96	100	SS-4	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
11-12.5	9 16 27	63	67	SS-5	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
13.5-15	14 31 50/5"	-	100	SS-6	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
15-22	7		100	NQ-1											CORE	
22-32	74		100	NQ-2											CORE	
32-42	100		100	NQ-3											CORE	
42-52	82		100	NQ-4											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-004-0-12

DRAWN MSJ CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 4/17/12 END: 4/28/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" OD CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 574+26, 627 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.4 (MSL) EOB: 402.0 ft. COORD: 40.281415000, -80.621029130

EXPLORATION ID: B-004-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, MICACEOUS, INTACT TO SLIGHTLY FRACTURED; RQD 100%, REC 100%. @ 54.6' - WEATHERED ZONE @ 60.6' - MEDIUM GRAINED	1012.7 1003.7	54–62	100		100	NQ-5											CORE	
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, EXTREMELY STRONG, SLIGHTLY FRACTURED, VERY ROUGH; RQD 100%, REC 100%. @ 63.4'-63.8' - 90° JOINT, SLIGHTLY WEATHERED	999.3	62–67																
SHALE, GRAY, SLIGHLY WEATHERED, WEAK, VERY THIN BEDDED, SILTY/ARGILLACEOUS, UNFRACTURED; RQD 100%, REC 100%. @ 67.5'-68.0', SDI (Id_2)=30.0% @ 67.1'-67.7' - CALCAREOUS @ 68.8', Qu = 226 psi	995.8	67–70	100		100	NQ-6											CORE	
SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, THICK BEDDED, SHALEY, ZONES ARENACEOUS; RQD 100%, REC 100%. @ 73.2' - WEATHERED ZONE	993.1	70–73																
SANDSTONE, GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, MEDIUM BEDDED, MICACEOUS; RQD 100%, REC 100%.	991.6	73–75																
SANDSTONE, BROWN, MODERATELY TO HIGHLY WEATHERED, SLIGHTLY TO MODERATELY STRONG, MEDIUM GRAINED, LAMINATED TO VERY THICK BEDDED, MICACEOUS, HIGHLY TO MODERATELY FRACTURED; RQD 64%, REC 100%. @ 74.8'-75.5' - 85° FRACTURE, HIGHLY WEATHERED WITH CLAY SEAM @ 75.9'-77.4' - 90° HIGHLY WEATHERED FRACTURE @ 78.3' - CLAY SEAM	986.0	75–80	80		100	NQ-7											CORE	
SILTSTONE, GRAY, UNWEATHERED TO MODERATELY WEATHERED, MODERATELY STRONG TO WEAK, THICK BEDDED, CALCAREOUS NODULES, HIGHLY TO MODERATELY FRACTURED; RQD 49%, REC 100%. @ 82.1'-83.7' - CLAYSTONE ADVANCED CASING TO 80.0 FT	981.9	80–84																
INTERBEDDED SANDSTONE AND SILTSTONE, GRAY/GREEN GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG, FINE GRAINED, THIN TO THICK BEDDED, CALCAREOUS NODULES, MODERATELY TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 99%, REC 100%. @ 92.5'-94.7' - INTERBEDDED SHALE	971.7	84–95	78		100	NQ-8											CORE	
SHALE, GRAY, UNWEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, UNFRACTURED; RQD 100%, REC 100%. @ 95.7', Qu = 2,259 psi @ 96.4'-97.0', SDI (Id_2)=84.3%	966.9	95–99	96		100	NQ-9											CORE	
LIMESTONE, GRAY, UNWEATHERED TO MODERATELY WEATHERED, WEAK TO VERY STRONG, INDISTINCT BEDDING, OCCASIONALLY BRECCIATED, FRACTURED TO MODERATELY FRACTURED; RQD 86%, REC 100%. @ 99.5'-99.6' - CLAY SEAM @ 100.4', Qu = 4,618 psi	961.8	99–104																
SILTSTONE, GREEN GRAY, UNWEATHERED, MODERATELY STRONG, THICK BEDDED, CALCAREOUS NODULES, UNFRACTURED; RQD 100%, REC 100%.	959.0	104–107	97		100	NQ-10											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-004-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 4/17/12 END: 4/28/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" OD CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 574+26, 627 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.4 (MSL) EOB: 402.0 ft. COORD: 40.281415000, -80.621029130

EXPLORATION ID B-004-0-12

PAGE 3 OF 8

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	959.0																	
SHALE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THIN BEDDED, UNFRACTURED, OCCASIONAL SILTSTONE LAYERS; RQD 100%, REC 100%.	952.4	108–114																
CLAYSTONE, RED/PURPLE/GREEN/GRAY, MODERATELY TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, INDISTINCT BEDDING, SLICKENSIDED; RQD 98%, REC 100%. @ 119.8'-121.1'- BRECCIATED LIMESTONE LAYER @ 123.6'-127.0' - RED/GRAY @ 128.4'; 128.7'; 129.0'-129.1' - CLAY SEAM @ 128.9'-130.5' - LIMESTONE	934.8	112–122	100		100	NQ-11											CORE	
		122–132	92		100	NQ-12											CORE	
INTERBEDDED SHALE AND LIMESTONE, GRAY/GREEN GRAY, UNWEATHERED, WEAK TO STRONG, VERY THIN TO INDISTINCT BEDDED, LIMESTONE, FOSSILIFEROUS; RQD 100%, REC 100%.	928.9	132–142	100		100	NQ-13											CORE	
SHALE, GREEN GRAY/BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, OCCASIONAL CLAYSTONE LAYER; REC 100%, REC 100%.	924.3																	
CLAYSTONE, GRAY/PURPLE, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, SLICKENSIDED; RQD 100%, REC 100%.	918.9	142–152	100		100	NQ-14											CORE	
SHALE, GRAY, UNWEATHERED, WEAK TO VERY WEAK, VERY THIN BEDDED, OCCASIONALLY CALCAREOUS, SLICKENSIDED, OCCASIONAL CLAYSTONE/SILTSTONE LAYERS; RQD 100%, REC 100%.	904.2	152–162	100		100	NQ-15											CORE	

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 574+26, 627 LT	EXPLORATION ID B-004-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1066.4 (MSL) EOB: 402.0 ft.	PAGE 4 OF 8
START: 4/17/12 END: 4/28/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.281415000, -80.621029130	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
LIMESTONE W/CALCAREOUS SILTSTONE LAYERS, GRAY/ GREEN GRAY, SLIGHTLY TO UNWEATHERED, WEAK TO STRONG, INDISTINCT BEDDING, OCCASIONALLY FOSSILIFEROUS, MODERATELY FRACTURED TO INTACT, OCCASIONAL SHALE LAYERS THROUGHOUT; RQD 93%, REC 100%. @ 162.2' - CLAY SEAM @ 162.3', Qu = 4,766 psi @ 163.9'-164.0'; 164.3'-164.6' - SHALE @ 167.6-168.1' - 85° JOINT @ 168.3'-169.1' - 85°-90° JOINT	904.2 890.4	163–176	89		100	NQ-16											CORE	
CLAYSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, THICK BEDDED, CALCITE INCLUSIONS, SLICKENSIDED, UNFRACTURED; RQD 100%, REC 100%. @ 176.7'-177.5', SDI (Id_2)=11.4%	887.8	176–178	100		100	NQ-17											CORE	
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, THICK BEDDED, OCCASIONAL CALCAREOUS NODULES, ARENACEOUS BRECCIATED ZONES; RQD 100%, REC100%.	884.9	179–181																
SHALE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THIN BEDDED, OCCASIONALLY CALCAREOUS, UNFRACTURED, OCCASIONAL SILTSTONE/SANDY LAYERS; RQD 100%, REC 100%. @ 182.4'-183.0', SDI (Id_2)=88.9%	875.8	182–190	100		100	NQ-18											CORE	
LIMESTONE, GRAY, UNWEATHERED, STRONG, VERY THICK BEDDED, FOSSILIFEROUS, UNFRACTURED; RQD 100%, REC 100%.	872.7	191–193																
SHALE, GRAY TO DARK GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, CARBONACEOUS, UNFRACTURED; RQD 100%, REC 100%. @ 193.7'-194.7' - CLAYSTONE/LIMESTONE LAYERS @ 195.2'-196.0', SDI (Id_2)=76.2%	863.7	194–202	100		100	NQ-19											CORE	
SHALE, GRAY/DARK GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, CARBONACEOUS LAMINATIONS, MICACEOUS, SANDY, UNFRACTURED, SANDSTONE INTERBEDS THROUGHOUT; RQD 100%, REC 100%.	854.3	203–212	100		100	NQ-20											CORE	
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, OCCASIONAL LAMINATIONS, UNWEATHERED; RQD 99%, REC 100%.		213–216																

ROCKFALL EXPLORATION
BORING LOG B-004-0-12 (CONT.)

DRAWN MSJ CHECKED EMK

PROJECT: JEF-7-10.0 | TYPE: ROCKFALL | PID: 92855 BR ID: | START: 4/17/12 END: 4/28/12

DRILLING FIRM / OPERATOR: ODOT / M. LEWIS | SAMPLING FIRM / LOGGER: HDR / R. KANITH | DRILLING METHOD: 3.0" OD CASING / NQ | SAMPLING METHOD: SPT

DRILL RIG: CME 850 TRACKED | HAMMER: AUTOMATIC HAMMER | CALIBRATION DATE: 4/1/11 | ENERGY RATIO (%): 88.4

STATION / OFFSET: 574+26, 627 LT | ALIGNMENT: CL S.R. 7 | ELEVATION: 1066.4 (MSL) EOB: 402.0 ft. | COORD: 40.281415000, -80.621029130

EXPLORATION ID B-004-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, OCCASIONAL LAMINATIONS, UNWEATHERED, OCCASIONAL CARBONACEOUS PARTINGS; RQD 99%, REC 100%.	850.4	216–222	100		100	NQ-21											CORE	
		222–232	100		100	NQ-22											CORE	
@ 231.6', Qu = 6,652 psi		232–242	100		100	NQ-23											CORE	
@ 245.7'- CARBONACEOUS PARTING @ 246.7'-247.1' - CARBONACEOUS PARTINGS AND CONGLOMERATE @ 248.9'-250.2'- CARBONACEOUS PARTINGS AND CONGLOMERATE @ 249.7'; 250.2' - COAL PARTINGS		242–252	100		100	NQ-24											CORE	
From 252.0'-262.0' - OCCASIONAL THIN DARK BEDDING BANDS @ 259.5' - 45° BREAK IN ROCK	802.1	252–262	100		100	NQ-25											CORE	
LIMESTONE, GRAY, UNWEATHERED, VERY STRONG, THICK BEDDED, FOSSILIFEROUS, UNFRACTURED; RQD 100%, REC 100%.	799.9																	
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, THICK BEDDED, ARENACEOUS, UNFRACTURED; RQD 100%, REC 100%. @ 267.0'-268.0', SDI (Id_2)=90.3%	797.6	262–268	94		100	NQ-26											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-004-0-12 (CONT.)

DRAWN MSJ | CHECKED EMK

PROJECT: JEF-7-10.0 | TYPE: ROCKFALL | PID: 92855 BR ID: | START: 4/17/12 END: 4/28/12

DRILLING FIRM / OPERATOR: ODOT / M. LEWIS | SAMPLING FIRM / LOGGER: HDR / R. KANITH | DRILLING METHOD: 3.0" OD CASING / NQ | SAMPLING METHOD: SPT

DRILL RIG: CME 850 TRACKED | HAMMER: AUTOMATIC HAMMER | CALIBRATION DATE: 4/1/11 | ENERGY RATIO (%): 88.4

STATION / OFFSET: 574+26, 627 LT | ALIGNMENT: CL S.R. 7 | ELEVATION: 1066.4 (MSL) EOB: 402.0 ft. | COORD: 40.281415000, -80.621029130

EXPLORATION ID B-004-0-12 | PAGE 6 OF 8

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, DARK GRAY/GRAY, UNWEATHERED, MODERATELY STRONG, VERY FINE TO FINE GRAINED, VERY THIN TO MEDIUM BEDDING, SLICKENSIDED, HIGHLY FRACTURED TO UNFRACTURED, OCCASIONAL SANDY SILTSTONE LAYERS, SLICKENSIDES, OCCASIONAL SILTY SHALE LAYERS; RQD 98%, REC 100%.	797.6	269																
@ 269.8'-270.4' - HIGHLY FRACTURED		270–272																
@ 276.3'- 277.7' - SLICKENSIDED AT BREAK @ 276.8', Qu = 4,625 psi		272–282	100		100	NQ-27											CORE	
@ 287.0'-298.2' - VERY FINE GRAINED WITH PLANT FOSSILS AND CROSS-BEDDING		282–292	100		100	NQ-28											CORE	
@ 298.7'-299.1' - FINE, DARKER GRAY LENSES	768.2	292–302	100		100	NQ-29											CORE	
SANDSTONE, LIGHT GRAY, UNWEATHERED, MODERATELY HARD, MEDIUM GRAINED TO COARSE GRAINED, VERY THIN TO THICK BEDDED, OCCASIONAL CARBONACEOUS PARTINGS; RQD 100%, REC 100%.																		
304.3'-306.7' - INTERBEDDED SHALEY LAYERS		302–312	100		100	NQ-30											CORE	
@ 312.6'-313.1' - SHALEY LAYERS @ 318.2-319.0 - SHALEY PARTINGS CARBONACEOUS		312–322	100		100	NQ-31											CORE	
@ 321.6'-324.2' - CONGLOMERATIC/BRECCIATED ZONE WITH CARBONACEOUS STRINGERS AND CALCAREOUS CLASTS																		
@ 324.0' - COAL LENSE	742.2	324																

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 574+26, 627 LT	EXPLORATION ID B-004-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.0" OD CASING / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1066.4 (MSL) EOB: 402.0 ft.	PAGE 7 OF 8
START: 4/17/12 END: 4/28/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.281415000, -80.621029130	

MATERIAL DESCRIPTION AND NOTES (ELEV. 742.2)

SHALE, TAN, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, DOLOMITIC, CARBONACEOUS, FRACTURED TO MODERATELY FRACTURED; RQD 50%, REC 93%.
@ 324.2'-324.5' - SHALE
@ 324.7', Qu = 1,860 psi
@ 325.2'-325.9', SDI (Id_2)=93.2%
@ 327.4'-328.2' - SANDY SILTSTONE (REDDISH LENSES)
@ 328.2'-328.6' - CARBONACEOUS LENSES
WITH MUDSTONE LAYERS
@ 327.4'-328.2' - SANDY SILTSTONE (REDDISH LENSES)
@ 328.2'-328.6' - CARBONACEOUS LENSES

737.8

SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, MEDIUM TO COARSE GRAINED, VERY THIN TO VERY THICKLY BEDDED, UNFRACTURED; RQD 100%, REC 100%.
@ 332.8'-333.3' - SILTSTONE LAYER

708.7

SHALE, GRAY, UNWEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, UNFRACTURED; RQD 100%, REC 100%.
@ 358.0'-358.9', SDI (Id_2)=71.9%
@ 359.1', Qu = 1,520 psi

706.2

SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO COARSE GRAINED, LAMINATED TO MEDIUM BEDDED, MICACEOUS, UNFRACTURED, OCCASIONAL COAL/CARBONACEOUS PARTINGS; RQD 100%, REC 100%.
@ 362.1'-362.2' - SHALE
@ 366.0', Qu = 6,579 psi
@ 377.1', Qu = 8,762 psi

DEPTHS: 325–379

DEPTH	SPT/RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
327	78		97	NQ-32											CORE	
337	100		100	NQ-33											CORE	
347	100		100	NQ-34											CORE	
357	100		100	NQ-35											CORE	
367	100		100	NQ-36											CORE	
377	100		100	NQ-37											CORE	

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 4/17/12 END: 4/28/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.0" OD CASING / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 574+26, 627 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1066.4 (MSL) EOB: 402.0 ft. COORD: 40.281415000, -80.621029130	EXPLORATION ID B-004-0-12 PAGE 8 OF 8

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	687.4	379																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO COARSE GRAINED, LAMINATED TO MEDIUM BEDDED, MICACEOUS, UNFRACTURED; RQD 100%, REC 100%.		380																
		381																
		382																
		383																
		384																
@ 384.8'-402.0' - OCCASIONAL COAL/CARBONACEOUS PARTINGS		385																
		386																
		387	100		100	NQ-38											CORE	
@ 387.2'; 387.6'; 387.7'; 388.0'; 390.0'; 390.7'; 391.1'; 391.1'; 391.3'; 391.7' - COAL/CARBONACEOUS PARTINGS		388																
		389																
		390																
		391																
		392																
@ 392.8'; 401.5'; 401.6'; 401.7'; 400.8' - CARBONACEOUS PARTINGS		393																
		394																
		395																
		396																
		397	100		100	NQ-39											CORE	
@ 399.6'-399.7' - SHALE		398																
		399																
		400																
		401																
	664.4	EOB 402																

NOTES: 50 LBS BENTONITE PELLETS ADDED @ 50.0 FT DURING GROUTING/BACKFILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 275 LB. BENTONITE POWDER; 1551 LB. CEMENT; 165 GAL. WATER

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-004-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/7/12 END: 3/21/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 582+04, 588 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1069.9 (MSL) EOB: 412.5 ft. COORD: 40.283536650, -80.621092650	EXPLORATION ID B-005-0-12 PAGE 1 OF 8

MATERIAL DESCRIPTION AND NOTES	ELEV. 1069.9	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
VERY STIFF, BROWN, **SILTY CLAY**, TRACE STONE FRAGMENTS, (FILL/RESIDUAL), DRY TO DAMP	1065.9	1–3	3 4 4	12	89	SS-1	3.25	-	-	-	-	-	-	-	-	-	A-6b (V)	
LOOSE, GRAY, **COARSE AND FINE SAND**, "AND" CLAY, (RESIDUAL), DRY TO MOIST	1064.4	4–5	2 3 7	15	100	SS-2	2.25	-	-	-	-	-	-	-	-	-	A-3 (V)	
VERY DENSE, GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, DRY (WEATHERED SHALE)	1062.9	6	50	-	100	SS-3	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	
		7 TR	50/0"	-		SS-4	-	-	-	-	-	-	-	-	-	-		
SHALE, GRAY/BROWN, SLIGHT TO MODERATE WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED, SILTY, HIGHLY TO MODERATELY FRACTURED, OCCASIONALLY ARENACEOUS; RQD 63%, REC 97%.	1056.4	7–13	67		98	NQ-1											CORE	
SHALE, GRAY/BROWN, OLIVE GREEN, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, SILTY, ARGILLACEOUS, HIGHLY TO MODERATELY FRACTURED; RQD 55%, REC 100%. @ 15.6'-15.7' -90° FRACTURE @ 16.0' - LOST WATER RETURN @ 21.0'-21.2' - 90° FRACTURE @ 22.0'-27.5' - FREQUENT ARGILLACEOUS SHALE LAYERS @ 25.7'-26.3', SDI (Id_2 ,)=69.7% @ 27.3'-27.5' - CLAY	1042.4	13–27	49		100	NQ-2											CORE	
COAL, BLACK, UNWEATHERED, WEAK, VERY THIN BEDDED, PYRITIC, CARBONACEOUS SHALE LAYERS, HIGHLY FRACTURED TO FRACTURED, SLICKENSIDED; RQD 0%, REC 100%.	1039.8	27–30	44		100	NQ-3											CORE	
SHALE, GRAY, MODERATELY WEATHERED, WEAK, VERY THIN BEDDED, CALCAREOUS, HIGHLY FRACTURED TO FRACTURED; RQD 25%, REC 100%. @ 30.1'-30.3' - CLAY	1038.2	30–32																
LIMESTONE, GRAY/BROWN, UNWEATHERED TO HIGHLY WEATHERED, STRONG TO VERY STRONG, VERY THICK BEDDED, OCCASIONALLY FOSSILIFEROUS, FRACTURED TO INTACT, VERY ROUGH; RQD 82%, REC 95%. @ 32.5'-32.9' - 90° HIGHLY WEATHERED, FRACTURED @ 33.6'-34.9' - CALCAREOUS SHALE @ 41.0'-41.4' - HIGHLY WEATHERED; SOFT ZONE @ 42.5'-43.0' - HIGHLY WEATHERED ZONE	1024.1	32–45	82		96	NQ-4											CORE	
SILTSTONE, GRAY, SLIGHTLY TO MODERATELY WEATHERED, VERY WEAK TO MODERATELY STRONG, THICK BEDDED, CALCAREOUS, OCCASIONALLY ARGILLACEOUS, FRACTURED TO MODERATELY FRACTURED; RQD 41%, REC 90%. @ 46.2', Qu = 58 psi	1021.4	46–48	45		90	NQ-5											CORE	
CLAYSTONE, GRAY, SEVERELY TO MODERATELY WEATHERED, VERY WEAK TO WEAK, INDISTINCT BEDDING, OCCASIONALLY CALCAREOUS, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED; RQD 33%, REC 92%. @ 52.5'-53.1', SDI (Id_2)=22.1%	1016.3	49–53																

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 582+04, 588 LT	EXPLORATION ID B-005-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1069.9 (MSL) EOB: 412.5 ft.	PAGE 2 OF 8
START: 3/7/12 END: 3/21/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.283536650, -80.621092650	

MATERIAL DESCRIPTION AND NOTES	ELEV.
	1016.3
COAL, BLACK, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK, VERY THIN BEDDED, PYRITIC, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED, SOME IRON STAINING; RQD 9%, REC 100%.	1010.7
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, SANDY, INTACT, SLIGHTLY ROUGH, OCCASIONAL FINE GRAINED SANDSTONE LAYERS; RQD 89%, REC 100%. @ 59.2'-59.7' - CLAYSTONE AND LIMESTONE LAYERS (0.1')	1003.5
SANDSTONE, GRAY, UNWEATHERED, STRONG, FINE GRAINED, VERY THICK BEDDED, MICACEOUS, INTACT, VERY ROUGH; RQD 100%, REC 100%.	998.5
LIMESTONE, GRAY, UNWEATHERED TO MODERATELY WEATHERED, STRONG, MEDIUM BEDDED, SLIGHTLY ROUGH; RQD 83%, REC 100%.	997.3
SHALE, GRAY, HIGHLY TO MODERATELY WEATHERED, VERY WEAK, VERY THIN BEDDED, HIGHLY TO MODERATELY FRACTURED, SLICKENSIDED; RQD 31%, REC 100%.	996.0
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, ARENACEOUS, INTACT, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 75.4'-75.9', SDI (Id_2)=87.6%	990.5
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, MICACEOUS, HIGHLY FRACTURED TO INTACT, VERY ROUGH; RQD 97%, REC 100%.	986.6
SHALE, DARK GRAY, UNWEATHERED, WEAK, VERY THIN BEDDED, ARGILLACEOUS, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 89%, REC 100%. @ 84.9'-85.2', SDI (Id_2)=93.8%	984.7
SILTSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, SLIGHTLY STRONG, VERY THICK BEDDED, SANDY, CALCAREOUS, INTACT; RQD 100%, REC 100%.	980.1
CLAYSTONE, GRAY, MODERATLY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, THICK BEDDED, CALCAREOUS, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 56%, REC 100%.	978.2
LIMESTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG TO VERY STRONG, THICK BEDDED, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 92.2'-92.7' - VERTICAL FRACTURE	975.6
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, SLICKENSIDED, OCCASIONAL CALCAREOUS NODULES, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH TO SLICKENSIDED, WITH OCCASIONAL CLAYSTONE LAYERS; RQD 90%, REC 100%. @ 98.9'-99.6', SDI (Id_2)=15.4%	970.5
CLAYSTONE, GRAY, MODERATELY WEATHERED, VERY WEAK TO WEAK, THICK BEDDED, HIGHLY FRACTURED TO FRACTURED, SLICKENSIDED; RQD 32%, REC 100%.	967.4
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, SANDY, CALCAREOUS NODULES, INTACT, SLIGHTLY ROUGH; RQD 100%, REC 100%.	962.5

DEPTHS: 54 – 107

SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
38		100	NQ-6											CORE	
99		100	NQ-7											CORE	
89		100	NQ-8											CORE	
90		100	NQ-9											CORE	
74		100	NQ-10											CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-005-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 582+04, 588 LT	EXPLORATION ID B-005-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1069.9 (MSL) EOB: 412.5 ft.	PAGE 3 OF 8
START: 3/7/12 END: 3/21/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.283536650, -80.621092650	

MATERIAL DESCRIPTION AND NOTES	ELEV.
	962.5
SANDSTONE, GRAY, UNWEATHERED, STRONG, VERY FINE GRAINED, VERY THICK BEDDED, MICACEOUS, INTACT, VERY ROUGH; RQD 100%, REC 100%. @ 112.5'-112.7' - CLAY SEAM	954.1
SHALE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, SILTY, INTACT, SLIGHTLY ROUGH, OCCASIONAL SILTSTONE LAYERS; RQD 100%, REC 100%. @ 116.6'-117.1', SDI (Id_2)=96.6%	950.1
SHALE, GRAY, DARK GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THIN BEDDED, ARGILLACEOUS, SLICKENSIDED, WITH INTERBEDDED CLAYSTONE; RQD 100%, REC 100%.	947.6
COAL, BLACK, UNWEATHERED, WEAK, VERY THIN BEDDED, SLICKENSIDED; RQD 0%, REC 100%. @ 122.3'-122.5' - CARBONACEOUS SHALE	947.1
LIMESTONE, GRAY, UNWEATHERED, STRONG TO VERY STRONG, VERY THICK BEDDED, OCCASIONAL SHALE, CLAYSTONE, (FOSSILIFEROUS) VERY ROUGH; RQD 76%, REC 100%. @ 123.7'-124.3' - SHALE @ 125.8'-126.7' - CLAYSTONE, VERY WEAK @ 127.6'-127.8' - SHALE	941.2
SHALE, GRAY TO DARK GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, SILTY, OCCASIONAL LIMESTONE NODULES, FRACTURED TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 88%, REC 100%. @ 129.7'-130.2', SDI (Id_2)=95.7%	937.2
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, ARENACEOUS, FRACTURED TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 133.2'-133.5' -85° FRACTURE	931.1
INTERBEDDED SHALE AND SILTSTONE, GRAY, UNWEATHERED, WEAK TO MODERATELY STRONG, VERY THIN BEDDED, SANDY LENSES, FOSSILIFEROUS, HIGHLY TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH, OCCASIONAL ARENACEOUS BRECCIA/CONGLOMERATE LAYERS WITH SHELL FRAGMENTS (CLACAREOUS); RQD 89%, REC100%. @ 139.1'-139.8' - VERTICAL AND HIGH ANGLE FRACTURES 141.1'-141.7', SDI (Id_2)=94.6% @ 142.5'-142.8'; 145.2'-146.2'; 151.5'-151.9' - CONGLOMERAT @ 141.1', Qu = 1,377 psi	920.8
SILTSTONE, GRAY, UNWEATHERED, STRONG TO VERY STRONG, VERY THICK BEDDED, VERY FINE SANDY LAYERS, MODERATELY TO UNFRACTURED, SLIGHTLY ROUGH, OCCASIONALLY SLICKENSIDED, VERY FINE SANDSTONE LAYERS; RQD 100%, REC 100%.	

DEPTHS: 108 – 162

SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
100		100	NQ-11											CORE	
98		100	NQ-12											CORE	
80		100	NQ-13											CORE	
88		100	NQ-14											CORE	
100		100	NQ-15											CORE	
100		100	NQ-16											CORE	

PROJECT: JEF-7-10.0 | DRILLING FIRM / OPERATOR: ODOT / M. LEWIS | DRILL RIG: CME 850 TRACKED | STATION / OFFSET: 582+04, 588 LT | EXPLORATION ID B-005-0-12

TYPE: ROCKFALL | SAMPLING FIRM / LOGGER: HDR / R. KANITH | HAMMER: AUTOMATIC HAMMER | ALIGNMENT: CL S.R. 7

PID: 92855 BR ID: | DRILLING METHOD: 3.25" HSA / NQ | CALIBRATION DATE: 4/1/11 | ELEVATION: 1069.9 (MSL) EOB: 412.5 ft. | PAGE 4 OF 8

START: 3/7/12 END: 3/21/12 | SAMPLING METHOD: SPT | ENERGY RATIO (%): 88.4 | COORD: 40.283536650, -80.621092650

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	907.9	162																
SILTSTONE, GRAY, UNWEATHERED, STRONG TO VERY STRONG, VERY THICK BEDDED, VERY FINE ARENACEOUS LAYERS, MODERATELY TO UNFRACTURED, SLIGHTLY ROUGH, OCCASIONALLY SLICKENSIDED; RQD 100%, REC 100%.	901.7	163–168	85		100	NQ-17											CORE	
CLAYSTONE, GRAY, UNWEATHERED, WEAK TO SLIGHTLY STRONG, THICK BEDDED, HIGHLY FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED, LIMESTONE LAYERS; RQD 28%, REC 100%.	899.9	169–170																
SANDSTONE, GRAY TO DARK GRAY, UNWEATHERED, STRONG TO VERY STRONG, VERY FINE GRAINED, VERY THICK BEDDED, SILTY, HIGHLY FRACTURED TO INTACT, SLIGHTLY ROUGH; RQD 90%, REC 100%. @ 170.0'-170.5', SDI (Id_2)=97.1% @ 170.9'-171.1' - COAL/CARBONACEOUS SHALE STRINGER @ 172.4'-172.5' - SHALEY	894.4	171–175	89		100	NQ-18											CORE	
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, SANDY, FOSSILIFEROUS, HIGHLY FRACTURED TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH, SANDSTONE LAYERS; RQD 87%, REC 100%. @ 180.7'-181.0' - 20° FRACTURE @ 188.6'-189.2' - HIGH ANGLE FRACTURES, CLAYSTONE LAYERS	880.6	176–189	88		100	NQ-19											CORE	
SANDSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, FRACTURED TO MODERATELY FRACTURED, VERY ROUGH; RQD 96%, REC 100%. @ 190.2'-190.4' - SHALE LAYER @ 192.5' - CARBONACEOUS/COAL STRINGER	875.6	190–194	95		100	NQ-20											CORE	
SILTSTONE, GRAY, UNWEATHERED, SLIGHTLY STRONG, VERY THICK BEDDED, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH, OCCASIONAL SHALE LAYERS, SLICKENSIDED JOINTS, PLANT FOSSILS; RQD 88%, REC 100%. @ 196.9', Qu = 1,340 psi @ 196.8' - SLICKENSIDED JOINT	871.3	195–198																
SANDSTONE, GRAY TO DARK GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, OCCASIONAL CARBONACEOUS STRINGERS, MODERATELY FRACTURED TO UNFRACTURED, VERY ROUGH; RQD 100%, REC 100%. @ 202.5'-204.1' - BRECCIATED ZONES @ 210.3' - CARBONACEOUS STRINGER		199–217	100		100	NQ-21											CORE	

ROCKFALL EXPLORATION
BORING LOG B-005-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/7/12 END: 3/21/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 582+04, 588 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1069.9 (MSL) EOB: 412.5 ft. COORD: 40.283536650, -80.621092650

EXPLORATION ID: B-005-0-12 — PAGE 5 OF 8

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS
	852.9	217
SANDSTONE, GRAY TO DARK GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, OCCASIONAL CARBONACEOUS STRINGERS, MODERATELY FRACTURED TO UNFRACTURED, VERY ROUGH; RQD 100%, REC 100%.	838.4	217–231.5
LIMESTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, MODERATELY FRACTURED TO INTACT, SLIGHTLY ROUGH, SILTSTONE LAYERS; RQD 100%, REC 100%.	832.0	231.5–237.9
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, VERY THICK BEDDED, MICACEOUS, MODERATELY TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%.	825.9	237.9–244.0
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS STRINGERS, INTACT, SLIGHTLY ROUGH; RQD 100%, REC 100%.	822.3	244.0–247.6
SHALE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THIN BEDDED, SILTY, INTACT TO UNFRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 256.5'-257.0', SDI (Id_2)=98.6% @ 258.0'-263.6' - DARKER GRAY, MORE CARBONACEOUS	806.3	247.6–263.6
COAL, BLACK, UNWEATHERED, WEAK, VERY THIN BEDDED, PYRITIC, FRACTURED TO MODERATELY FRACTURED, SLICKENSIDED; RQD 46%, REC 100%.	805.0	263.6–264.9
CLAYSTONE, GRAY, SLIGHTLY WEATHERED, VERY WEAK, THICK BEDDED, CALCAREOUS, SLICKENSIDED, HIGHLY TO MODERATELY FRACTURED, SHEAR WITH SLICKENSIDES, SILTSTONE LAYERS; RQD 45%, REC 100%. @ 265.5' - 80° FRACTURE @ 266.0'; 266.9'; 267.5' - SLICKENSIDES @ 267.0'-267.5', SDI (Id_2)=3.1% @ 269.7' - 45° FRACTURE	800.1	264.9–269.8
LIMESTONE, GRAY, UNWEATHERED, VERY STRONG, THICK BEDDED, FOSSILIFEROUS, UNFRACTURED, VERY ROUGH; RQD 100%, REC 100%.	797.6	269.8–272

SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
100		100	NQ-22											CORE	
100		100	NQ-23											CORE	
100		100	NQ-24											CORE	
100		100	NQ-25											CORE	
100		100	NQ-26											CORE	
64		100	NQ-27											CORE	

PROJECT: JEF-7-10.0 TYPE: ROCKFALL PID: 92855 BR ID: START: 3/7/12 END: 3/21/12	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS SAMPLING FIRM / LOGGER: HDR / R. KANITH DRILLING METHOD: 3.25" HSA / NQ SAMPLING METHOD: SPT	DRILL RIG: CME 850 TRACKED HAMMER: AUTOMATIC HAMMER CALIBRATION DATE: 4/1/11 ENERGY RATIO (%): 88.4	STATION / OFFSET: 582+04, 588 LT ALIGNMENT: CL S.R. 7 ELEVATION: 1069.9 (MSL) EOB: 412.5 ft. COORD: 40.283536650, -80.621092650

EXPLORATION ID B-005-0-12

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	797.6																	
SILTSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, VERY THICK BEDDED, CALCAREOUS STRINGERS, UNFRACTURED, SLIGHTLY ROUGH TO FRACTURED, SILTY SHALE LAYERS THROUGHOUT; RQD 98%, REC 100%. @ 275.0'-275.8', SDI (Id_2)=98.2%	784.5	273–285	100		100	NQ-28											CORE	
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, VERY THICK BEDDED, INTACT, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 285.3'-285.4' - CLAY LAYER	777.2	286–292	100		100	NQ-29											CORE	
SHALE, GRAY, UNWEATHERED, SLIGHTLY TO MODERATELY STRONG, VERY THIN BEDDED, INTACT, SLIGHTLY ROUGH, PLANT FOSSILS THROUGHOUT, SILTSTONE INTERBEDS, SANDSTONE LAYERS; RQD 100%, REC 100%. @ 295.9'-296.5', SDI (Id_2)=98.6%	767.5	293–302	100		100	NQ-30											CORE	
INTERBEDDED SILTSTONE AND SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, FINE GRAINED, MICACEOUS, PLANT FOSSILS, UNFRACTURED TO INTACT, SLIGHTLY ROUGH, OCCASIONAL SHALE LAYERS THROUGHOUT, VERY FINE GRAINED; RQD 100%, REC 100%. @ 303.5' - PLANT STEM FOSSIL @ 310.5' - SLIGHTLY CALCAREOUS		303–327	100 100		100 100	NQ-31 NQ-32											CORE CORE	

JEF-7-10.00

ROCKFALL EXPLORATION
BORING LOG B-005-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 582+04, 588 LT	EXPLORATION ID B-005-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1069.9 (MSL) EOB: 412.5 ft.	PAGE 7 OF 8
START: 3/7/12 END: 3/21/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.283536650, -80.621092650	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
	742.9	327																
INTERBEDDED SILTSTONE AND SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, FINE GRAINED, MICACEOUS, PLANT FOSSILS, UNFRACTURED TO INTACT, SLIGHTLY ROUGH, OCCASIONAL CALCAREOUS NODULES; RQD 100%, REC 100%. @ 330.3' - 75° FRACTURE @ 331.5'-332.2' - BRECCIATED LIMESTONE @ 332.4' - SLICKENSIDED @ 332.5'-333.6' - DOLOMITIC @ 332.5'-332.8' - VERTICAL FRACTURE		327–332	100		100	NQ-33											CORE	
@ 339.0'-342.5' - OCCASIONAL COARSE GRAINED SAND LAYERS @ 343.6'-345.2' - LIMESTONE	727.0	332–342	100		100	NQ-34											CORE	
CLAYSTONE, GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, WEAK TO SLIGHTLY STRONG, VERY THICK BEDDED, ARENACEOUS, SLICKENSIDED, SHEAR, FRACTURED TO MODERATELY FRACTURED, SLIGHTLY ROUGH TO SLICKENSIDED WITH RED STREAKS; RQD 77%, REC 100%. @ 342.9'-344.7' - BRECCIATED ZONE	723.9	343–346																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY FINE TO MEDIUM GRAINED, VERY THICK BEDDED, MICACEOUS, SILTY, MODERATELY FRACTURED TO SLIGHTLY FRACTURED, SLIGHTLY ROUGH TO VERY ROUGH; RQD 100%, REC 100%. @ 346.9'-347.9' - SHALE (SILTY)		342–352	93		100	NQ-35											CORE	
@ 355.5' - MEDIUM GRAINED		352–362	100		100	NQ-36											CORE	
		362–372	100		100	NQ-37											CORE	
@ 377.3'-377.6' - LIMESTONE NODULES	692.3	372–377	100		100	NQ-38											CORE	
INTERBEDDED SANDSTONE AND SILTSTONE, GRAY TO DARK GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, VERY THIN BEDDED, CROSS BEDDING, OCCASIONALLY PYRITIC, MODERATELY FRACTURED TO INTACT, SLIGHTLY ROUGH TO SLICKENSIDED; RQD 100%, REC 100%. @ 377.8' - SLICKENSIDED 70° FRACTURE @ 378.5', Qu = 4,643 psi @ 378.8'-379.3', SDI (Id_2)=99.1%	687.1	378–382																

ROCKFALL EXPLORATION
BORING LOG B-005-0-12 (CONT.)

DRAWN MSJ
CHECKED EMK

PROJECT: JEF-7-10.0	DRILLING FIRM / OPERATOR: ODOT / M. LEWIS	DRILL RIG: CME 850 TRACKED	STATION / OFFSET: 582+04, 588 LT	EXPLORATION ID B-005-0-12
TYPE: ROCKFALL	SAMPLING FIRM / LOGGER: HDR / R. KANITH	HAMMER: AUTOMATIC HAMMER	ALIGNMENT: CL S.R. 7	
PID: 92855 BR ID:	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/1/11	ELEVATION: 1069.9 (MSL) EOB: 412.5 ft.	PAGE 8 OF 8
START: 3/7/12 END: 3/21/12	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.4	COORD: 40.283536650, -80.621092650	

MATERIAL DESCRIPTION AND NOTES	ELEV. 687.1	DEPTHS	SPT/ RQD	N60	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, MEDIUM GRAINED, LAMINATED TO THICKLY BEDDED, CARBONACEOUS LAMINATIONS, FRACTURED TO SLIGHTLY FRACTURED, VERY ROUGH; RQD 94%, REC 100%. @ 390.0' - 75° FRACTURE @ 390.0' - LOST WATER RETURN	677.6	383–392	94		100	NQ-39											CORE	
SANDSTONE, DARK GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, THICK BEDDED, PYRITIC, CROSS-BEDDING, SLIGHTLY FRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%. @ 392.0'-392.1 - CLAY SEAM @ 393.0 - CARBONACEOUS JOINT	675.4	393–394																
SANDSTONE, GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, VERY THIN BEDDED, PYRITIC, CROSS-BEDDING; BLACK LAMINATIONS, INTACT, SLIGHTLY ROUGH, INTERBEDDED SHALE LAYERS; RQD 100%, REC 100%.	671.6	395–398	85		100	NQ-40											CORE	
LIMESTONE, GRAY, UNWEATHERED, MODERATELY STRONG, FINE TO COARSE GRAINED, THIN BEDDED, SHELL FOSSILS, MODERATELY FRACTURED, VERY ROUGH, INTERBEDDED SHALE LAYERS; RQD 100%, REC 100%.	669.9	399–400																
SHALE, DARK GRAY TO BLACK, UNWEATHERED, SLIGHTLY STRONG, VERY THIN BEDDED, PYRITIC, SHEAR, FRACTURED, CARBONACEOUS, SLICKENSIDED; RQD 55%, REC 100%. @ 404.5'-405.4' - CROSS-BEDDED SANDY LAYERS	664.4	401–405																
SANDSTONE, DARK GRAY, UNWEATHERED, STRONG TO MODERATELY STRONG, FINE GRAINED, VERY THICK BEDDED, UNFRACTURED, SLIGHTLY ROUGH; RQD 100%. REC 100%.	660.6	406–409	95		100	NQ-41											CORE	
INTERBEDDED SANDSTONE AND SHALE, GRAY, UNWEATHERED, MODERATELY STRONG, FINE GRAINED, VERY THIN TO LAMINATED BEDDING, UNFRACTURED, SLIGHTLY ROUGH; RQD 100%, REC 100%.	657.4	410–412 EOB																

NOTES: WATER METER - MAX. LENGTH WAS 200'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH 100 LB. BENTONITE POWDER; 564 LB. CEMENT; 60 GAL. WATER