NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	10+00 to 99+78	4 - 10	-	11 - 75
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. R-3622A F.A. PROJ. N/A

COUNTY Cherokee

PROJECT DESCRIPTION NC 294 Roadway Improvements From West of SR 1130 (Sunny Point Rd.) to East of SR 1309 (Oak Grove Rd.)

CONTRACT No. C201819

RECOMMENDATIONS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3622A	1	-

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
38068.1.1	N/A	P.E.
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

W. Duggins
K. Hicks
D. Kitchen
A. Hayes
W. Whichard
R. Boykin
-
-
-

INVESTIGATED BY T. Wells
CHECKED BY J. Vinson
SUBMITTED BY P. Weaver
DATE 8/10/07

NOTE: Roadway Subsurface Investigation Performed by and Roadway Subsurface Investigation Recommendations Report Prepared by Trigon Engineering Consultant Inc. Greensboro, North Carolina

NORTH CAROLINA LICENSED SEAL 1800 GEOLOGIST PAUL M. WEAVER

CONTRACT: C201819

ID: R-3622A

DRAWN BY: DRK

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

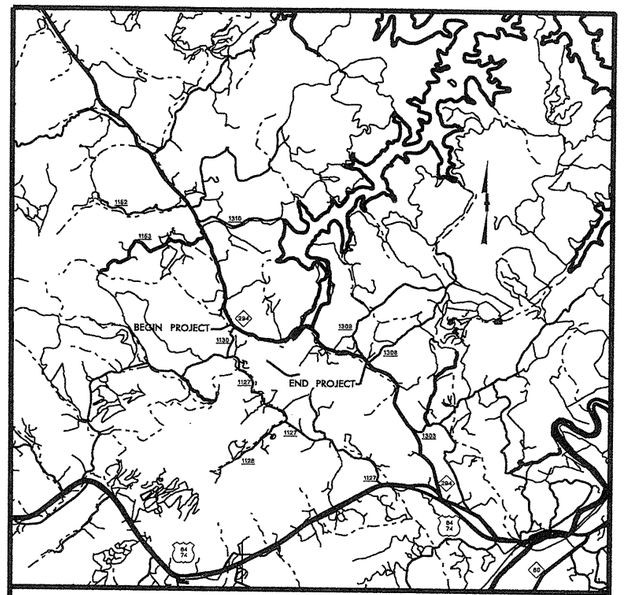
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

...\05014_RdwyTitle&Legend_e.dgn 6/6/2008 11:48:46 AM

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3622A	2A	82

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
38068.1.1	N/A	P.E.

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols

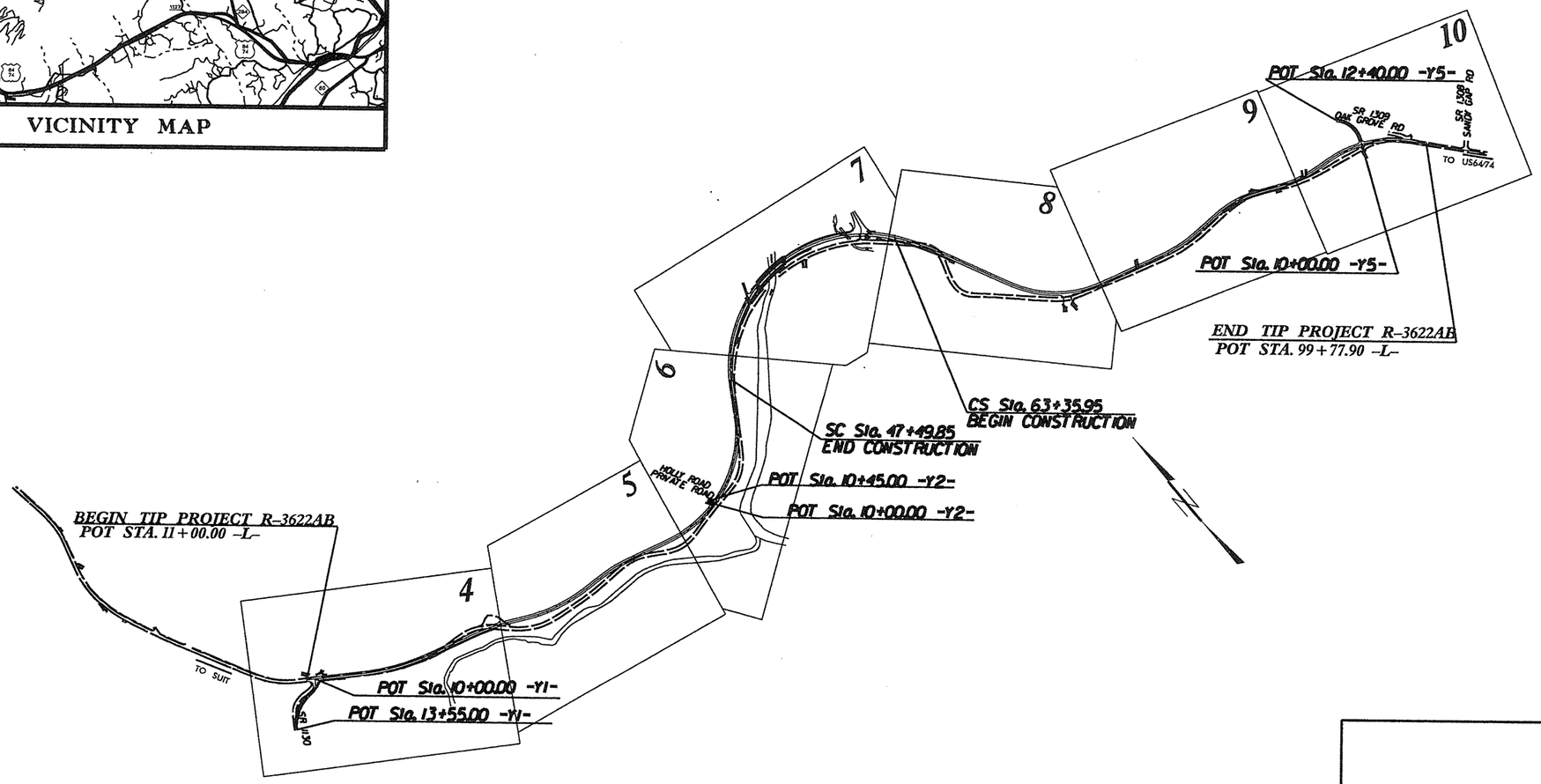


VICINITY MAP

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. R-3622A F.A. PROJ. N/A
COUNTY Cherokee
PROJECT DESCRIPTION NC 294 Roadway Improvements From West of SR 1130 (Sunny Point Rd.) to East of SR 1309 (Oak Grove Rd.)



DRAWN BY: DRK

ID: R-3622A

CONTRACT:

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT R-3622AA COUNTY Cherokee DATE 3/8/2008 SHEET 3 OF __ SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	42+90.00	53+87.34	7110	1212			5898	5892	1212		4680	6828		282		282
-Y3-	10+15.00	11+40.00	23	0			23	696	0		696	835	812			
TOTAL SUMMARY #1			7133	1212			5921	6588	1212		5376	7663	812	282		282
-L-	55+92.34	67+50.00	7221	0			7221	26012	0		26012	31214	23993			
-Y4-	10+12.00	12+50.00	1083	0			1083	2824	0		2824	3388	2305			
TOTAL SUMMARY #2			8304	0			8304	28836	0		28836	34602	26298	0		0
PROJECT SUBTOTAL			15437	1212	0	0	14225	35424	1212	0	34212	42265	27110	282	0	282
													0			
SHOULDER MATERIAL											1478	1774	1774			
WASTE IN LIEU OF BORROW													-282	-282		-282
LOSS DUE TO CLEARING & GRUBBING			-400									400	400			
PROJECT TOTAL			15037	1212	0	0	14225	35424	1221	0	35690	44439	29002	0	0	0
EST 5% TO REPLACE BORROW PIT TOPSOIL													1450			
GRAND TOTAL			15037										30452			
SAY			**15050**										**30500**			

1350 CY UNDERCUT CONTINGENCY

SHEET 3A

TRIGON
ENGINEERING CONSULTANTS, INC.
Since 1983
www.trigoneng.com
P.O. Box 18846 • Zip 27419-8846 • 313 Gallimore Dairy Road • Greensboro, NC 27409 • p 336.668.0093 • f 336.668.3868

SUBMITTED TO: Wilbur Smith Associates
421 Fayetteville Street, Suite 1303
Raleigh, North Carolina 27601

ATTENTION: Mr. David L. Wilver, P.E.
Vice President

SUBMITTED BY: Trigon Engineering Consultants, Inc.
Post Office Box 18846
Greensboro, North Carolina 27419-8846
Trigon Project No. 071-05-014

DATE: September 10, 2007

STATE PROJECT: 38068.1.1

TIP: R-3622A

COUNTY: Cherokee

DESCRIPTION: NC 294 Roadway Improvements

SUBJECT: Geotechnical Report – Design and Construction Recommendations

Trigon Engineering Consultants, Inc. (Trigon) has completed the authorized subsurface investigation for the above referenced project in Cherokee County, North Carolina, and we submit the following recommendations.

I. Slope and Embankment Stability

A. Cut Slope Designs

Cut slopes of 1H:1V should generally be acceptable along the proposed roadway alignment with the following discussion kept in mind. The preliminary general drawings indicate isolated cut slopes to the ditch line and through the existing roadway and/or shoulder at inclinations of 4H:1V to 8H:1V which we find to be acceptable.

Existing cut slopes along the roadway alignment, with the exception of the vertical cut slope at approximately Station 23+25, are generally at approximately 1H:1V. These cut slopes have remained generally stable since the original roadway construction, with isolated small scale wedge-shaped block failures. Our field observations of the existing cut slopes and rock strike/dip features indicate that the proposed roadway alignment is generally oriented subnormal to the regional strike of bedding, and major rock instability in the form of large-scale slab slides

is not anticipated. It should be noted that both small scale bedding and/or fracture plane slab-type and wedge-type instability are possible within cuts along the proposed roadway alignment.

Areas which are potentially most prone to slope failure include the northeastern facing slopes of the deep trench cut located from approximately Station 68+00 to Station 72+00, and the areas in the vicinity of Stations 41+50 to 42+50 where the toes of the existing 2H:1V and 3H:1V soil/rock slopes will be undercut by the proposed 1H:1V cut. In particular, the northeast facing slopes of the trench cut should be closely evaluated. Mapped bedding and facture planes in localized segments of the existing cuts projected to the area of the proposed alignment suggest the potential for slab-type and wedge-type slides. Field inspection by a qualified geologist should be performed during the blasting and excavation of these areas and field design modifications such a benched cuts or other slope stabilization measures should be implemented as needed.

B. Undercut (Soft Foundation Soils)

We recommend that 3000 cubic yards of undercut be included in the project contract as a contingency item to be used at the discretion of the Engineer for areas of soft foundation soil.

C. Embankment Slope Designs

We recommend that all embankment slopes be constructed at inclinations of 2H:1V or flatter.

D. Embankment Stabilization

1. Fabric for Soil Stabilization Under Embankments

Soft soils, near surface (within 3 feet of the existing ground surface) groundwater, and fill heights generally exceeding 10 feet are anticipated from approximately Station 52+50 to approximately Station 60+50 (excluding bridge area). In addition, soft soils where a near surface groundwater table is not expected and where fill heights are expected to not exceed 12 feet are anticipated from approximately Station 21+50 to approximately Station 23+00. These areas may require stabilization via soil stabilization fabric and/or stone stabilization.

We recommend that 3,500 square yards of fabric for soil stabilization be included in the project contract as a contingency item. This material is to be used to facilitate the construction of embankments on soft and/or saturated foundation soils.

2. Rip Rap for Soil Stabilization Under Embankments

We recommend that 7,000 tons of Class A Rip Rap be included in the project contract as a contingency item. This material is to be used to facilitate the construction of embankments on soft and/or saturated foundation soils.

Shot rock from the cut areas of the project where blasting is anticipated may be utilized as the rip rap for soil stabilization under embankments provided that it meets NCDOT gradation requirements.

II. Subgrade Stability

A. Grade point undercut

We estimate that approximately 750 cubic yards will be undercut at grade points on the project.

B. Subgrade Undercut

The following areas may contain near surface soils with greater than 10% organic content by weight and may require undercutting:

Approximately Station 78+00 to approximately Station 79+50
Approximately Station 87+00 to approximately Station 88+00

Should proofrolling reveal the need to undercut soils in those areas, the depth of undercut should be to 3 feet below the subgrade of to suitable soils, whichever is less. We recommend than 1,000 cubic yards of undercut be included in the project as a contingency item to be used at the discretion of the Engineer for areas of unsuitable subgrade soil.

C. Fabric for Soil Stabilization in Undercut of Subgrade

We recommend that 800 square yards of soil stabilization fabric be included in the project contract as a contingency item to be used at the discretion of the Engineer for areas of subgrade undercut.

III. Borrow Specifications

A. Unsuitable Unclassified Excavation

The following areas contains unclassified excavation that is most likely unsuitable and should be wasted. The approximate limits of this material are delineated on the plans and cross-sections with a single hatch (\\\\) symbol. Quantities of this material may be obtained from the plans and cross sections.

Approximately Station 77+00 to approximately Station 79+00
Approximately Station 87+00 to approximately Station 88+00

B. Select Granular Material

We recommend a contingency item of 3,000 cubic yards of Class I or Class II select granular material (from Section 265 of the 2002 Standard Specifications) to be used as backfill with fabric for soil stabilization or backfill in water as directed by the Engineer. Select granular material should be placed to a height of 3 feet above the fabric for soil stabilization.

C. Shrinkage Factor

We recommend a 20% shrinkage factor be used for earthwork calculations.

SHEET 3B

IV. Miscellaneous

A. Reduction of Unclassified Excavation

A loss of 6,000 cubic yards is estimated on the project due to clearing and grubbing of cut sections.

B. Springs

Springs were observed in the existing cuts along the roadway corridor at approximately Station 24+00 and at approximately Station 71+80.

C. Water Wells

No water wells were evident within the proposed construction area of the project.

D. Blasting

Due to the shallow rock within many of the proposed cuts along the alignment and in particular in the deep trench cut, significant quantities of rock excavation via blasting are anticipated. To minimize localized rock slope failures, controlled blasting is critical. Line drilling of selected areas to prevent overbreak in areas of the trench cut which are poorly buttressed by soil/rock separating the proposed cuts from the existing roadway, and/or cushion blasting with reduced weight/delay interval (lbs/delay) at the finished rock face should be used. Scaling of the finished slope surfaces to remove loose rock caused by overbreak should be performed. Additionally, due to the proximity of existing homes at the eastern extent of the relocated roadway, preblast inspections of the existing structures should be performed. Conservative limits on peak particle velocity near the existing structures should be established and verified by field measurements. Field adjustments should be made to ensure peak particle velocity at the existing structures is within specified limits.

Closure

Trigon Engineering Consultants, Inc. appreciates the opportunity to work with you during this phase of the project. Should you have any questions concerning this report, please do not hesitate to contact our office.

Respectfully submitted,
TRIGON ENGINEERING CONSULTANTS, INC.

Paul M. Weaver, P.G.
North Carolina License No. 1500

Xavier C. Barrett, P.E.
North Carolina License No. 15741

PMW/JRV:pmw
S:\0710\Projects\2007\NC294NC294Roadway\Recommendations Report.doc

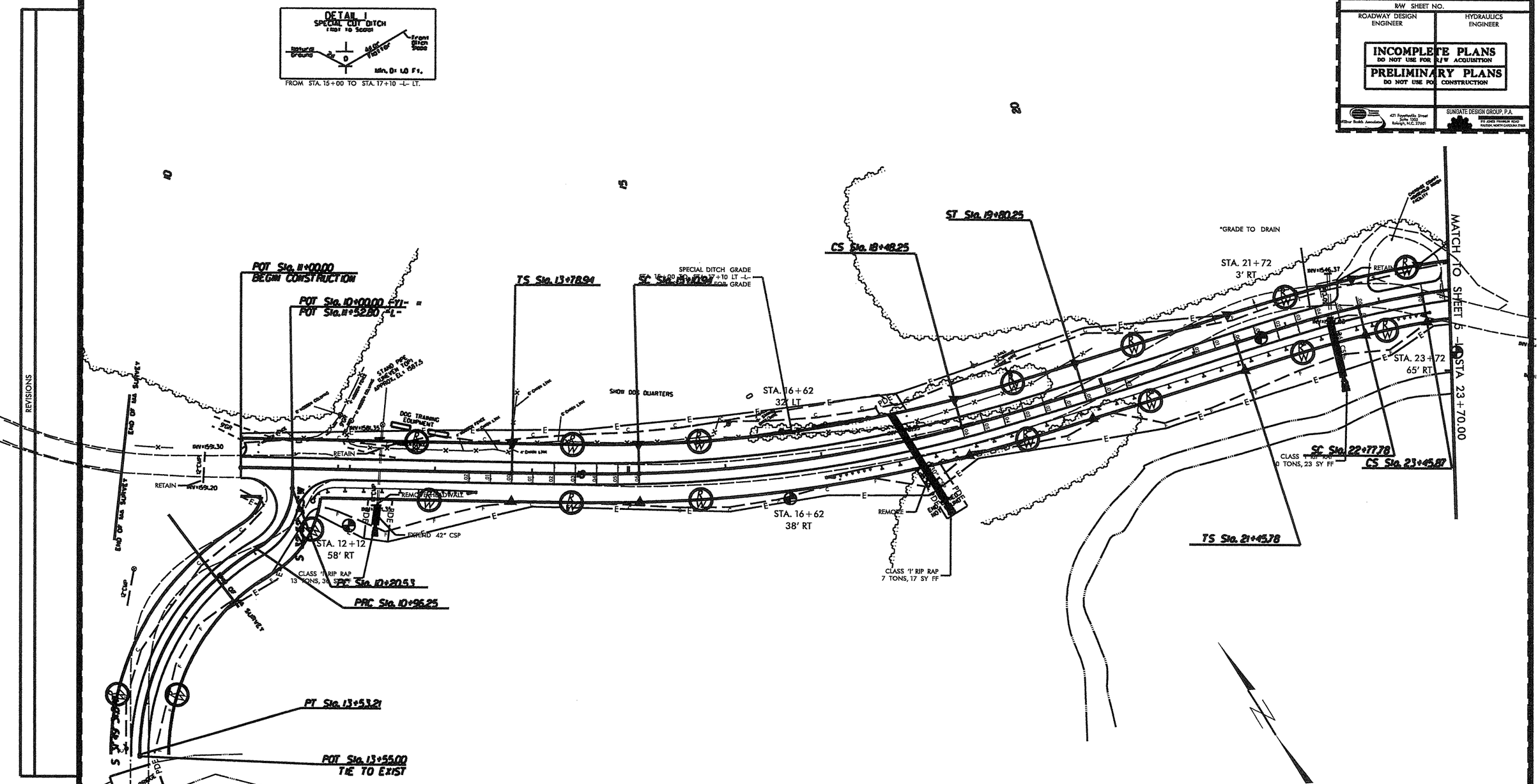
PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

421 Fayetteville Street Suite 1200 Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A.
810 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606

REVISIONS



-Y1-

Pi Sta 10+61.97	Pi Sta 12+37.38
Δ = 57° 50' 27.0" (RT)	Δ = 58° 53' 26.6" (LT)
D = 76° 23' 39.7"	D = 22° 55' 05.9"
L = 75.71'	L = 256.96'
T = 41.44'	T = 141.13'
R = 75.00'	R = 250.00'

-L-

Pts Sta 7+98.35	Pi Sta 9+00.36	Pts Sta 10+01.99	Pts Sta 14+66.95	Pi Sta 16+80.38	Pts Sta 18+92.26	Pts Sta 22+33.80	Pi Sta 23+41.84	Pts Sta 23+89.89
Es = 1° 46' 22.5"	Δ = 13° 37' 11.1" (LT)	Es = 1° 46' 22.5"	Es = 2° 38' 24.0"	Δ = 13° 29' 32.7" (LT)	Es = 2° 38' 24.0"	Es = 3° 57' 36.0"	Δ = 4° 05' 07.4" (RT)	Es = 3° 57' 36.0"
Ls = 132.00'	D = 11° 46' 37.7"	Ls = 132.00'	Ls = 132.00'	D = 4° 00' 00.0"	Ls = 132.00'	Ls = 132.00'	D = 6° 00' 00.0"	Ls = 132.00'
LT = 88.08'	L = 115.65'	LT = 88.08'	LT = 88.01'	L = 337.31'	LT = 88.01'	LT = 88.02'	L = 68.09'	LT = 88.02'
ST = 44.08'	T = 58.10'	ST = 44.08'	ST = 44.01'	T = 169.44'	ST = 44.01'	ST = 44.02'	T = 34.06'	ST = 44.02'
	R = 486.50'			R = 1,432.39'			R = 954.93'	

SEE SHEET 11 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: EFILES
DATE: 10/4/1965

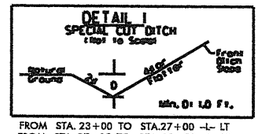
PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

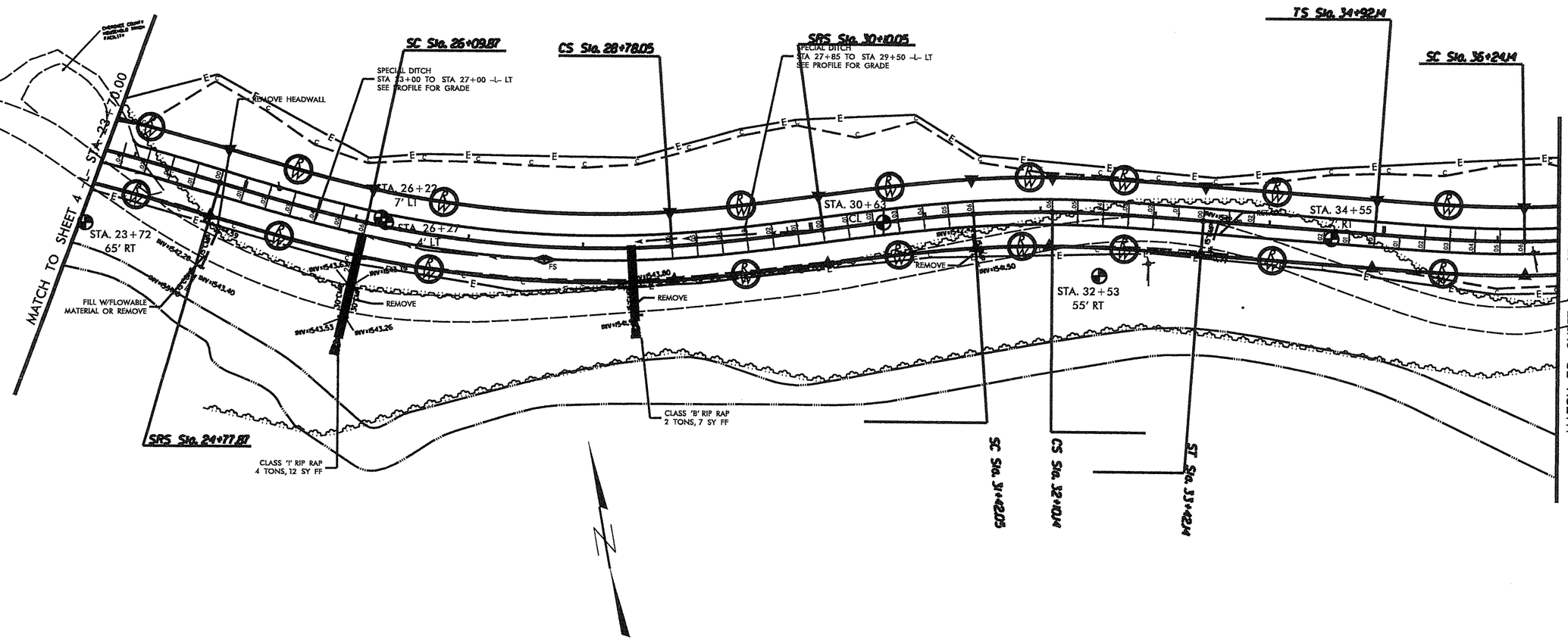
421 Fayetteville Street Suite 1300 Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A.
815 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606

REVISIONS



FROM STA. 23+00 TO STA.27+00 -L- LT
FROM STA. 27+85 TO STA. 29+50 -L- LT



-L-

Pts Sta 25+65.89	Pi Sta 27+44.85	Pts Sta 29+22.07	Pts Sta 30+98.07	Pi Sta 31+76.11	Pts Sta 32+54.16
Es = 3'57' 36.0'	Δ = 16°05' 26.9" (LT)	Es = 3'57' 36.0'	Es = 3'57' 36.0'	Δ = 4°05' 07.4" (RT)	Es = 3'57' 36.0'
Ls = 132.00'	D = 6°00' 00.0"	Ls = 132.00'	Ls = 132.00'	D = 6°00' 00.0"	Ls = 132.00'
LT = 88.02'	L = 268.18'	LT = 88.02'	LT = 88.02'	L = 68.09'	LT = 88.02'
ST = 44.02'	T = 134.98'	ST = 44.02'	ST = 44.02'	T = 34.06'	ST = 44.02'
	R = 954.93'			R = 954.93'	

SEE SHEET 12 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: STILES
DATE: STATES STIMES

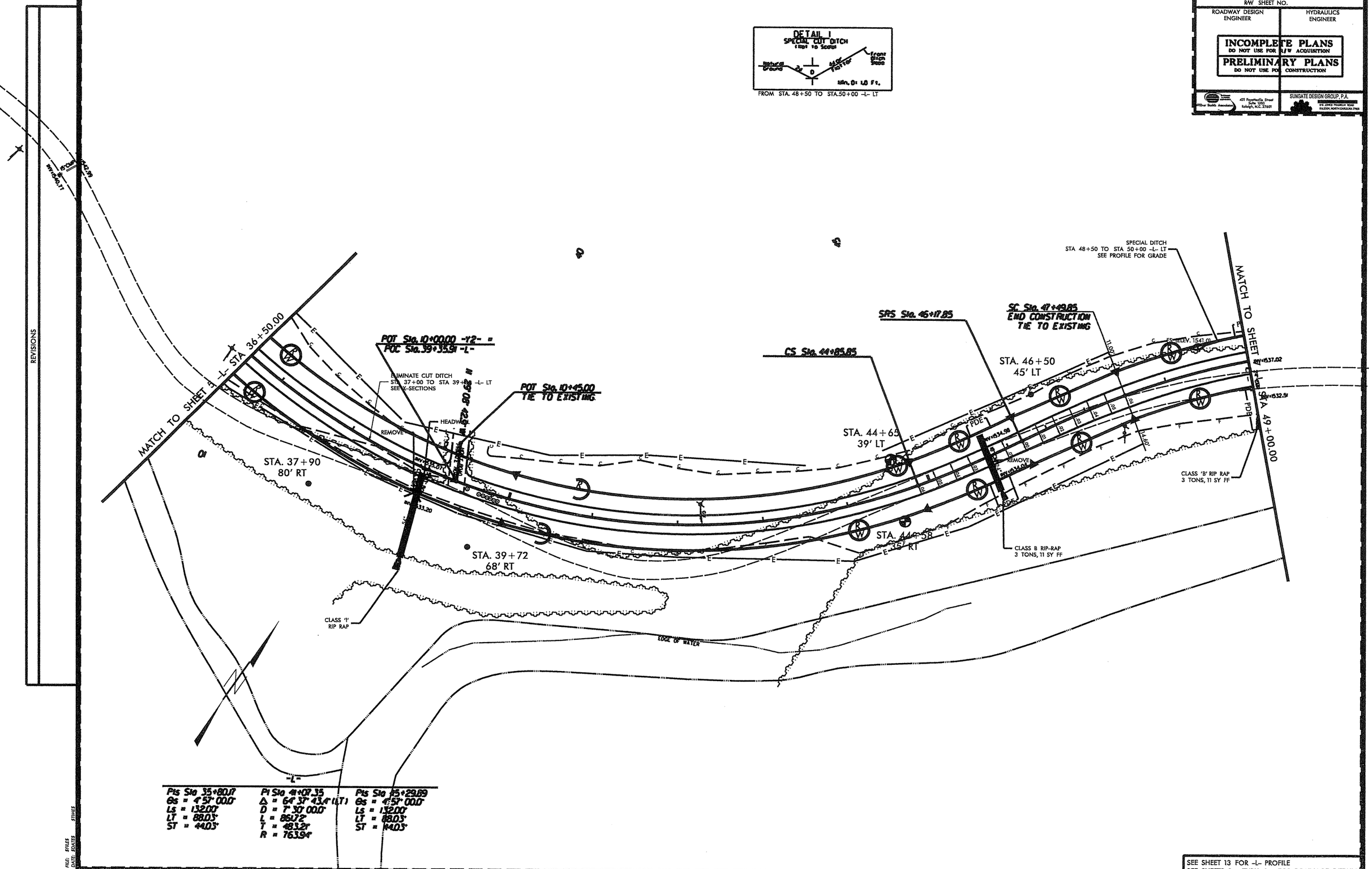
PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Kimley-Horn and Associates, 421 Fayetteville Street Suite 1210, Raleigh, N.C. 27601
SUNGATE DESIGN GROUP, P.A. 8016 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27616

REVISIONS

FROM STA. 48+50 TO STA.50+00 -L- LT



Pts Sta 35+80.17	Pi Sta 41+07.35	Pts Sta 45+29.89
Es = 4°57' 00.0"	Δ = 64° 37' 43.4" (LT)	Es = 4°57' 00.0"
Ls = 132.00'	D = 7° 30' 00.0"	Ls = 132.00'
LT = 88.03'	L = 861.72'	LT = 88.03'
ST = 44.03'	T = 483.21'	ST = 44.03'
	R = 763.94'	

SEE SHEET 13 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: SFILES
DATE: SDATES
STAGES

PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Kimley-Horn and Associates, 421 Fayetteville Street, Suite 1200, Raleigh, N.C. 27601
SUNGATE DESIGN GROUP, P.A., 810 JONES FRANKLIN ROAD, RALEIGH, NORTH CAROLINA 27606

REVISIONS

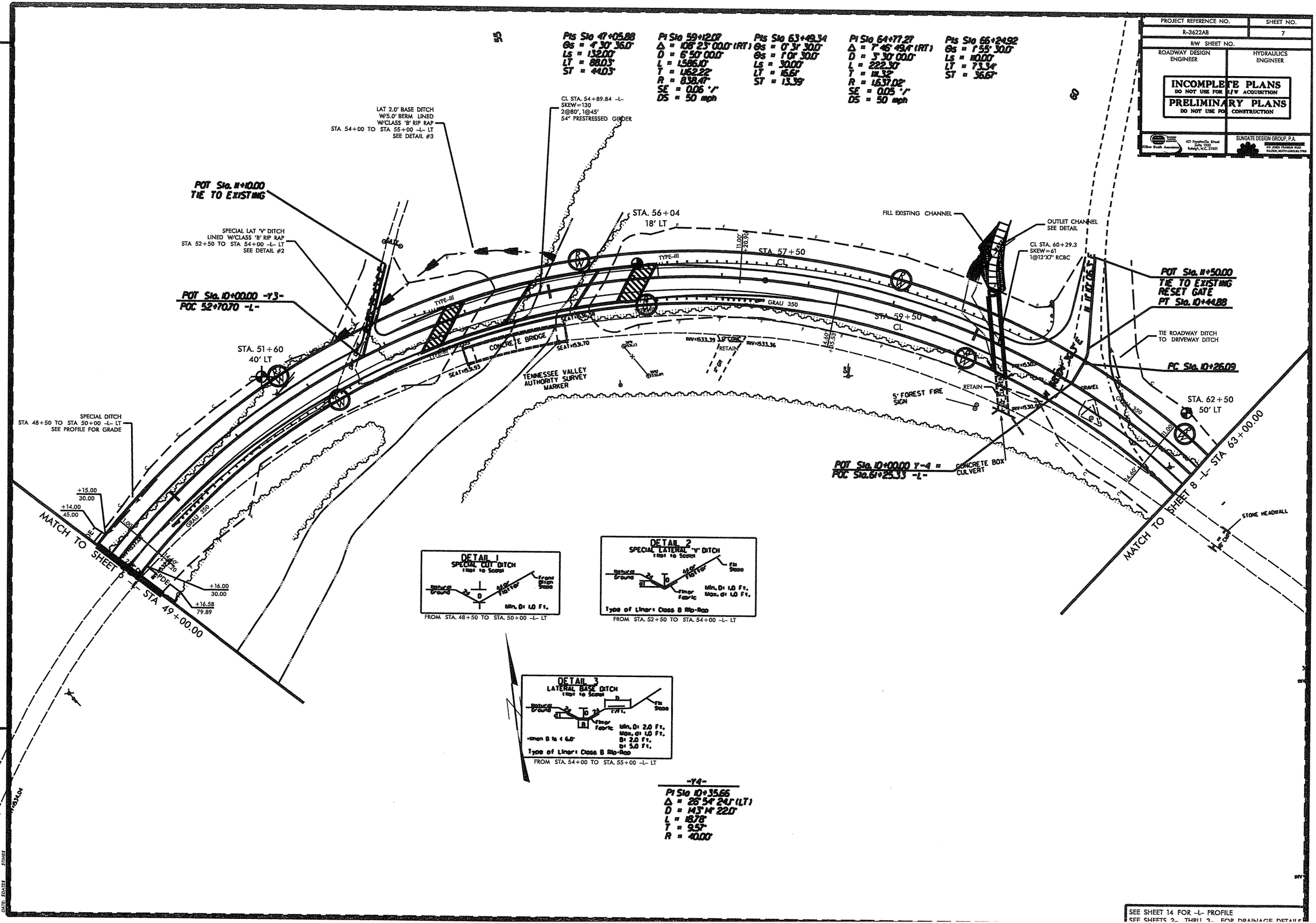
PI Sta 47+05.88
Δs = 4° 30' 35.0"
Ls = 132.00'
LT = 88.03'
ST = 44.03'

PI Sta 59+12.07
Δ = 106° 23' 00.0" (RT)
D = 6° 50' 00.0"
L = 1,565.10'
T = 1,162.22'
R = 838.47'
SE = 0.06 '/'
DS = 50 mph

PI Sta 63+49.34
Δs = 0° 31' 30.0"
Δs = 1° 01' 30.0"
Ls = 30.00'
LT = 15.61'
ST = 15.39'

PI Sta 64+77.27
Δ = 1° 45' 49.4" (RT)
D = 3° 30' 00.0"
L = 222.30'
T = 111.32'
R = 1,637.02'
SE = 0.05 '/'
DS = 50 mph

PI Sta 66+24.92
Δs = 1° 55' 30.0"
Ls = 110.00'
LT = 73.34'
ST = 36.67'



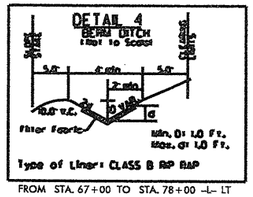
SEE SHEET 14 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

PROJECT REFERENCE NO.	SHEET NO.
R-3622AA	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

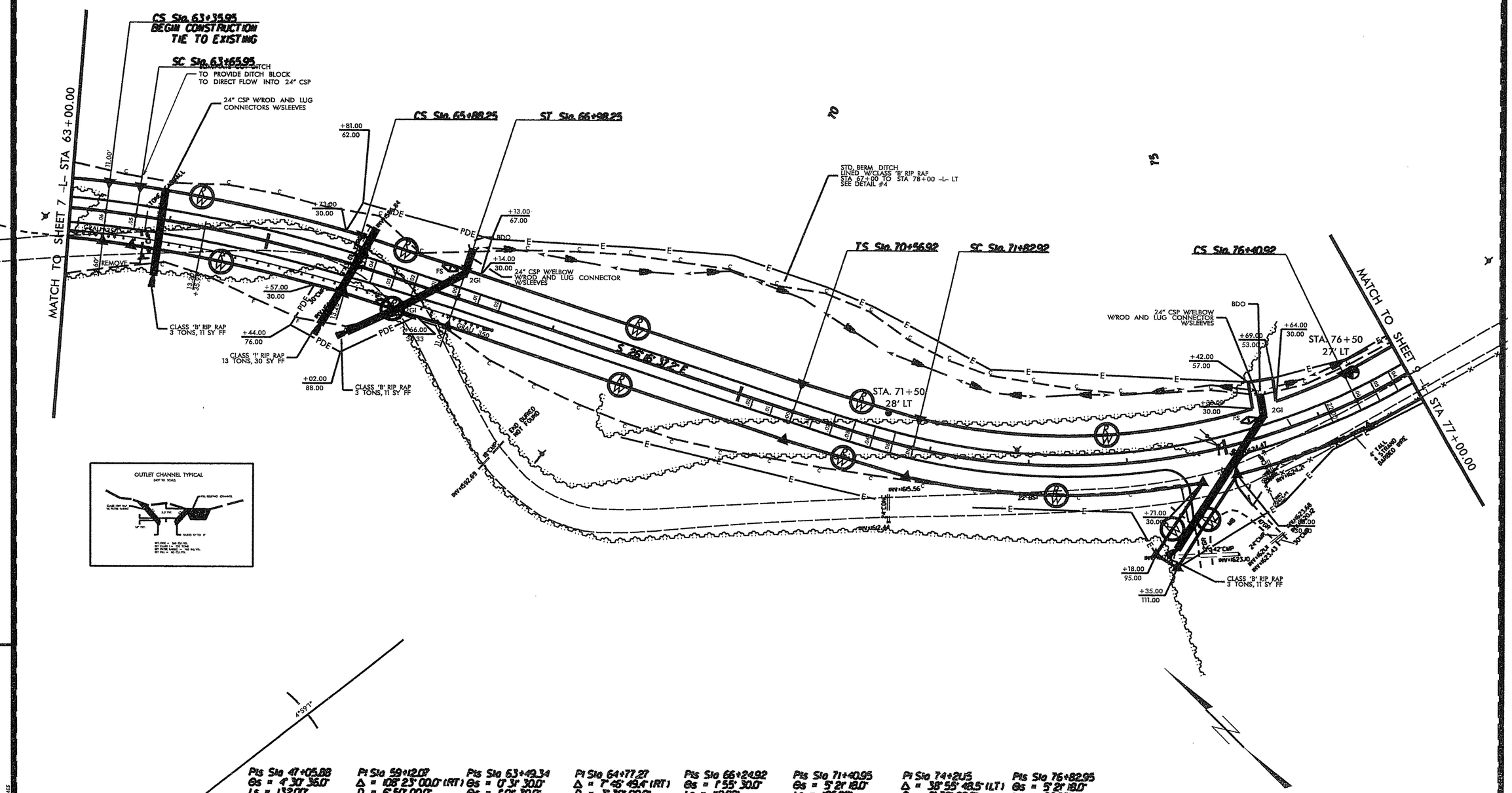
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

421 Fayetteville Street Suite 1203 Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606



FROM STA. 67+00 TO STA. 78+00 -L- LT



Pts Sta 47+05.88	Pi Sta 59+12.07	Pts Sta 63+49.34	Pi Sta 64+77.27	Pts Sta 66+24.92	Pts Sta 71+40.95	Pi Sta 74+20.5	Pts Sta 76+82.95
Es = 4' 30' 36.0"	Δ = 108° 23' 00.0" (RT)	Es = 0' 31' 30.0"	Δ = 7° 46' 49.4" (RT)	Es = 1' 55' 30.0"	Es = 5' 21' 18.0"	Δ = 38° 55' 48.5" (LT)	Es = 5' 21' 18.0"
Ls = 132.00'	D = 6° 50' 00.0"	Es = 1' 01' 30.0"	D = 3° 30' 00.0"	Ls = 110.00'	Ls = 126.00'	D = 8° 30' 00.0"	Ls = 126.00'
LT = 88.03'	L = 1,586.10'	Ls = 30.00'	L = 222.30'	LT = 73.34'	LT = 84.04'	L = 458.00'	LT = 84.04'
ST = 44.03'	T = 1,162.22'	LT = 15.61'	T = 111.32'	ST = 36.67'	ST = 42.03'	T = 239.24'	ST = 42.03'
	R = 838.47'	ST = 13.39'	R = 1,637.02'			R = 671.00'	
	SE = 0.06 '/'		SE = 0.05 '/'			SE = 0.06 '/'	
	DS = 50 mph		DS = 50 mph			DS = 45 mph	

SEE SHEET 15 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: SFILES
DATE: SDATES

PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

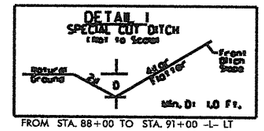
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

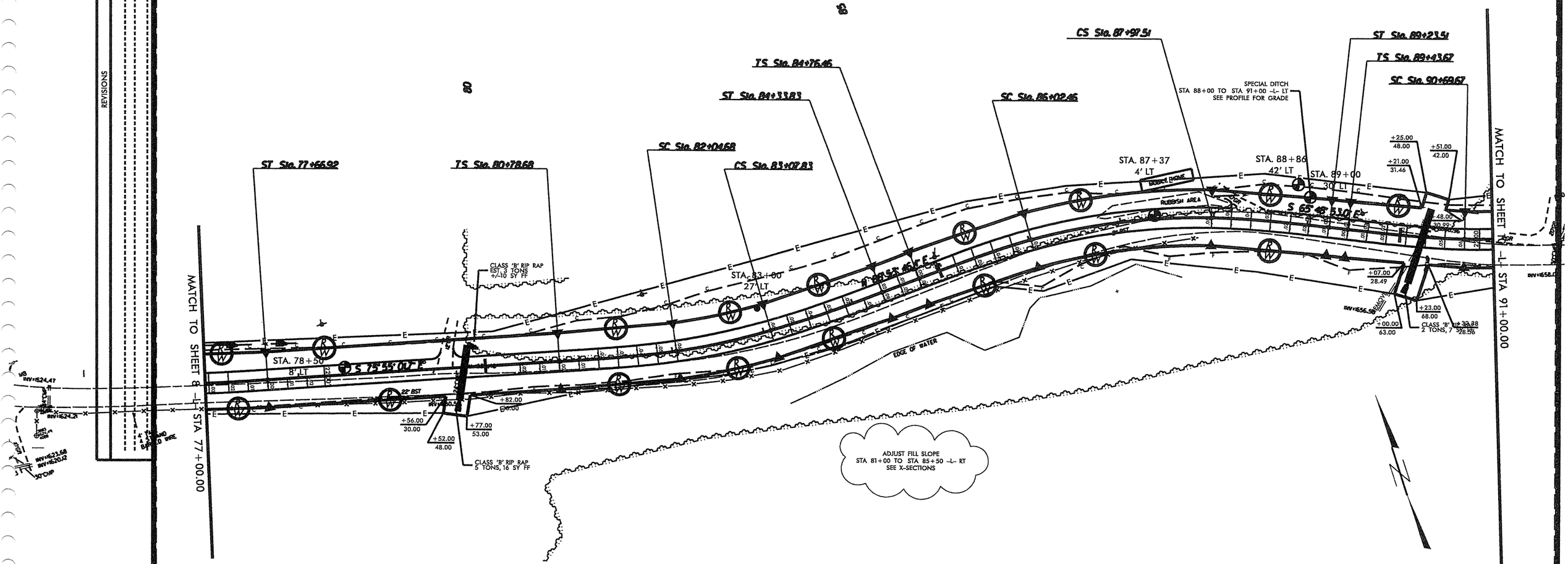
Wilbur Smith Associates — 421 Fayetteville Street Suite 1300 Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A. — 810 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606

REVISIONS



FROM STA. 88+00 TO STA. 91+00 -L- LT



Pts Sta 71+40.95
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

PI Sta 74+21.5
Δ = 38° 55' 48.5" (LT)
D = 8° 30' 00.0"
L = 458.00'
T = 238.24'
R = 674.01'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 76+82.95
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 81+62.71
Es = 4' 4.5' 30.0'
Ls = 126.00'
LT = 84.03'
ST = 42.03'

PI Sta 82+56.34
Δ = 7° 44' 11.9" (LT)
D = 7° 30' 00.0"
L = 103.16'
T = 51.65'
R = 763.94'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 83+49.86
Es = 4' 4.5' 30.0'
Ls = 126.00'
LT = 84.03'
ST = 42.03'

Pts Sta 85+60.50
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

PI Sta 87+00.67
Δ = 16° 34' 44.6" (RT)
D = 8° 30' 00.0"
L = 195.05'
T = 98.21'
R = 674.01'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 88+39.54
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 90+27.70
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

PI Sta 91+19.87
Δ = 8° 31' 09.2" (LT)
D = 8° 30' 00.0"
L = 100.23'
T = 50.21'
R = 674.01'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 92+11.93
Es = 5' 2' 18.0'
Ls = 126.00'
LT = 84.04'
ST = 42.03'

SEE SHEET 16 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: SFILES
DATE: SDATES

PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

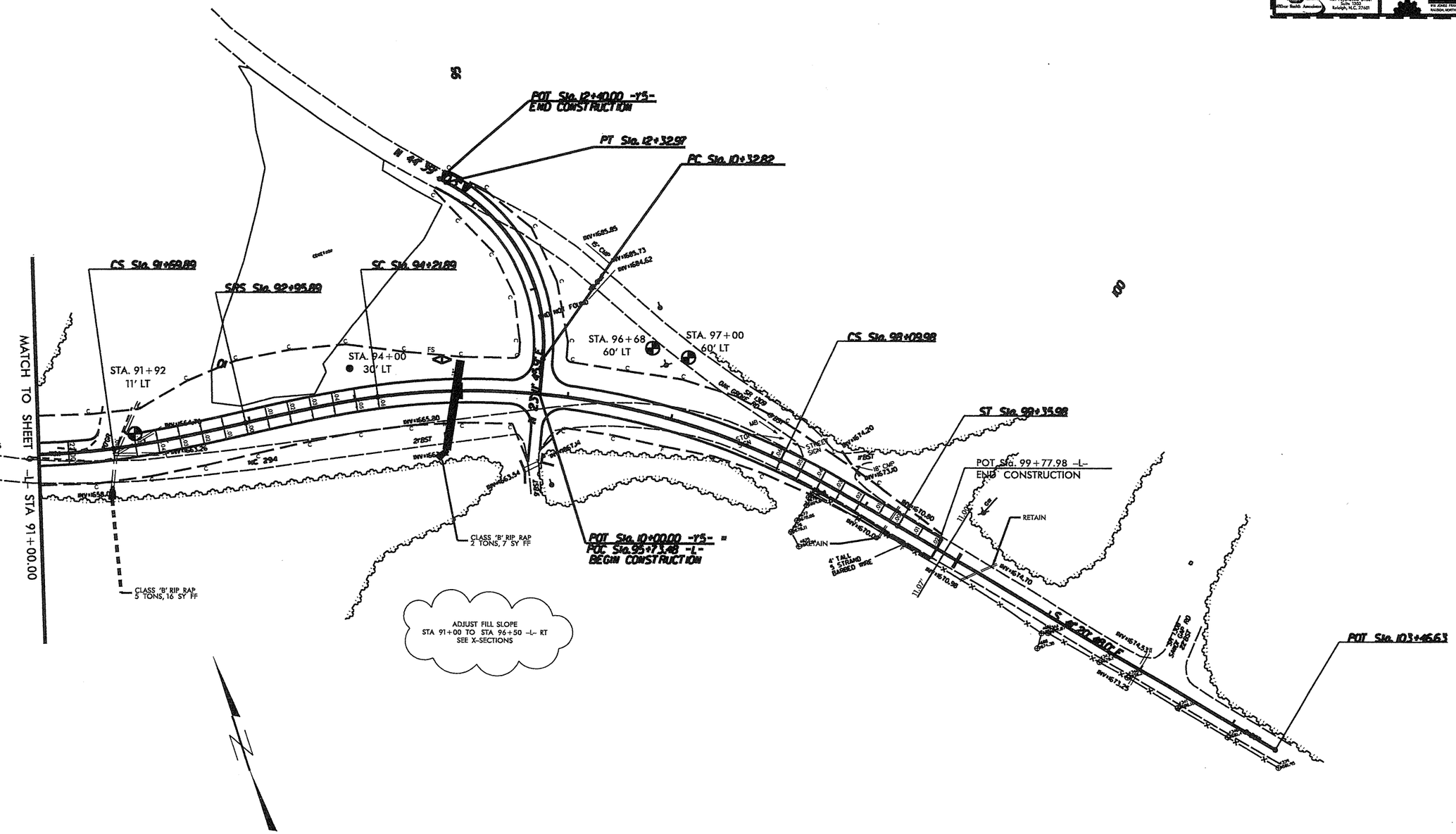
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Wilbur Smith Associates
421 Fayetteville Street
Suite 1205
Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A.
918 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606

REVISIONS



Pts Sta 90+27.70
Gs = 5' 2r 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pi Sta 91+19.87
Δ = 8° 31' 09.2" (LT)
D = 8° 30' 00.0"
L = 100.23'
T = 50.21'
R = 674.07'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 92+18.93
Gs = 5' 2r 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 93+79.93
Gs = 5' 2r 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pi Sta 96+21.48
Δ = 32° 59' 14.3" (RT)
D = 8° 30' 00.0"
L = 388.09'
T = 199.59'
R = 674.07'
SE = 0.06 '/'
DS = 45 mph

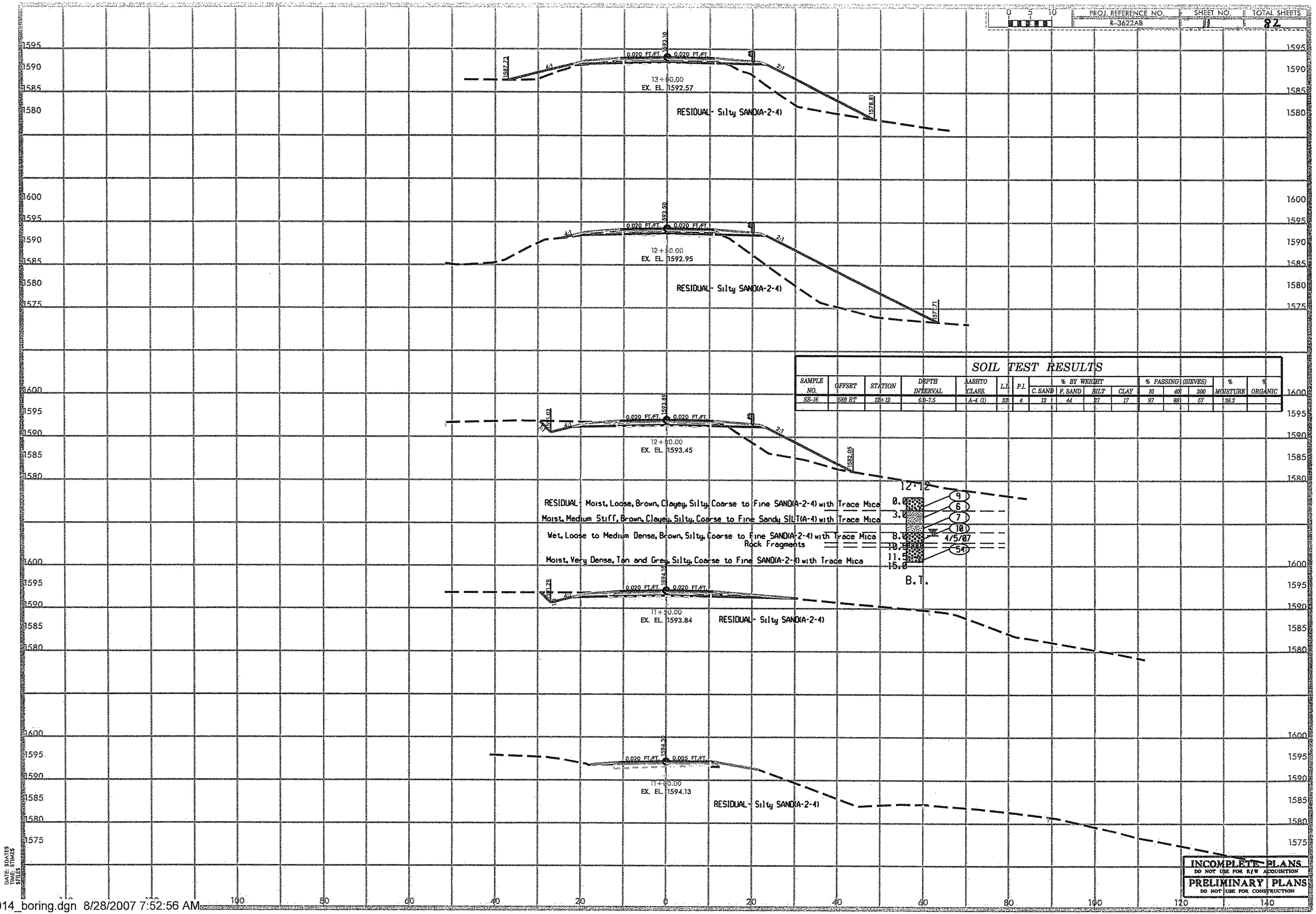
Pts Sta 98+52.01
Gs = 5' 2r 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Y-5
Pi Sta 11+46.50
Δ = 67° 51' 16.3" (LT)
D = 33° 54' 10.2"
L = 200.14'
T = 113.68'
R = 169.00'

SEE SHEET 17 FOR -L- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

FILE: STILES
DATE: STATES

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	11	82



SOIL TEST RESULTS

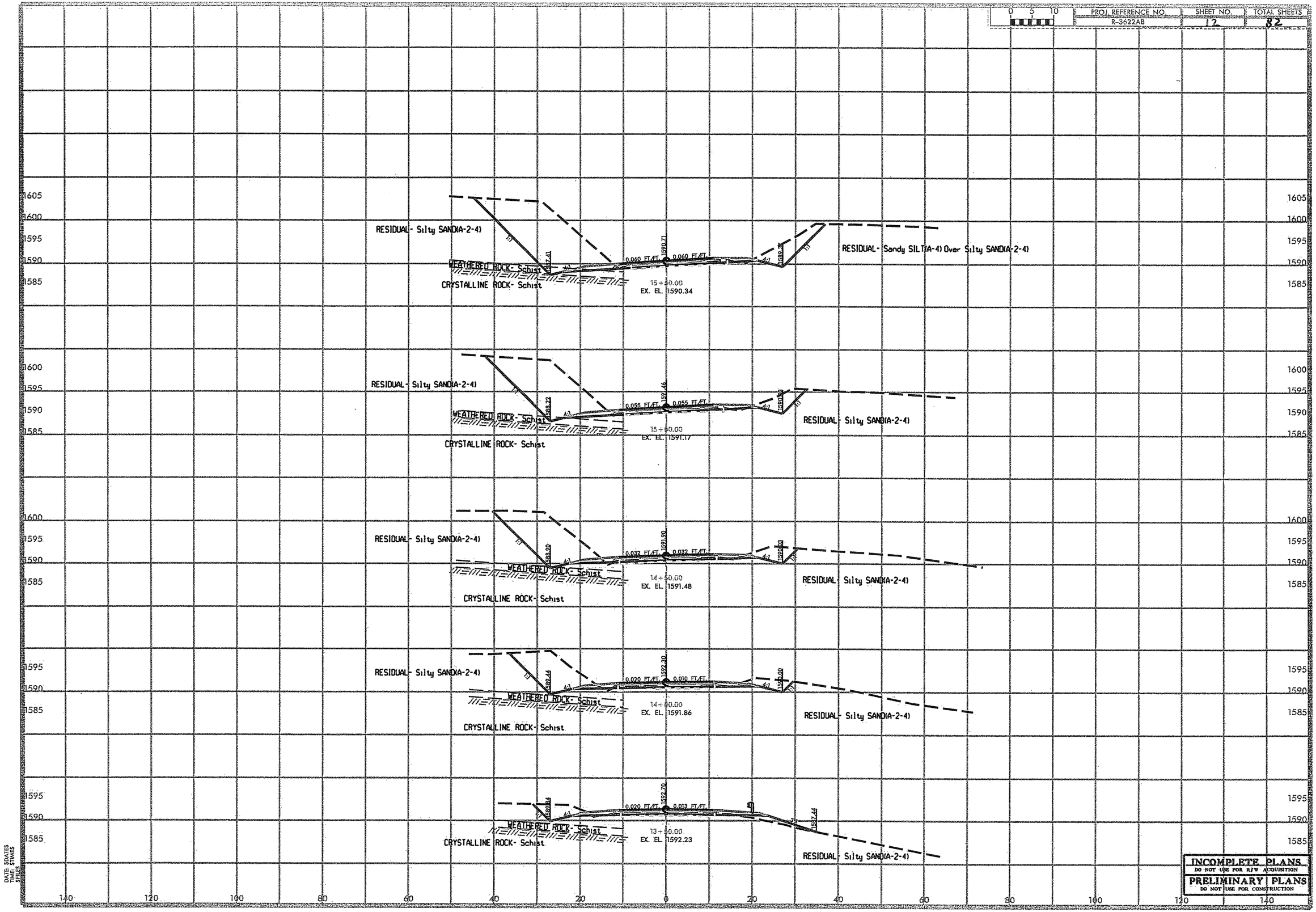
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-16	55ft RT	12+12	6.0-7.5	A-4 (1)	33	4	12	44	27	17	97	88	57	28.2	

DATE: $DATE$
TIME: $TIME$
$FILE$

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

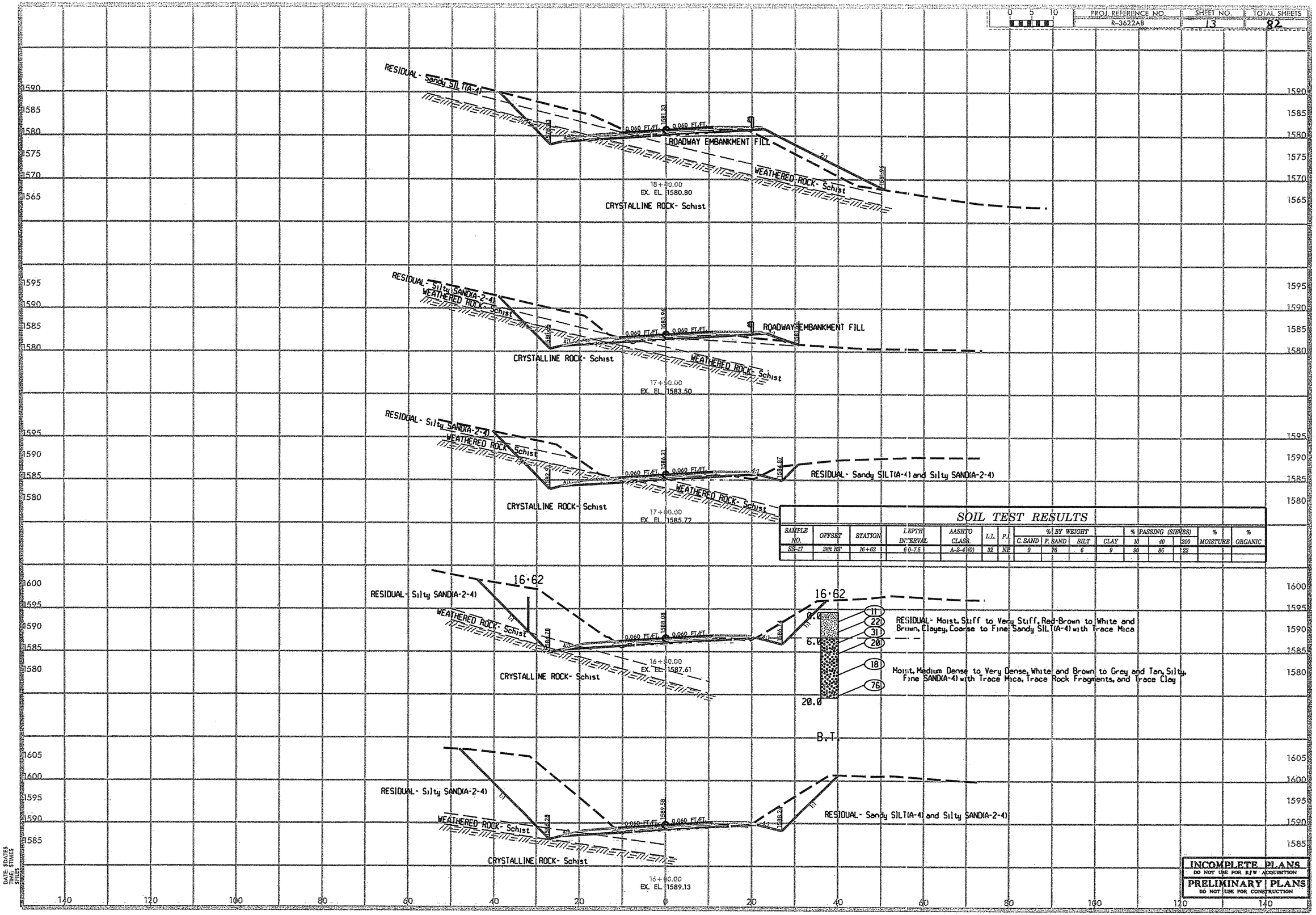
...\bridge-1\05014_boring.dgn 8/28/2007 7:52:56 AM

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	12	82



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 3DATE3
TIME: 5TIME5
5FILE5



SOIL TEST RESULTS

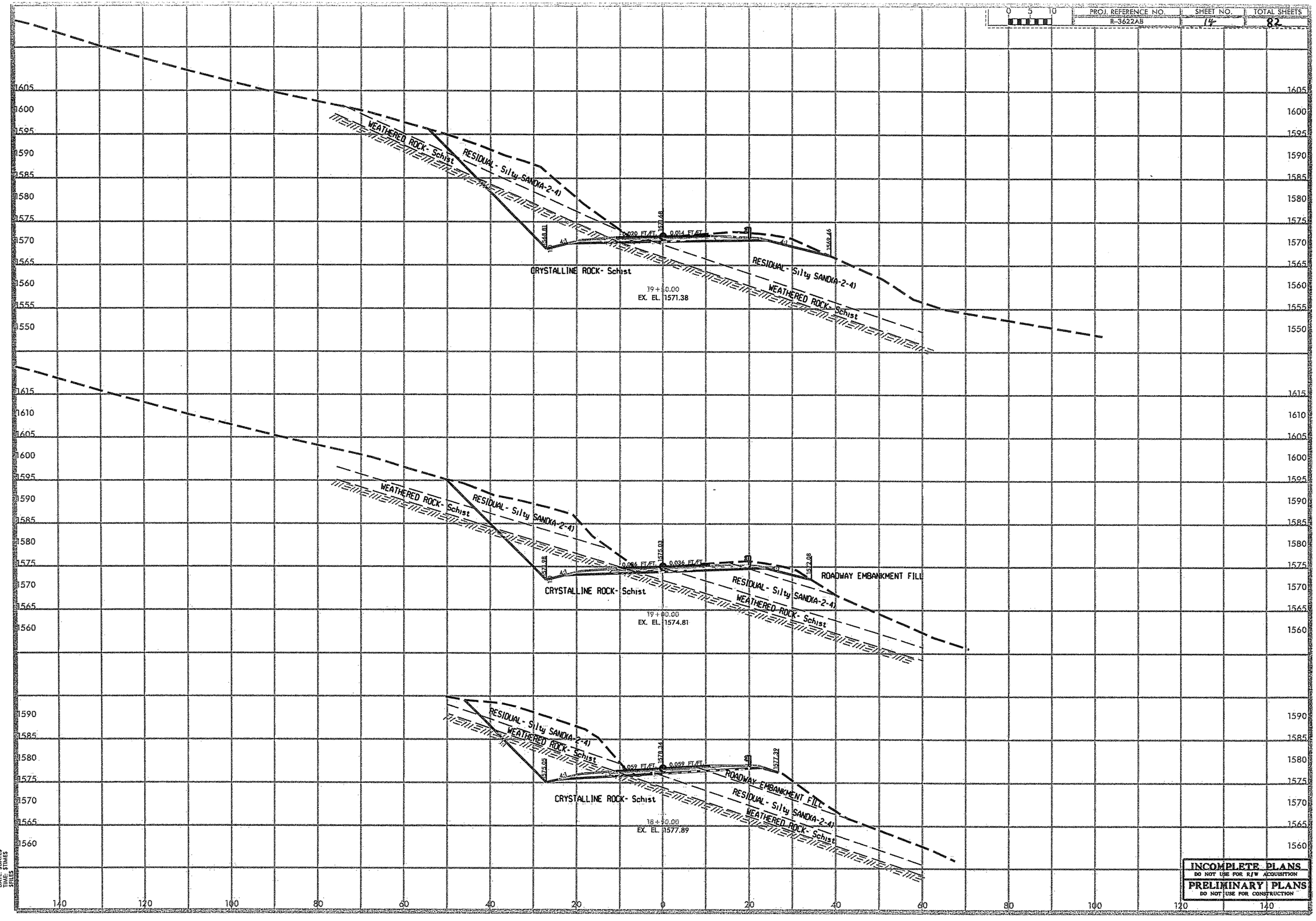
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-17	38ft RT	16+62	6.0-7.5	A-2-4(0)	32	NP	9	76	6	9	99	86	22		

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	14	82

0 5 10



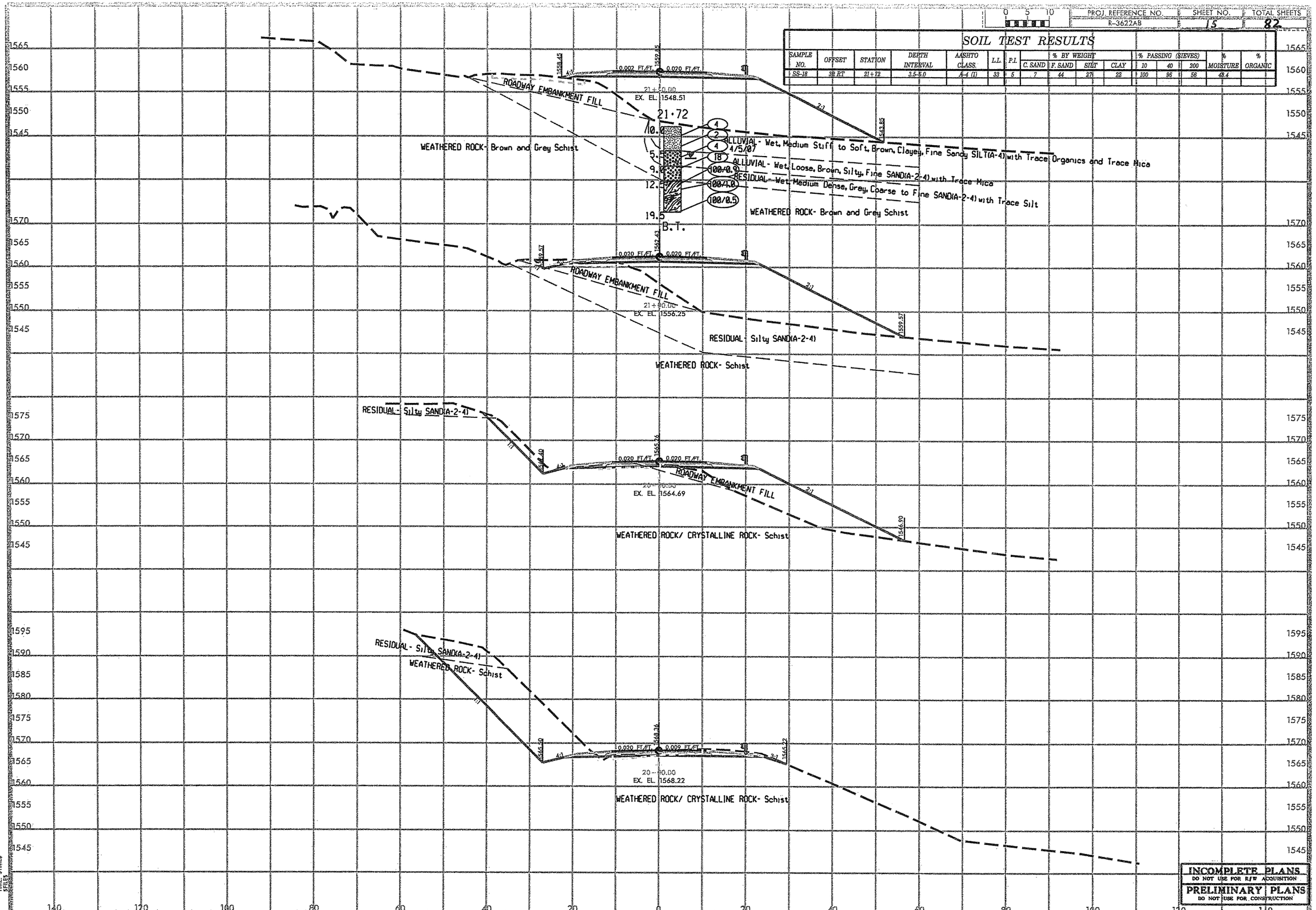
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

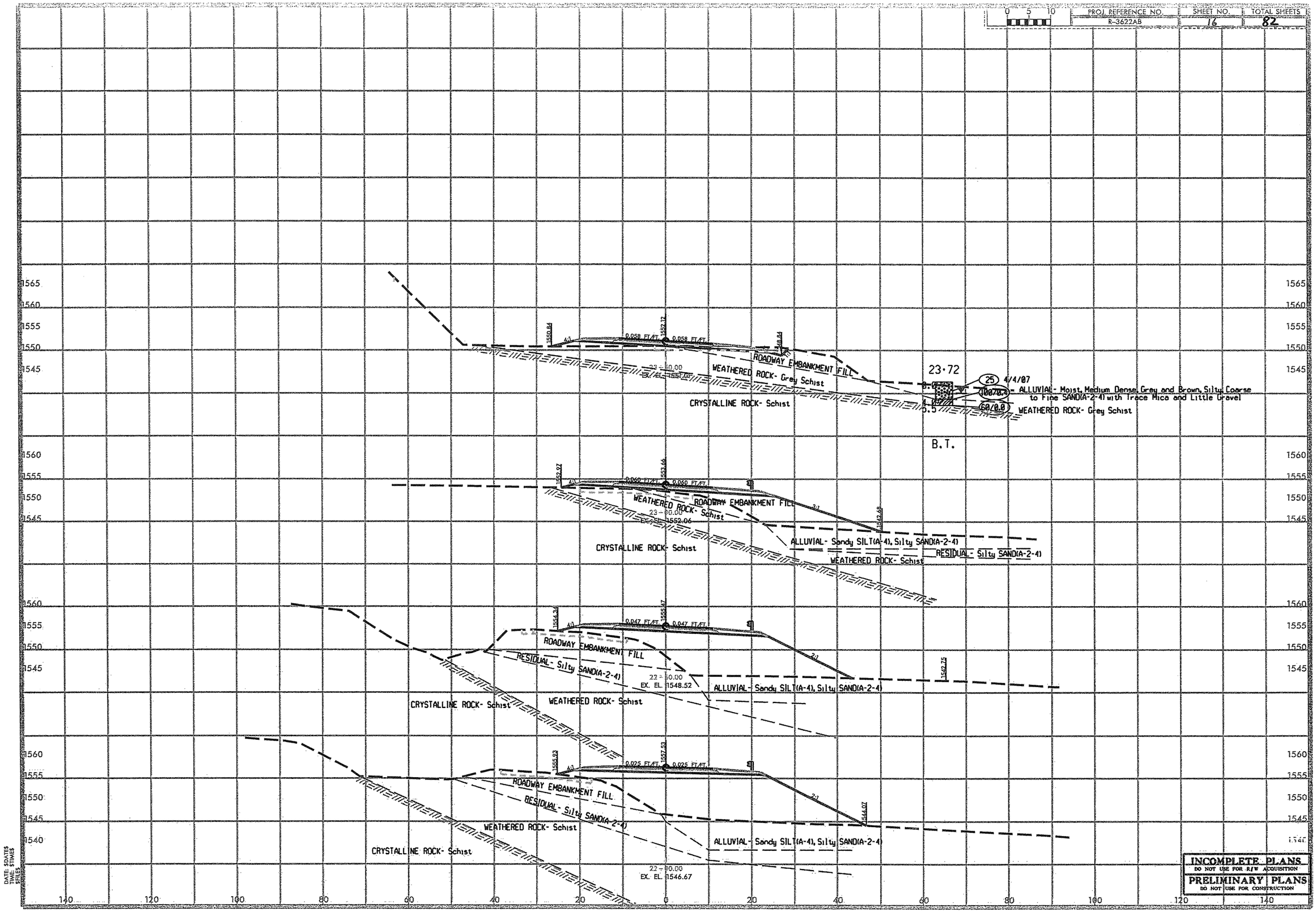
DATE: $DATE$
TIME: $TIME$
FILE: $FILE$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	15	82

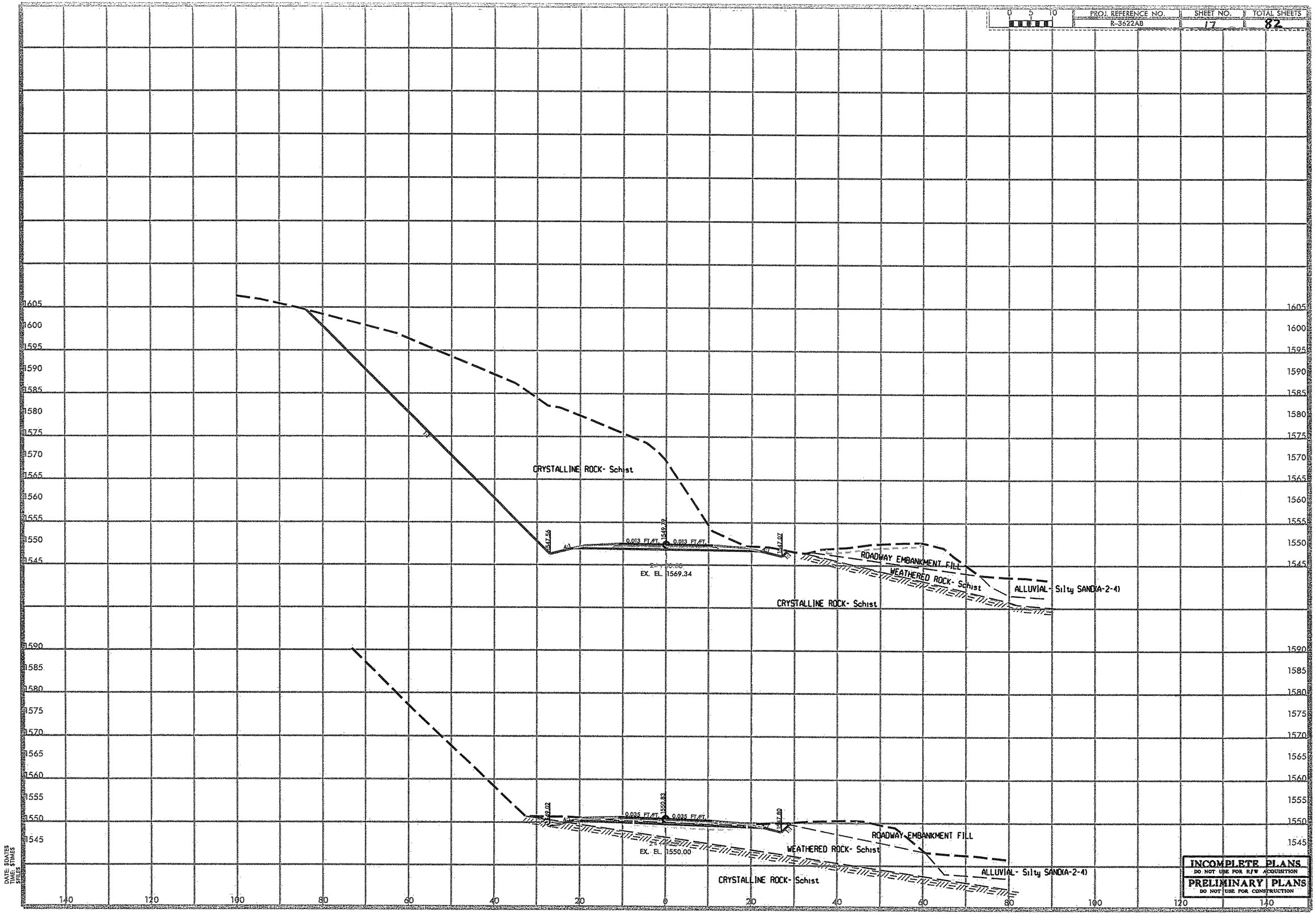
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-18	3ft RT	21+72	3.5-5.0	A-4 (1)	33	5	7	44	27	22	100	96	56	48.4	



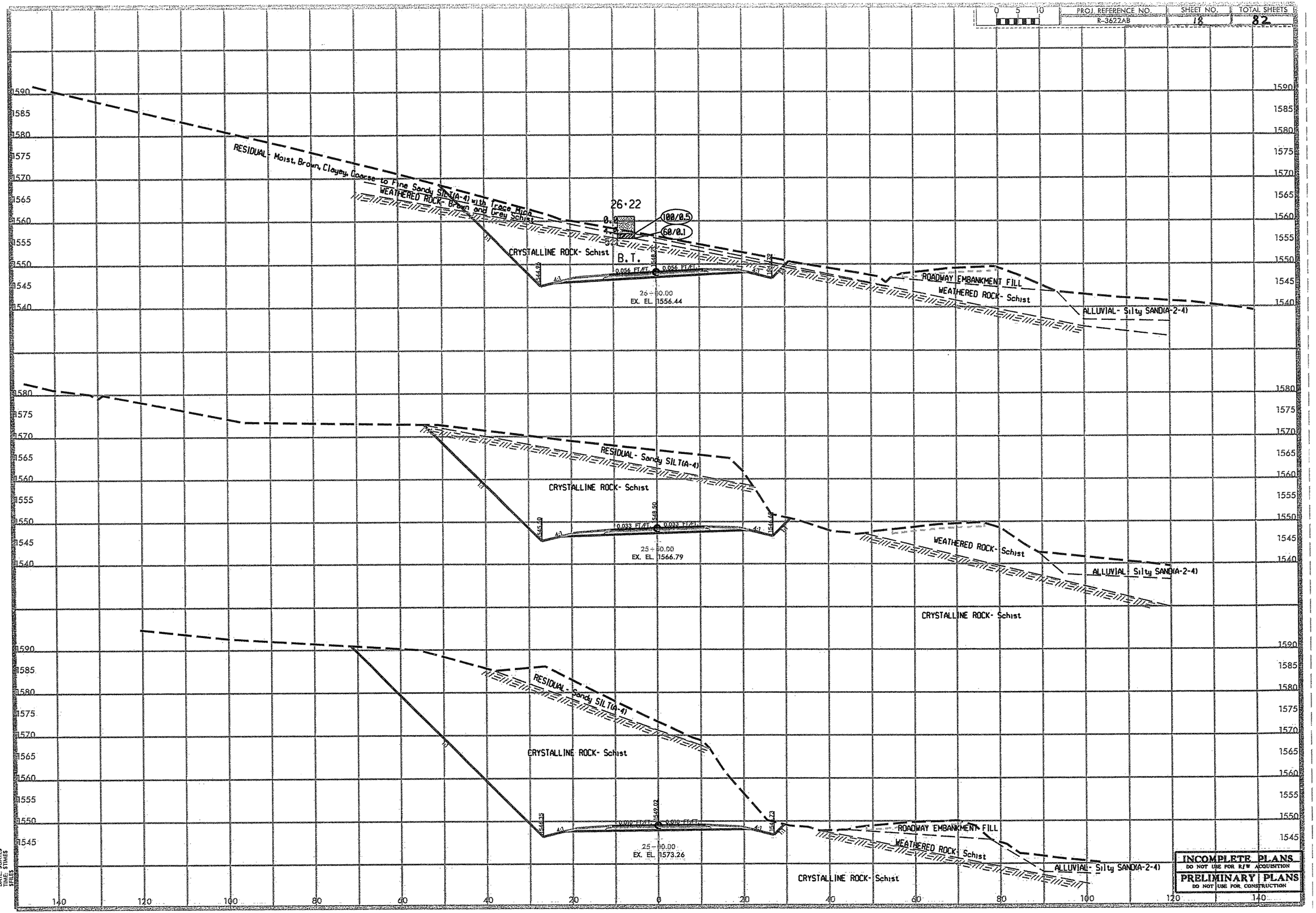

1565
1560
1555
1550
1545
1540
1550.84
0.058 FT/FT
1552.12
0.058 FT/FT
1548.84
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Grey Schist
CRYSTALLINE ROCK- Schist
23+72
25
4/4/07
(100/70.0)
ALLUVIAL- Moist, Medium Dense, Grey and Brown, Silty Coarse to Fine SAND(A-2-4) with Trace Mica and Little Gravel
(60/0.0)
WEATHERED ROCK- Grey Schist
B.T.
1552.97
0.060 FT/FT
1553.66
0.060 FT/FT
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
23+00.00
EX. EL. 1552.06
1542.68
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
1554.34
0.047 FT/FT
1555.47
0.047 FT/FT
ROADWAY EMBANKMENT FILL
RESIDUAL- Silty SAND(A-2-4)
22+50.00
EX. EL. 1548.52
1542.75
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
WEATHERED ROCK- Schist
1555.93
0.025 FT/FT
1557.53
0.025 FT/FT
ROADWAY EMBANKMENT FILL
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
1544.07
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
22+00.00
EX. EL. 1546.67
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: $DATE$
TIME: $TIME$
$FILE$
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	17	82



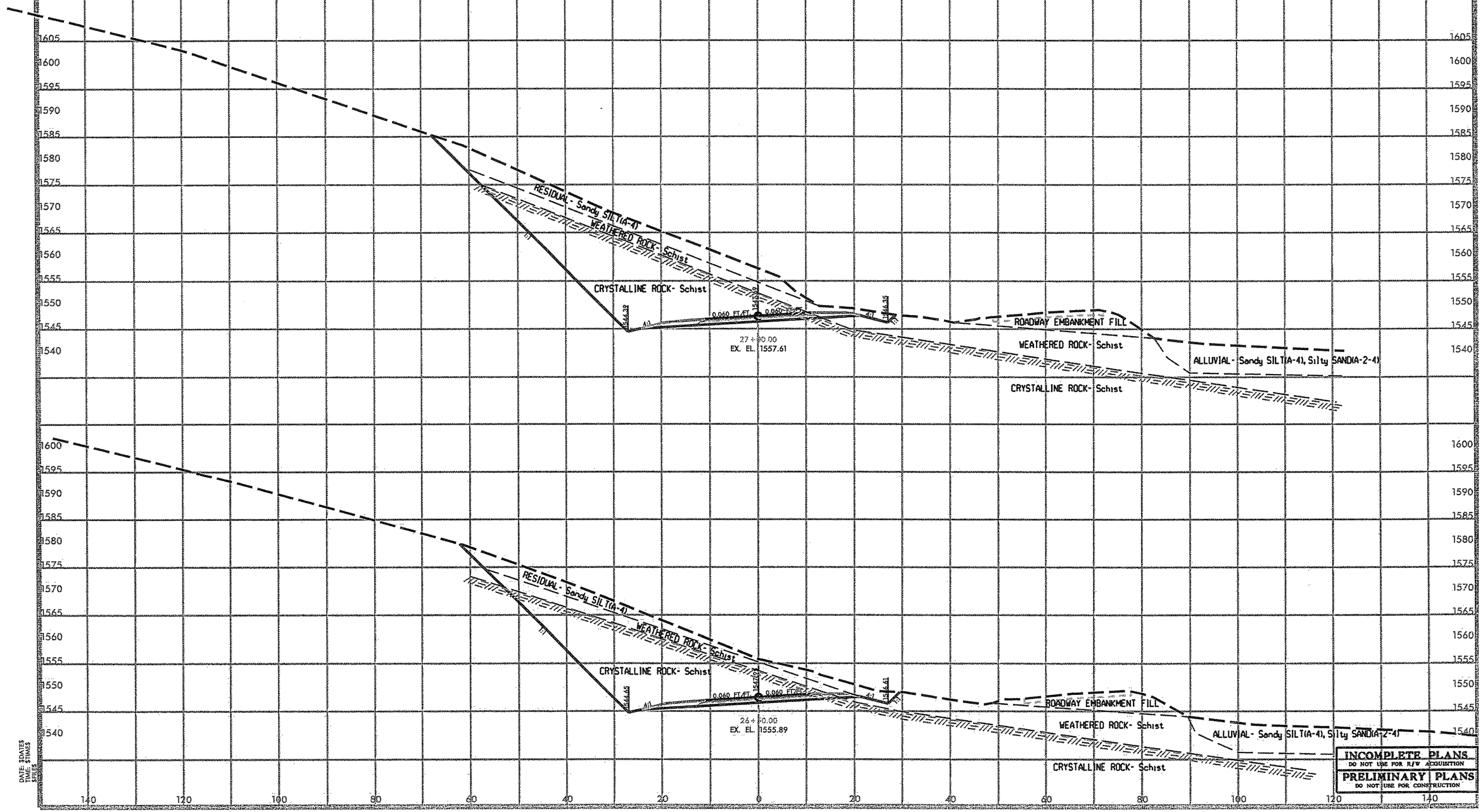
DATE: $DATE$
TIME: $TIME$
$FILE$

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

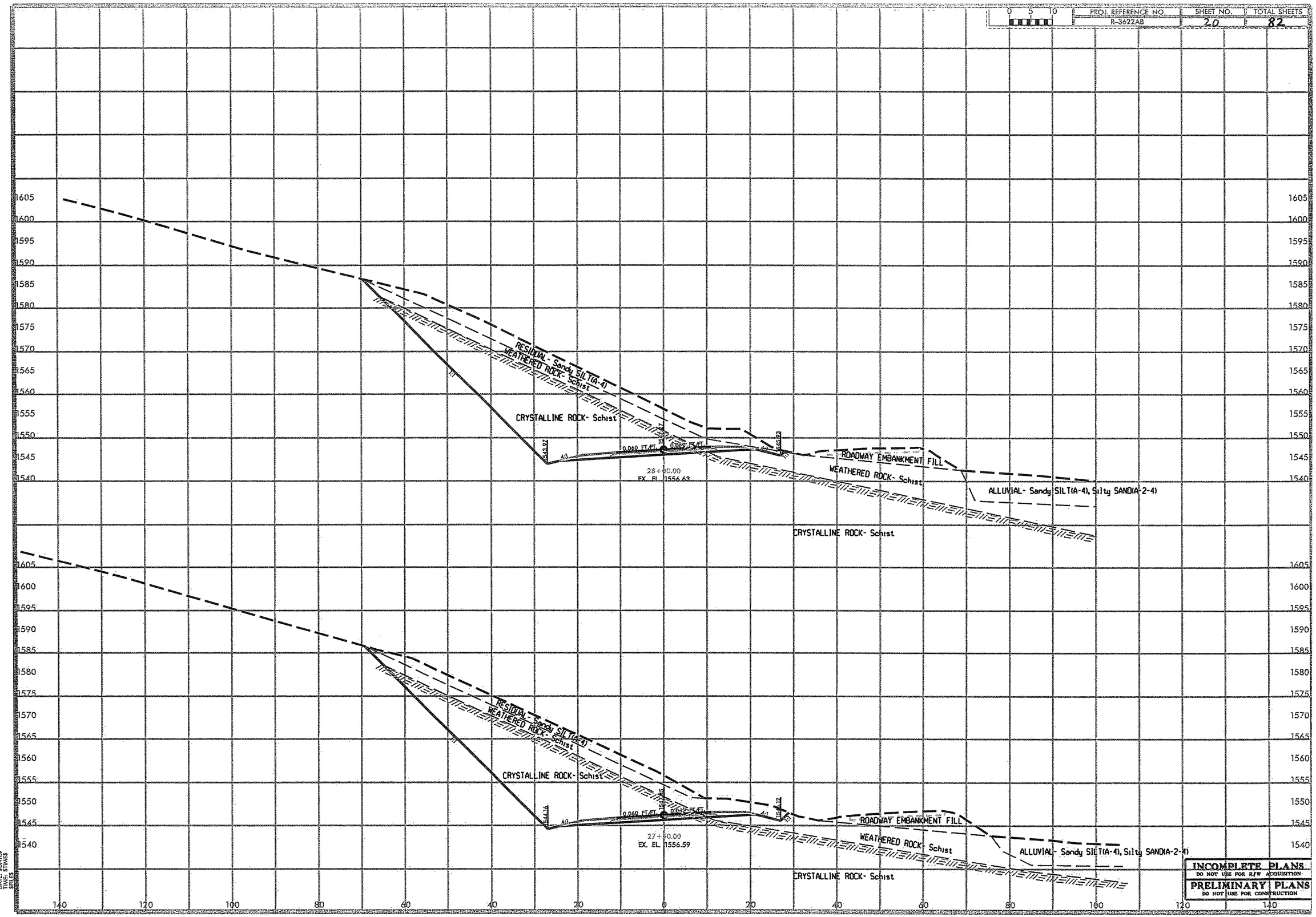
DATE, STATES
TIME, STATES
SFILES



DATE: $DATE$
TIME: $TIME$
SPACE: $SPACE$

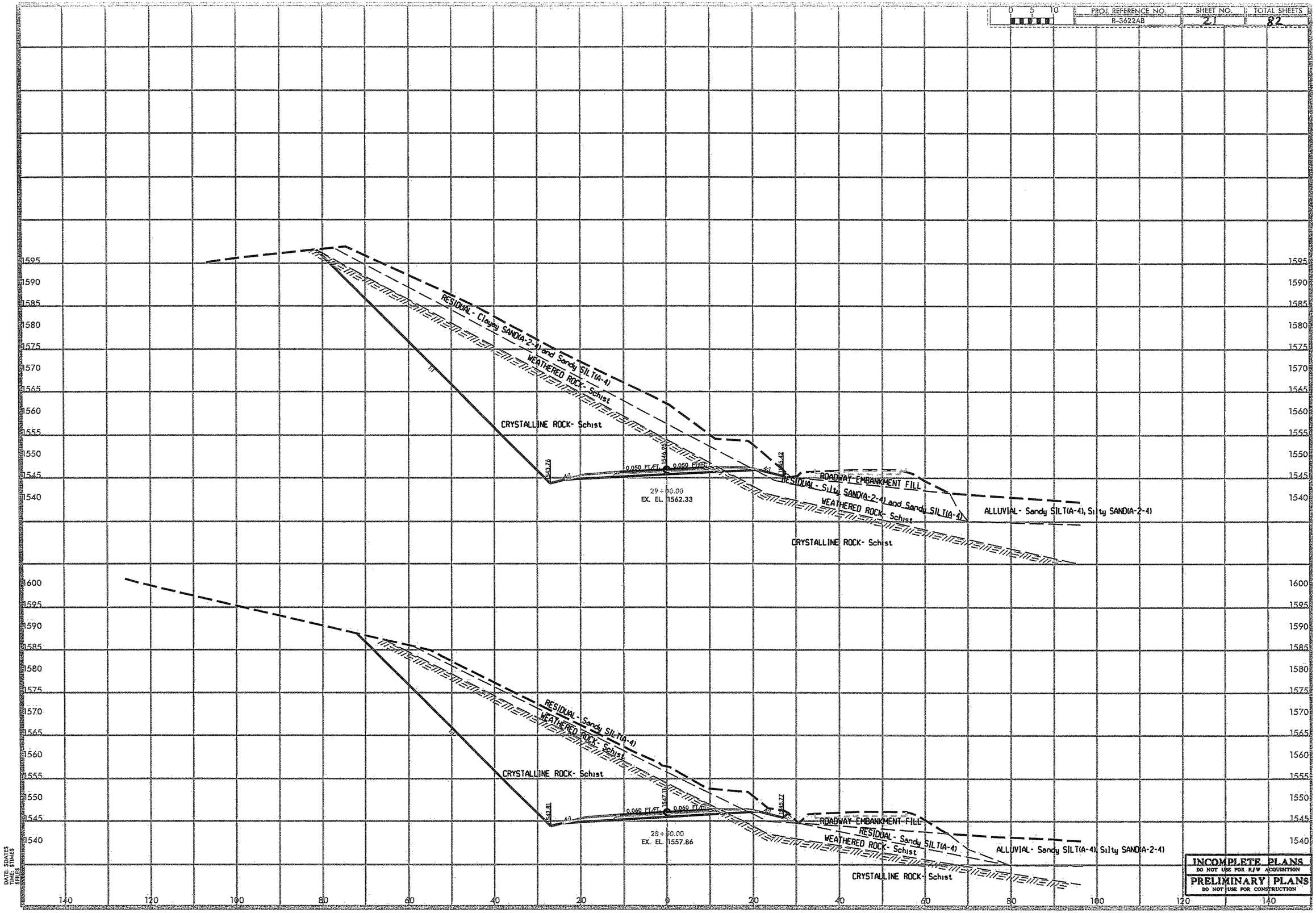
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

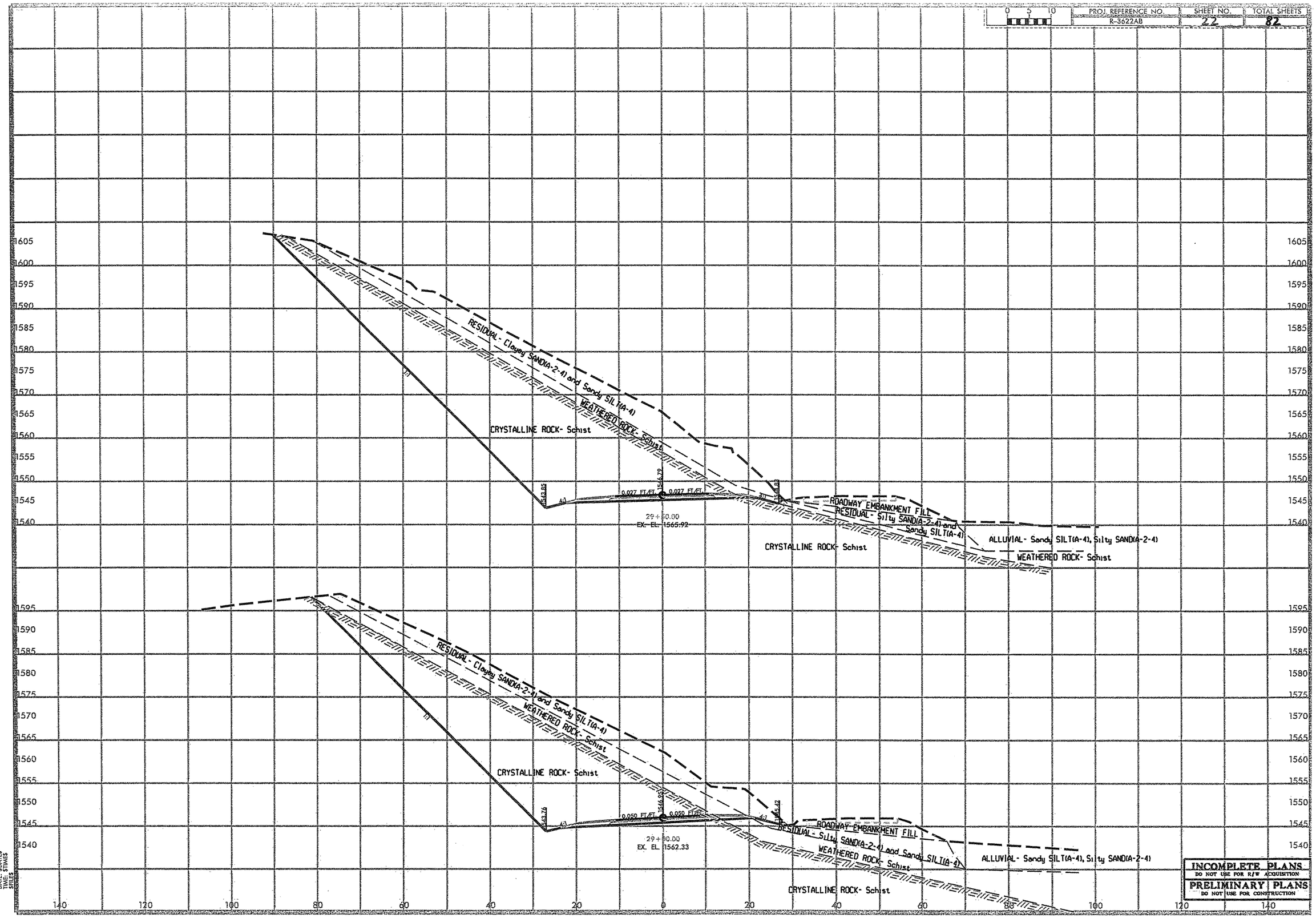
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	20	82



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
USER: $USER$


1595
1590
1585
1580
1575
1570
1565
1560
1555
1550
1545
1540
RESIDUAL- Clayey SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
543.76
4:1
0.050 FT/FT
1546.08
0.050 FT/FT
4:1
1546.42
ROADWAY EMBANKMENT FILL
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)
29+00.00
EX. EL. 1562.33
CRYSTALLINE ROCK- Schist
1600
1595
1590
1585
1580
1575
1570
1565
1560
1555
1550
1545
1540
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
543.81
4:1
0.060 FT/FT
1547.10
0.060 FT/FT
4:1
1545.77
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)
28+00.00
EX. EL. 1557.86
CRYSTALLINE ROCK- Schist
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: $DATE$
TIME: $TIME$
SCALE: $SCALE$
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

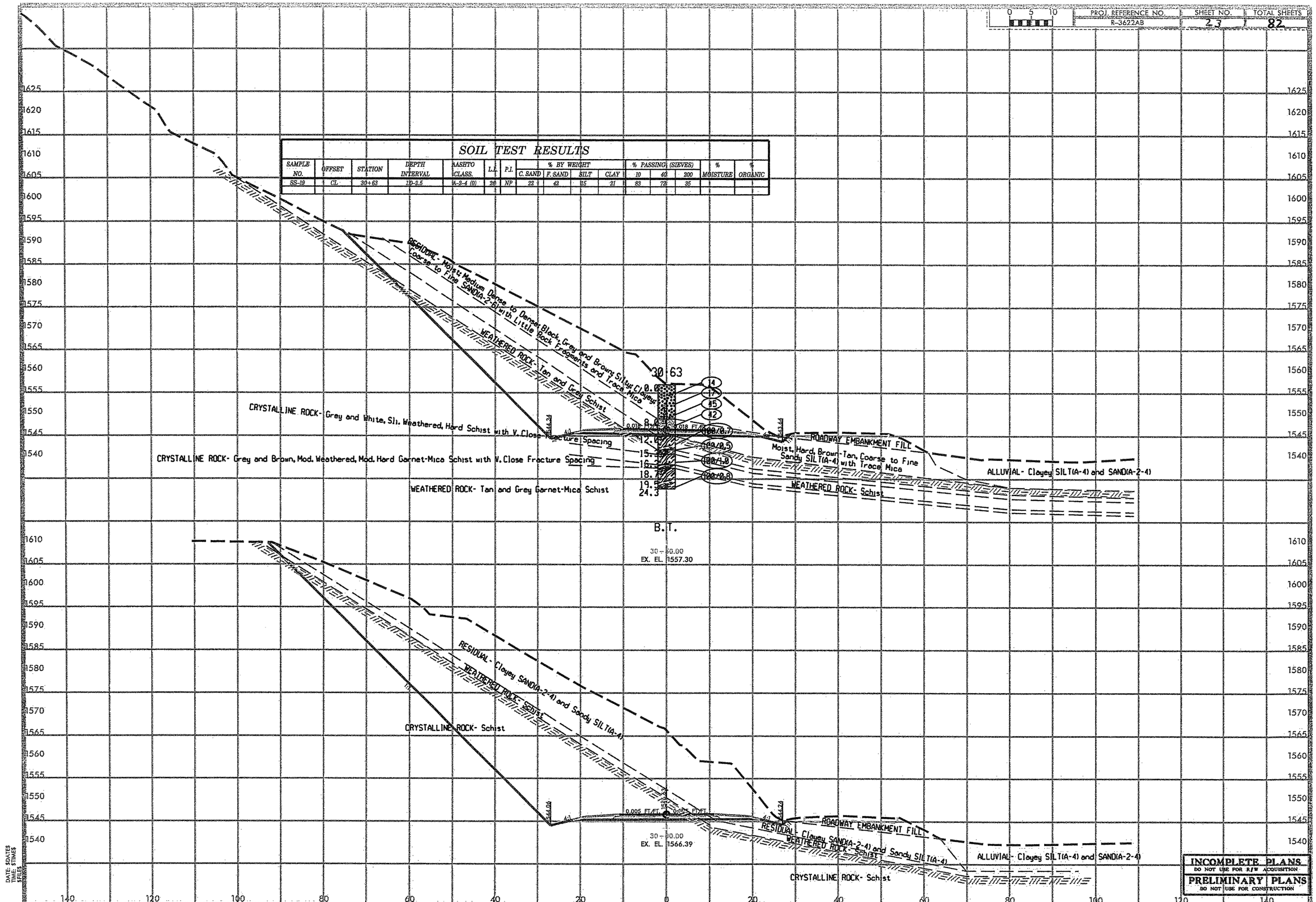


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	23	82

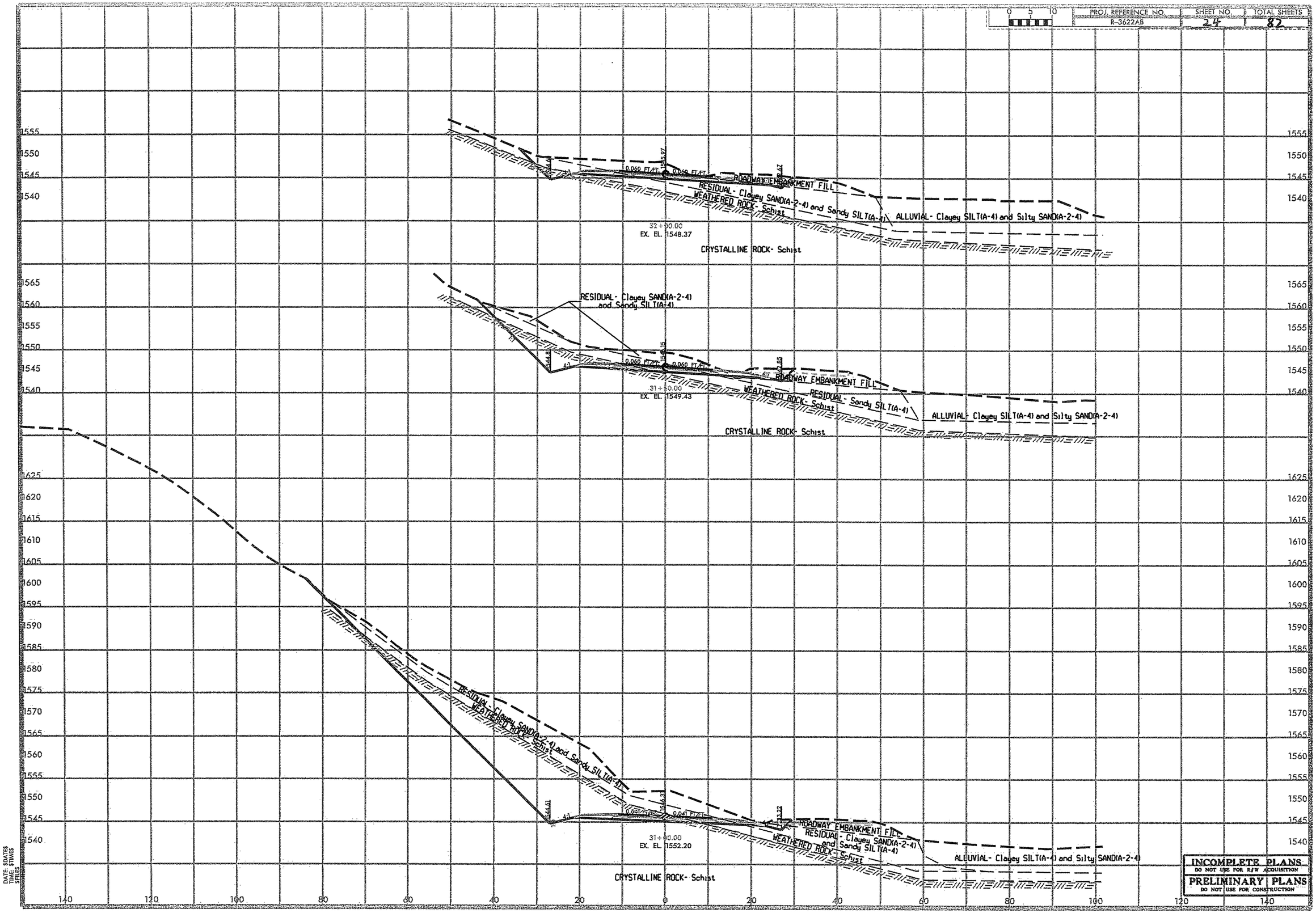
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-19	CL	30+63	1.0-2.5	A-2-4 (0)	26	NP	22	42	15	21	83	72	35		



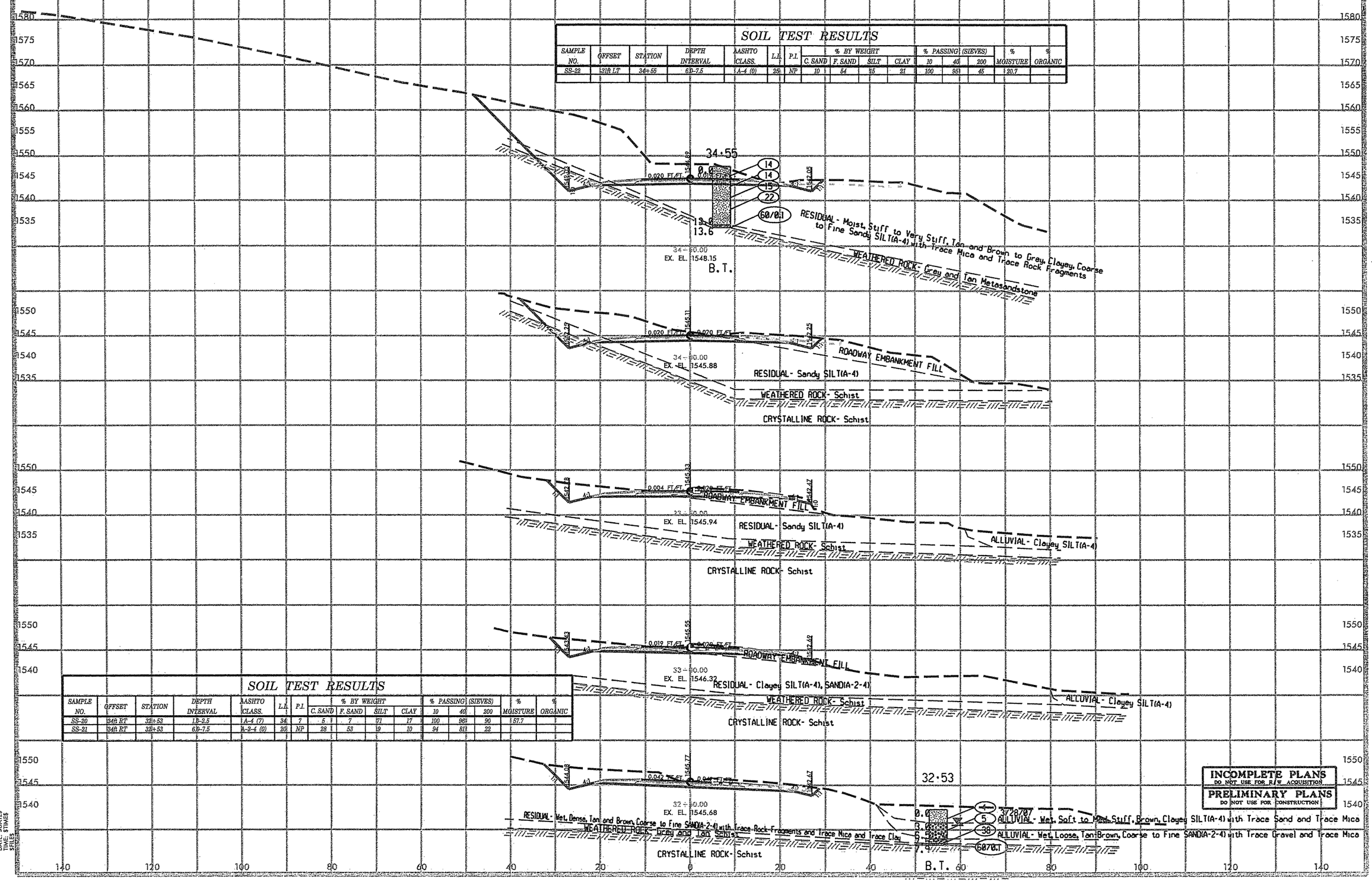
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	24	82



SOIL TEST RESULTS

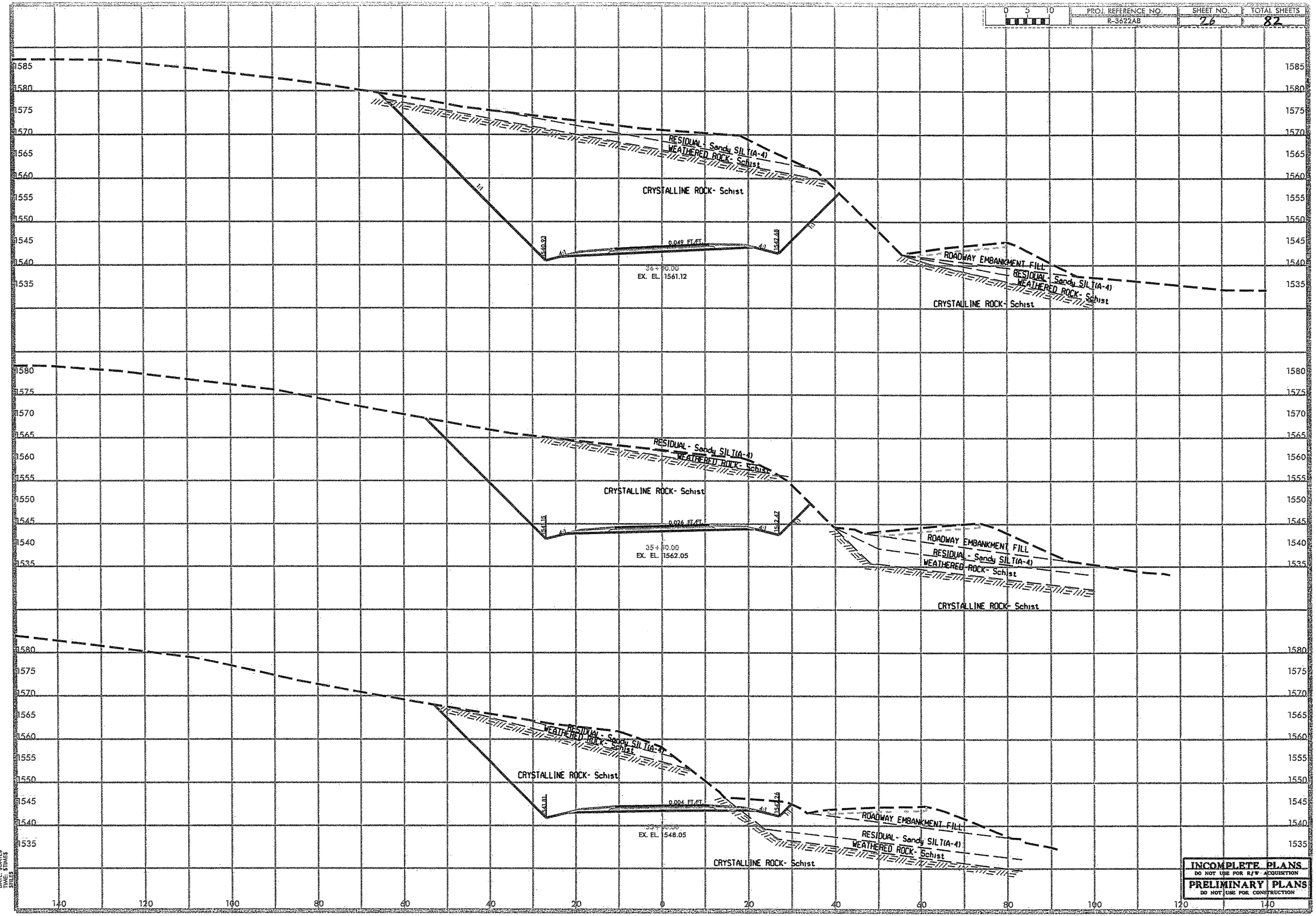
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-22	31ft LT	34+55	6.0-7.5	A-4 (0)	25	NP	10	54	35	21	100	95	45	20.7	



SOIL TEST RESULTS

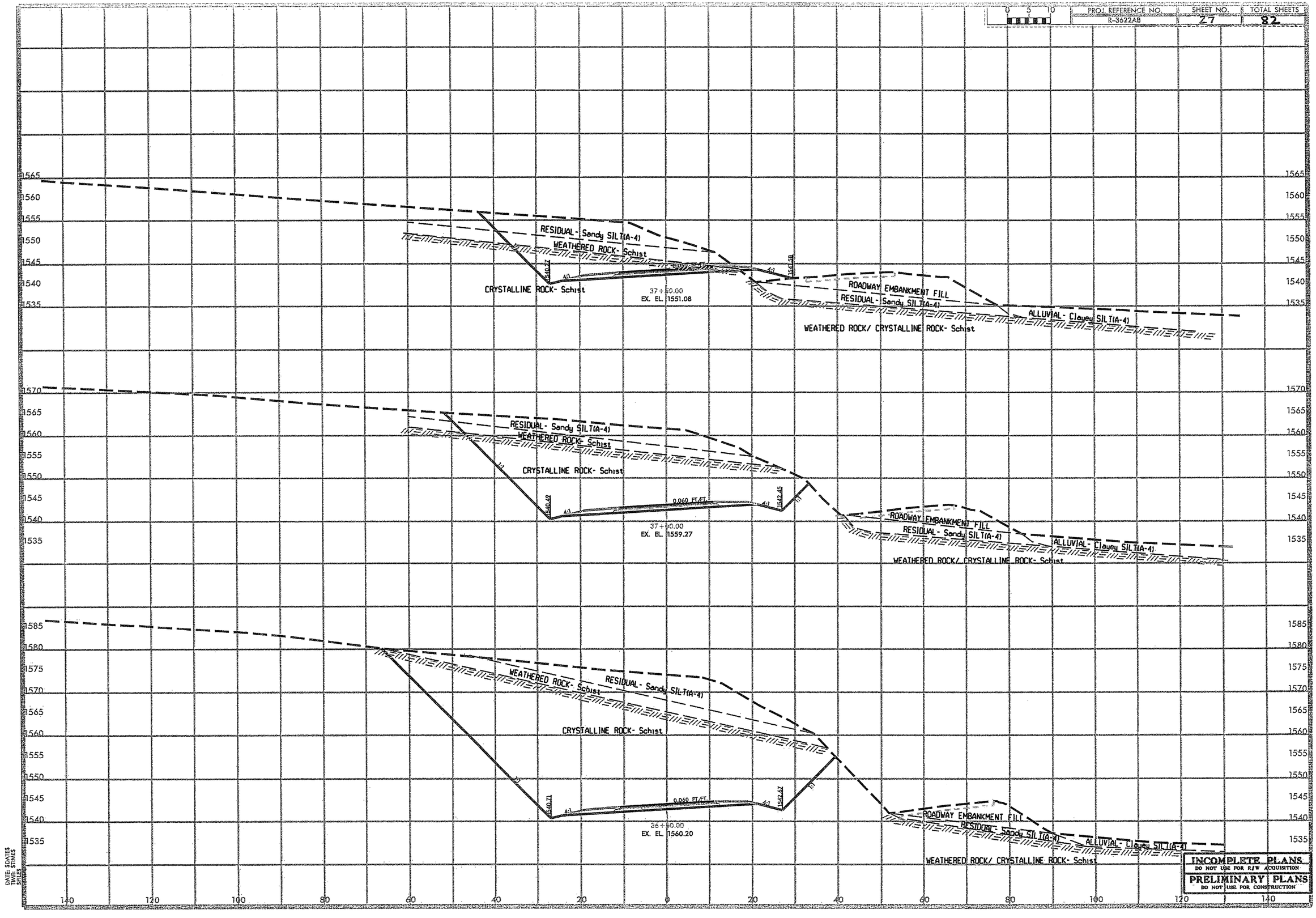
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-20	34ft RT	32+53	1.0-2.5	A-4 (7)	34	7	5	7	71	17	100	96	90	57.7	
SS-21	34ft RT	32+53	6.0-7.5	A-2-4 (0)	20	NP	28	53	19	10	94	81	22		

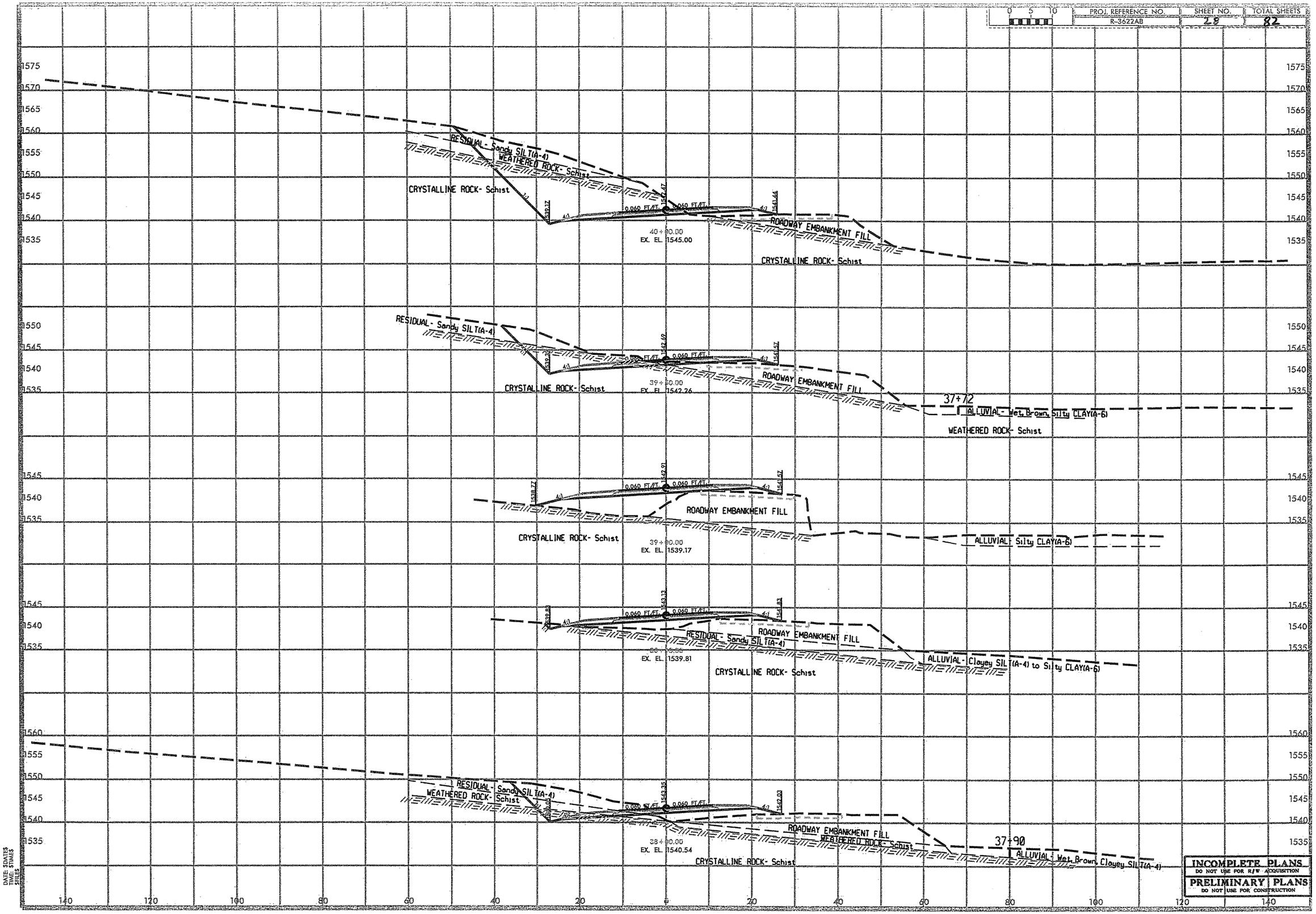
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	26	82



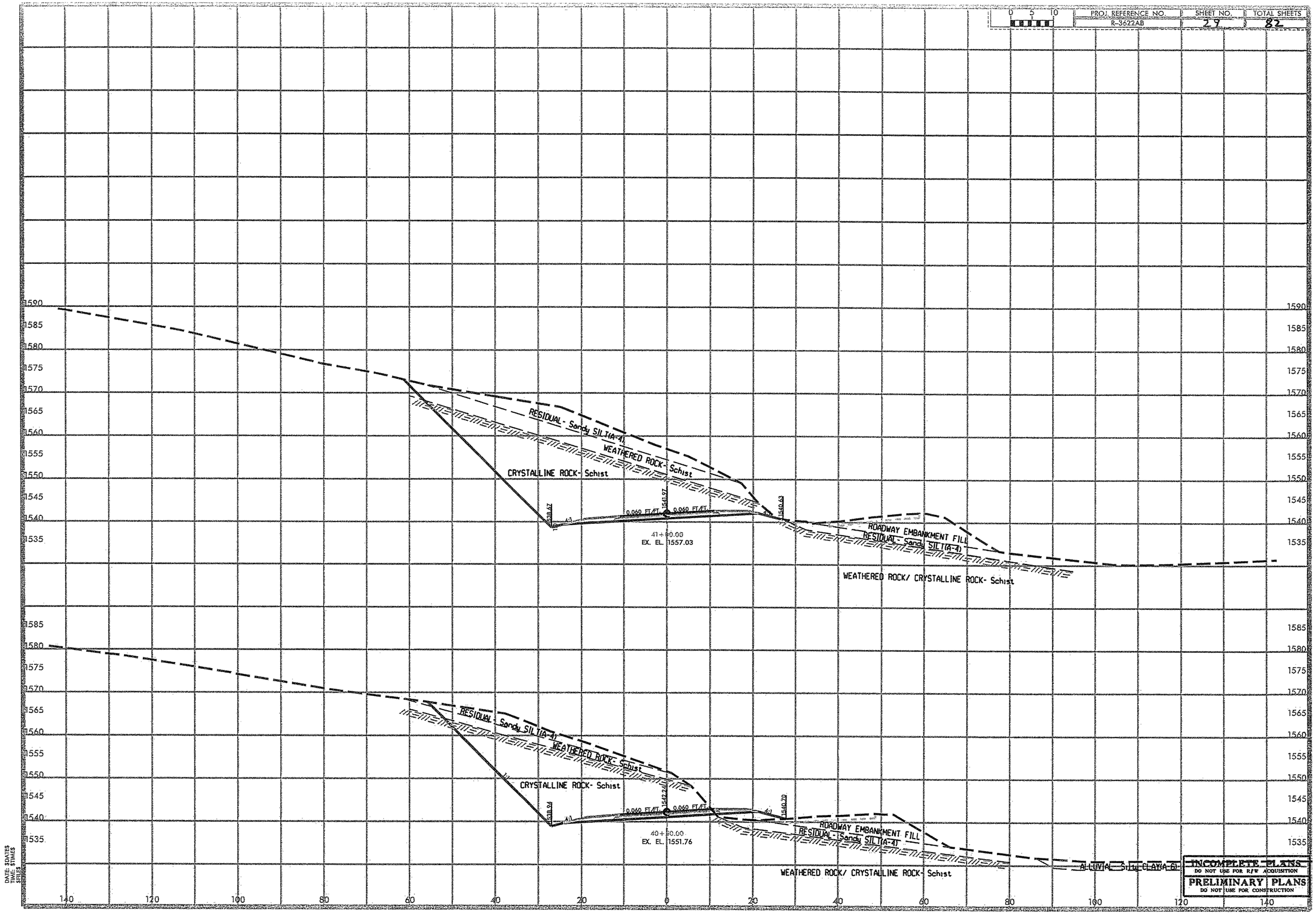
DATE: $DATE$
TIME: $TIME$
$FILE$

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION


0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
27
TOTAL SHEETS
82
RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
37+50.00
EX. EL. 1551.08
ROADWAY EMBANKMENT FILL
RESIDUAL - Sandy SILT(A-4)
ALLUVIAL - Clayey SILT(A-4)
WEATHERED ROCK/ CRYSTALLINE ROCK- Schist
0.060 FT/FT
37+50.00
EX. EL. 1559.27
36+50.00
EX. EL. 1560.20
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DATE: 8/24/15
TIME: 8:19:46 AM
FILES


RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060 FT/FT
40+00.00
EX. EL. 1545.00
ROADWAY EMBANKMENT FILL
CRYSTALLINE ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
CRYSTALLINE ROCK- Schist
39+00.00
EX. EL. 1542.26
ROADWAY EMBANKMENT FILL
37+72
ALLUVIAL- Wet, Brown, Silty CLAY(A-6)
WEATHERED ROCK- Schist
ROADWAY EMBANKMENT FILL
CRYSTALLINE ROCK- Schist
39+00.00
EX. EL. 1539.17
ALLUVIAL- Silty CLAY(A-6)
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
38+00.00
EX. EL. 1539.81
ALLUVIAL- Clayey SILT(A-4) to Silty CLAY(A-6)
CRYSTALLINE ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
37+90
ALLUVIAL- Wet, Brown, Clayey SILT(A-4)
38+00.00
EX. EL. 1540.54
CRYSTALLINE ROCK- Schist
DATE: 5/DATE5
TIME: 5/TIME5
FILE: 5/FILE5
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	29	82

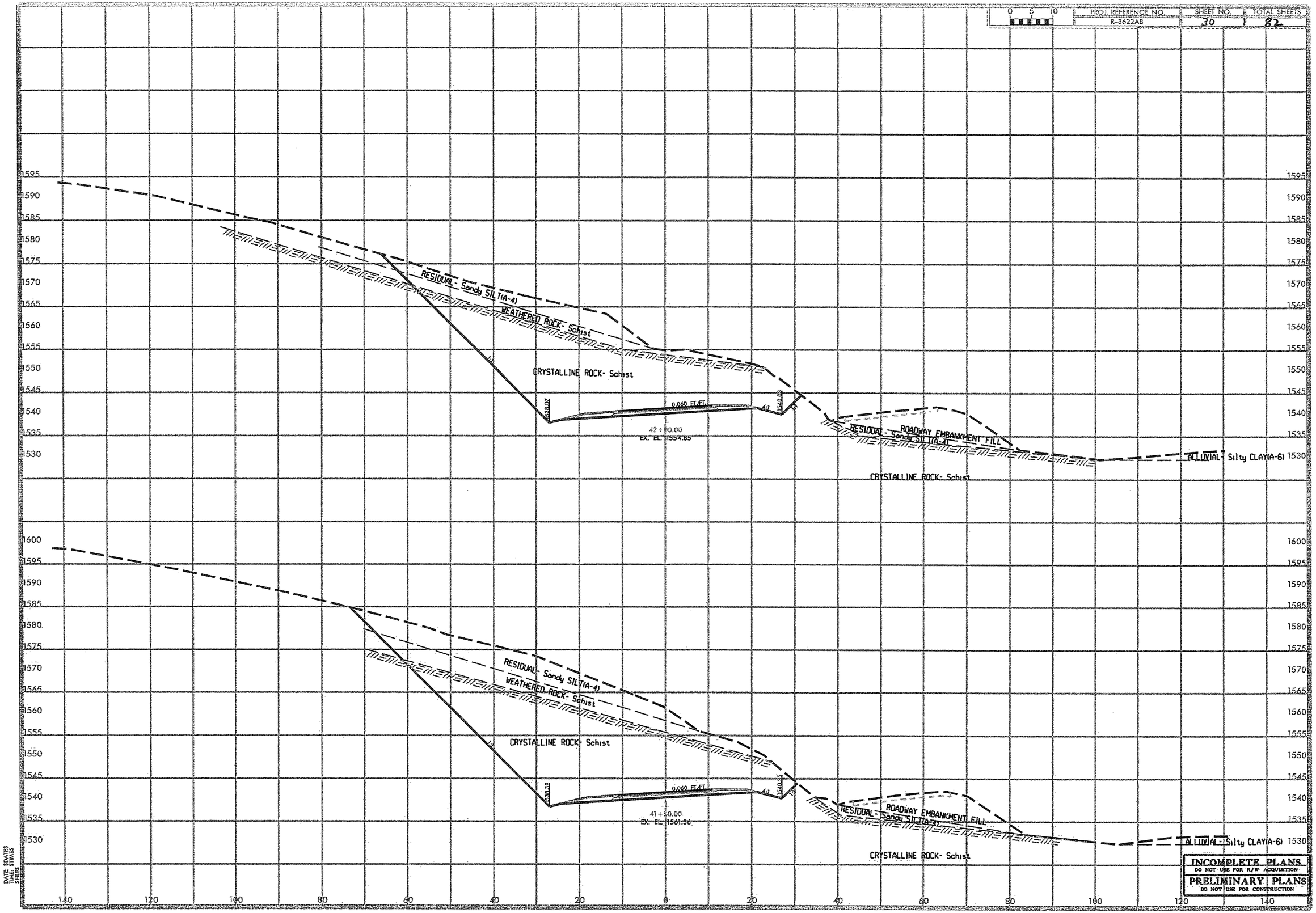


DATE: $DATE$
TIME: $TIME$
$FILE$

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	30	82

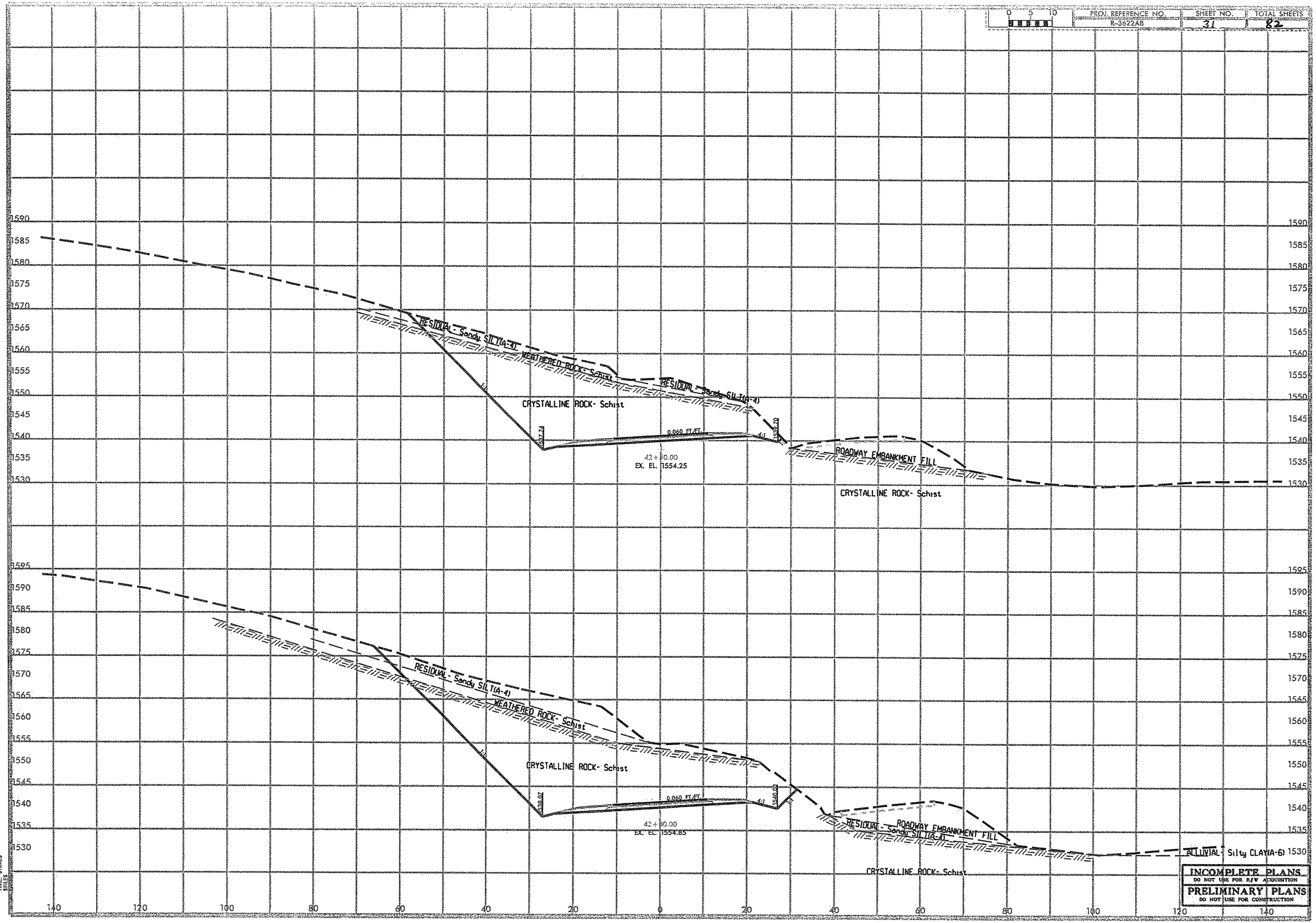


DATE: 5/24/15
TIME: 8:17:44 AM
FILES:

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

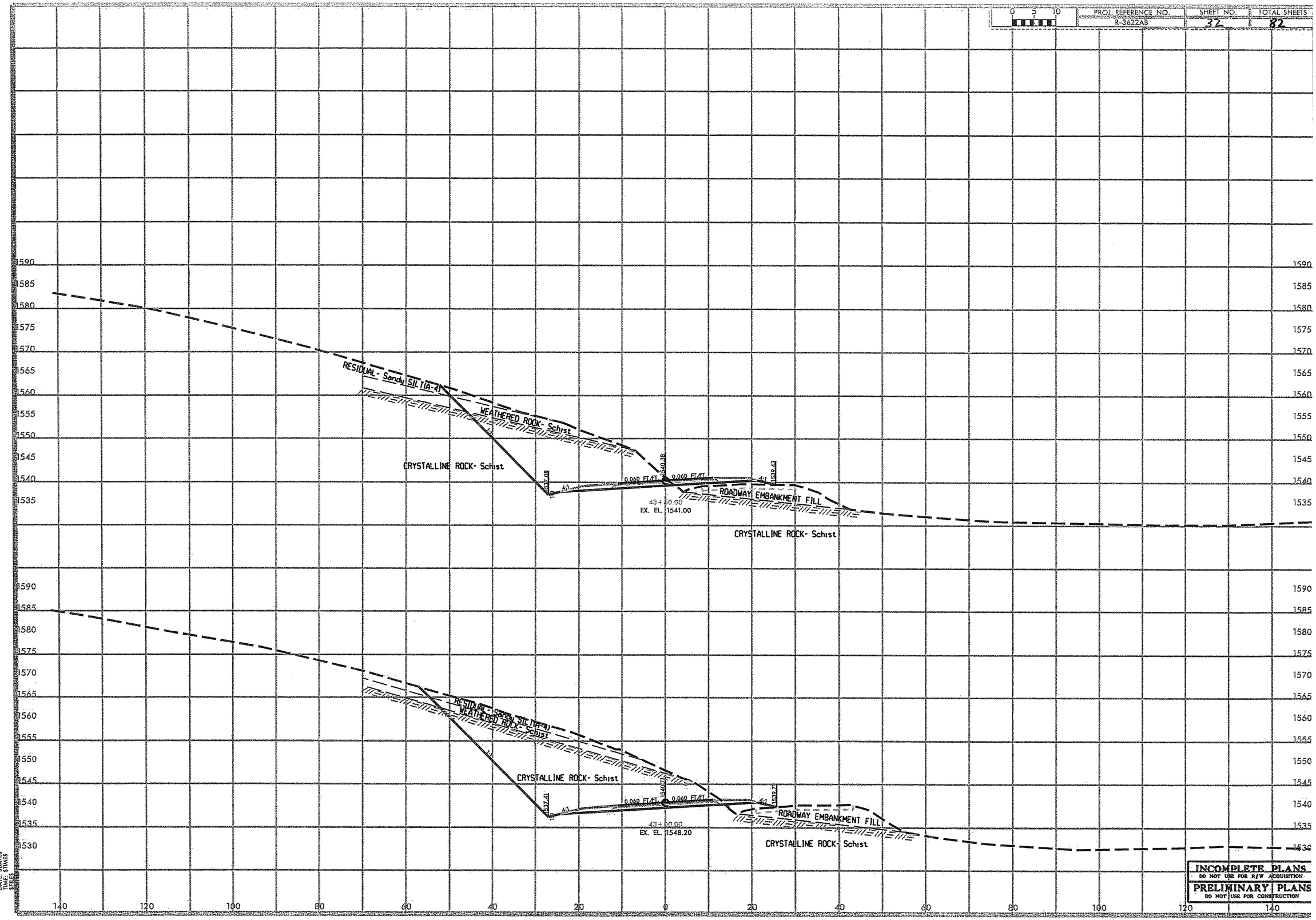
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	31	82

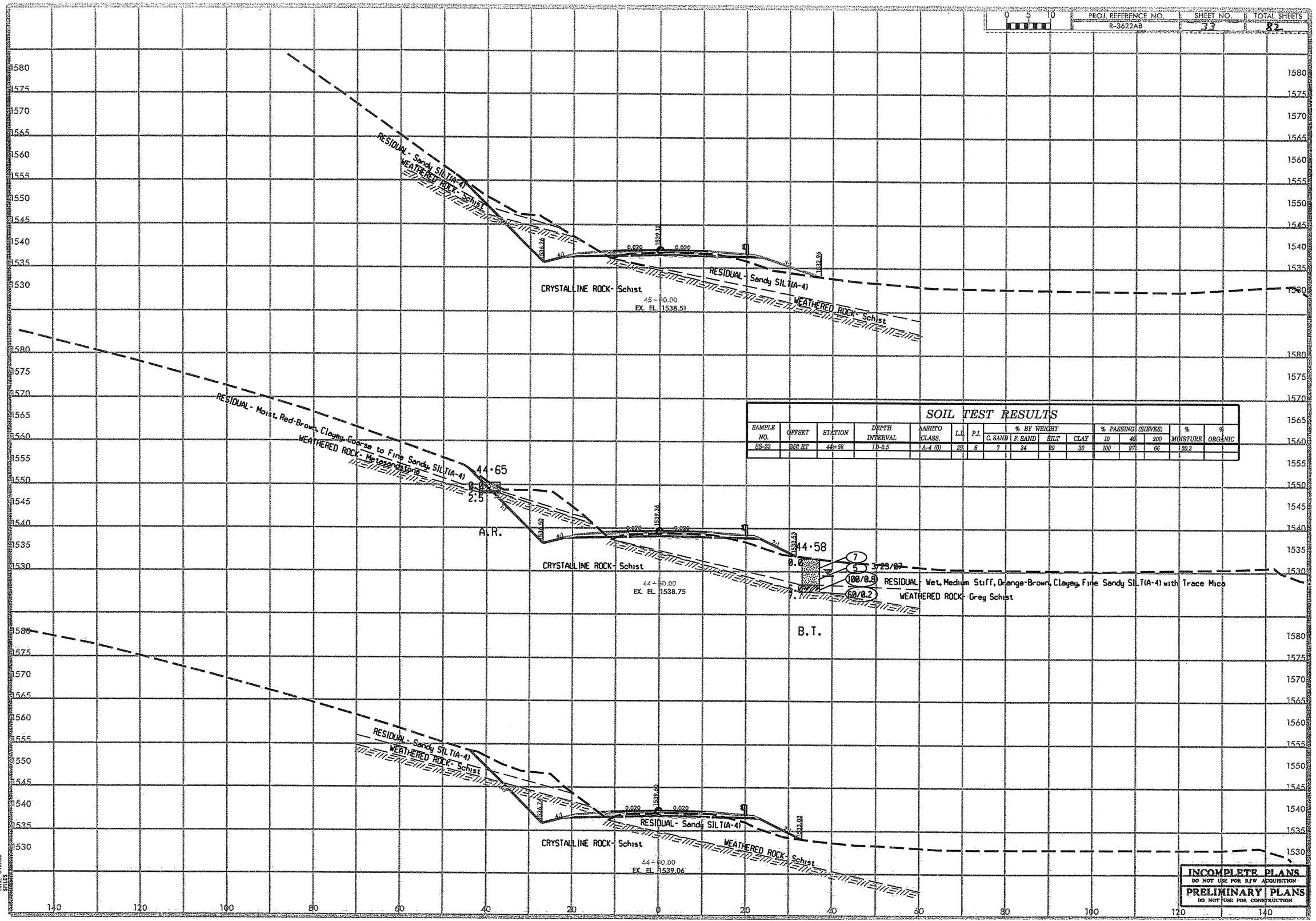


DATE: $DATE$
TIME: $TIME
$FILES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION


1590
1585
1580
1575
1570
1565
1560
1555
1550
1545
1540
1535
RESIDUAL- Sandy SILT (A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1537.08
4:1
0.060 FT/FT
1540.38
0.060 FT/FT
4:1
1539.43
ROADWAY EMBANKMENT FILL
43+00.00
EX. EL. 1541.00
CRYSTALLINE ROCK- Schist
1590
1585
1580
1575
1570
1565
1560
1555
1550
1545
1540
1535
1530
RESIDUAL- Sandy SILT (A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1537.41
4:1
0.060 FT/FT
1540.71
0.060 FT/FT
4:1
1539.72
ROADWAY EMBANKMENT FILL
43+00.00
EX. EL. 1548.20
CRYSTALLINE ROCK- Schist
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: $DATE$
TIME: $TIME$
$FILE$
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	33	82

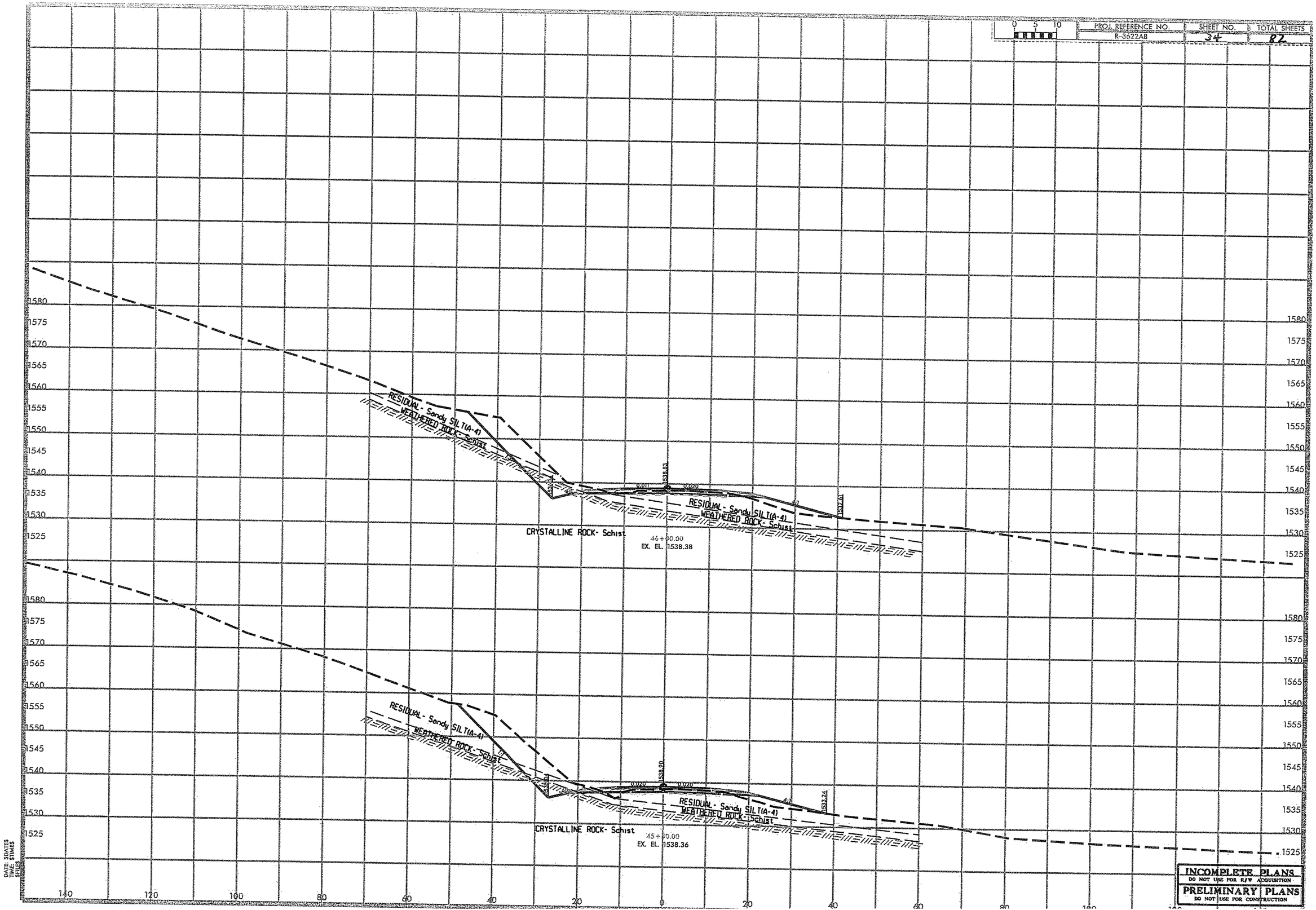


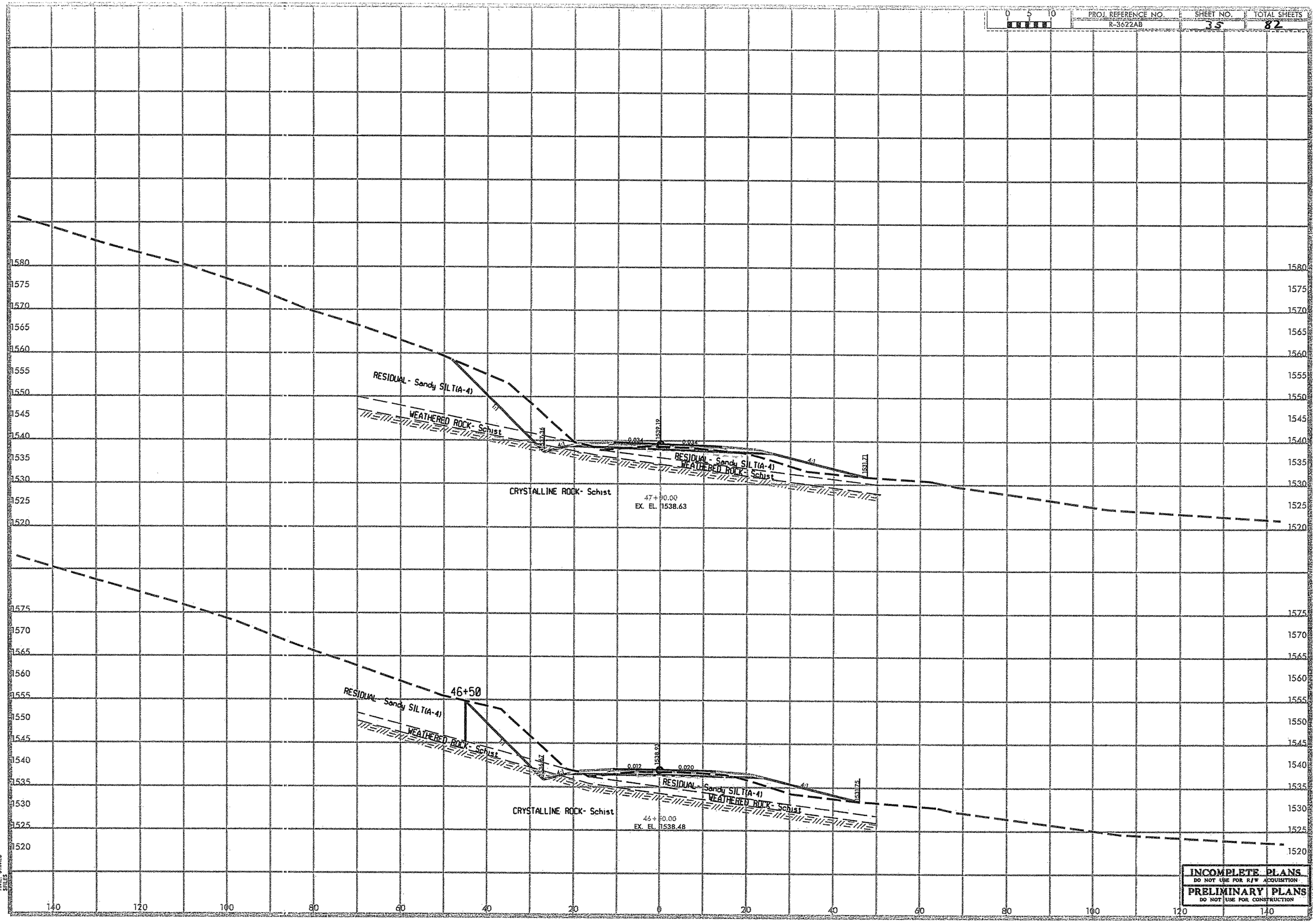
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-23	35ft RT	44+58	1.0-2.5	A-4 (0)	29	6	7	34	89	30	100	97	66	20.3	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

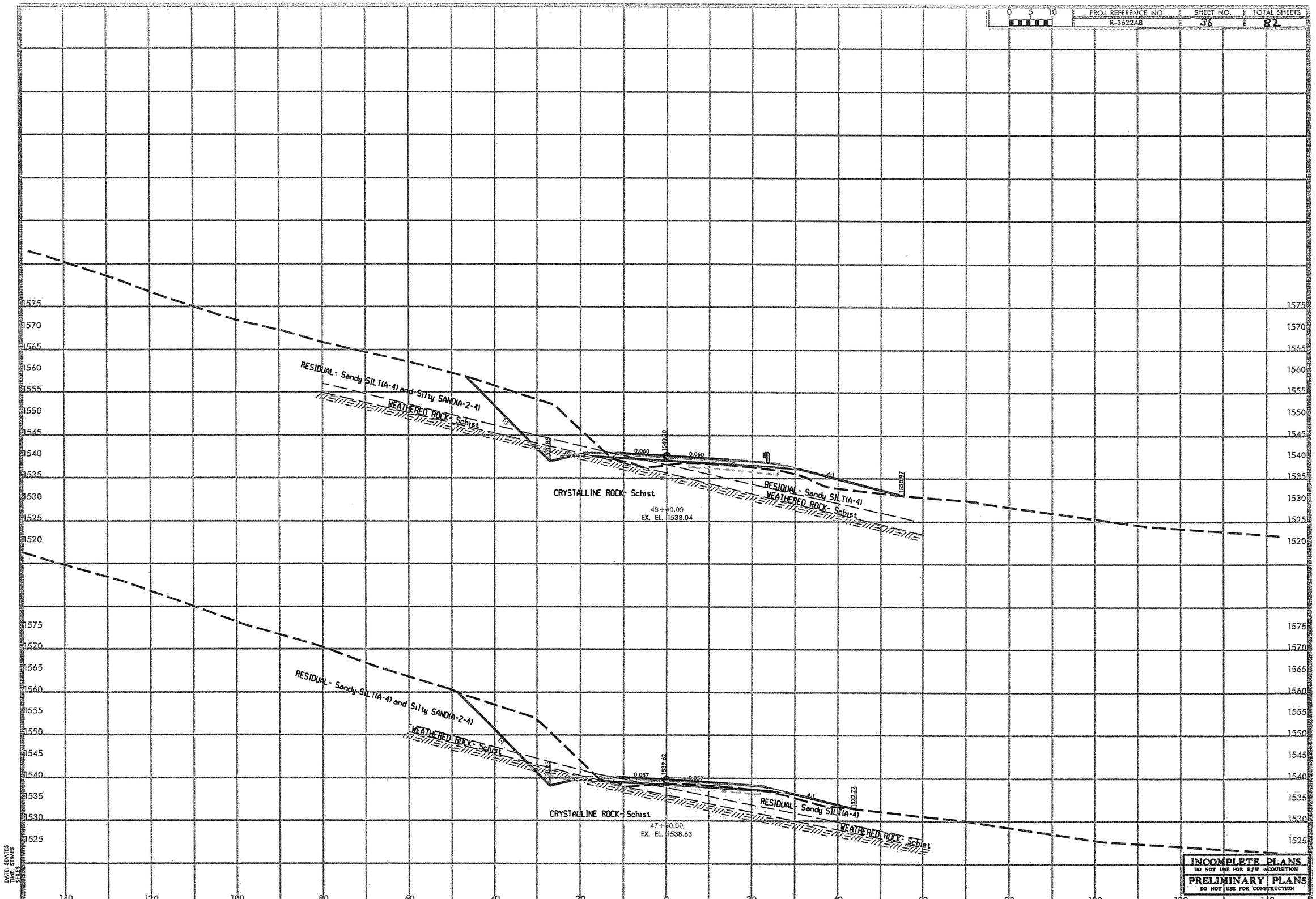
DATE: $DATE$
TIME: $TIME$
$FILE$

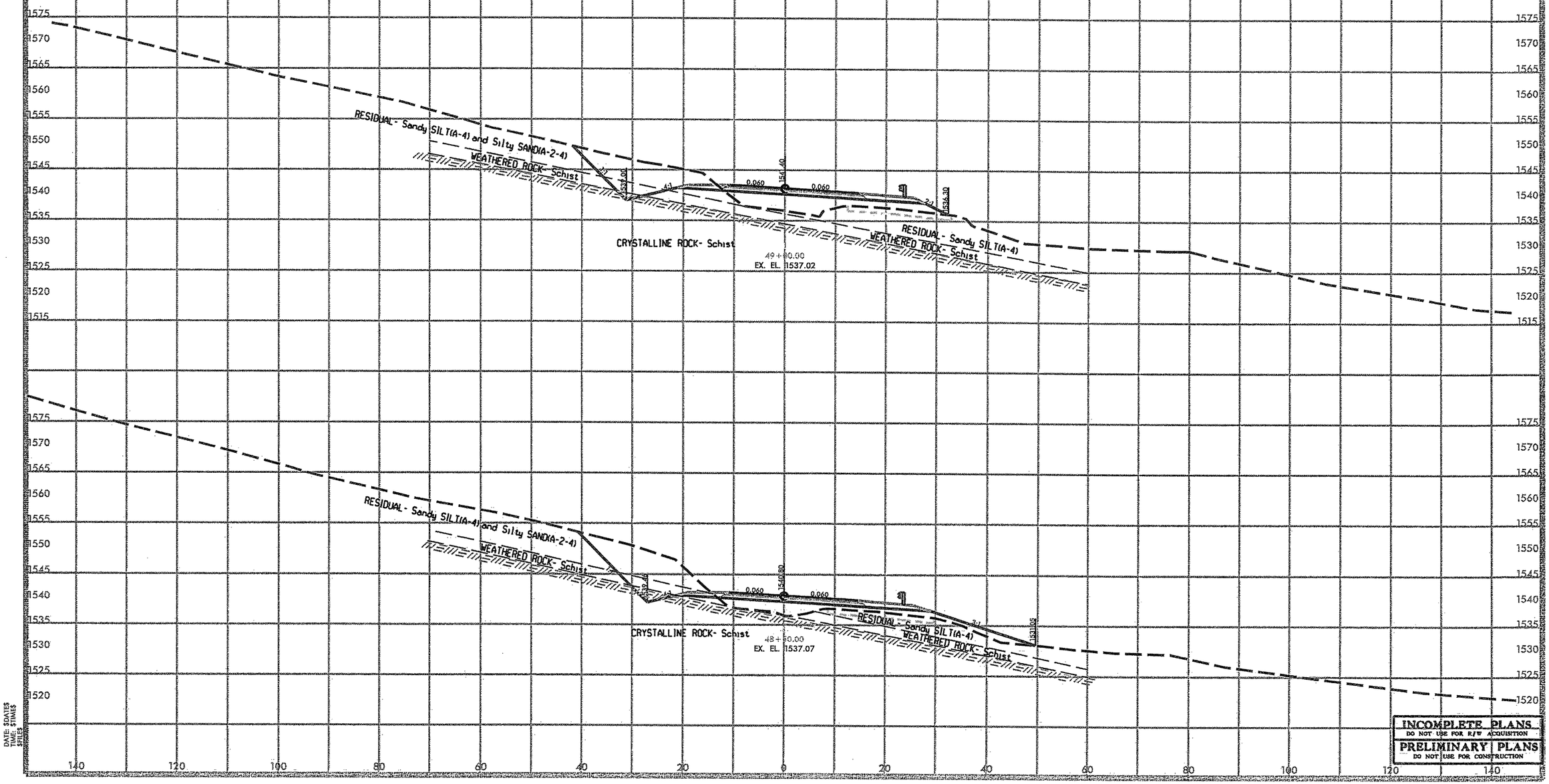

0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
34
TOTAL SHEETS
82
RESIDUAL - Sandy SILT (A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
46+00.00
EX. EL. 1538.38
1538.83
1527.61
0.01
0.020
4:1
RESIDUAL - Sandy SILT (A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
45+00.00
EX. EL. 1538.36
1538.20
1533.24
0.020
0.020
4:1
1580
1575
1570
1565
1560
1555
1550
1545
1540
1535
1530
1525
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: 3DATES
TIME: 3TIMES
SFILES
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DATE: $DATE$
TIME: $TIME$
$FILE$

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

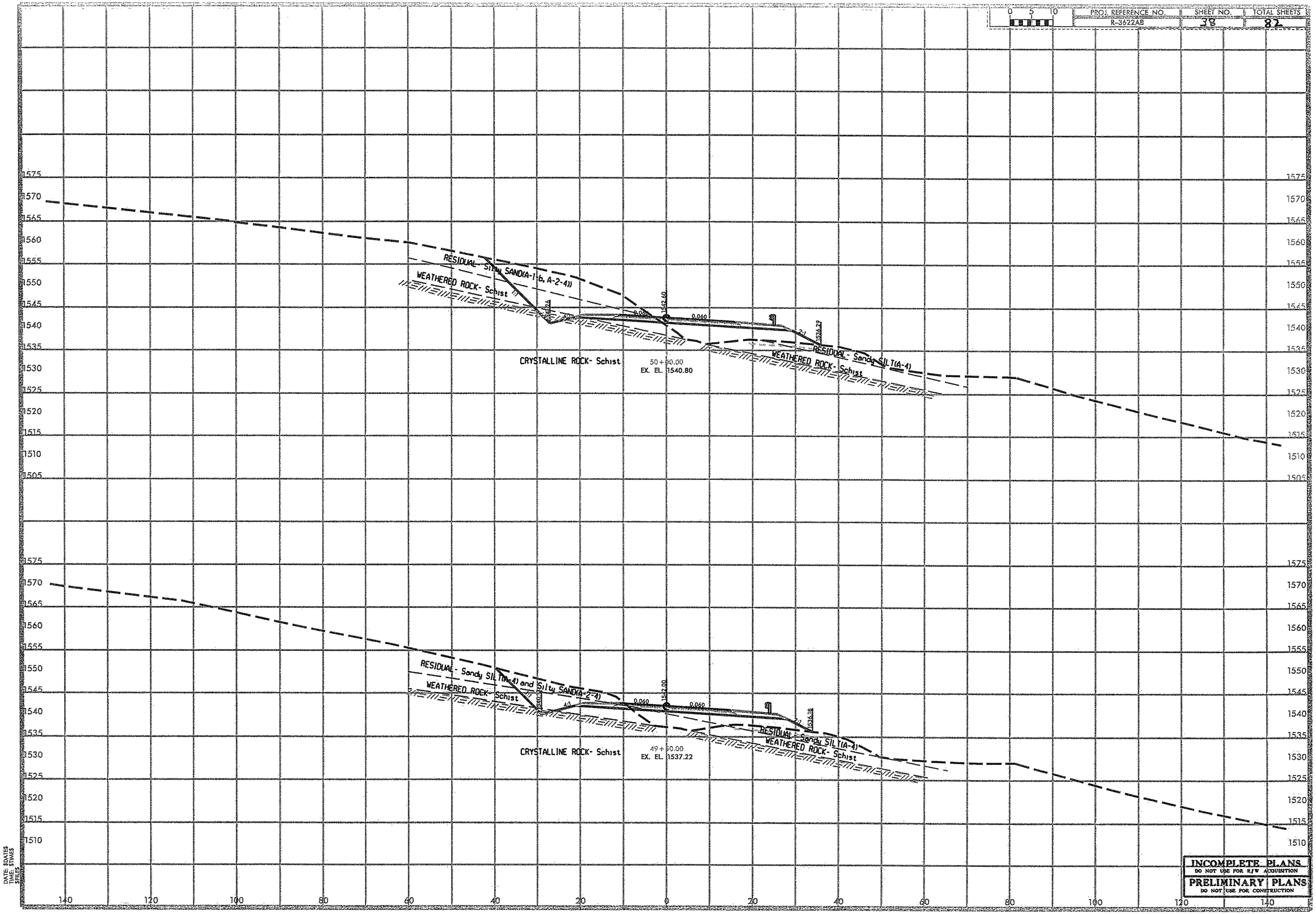

1575
1570
1565
1560
1555
1550
1545
1540
1535
1530
1525
1520
RESIDUAL - Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060
1540.30
0.060
4:1
1530.97
RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
48+00.00
EX. EL. 1538.04
RESIDUAL - Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.057
1539.62
0.057
4:1
1532.72
RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
47+00.00
EX. EL. 1538.63
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: 5DATES
TIME: 5TIMES
SFILES
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DATE: $DATE$
TIME: $TIME$
$FILE$

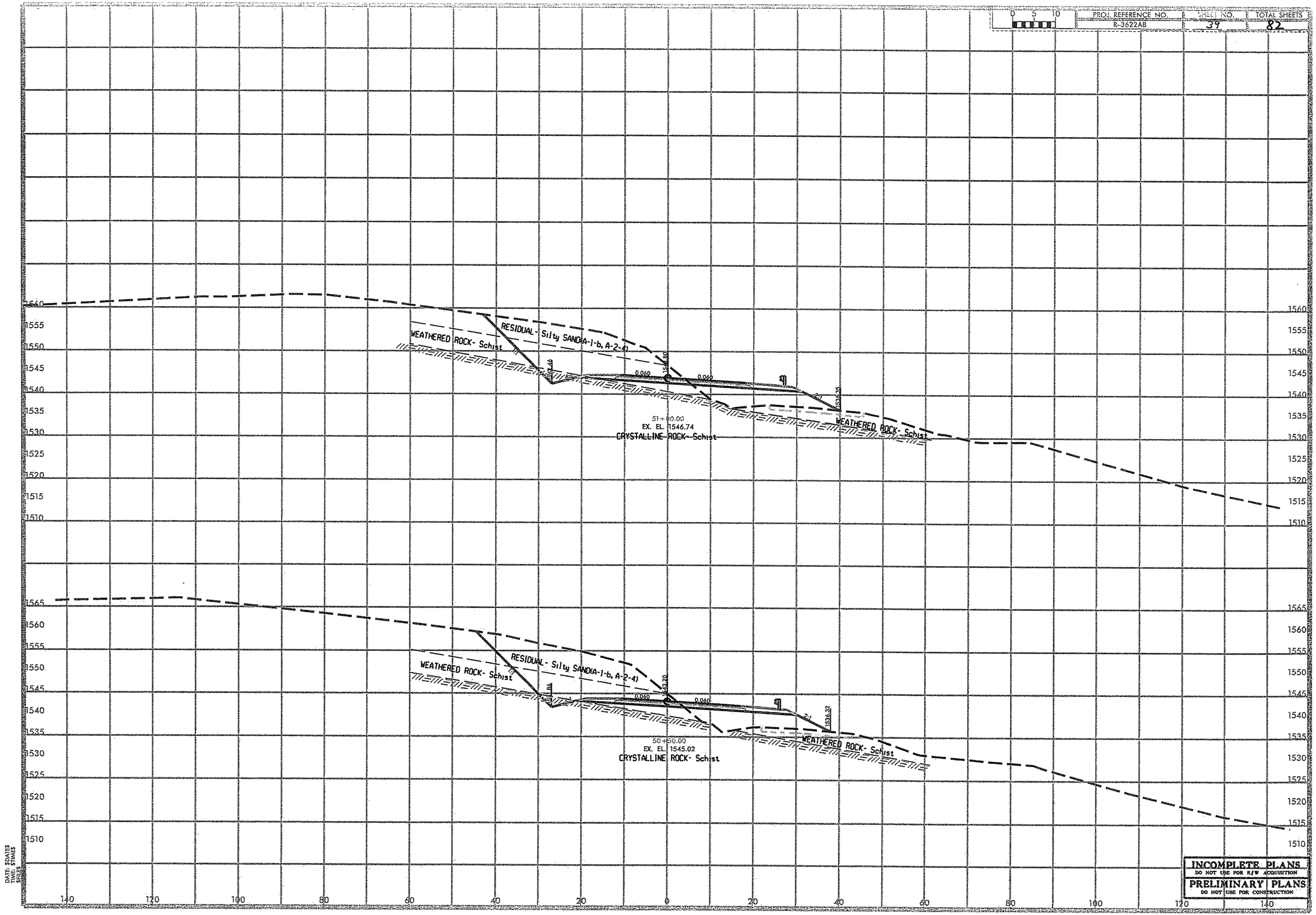
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

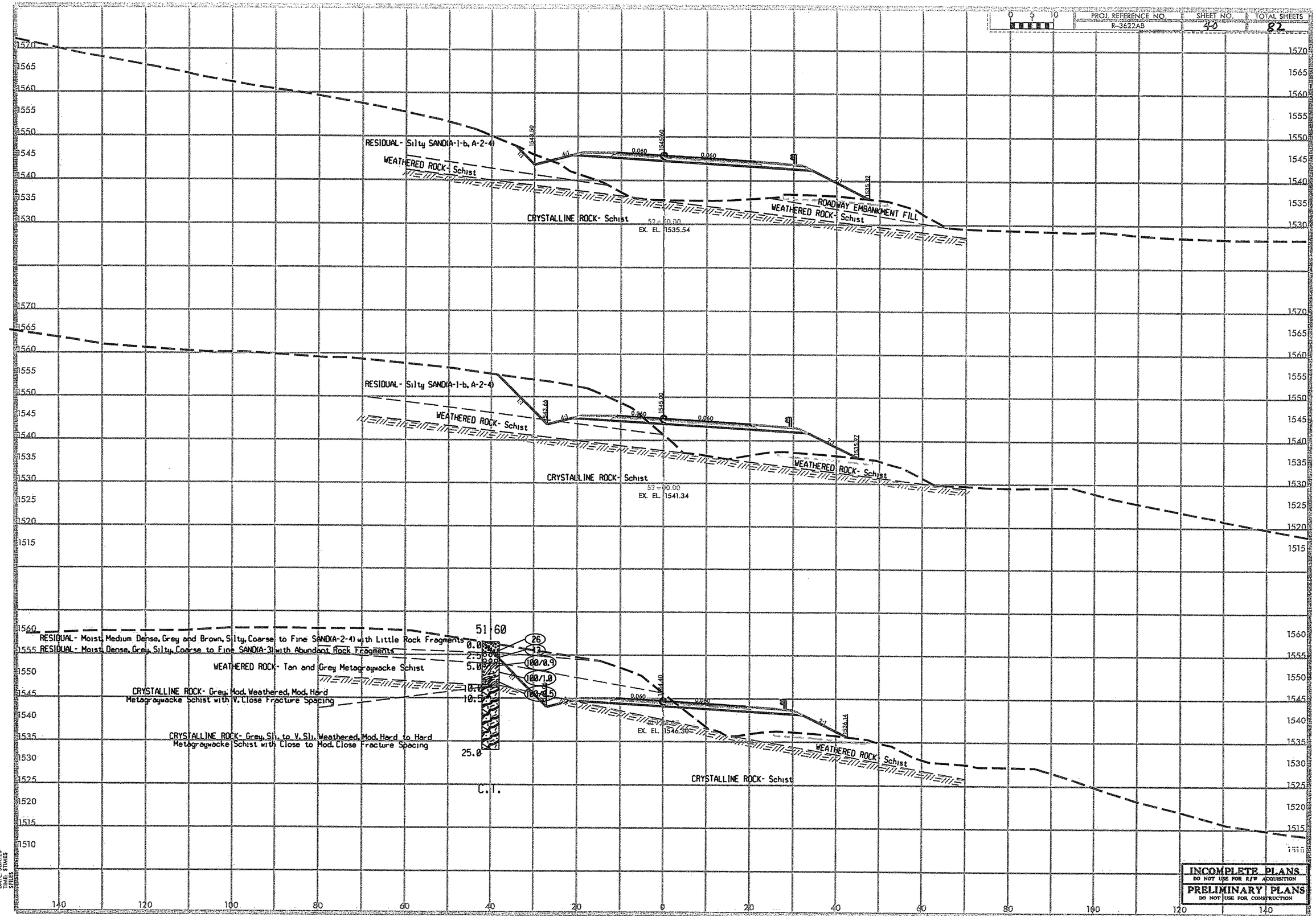
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	38	82

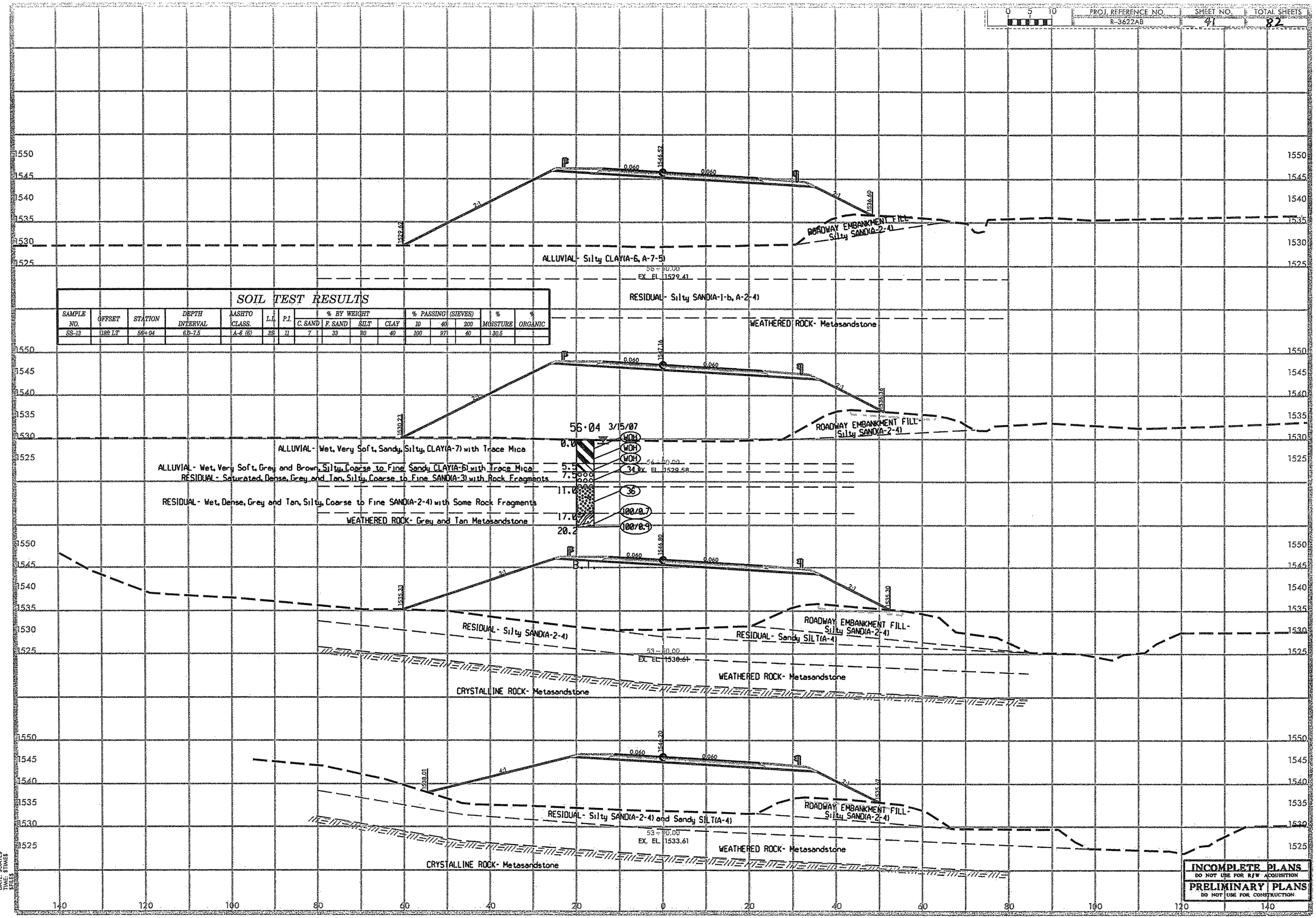


DATE: DATES
TIME: TIMES
SFILES

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	39	82



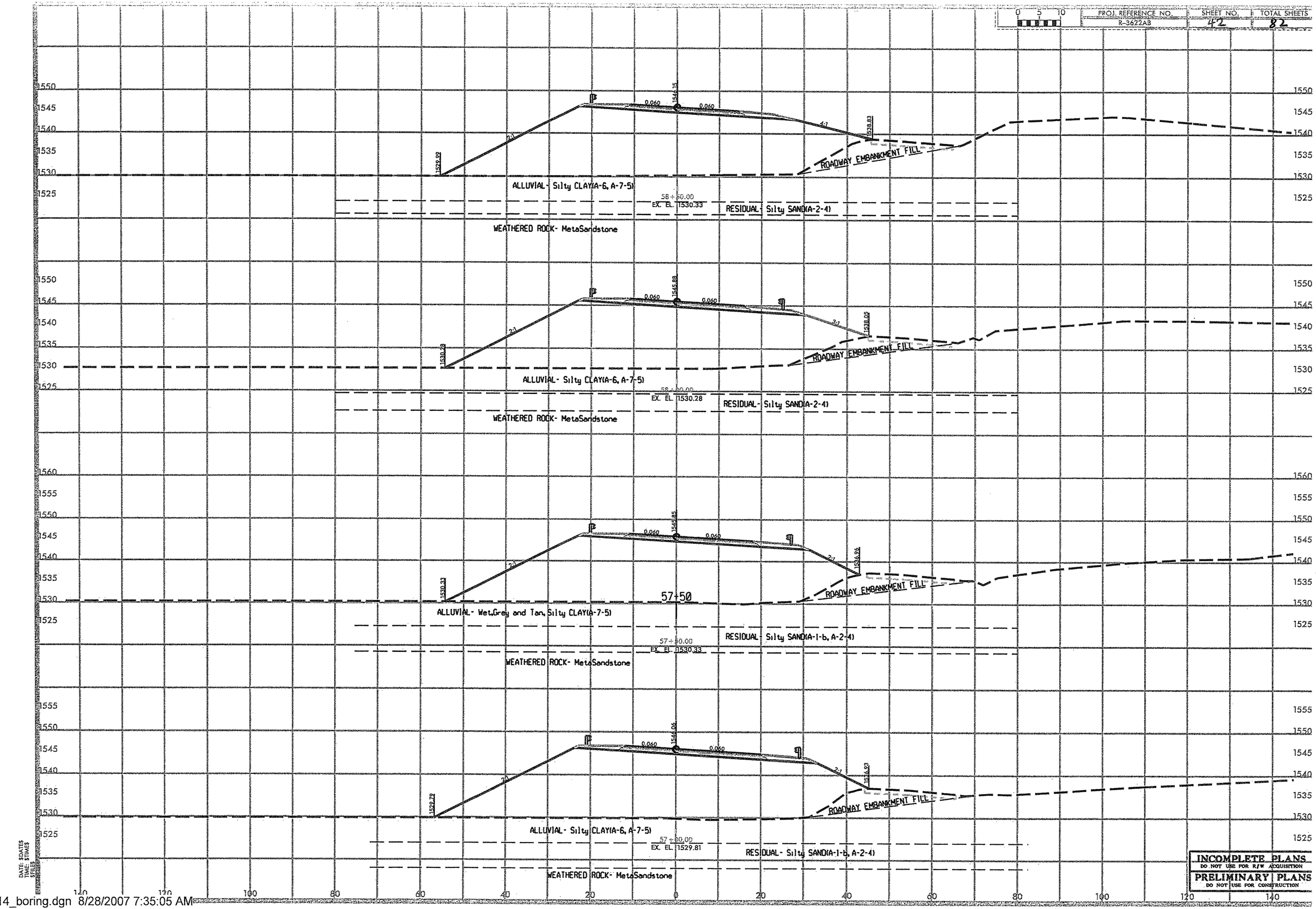

0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
45
TOTAL SHEETS
82
RESIDUAL- Silty SAND(A-1-b, A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
52 + 50.00
EX. EL. 1535.54
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
1549.50
1545.60
1535.52
0.060
0.060
4:1
2:1
RESIDUAL- Silty SAND(A-1-b, A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
52 + 80.00
EX. EL. 1541.34
WEATHERED ROCK- Schist
1543.46
1545.00
1543.27
0.060
0.060
4:1
2:1
51 + 60
RESIDUAL- Moist, Medium Dense, Grey and Brown, Silty, Coarse to Fine SAND(A-2-4) with Little Rock Fragments
RESIDUAL- Moist, Dense, Grey, Silty, Coarse to Fine SAND(A-3) with Abundant Rock Fragments
WEATHERED ROCK- Tan and Grey Metagraywacke Schist
CRYSTALLINE ROCK- Grey, Mod. Weathered, Mod. Hard Metagraywacke Schist with V. Close Fracture Spacing
CRYSTALLINE ROCK- Grey, Sli. to V. Sli. Weathered, Mod. Hard to Hard Metagraywacke Schist with Close to Mod. Close Fracture Spacing
0.0
2.5
5.0
10.0
10.5
25.0
C.I.
26
13
100/0.9
100/1.0
100/0.5
EX. EL. 1546.36
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1544.40
1536.14
0.060
0.060
2:1
DATE: $DATE$
TIME: $TIME$
$FILE$
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-13	18ft LT	56+04	6.0-7.5	A-6 (6)	35	11	7	33	30	40	100	97	40	30.5	

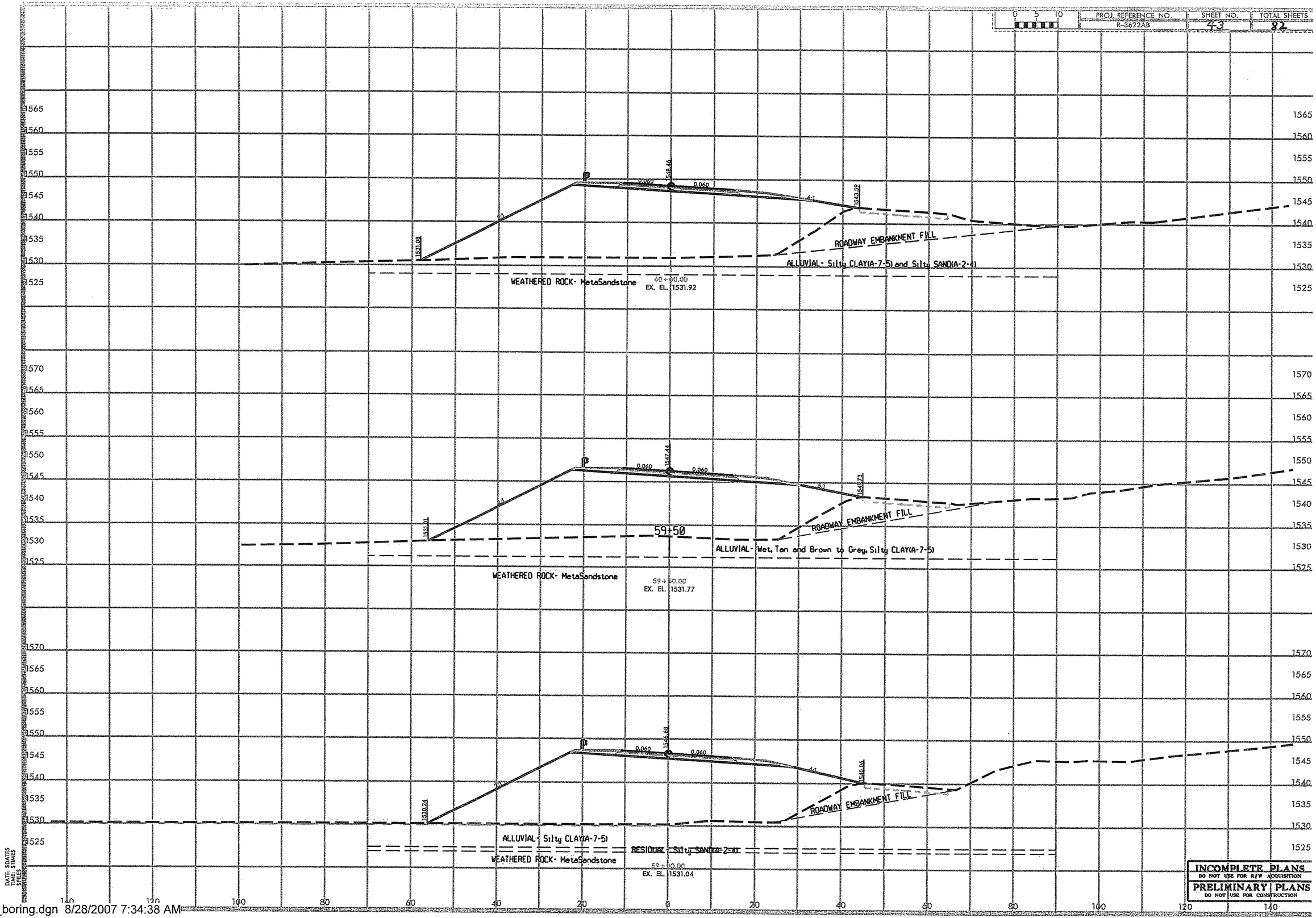
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	42	82



DATE: $DATE$
TIME: $TIME$
$FILE$

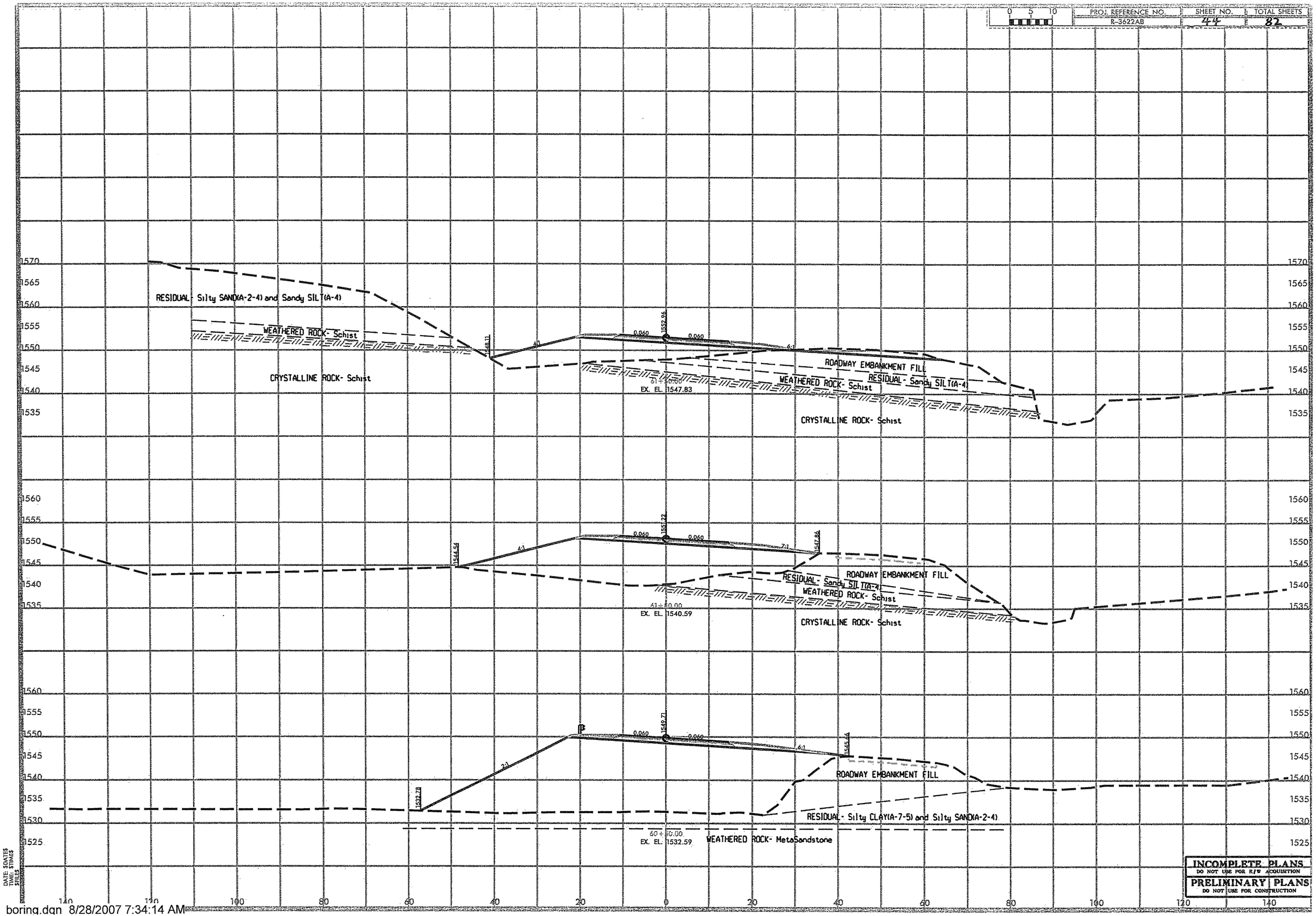
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

...\bridge-1\05014_boring.dgn 8/28/2007 7:35:05 AM



DATE: $DATE$
TIME: $TIME$
$FILES

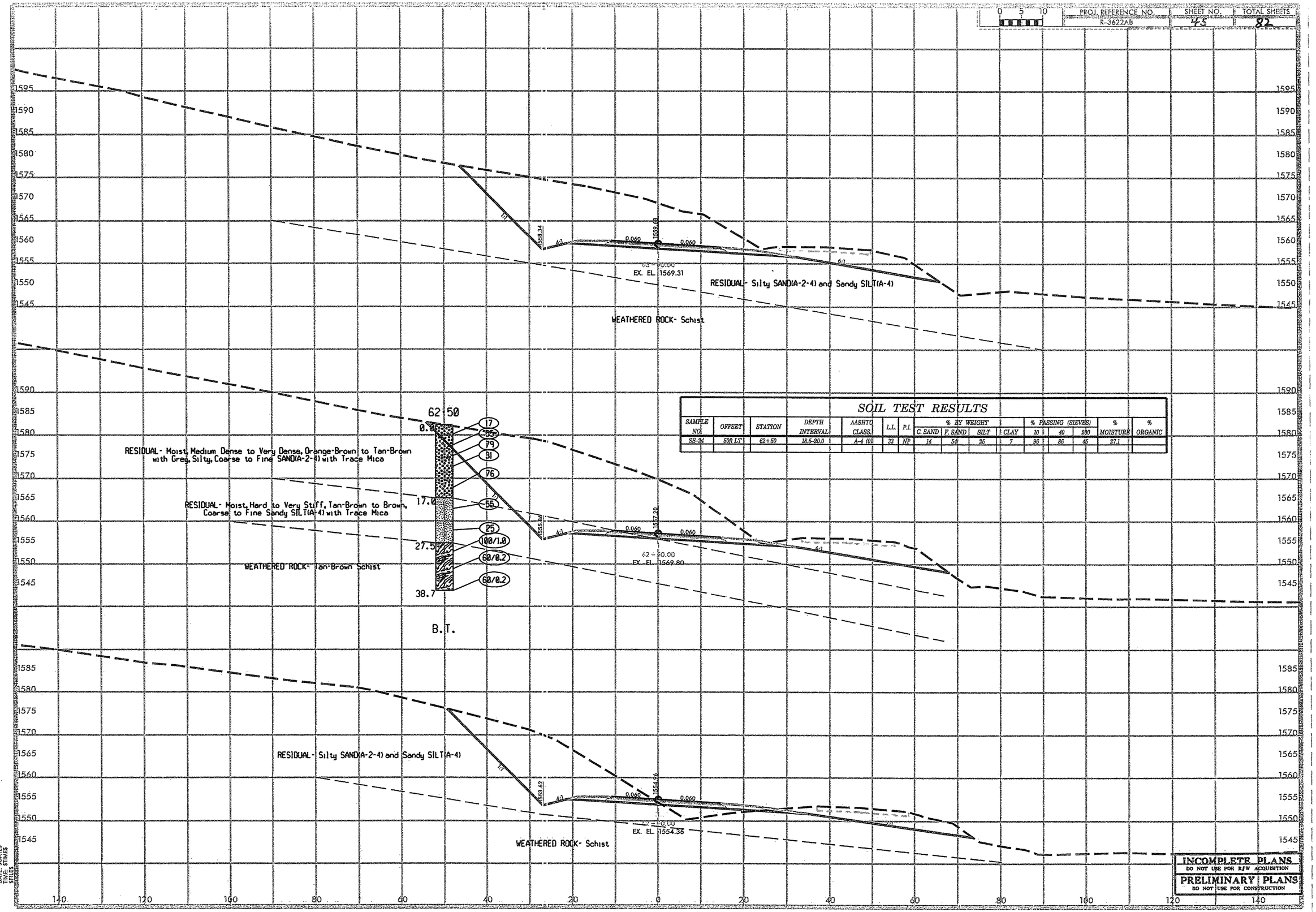
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 5DATES
TIME: 5TIMES
5FILES

...\bridge-1\05014 boring.dgn 8/28/2007 7:34:14 AM

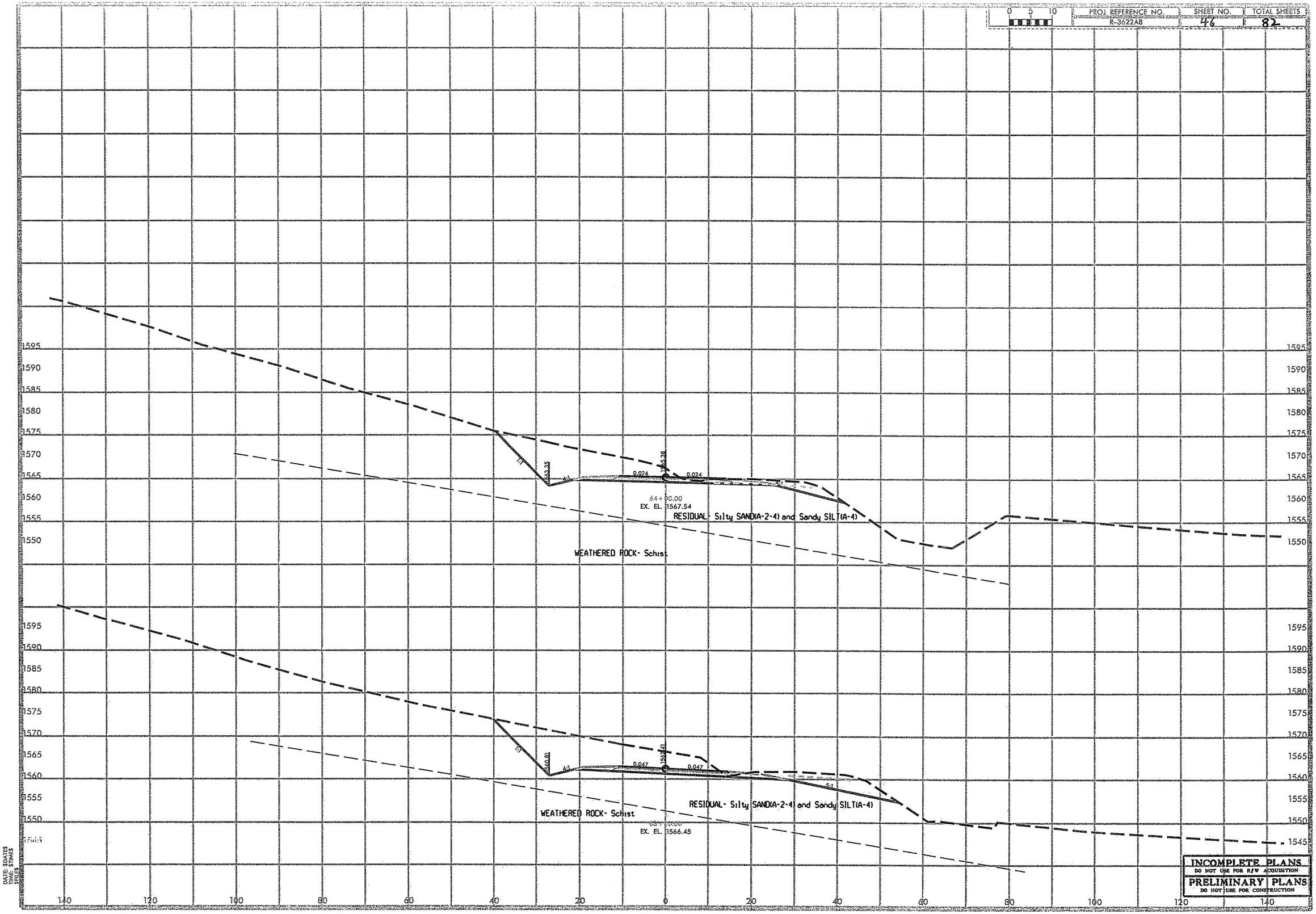


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-24	50ft LT	62+50	18.5-20.0	A-4 (0)	33	NP	14	54	25	7	96	86	45	27.1	

DATE: $DATE$
TIME: $TIME$
$FILE$

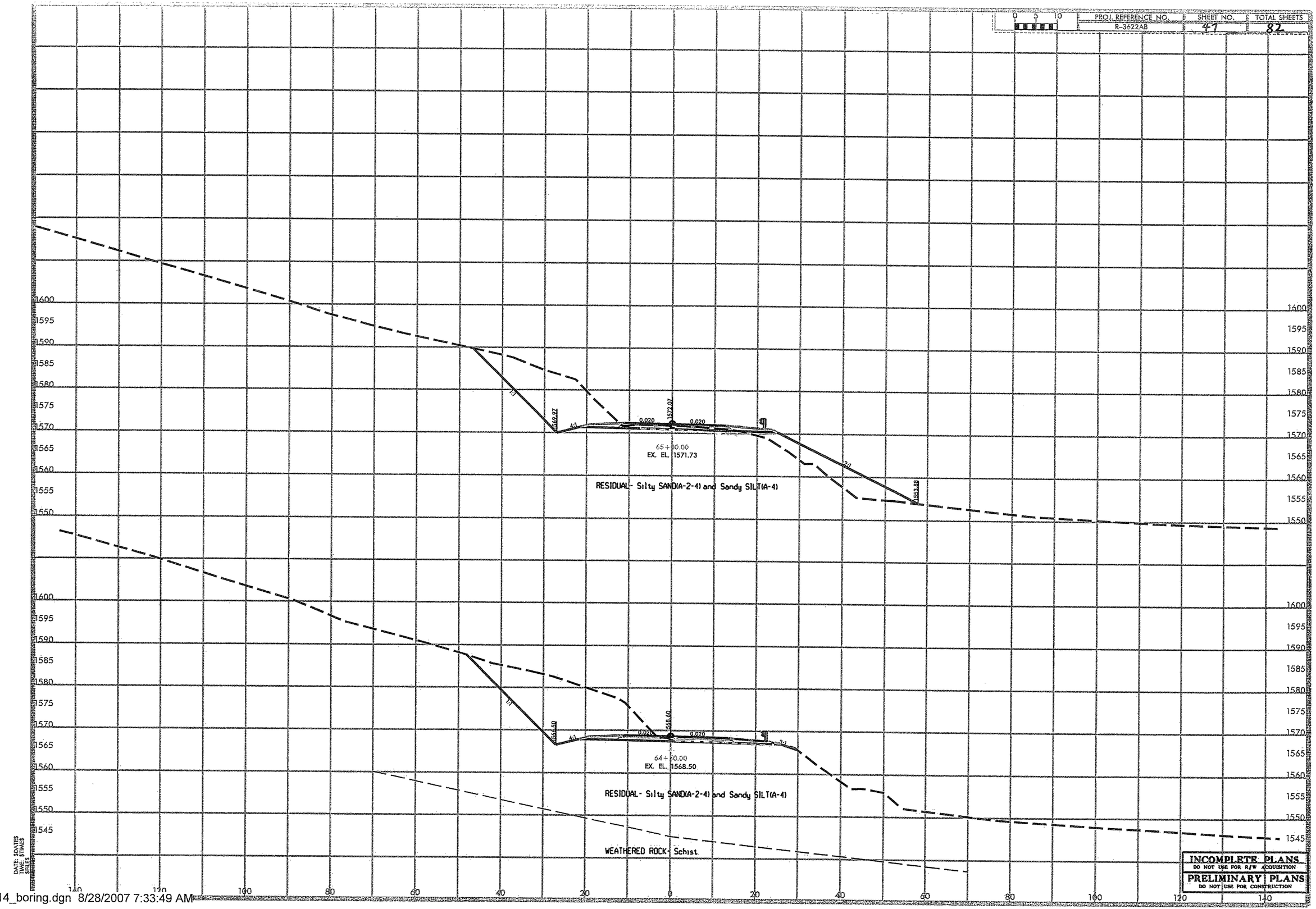
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 3/DATES
TIME: 5/TIMES
SFILE:5

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	47	82

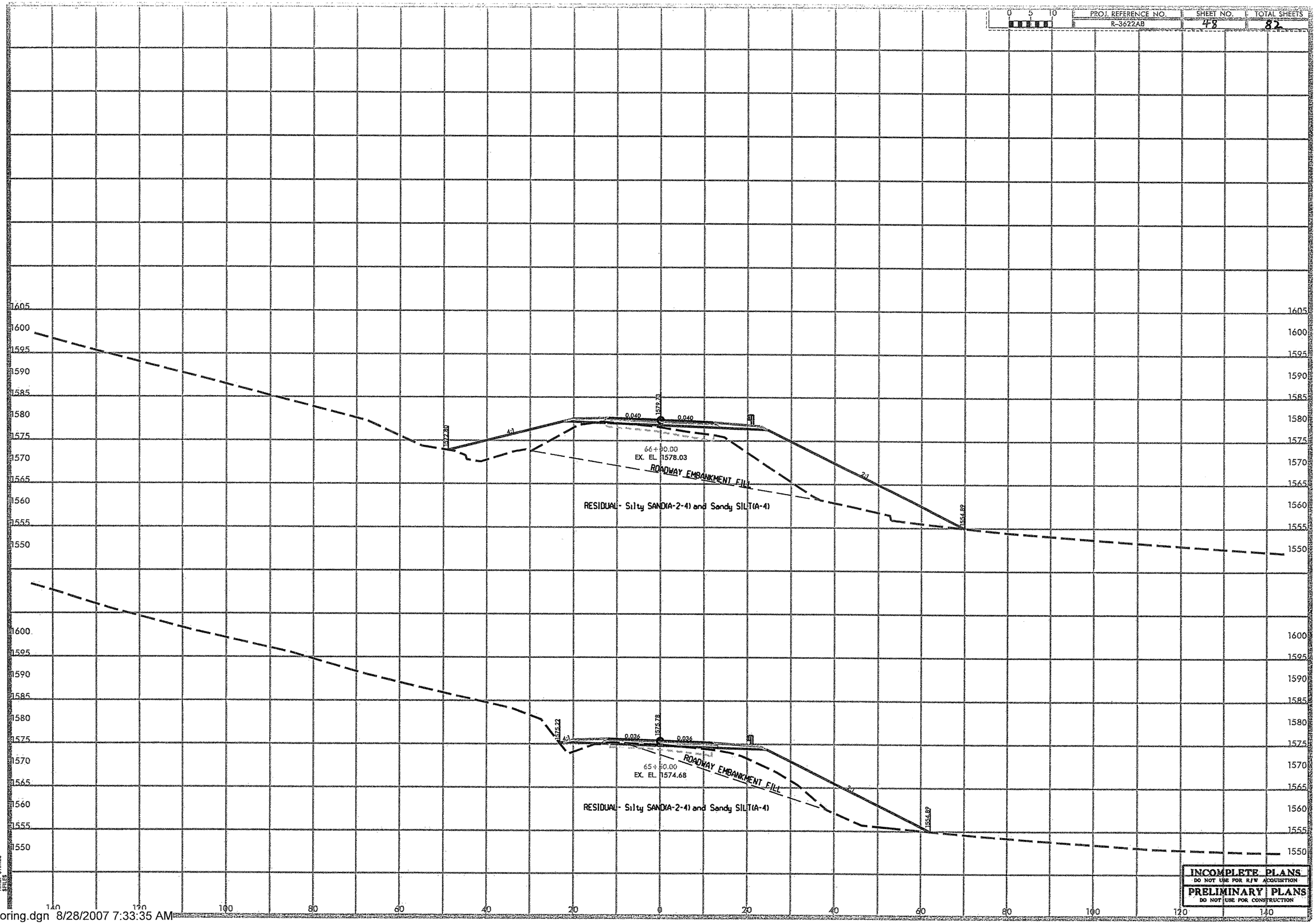


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILES

...\bridge-1\05014_boring.dgn 8/28/2007 7:33:49 AM

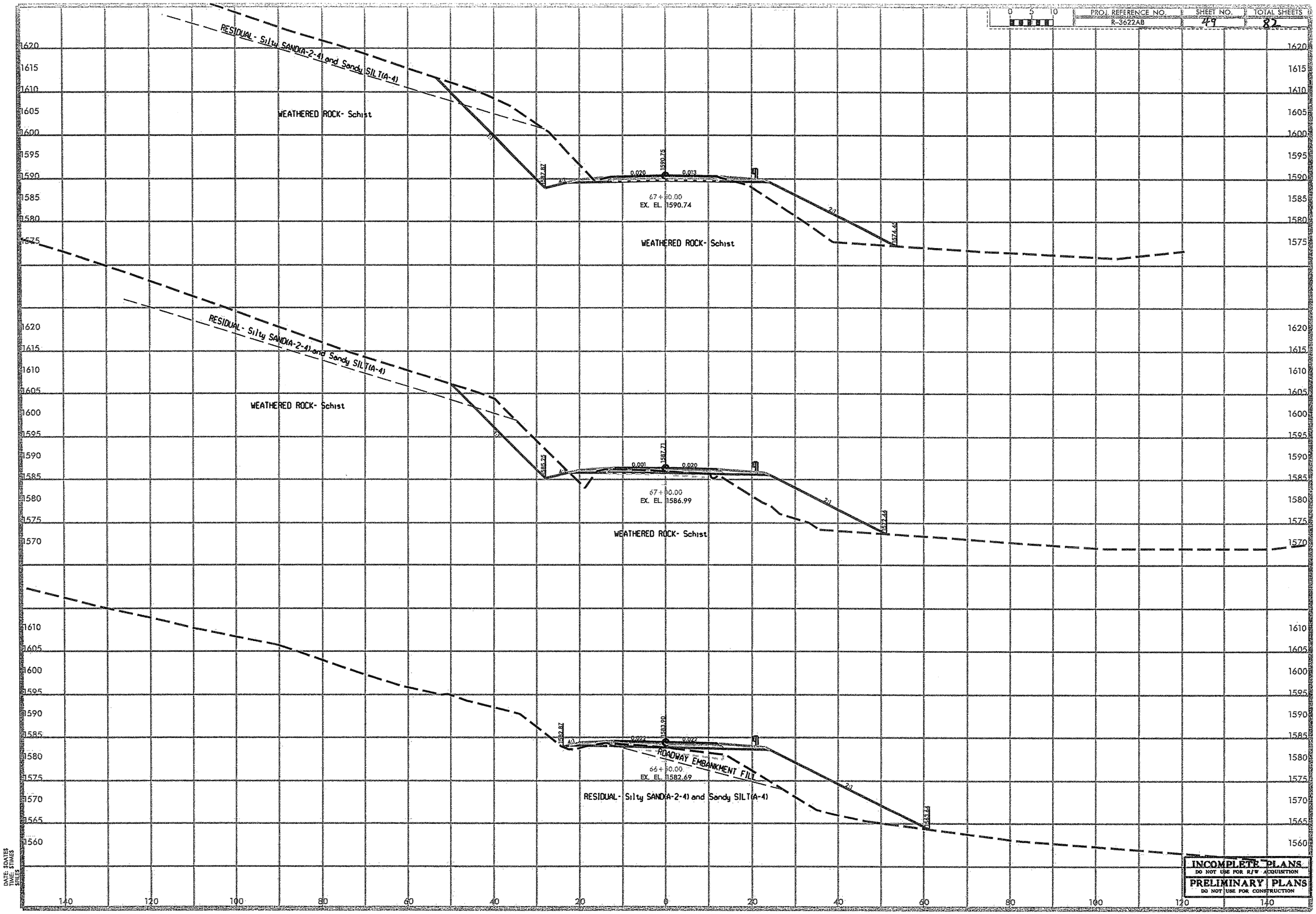
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	48	82



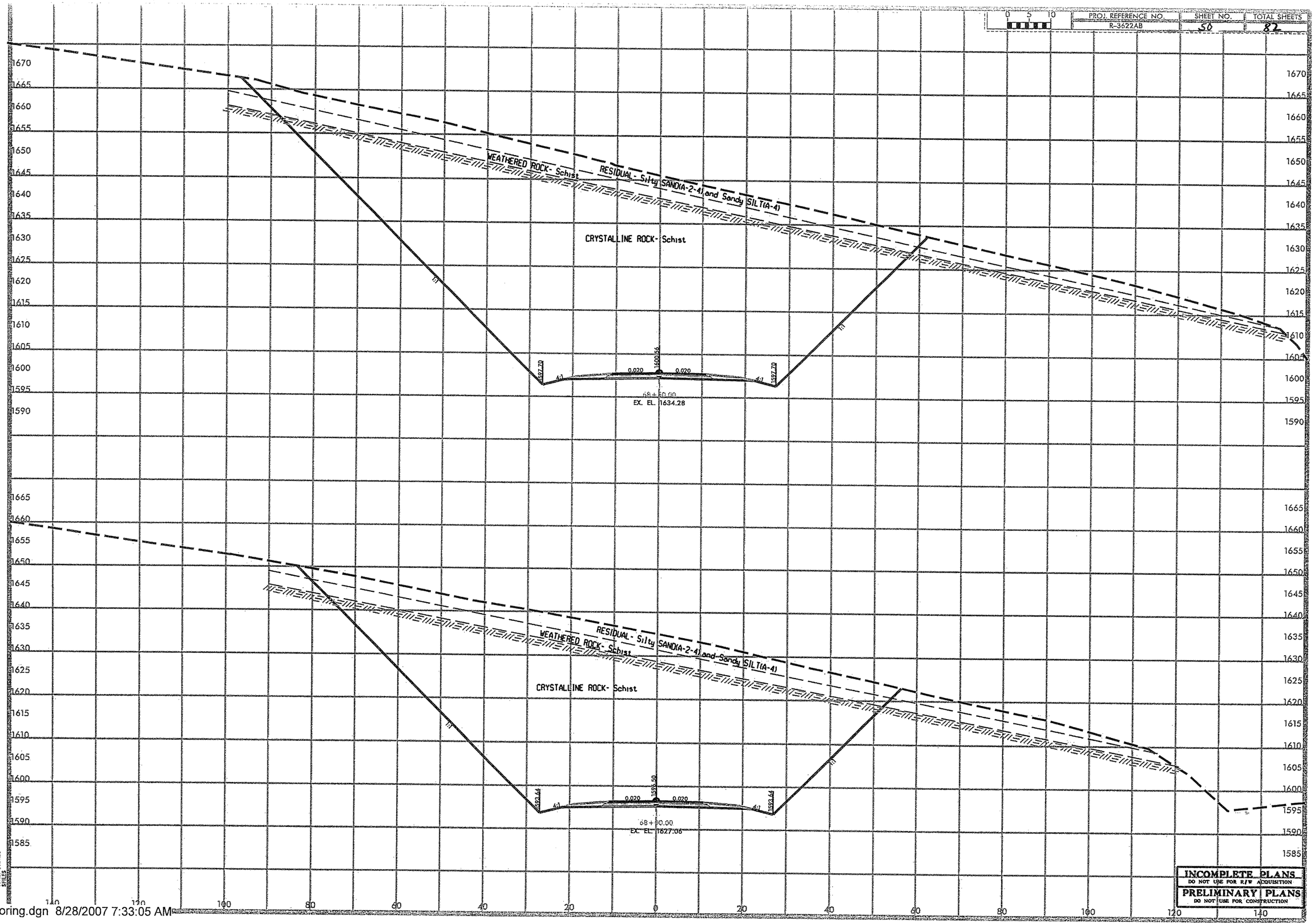
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$

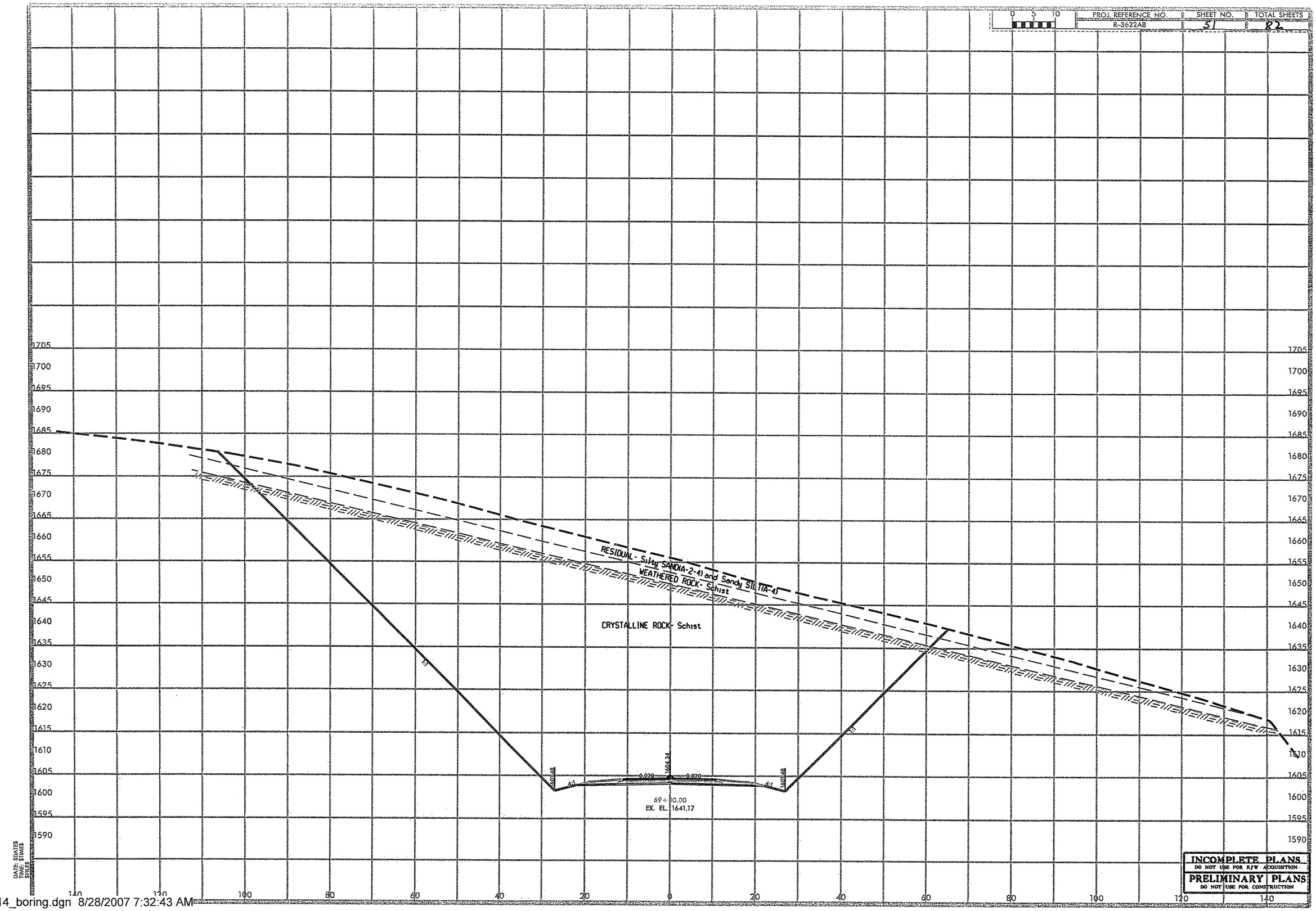
...\bridge-1\05014_boring.dgn 8/28/2007 7:33:35 AM


0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
49
TOTAL SHEETS
82
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
1590.75
1587.87
0.020
0.013
67+50.00
EX. EL. 1590.74
1574.45
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
1587.71
1585.25
0.001
0.020
67+50.00
EX. EL. 1586.99
1572.44
WEATHERED ROCK- Schist
1583.90
1582.87
0.022
0.022
ROADWAY EMBANKMENT FILL
66+50.00
EX. EL. 1582.69
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
1568.44
2:1
4:1
1620
1615
1610
1605
1600
1595
1590
1585
1580
1575
1570
1565
1560
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
DATE: 3DATES
TIME: 3TIMES
SHEET: 3SHEETS
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

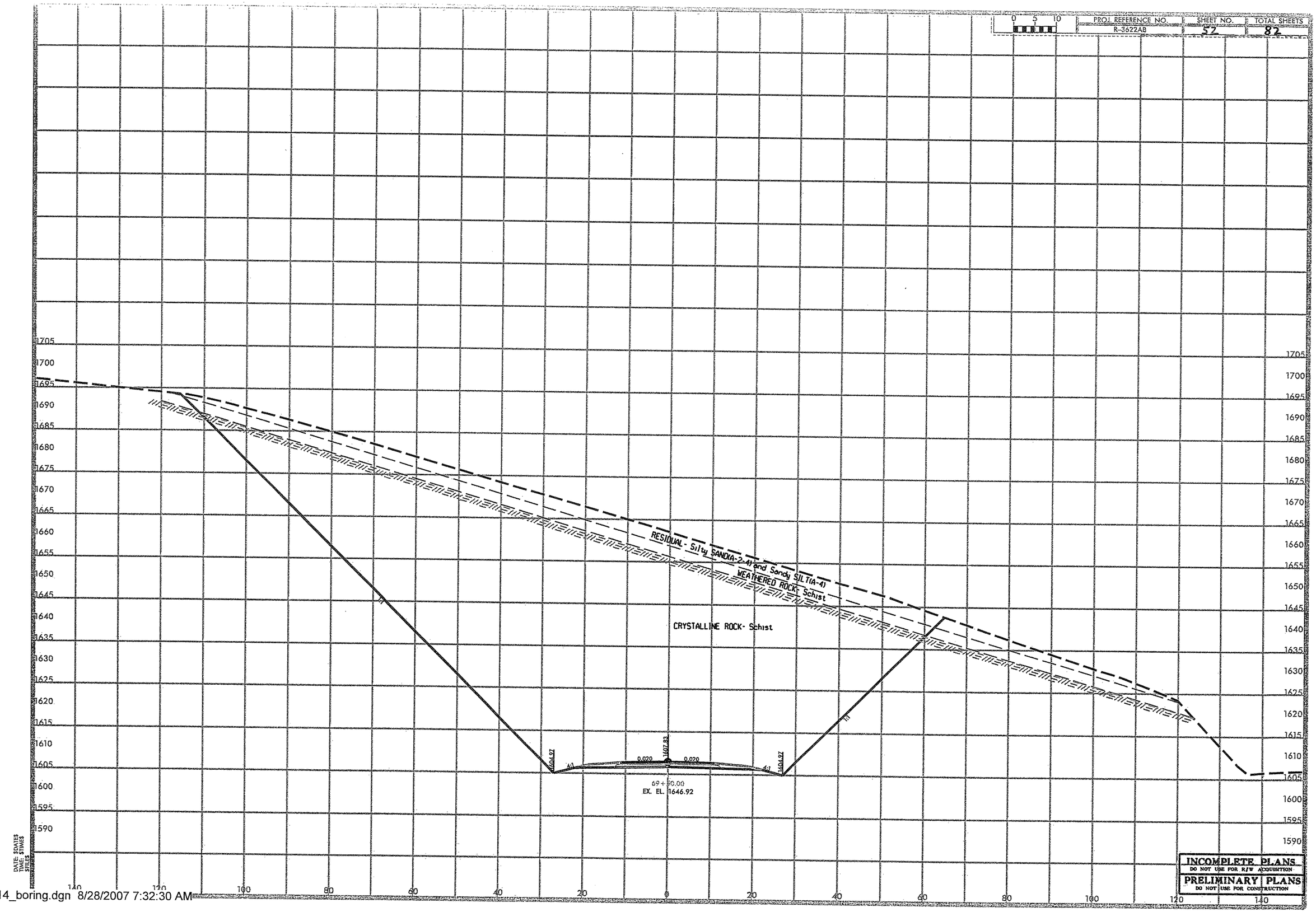
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	50	82



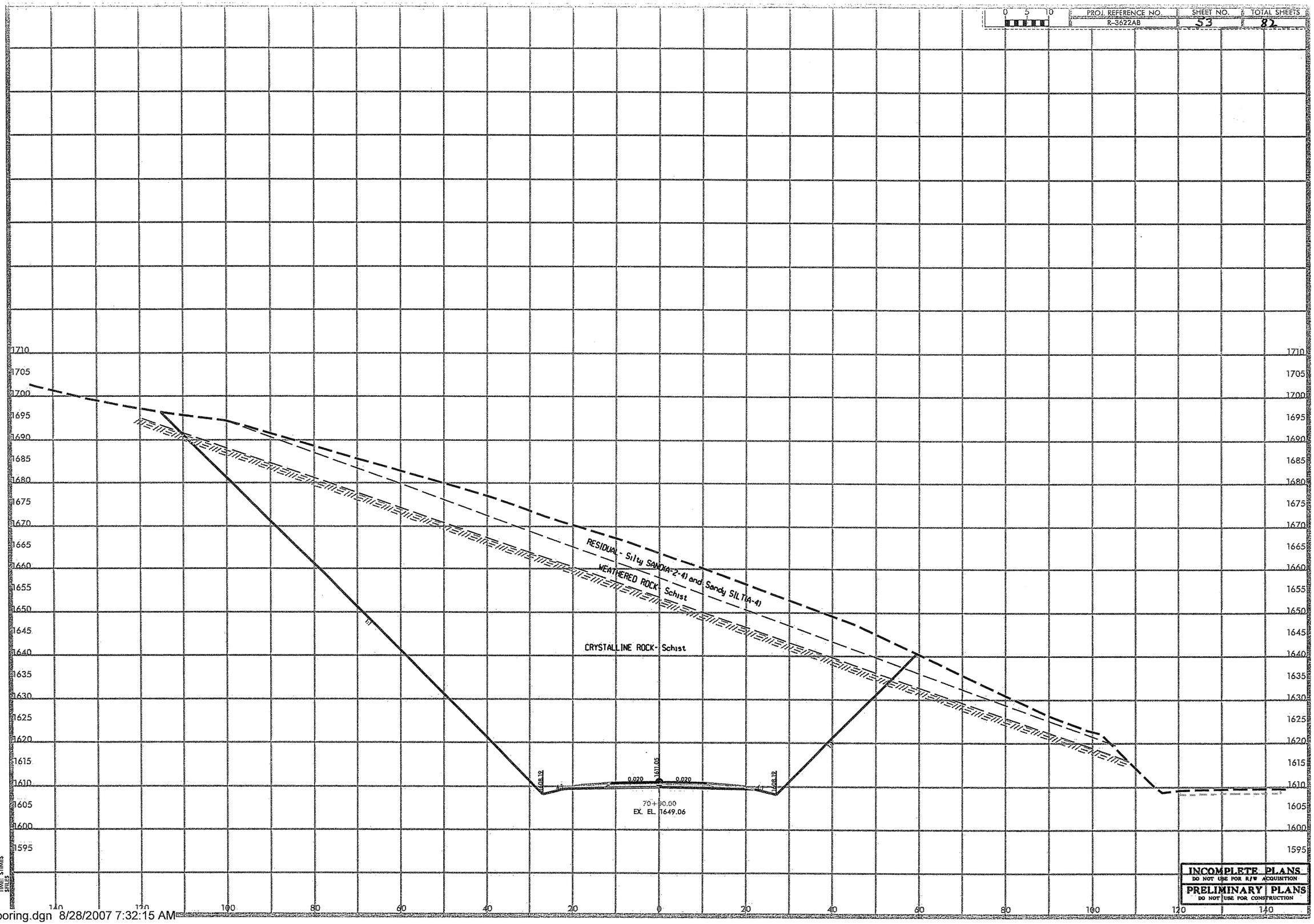
...\bridge-1\05014_boring.dgn 8/28/2007 7:33:05 AM



...\bridge-1\05014_boring.dgn 8/28/2007 7:32:43 AM



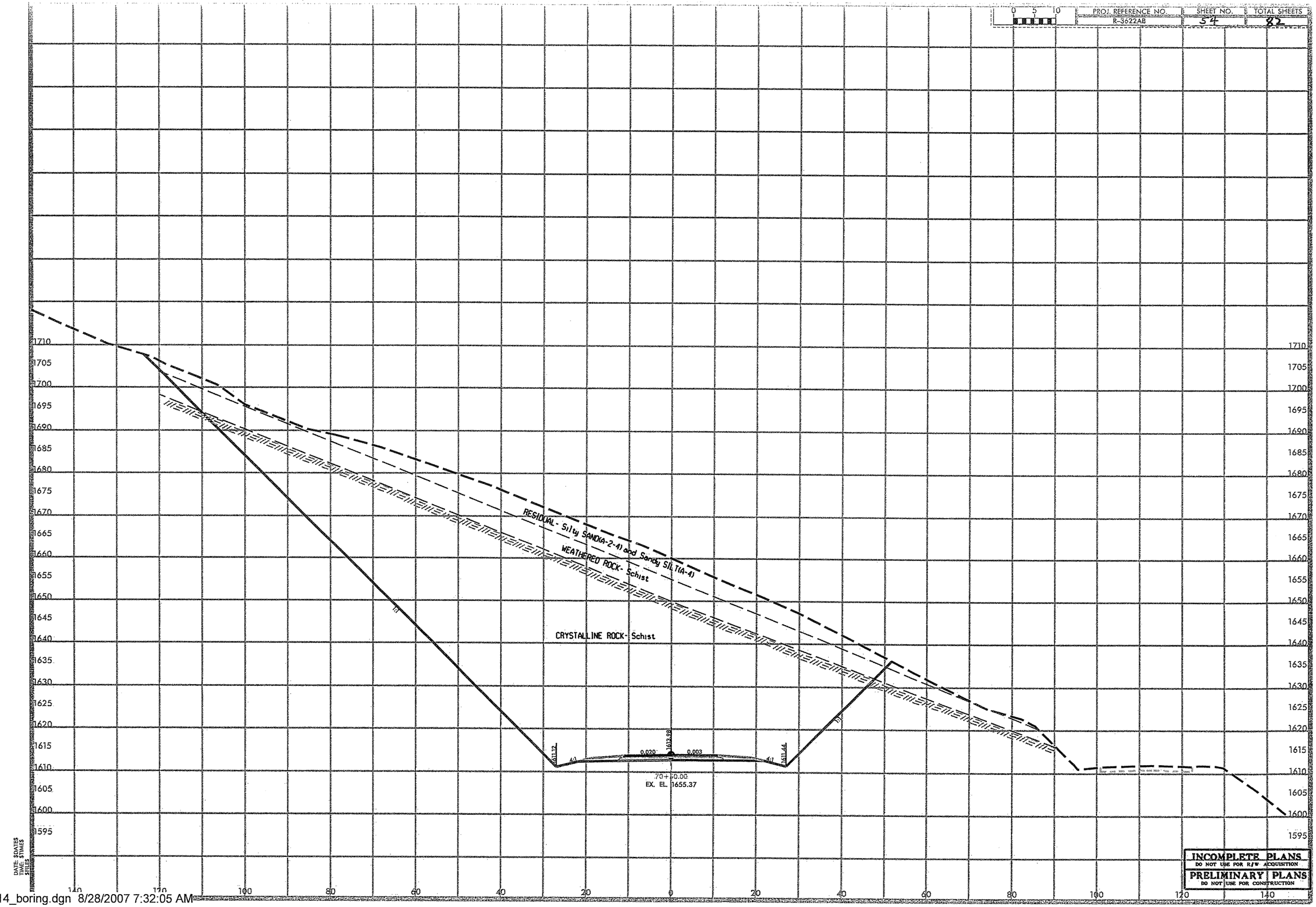
...\bridge-1\05014_boring.dgn 8/28/2007 7:32:30 AM



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILES

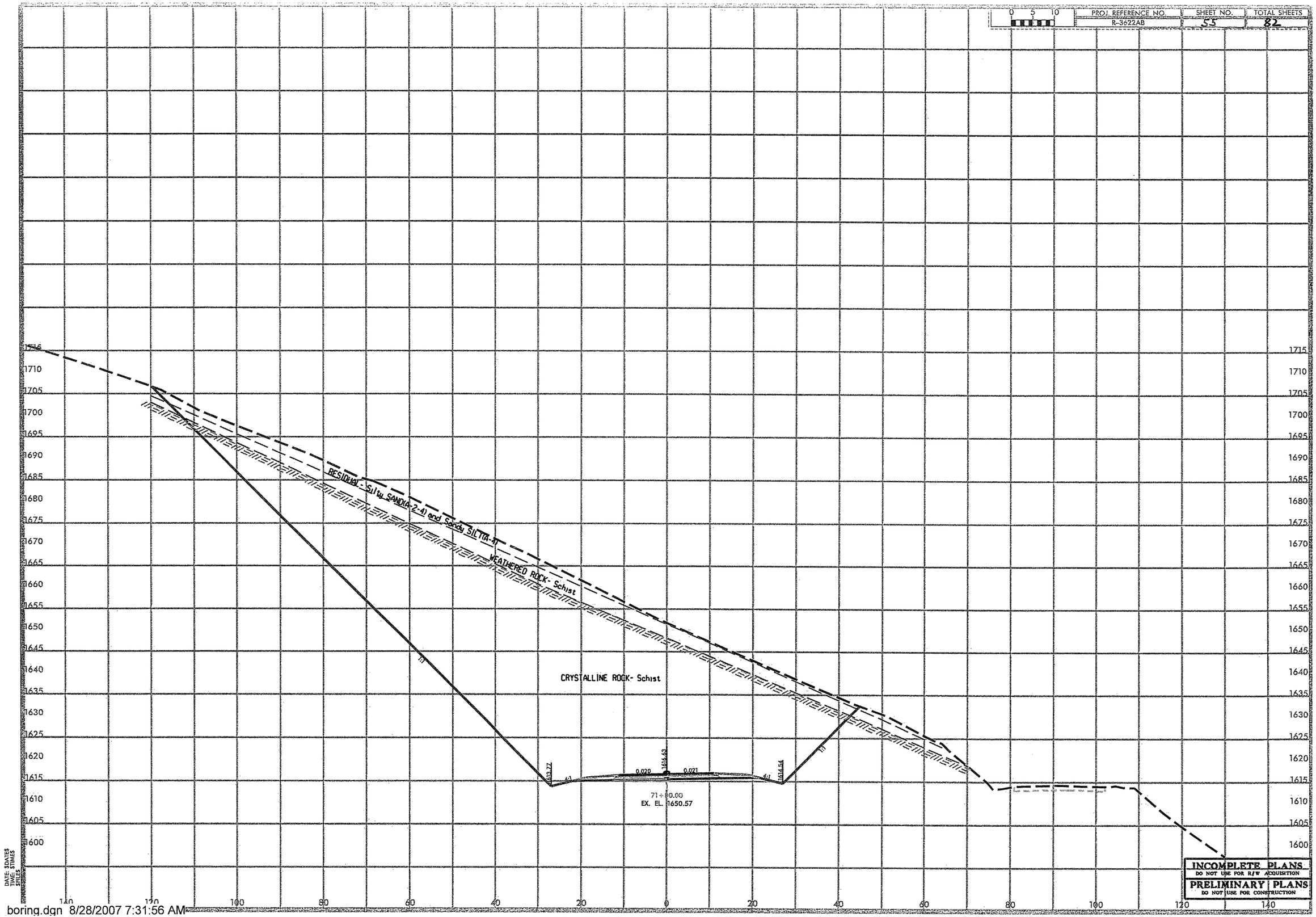
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	54	82



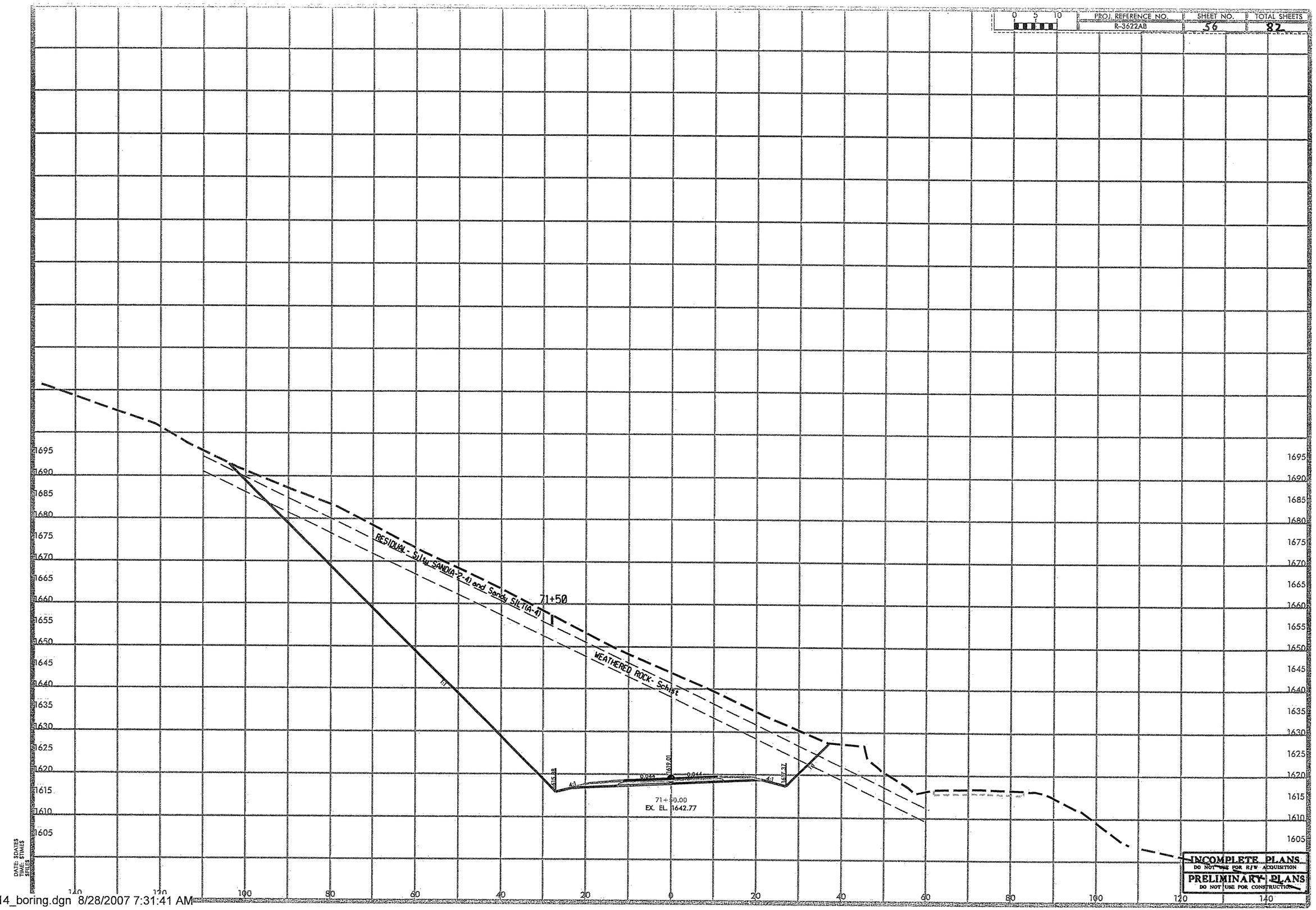
DATE: 5/24/15
TIME: 5:17:46 PM
$FILES

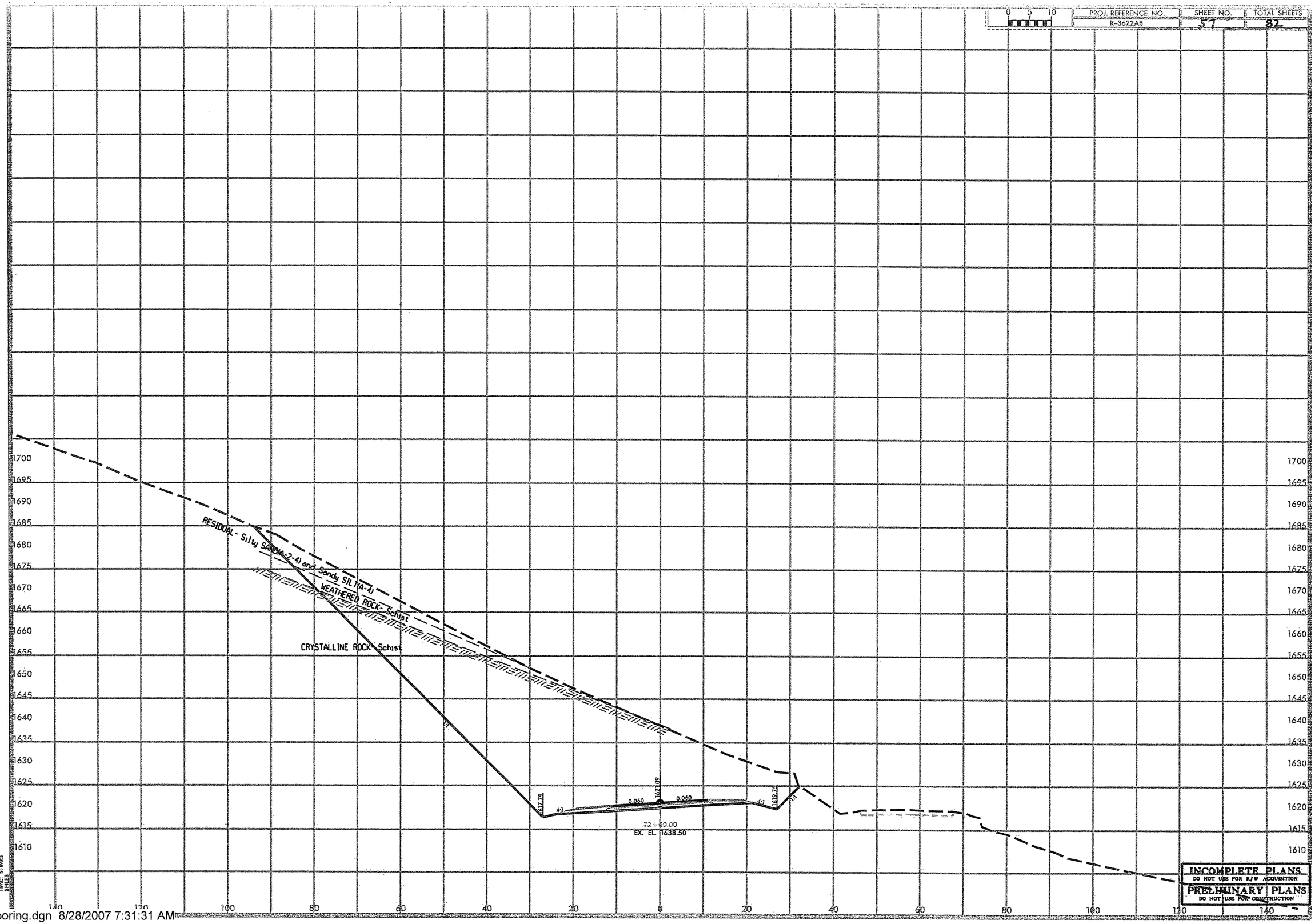
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

...\bridge-1\05014_boring.dgn 8/28/2007 7:32:05 AM



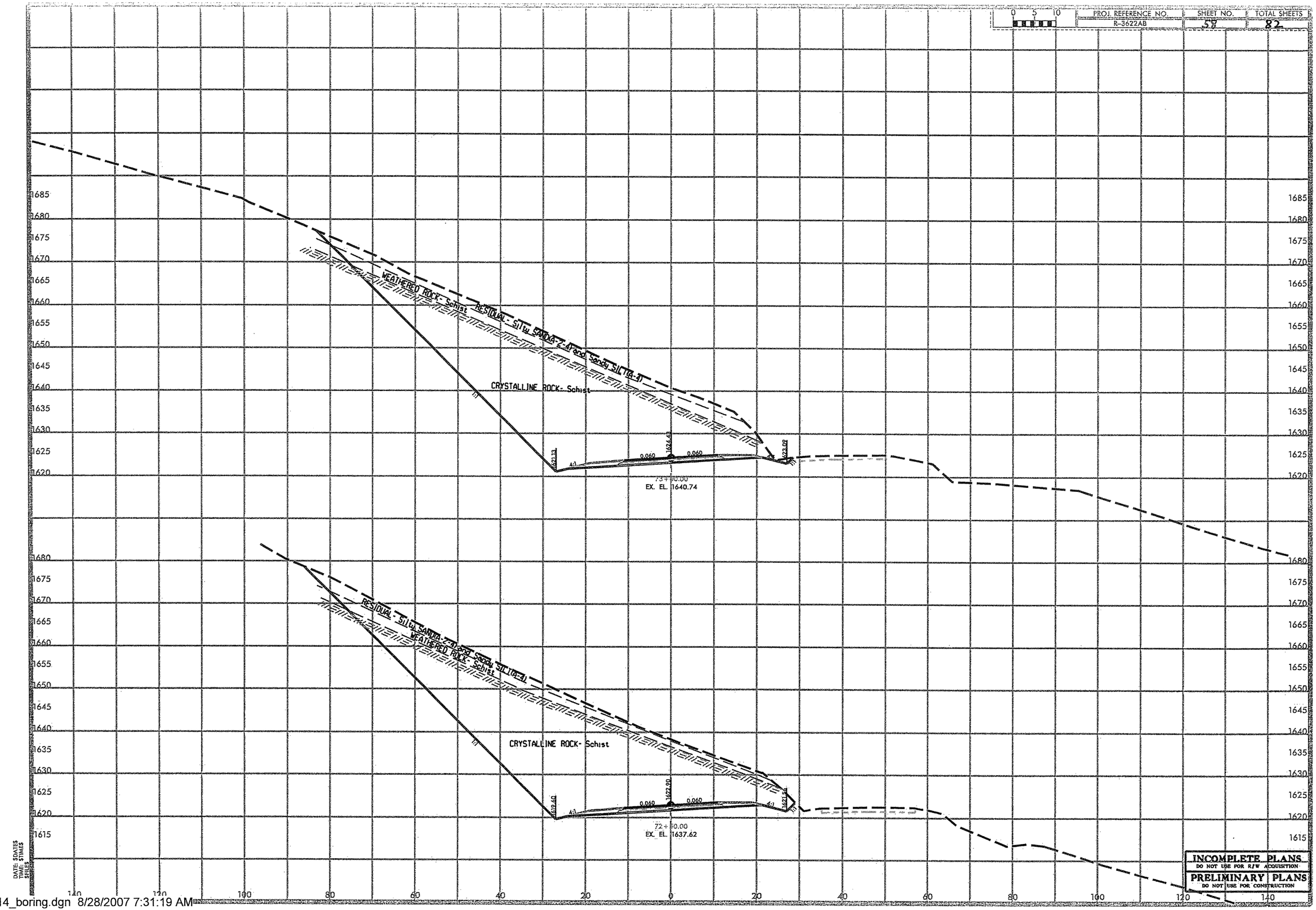
...\bridge-1\05014 boring.dgn 8/28/2007 7:31:56 AM


PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
56
TOTAL SHEETS
82
RESIDUAL - Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
71+50
71+50.00
EX. EL. 1642.77
1615.88
1619.01
1617.32
0.044
0.044
4:1
4:1
1695
1690
1685
1680
1675
1670
1665
1660
1655
1650
1645
1640
1635
1630
1625
1620
1615
1610
1605
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DATE: $DATE$
TIME: $TIME$
$FILE$

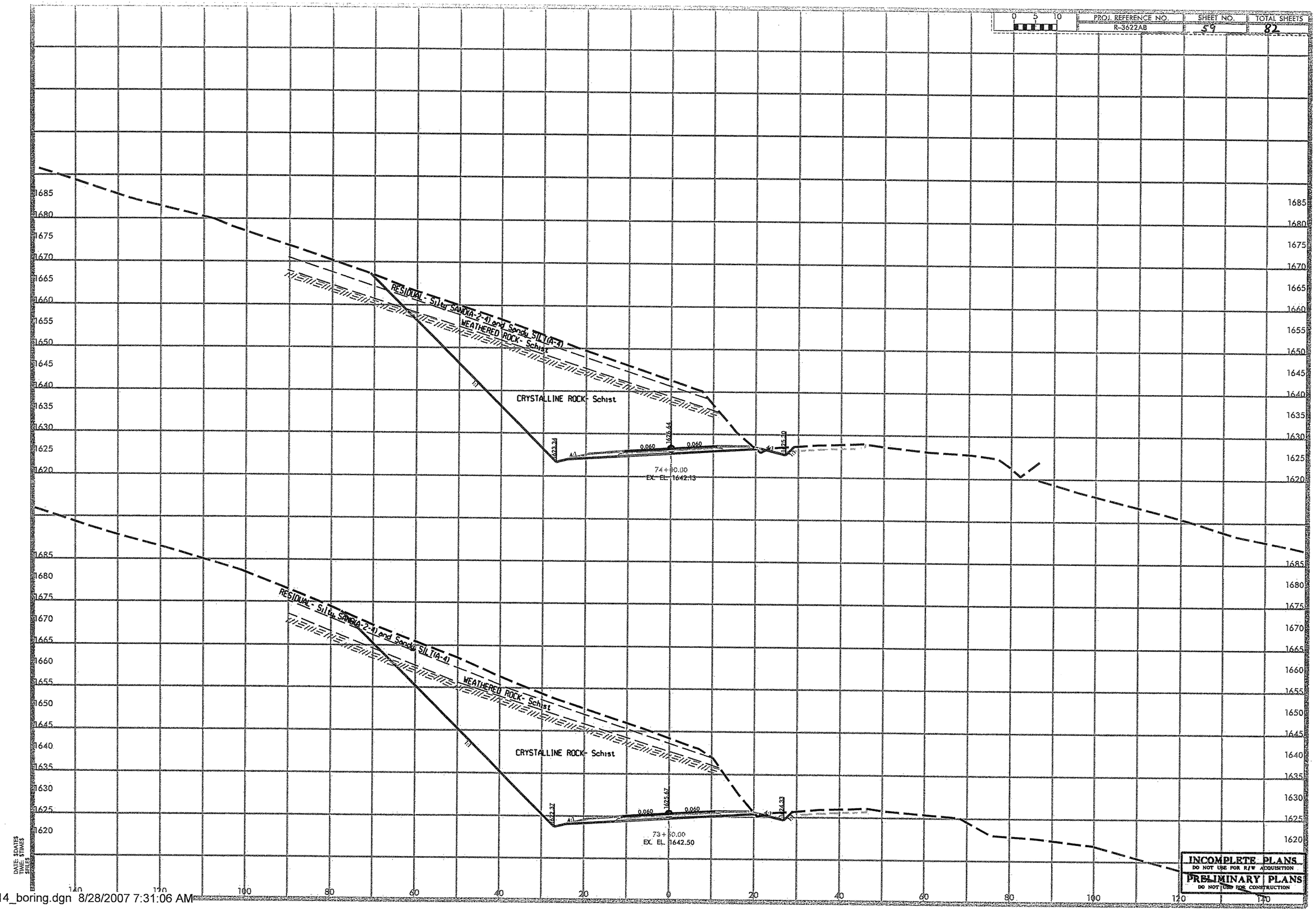


DATE: 5DATE5
TIME: 5TIME5
5FILE5

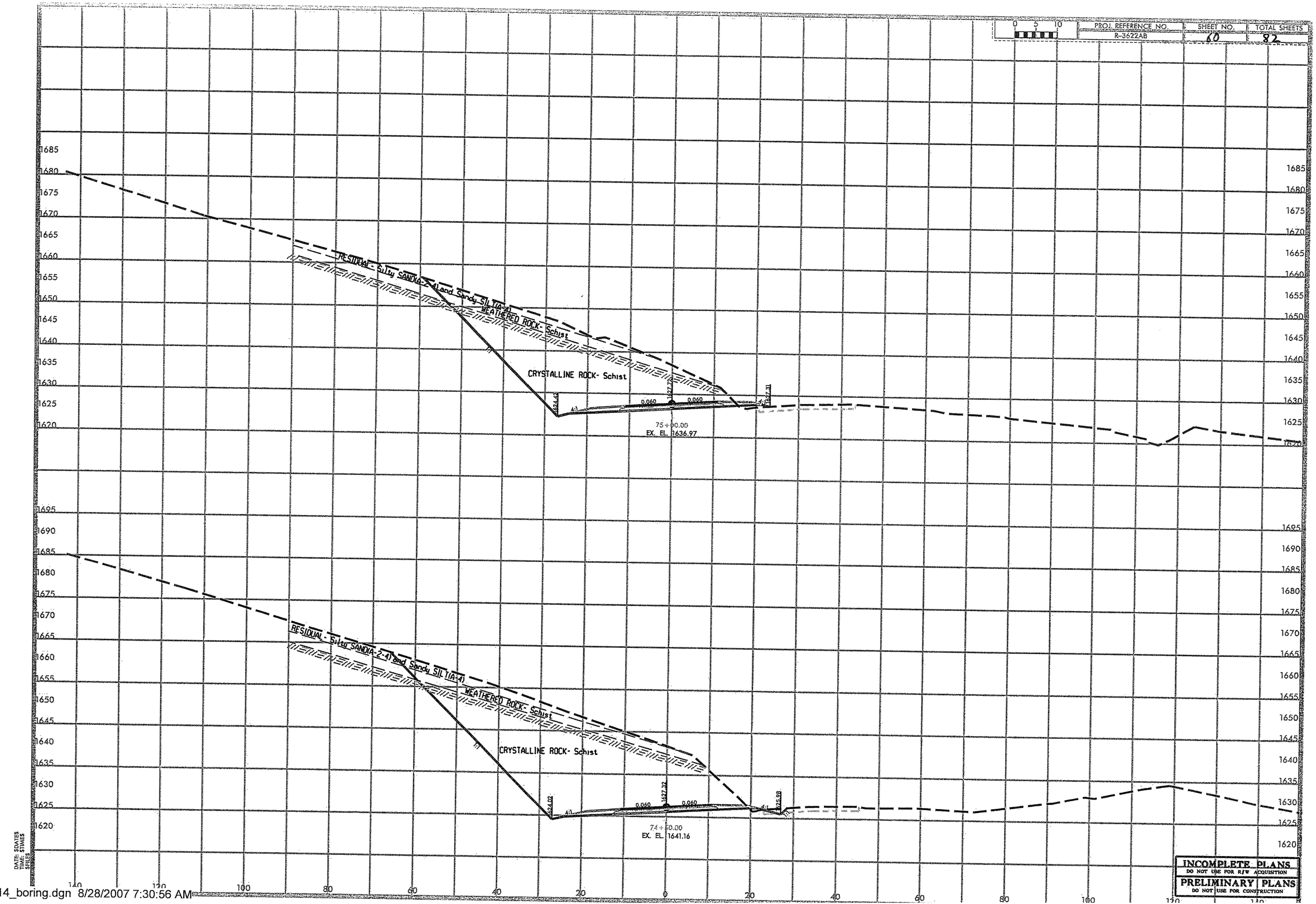
...\bridge-1\05014_boring.dgn 8/28/2007 7:31:31 AM



...\bridge-1\05014_boring.dgn 8/28/2007 7:31:19 AM

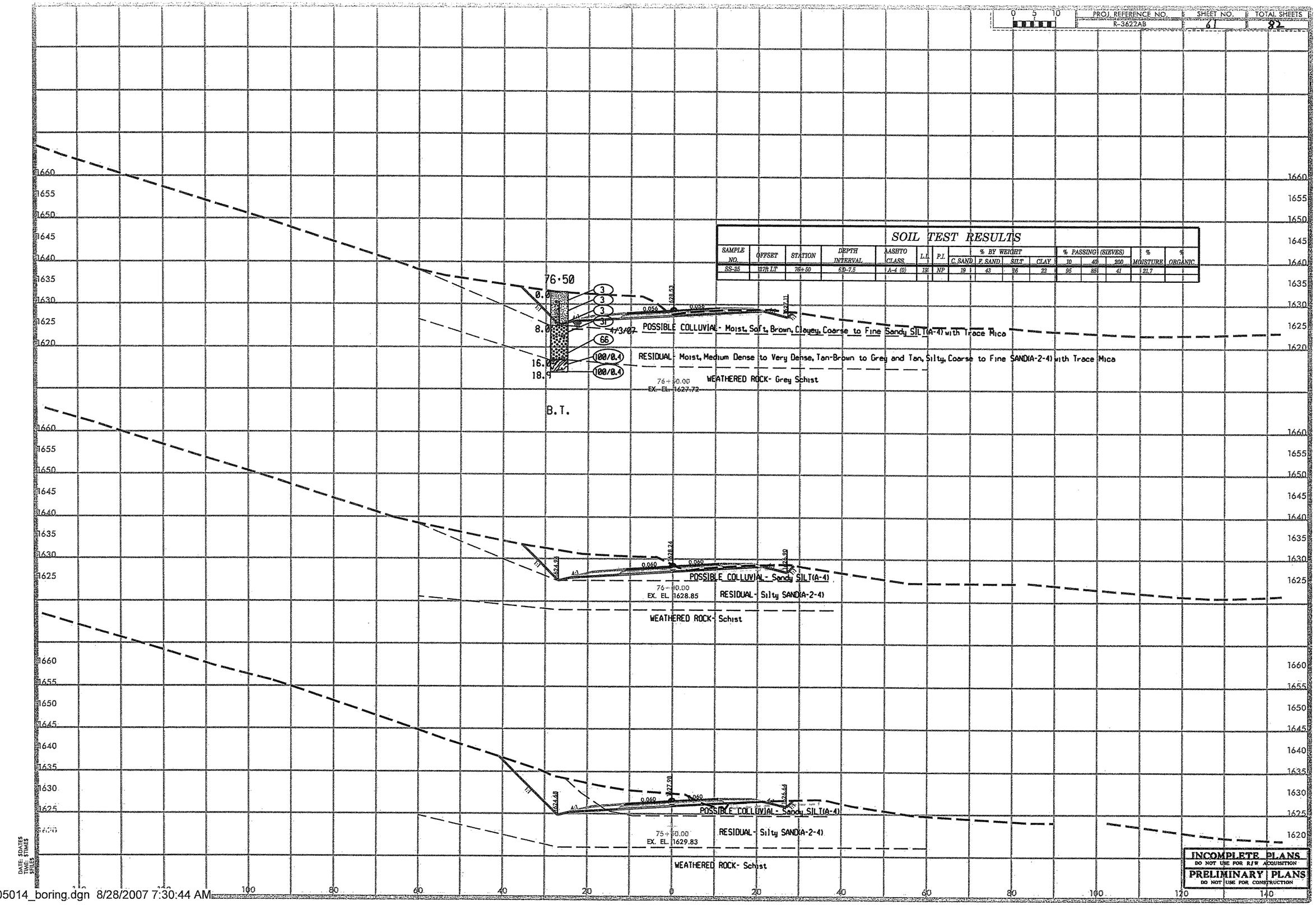


...\bridge-1\05014_boring.dgn 8/28/2007 7:31:06 AM



...\bridge-1\05014_boring.dgn 8/28/2007 7:30:56 AM

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	61	82



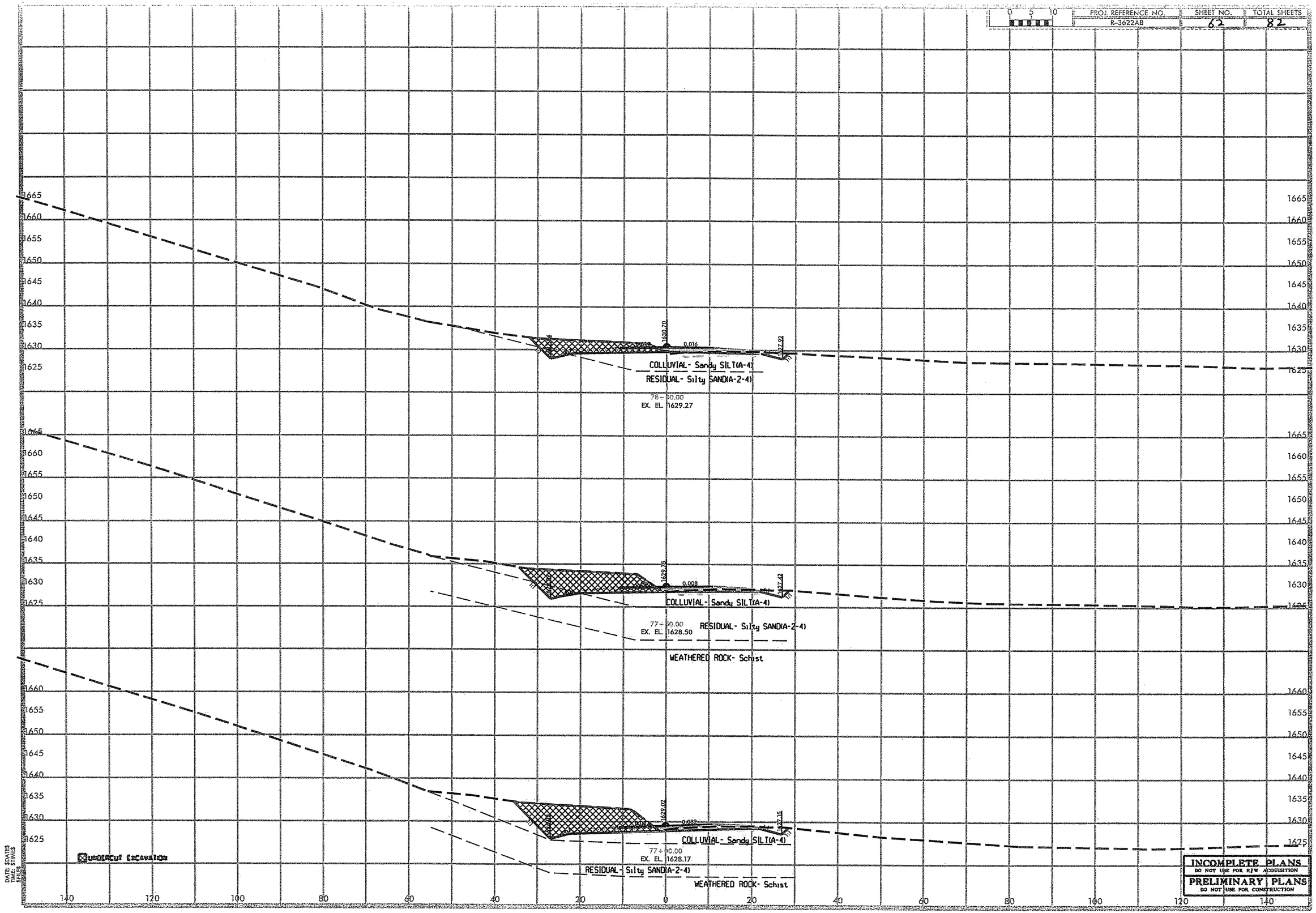
SOIL TEST RESULTS

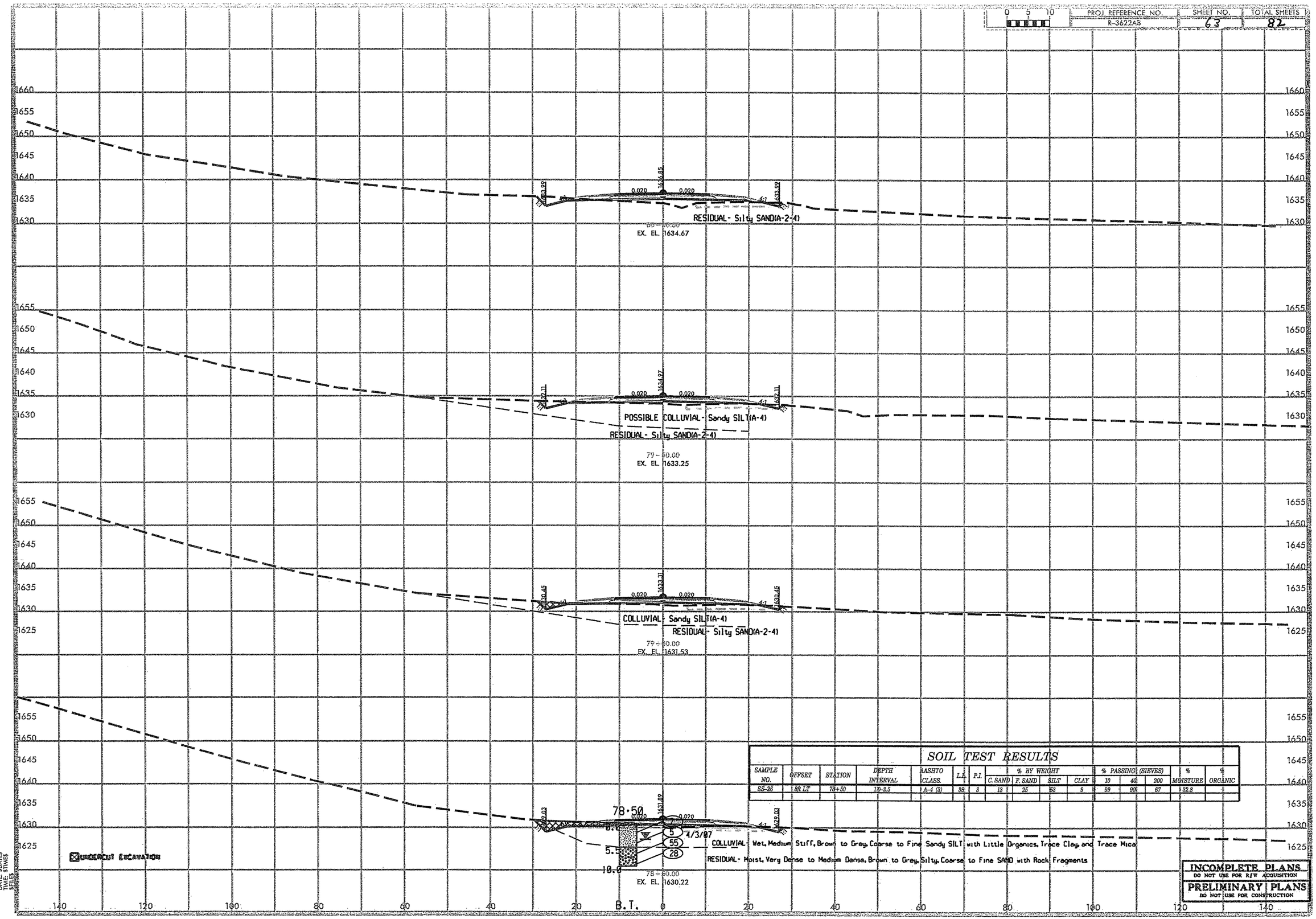
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-25	127ft LT	76+50	6.0-7.5	A-4 (0)	19	NP	19	43	16	22	95	85	41	21.7	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$

...\bridge-1\05014_boring.dgn 8/28/2007 7:30:44 AM


0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
62
TOTAL SHEETS
82
1630.70
0.016
1627.92
COLLUVIAL- Sandy SILT(A-4)
RESIDUAL- Silty SAND(A-2-4)
78+00.00
EX. EL. 1629.27
1629.75
0.008
1627.42
COLLUVIAL- Sandy SILT(A-4)
77+50.00
EX. EL. 1628.50
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
1628.02
0.032
1627.15
COLLUVIAL- Sandy SILT(A-4)
77+00.00
EX. EL. 1628.17
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
UNDERCUT EXCAVATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



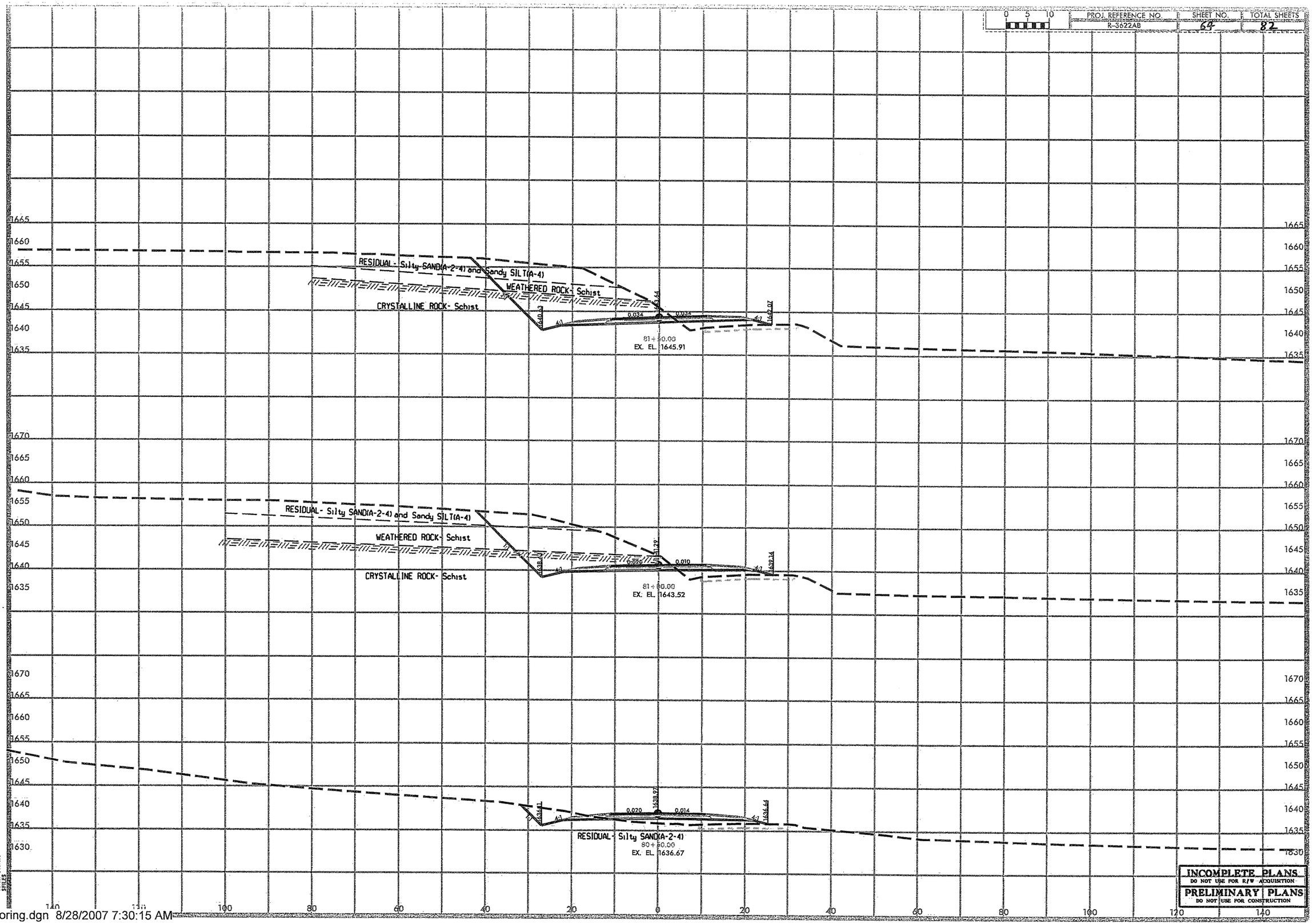
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-26	8ft LT	78+50	1.0-2.5	A-4 (3)	38	3	13	25	53	9	99	90	67	32.8	

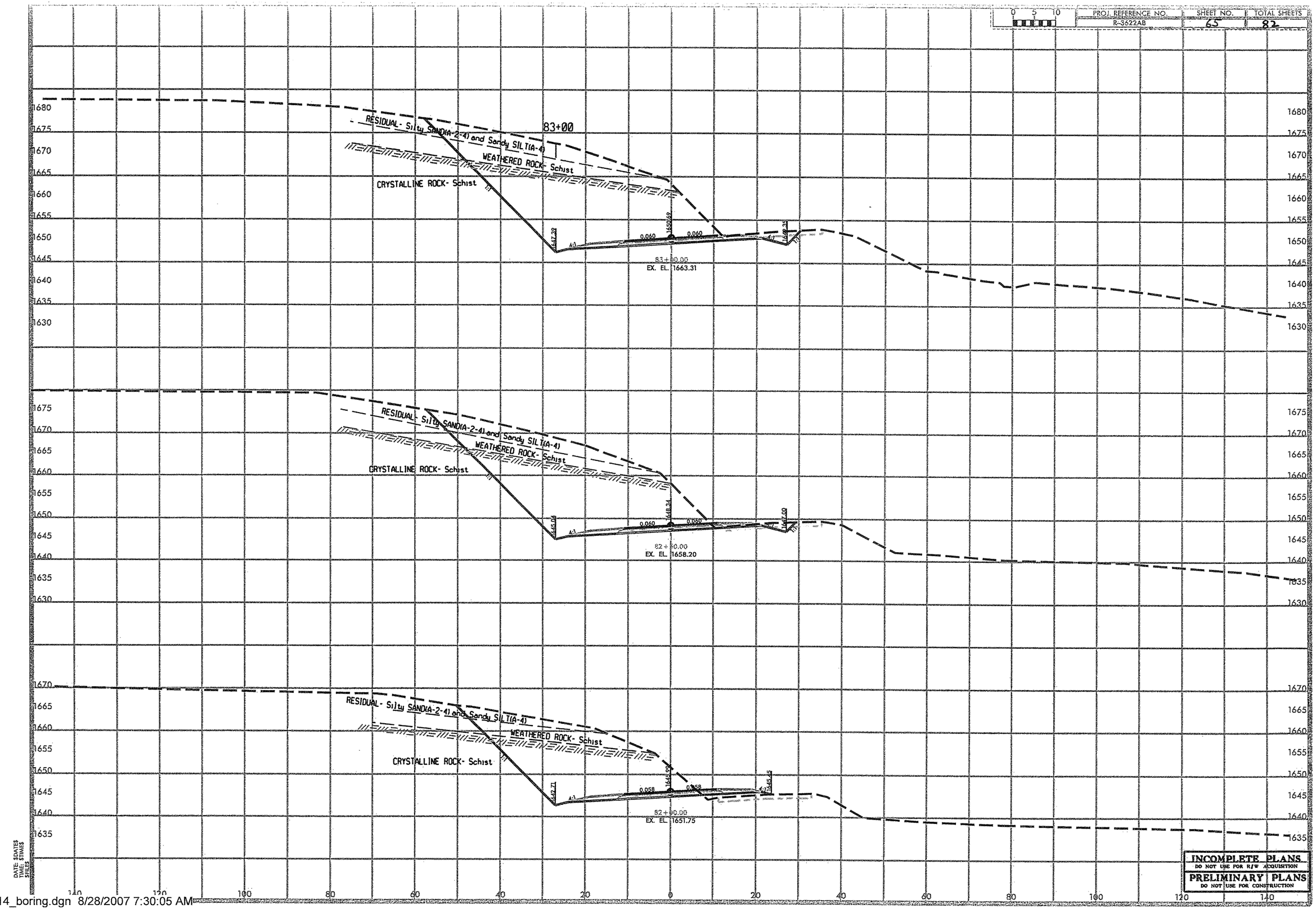
DATE: SDATES
TIME: STIMES
SITES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	64	82



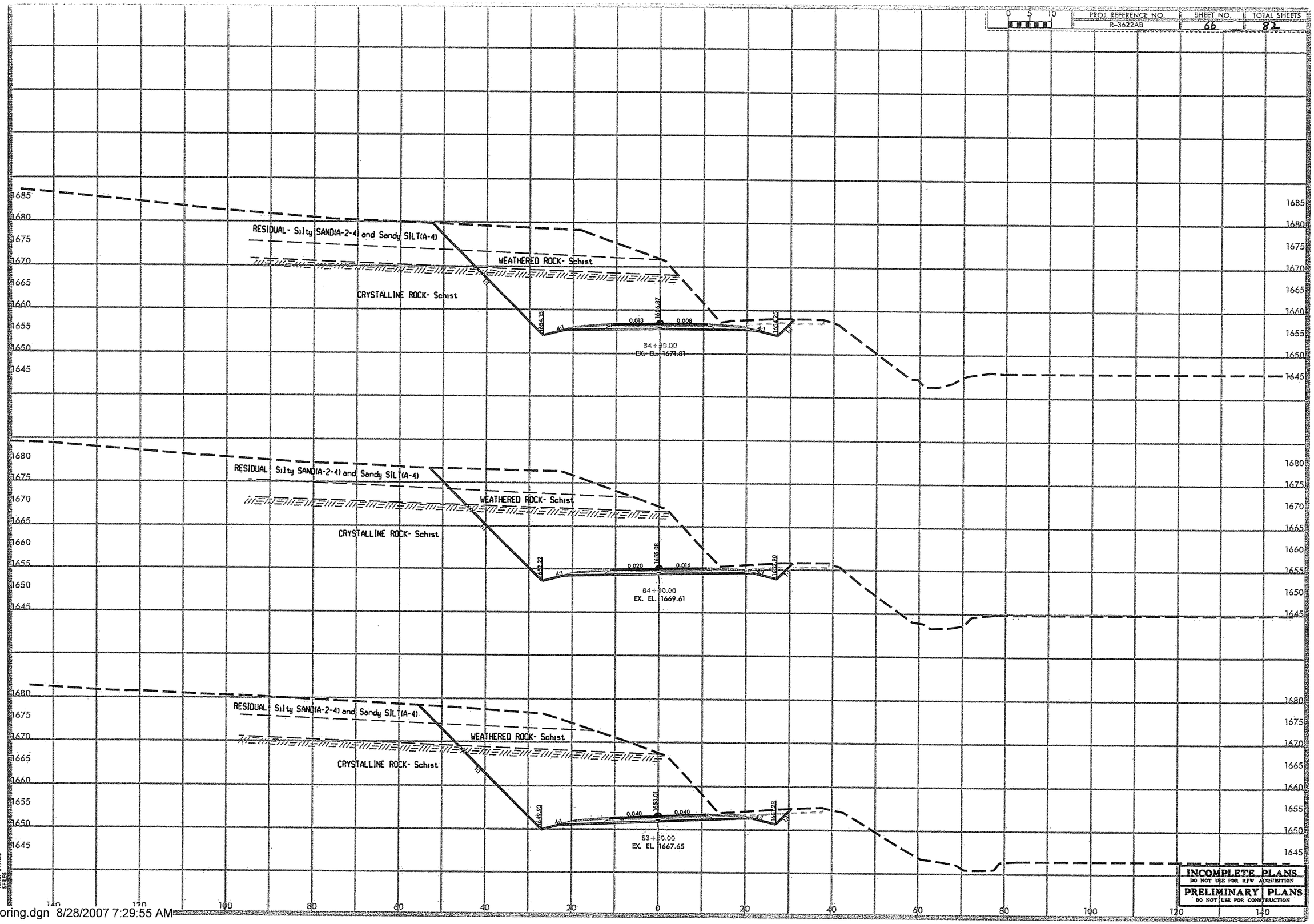
...\bridge-1\05014_boring.dgn 8/28/2007 7:30:15 AM



DATE: $DATE$
TIME: $TIME$
$FILES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

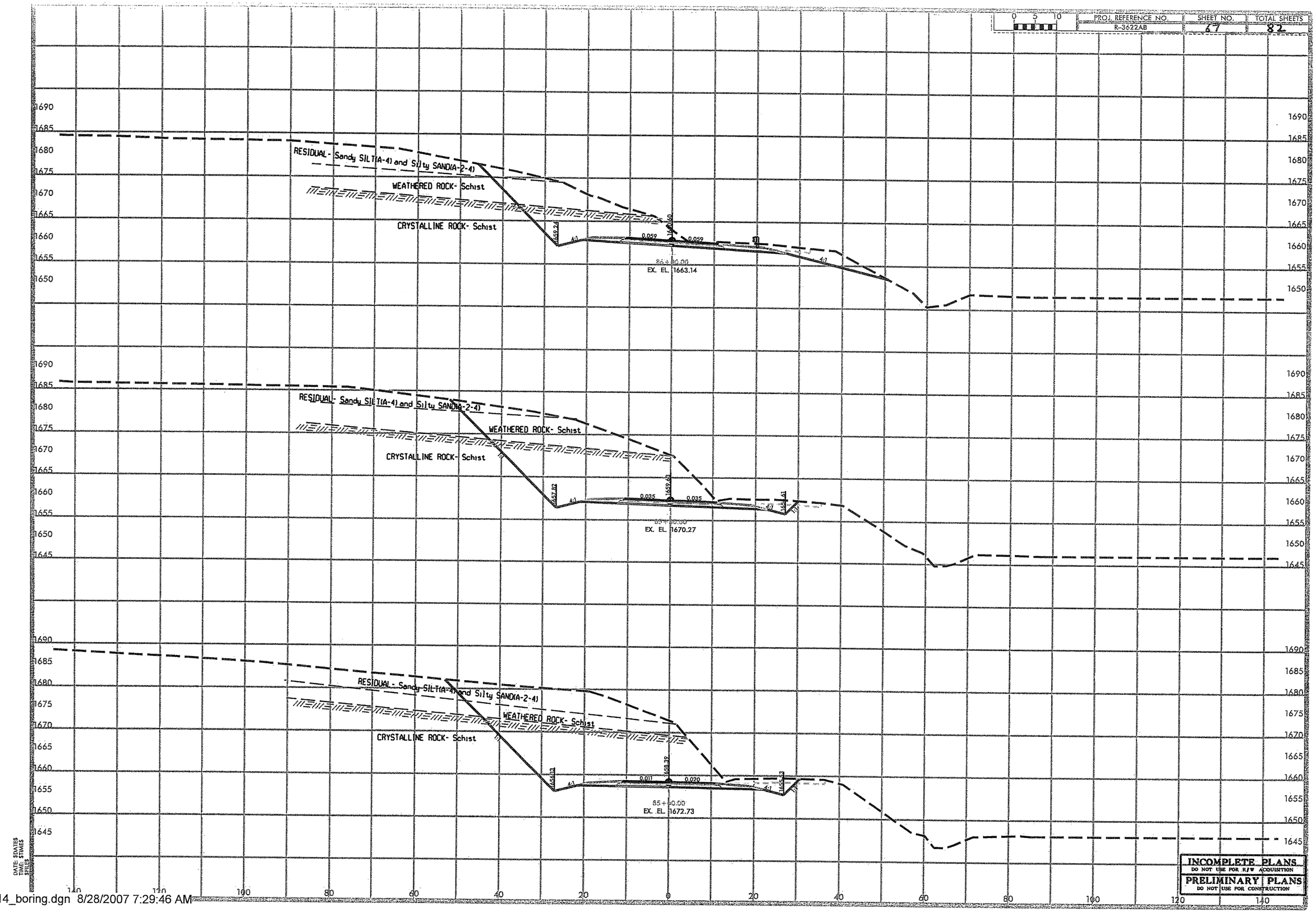
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	66	82



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$

...\bridge-1\05014_boring.dgn 8/28/2007 7:29:55 AM

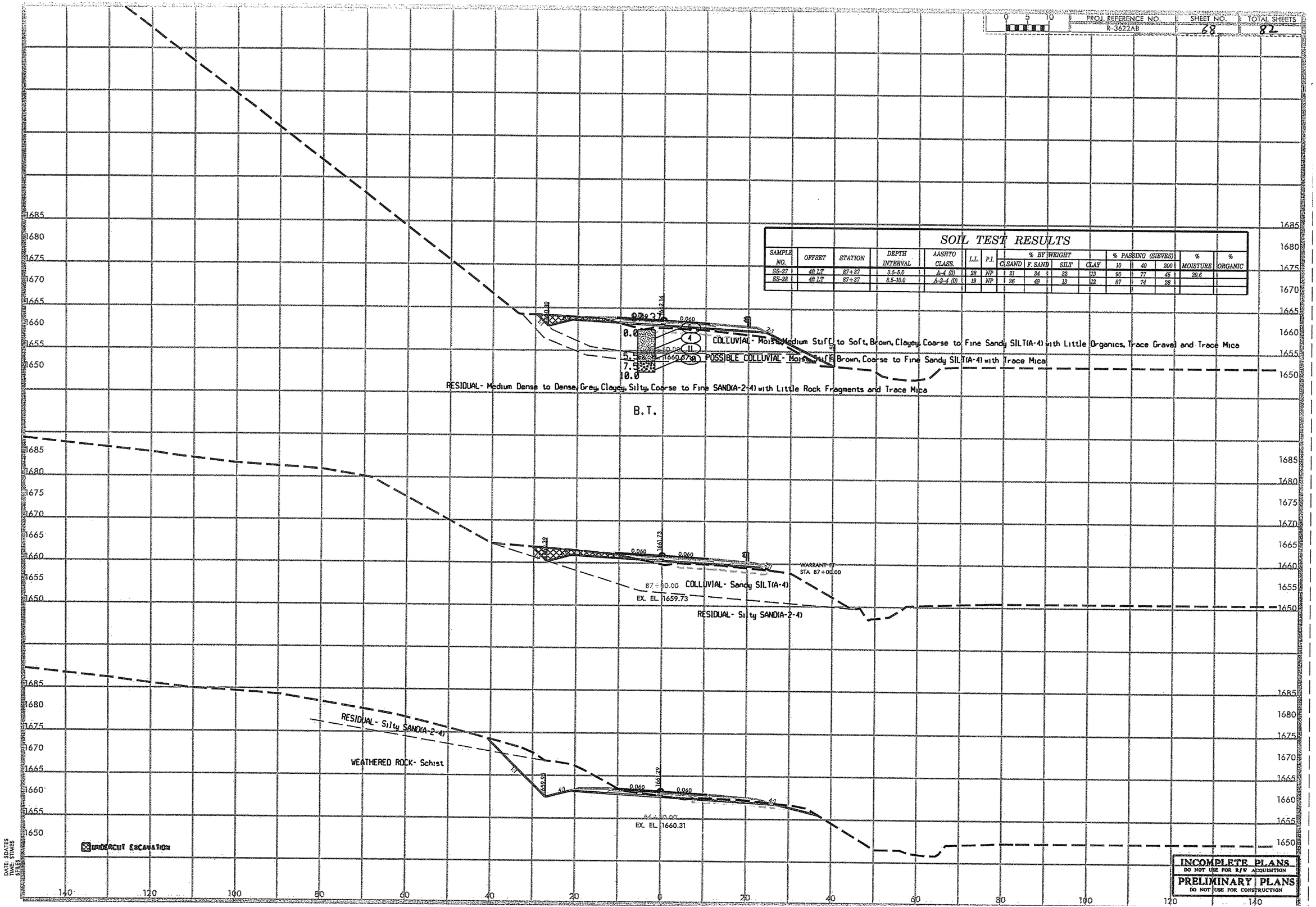


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$

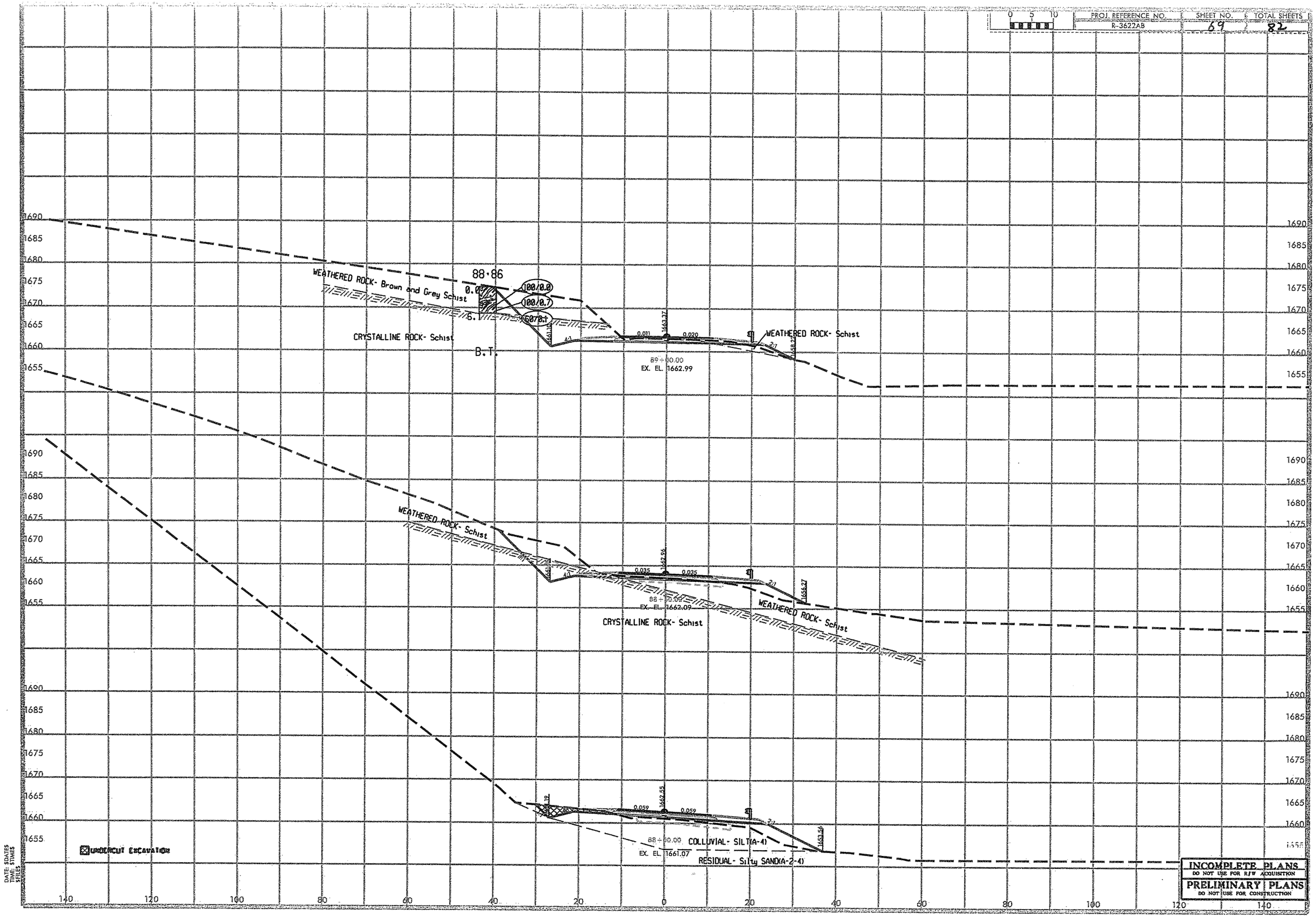
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT CL SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-27	4ft LT	87+37	3.5-5.0	A-4 (0)	28	NP	21	34	32	13	90	77	45	29.6	
SS-28	4ft LT	87+37	8.5-10.0	A-2-4 (0)	19	NP	26	49	13	12	87	74	28		



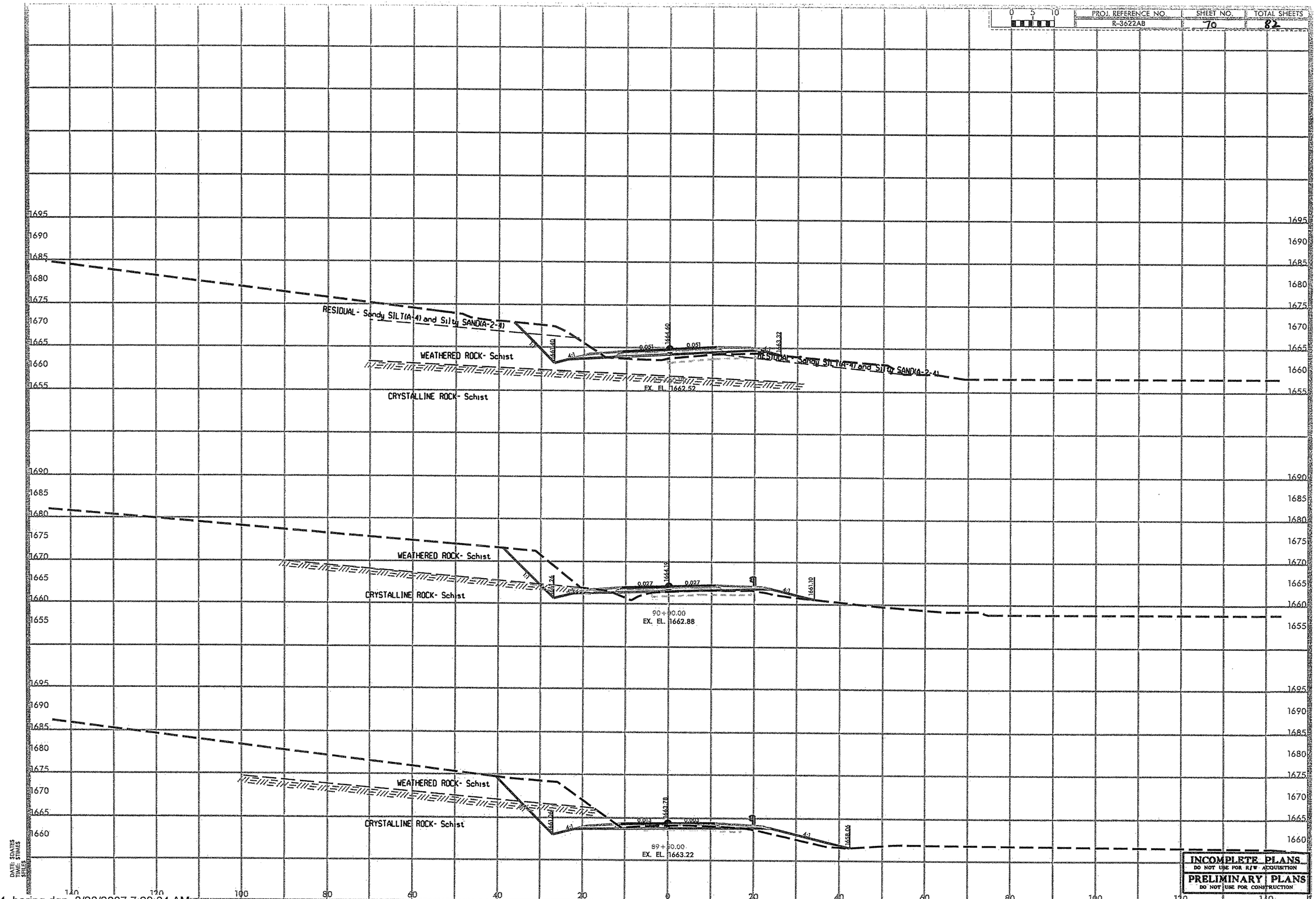
DATE: 3DATES
TIME: 3TIMES
SFILES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

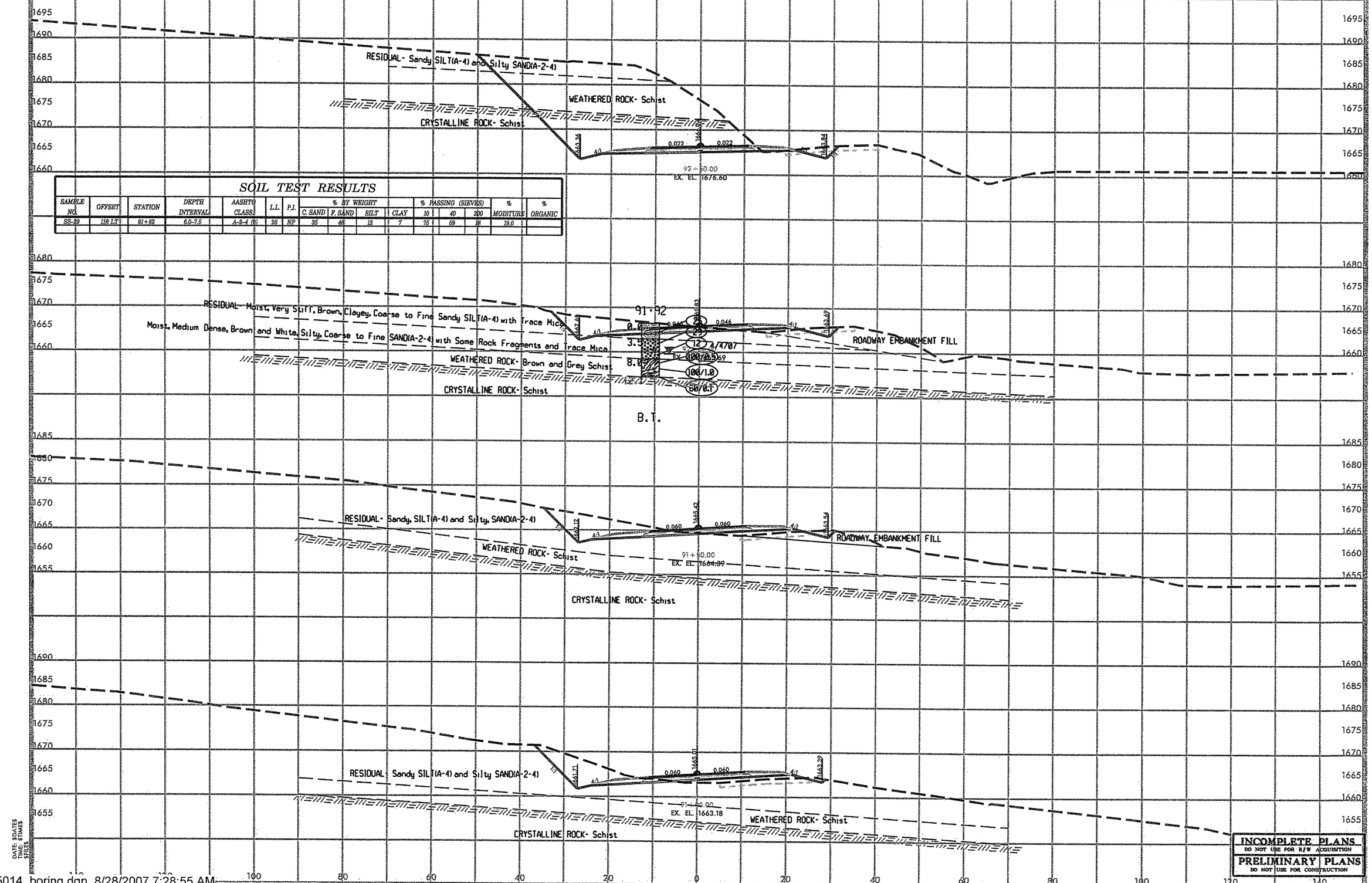


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
$FILE$



...\bridge-1\05014_boring.dgn 8/28/2007 7:29:04 AM

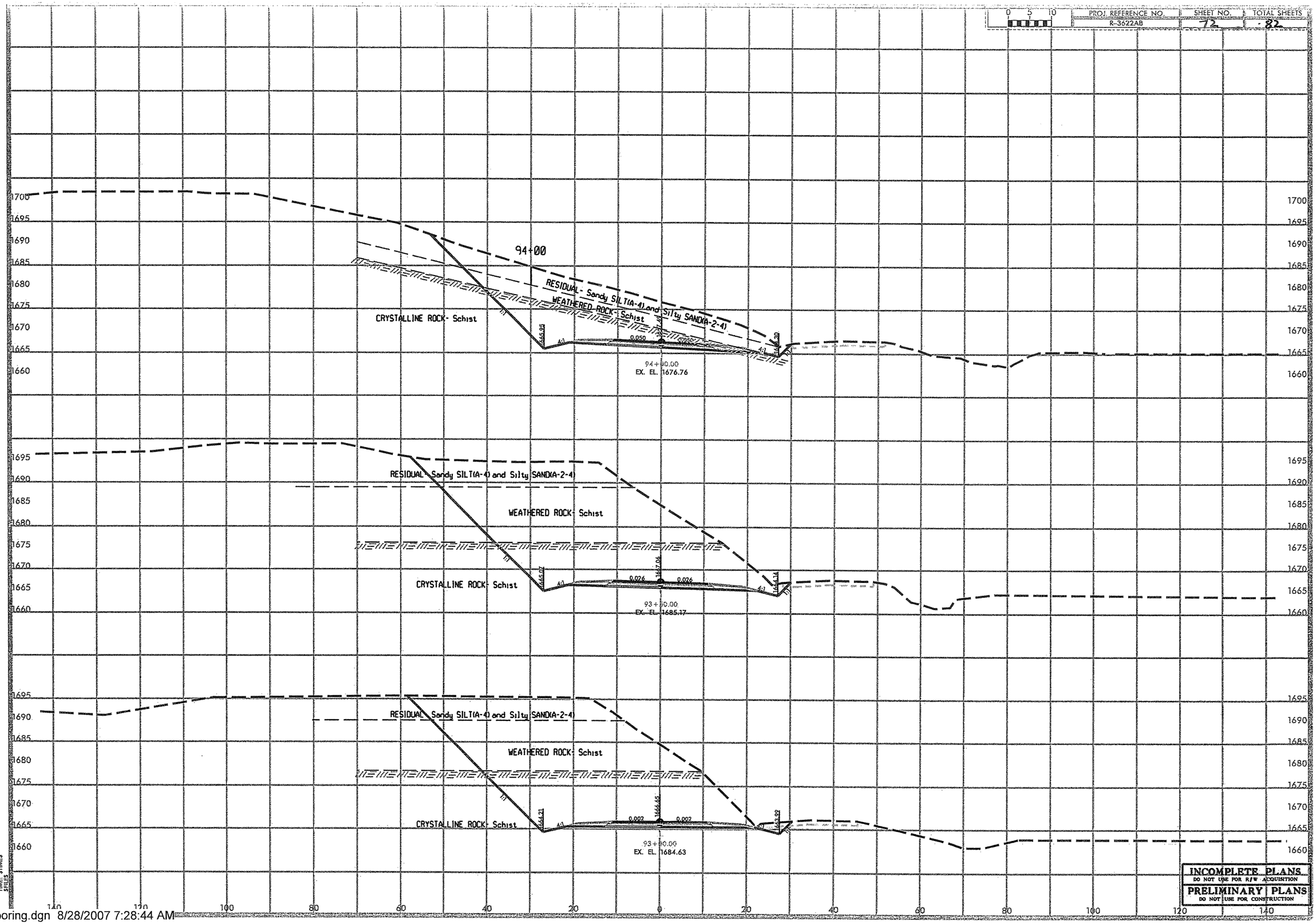


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-29	11ft LT	91+92	6.0-7.5	A-2-4 (0)	25	NP	35	46	12	7	75	69	18	19.0	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

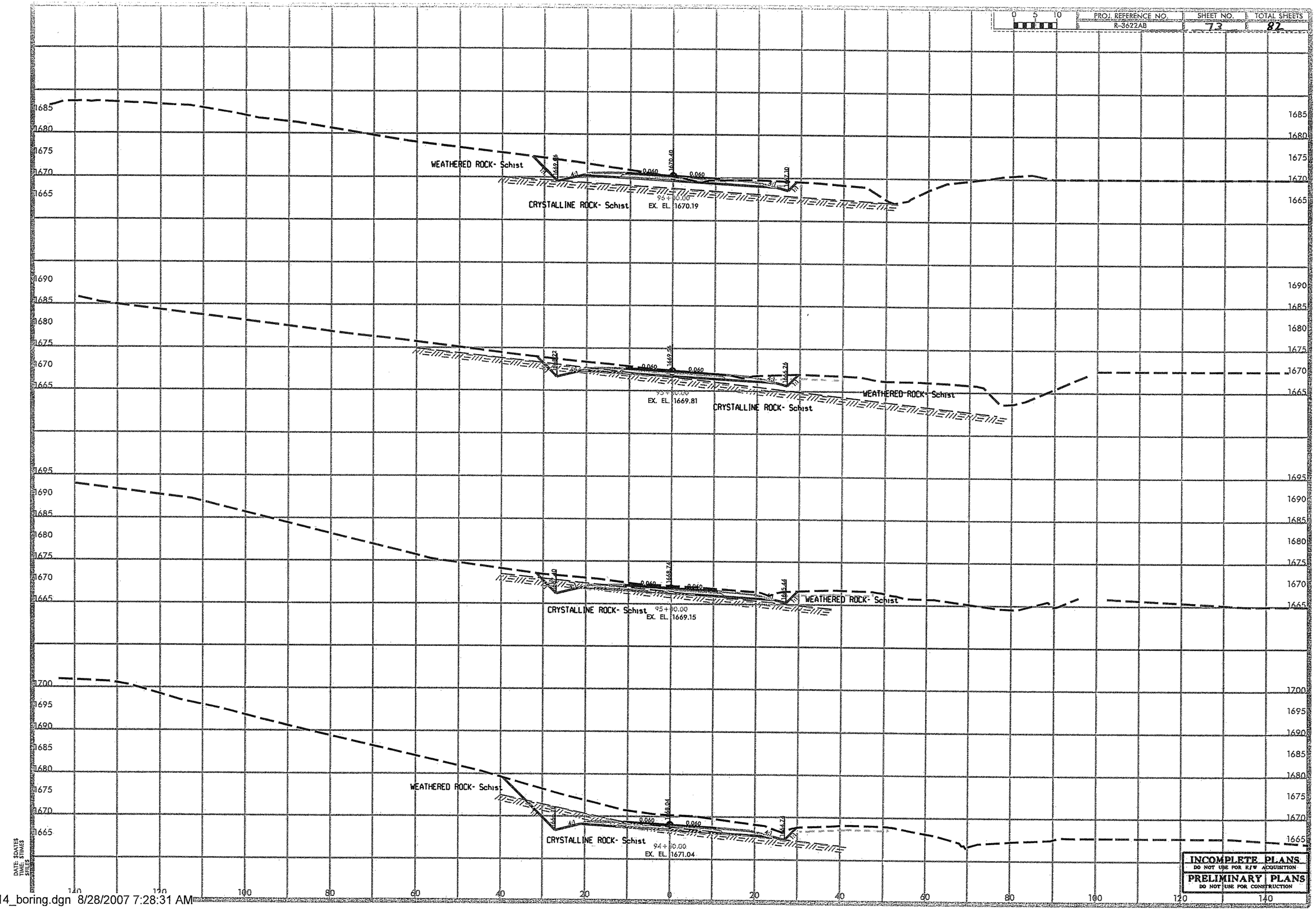
DATE: SDATES
TIME: STIMES
FILE: SFILES
PROJECT: SPROJNUMBER



DATE: $DATE$
TIME: $TIME$
$FILE$

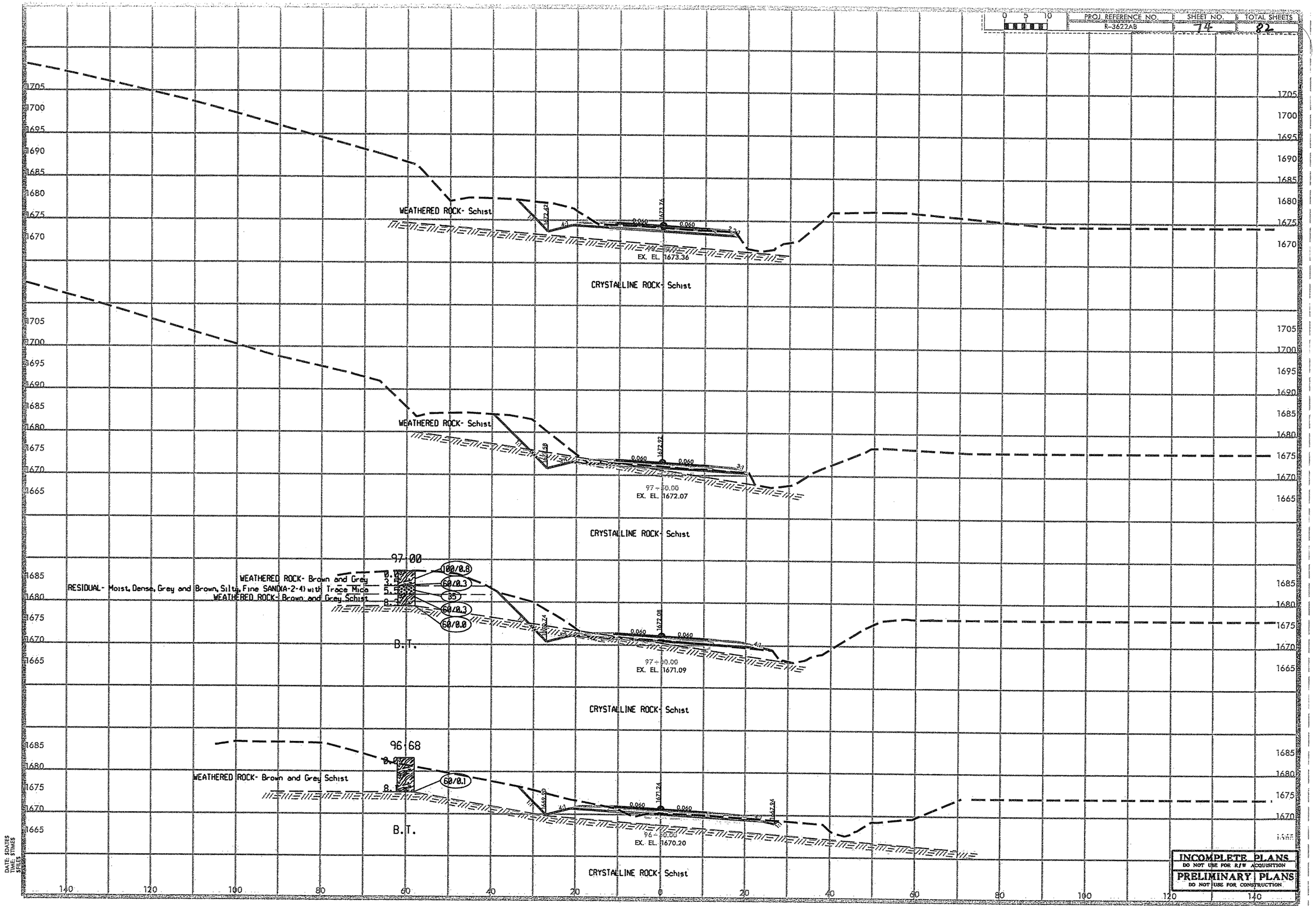
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

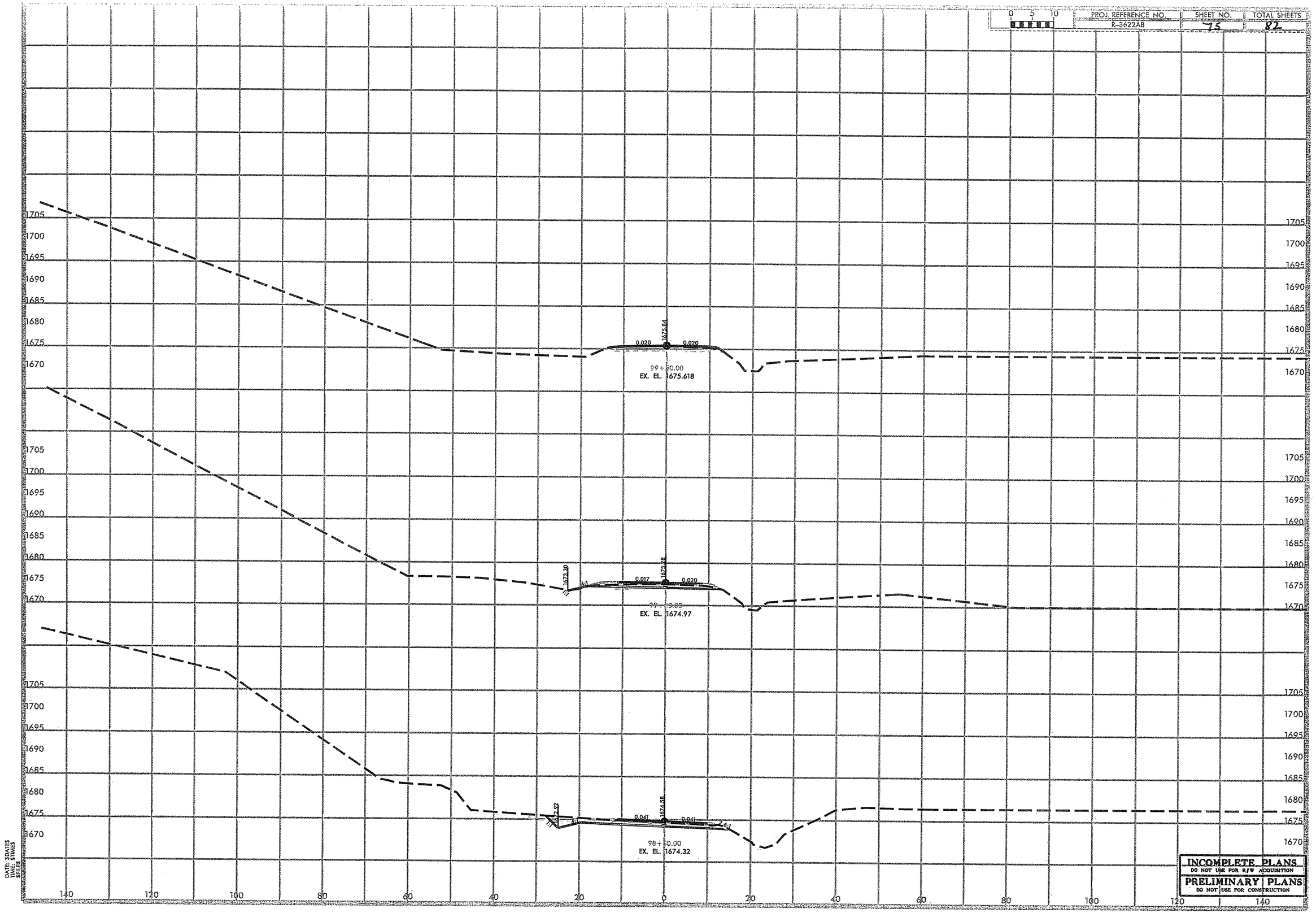


INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATE$
TIME: $TIME$
SHEET: $SHEET$


PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
74
TOTAL SHEETS
82
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
EX. EL. 1673.36
97+00.00
EX. EL. 1672.07
97+00
WEATHERED ROCK- Brown and Grey
RESIDUAL- Moist, Dense, Grey and Brown, Silty, Fine SAND(A-2-4) with Trace Mica
WEATHERED ROCK- Brown and Grey Schist
B.T.
EX. EL. 1671.09
96+68
WEATHERED ROCK- Brown and Grey Schist
EX. EL. 1670.20
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	75	82



NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 38068.1.1	**ID.** R-3622A	**COUNTY** Cherokee	**GEOLOGIST** T. Wells
SITE DESCRIPTION NC 294 Roadway Improvements			**GROUND WTR (ft)**
BORING NO. 30+63	**STATION** 30+63	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,557.0 ft	**TOTAL DEPTH** 24.3 ft	**NORTHING** 515,511	**EASTING** 451,789	**24 HR.** Dry
DRILL MACHINE Mobile B-57 ATV	**DRILL METHOD** Wash/NQ		**HAMMER TYPE** 140lb Manual
START DATE 04/10/07	**COMP. DATE** 04/10/07	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 15.3 ft
CORE SIZE NQ	**TOTAL RUN** 3.7 ft	**DRILLER** K. Hicks	

ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS (ELEV. (ft) / DEPTH (ft))
1542.7										Begin Coring @ 14.3 ft
1,542.7	14.3	2.7	4:30 6:45 5:45/0.7	(0.9) 33%	(0.0) 0%		(0.0) 0%	(0.0) 0%		1,542.7 WEATHERED ROCK: Metasandstone 14.3
1,540.0	17.0		N=100/1.0				(0.9) 90%			1,541.7 CRYSTALLINE ROCK: Grey with White, Slightly Weathered, Hard, Metasandstone with Very Close Fracture Spacing 15.3
1,538.5	18.5									1,540.7 WEATHERED ROCK: Metasandstone 16.3
1,537.5	19.5	1.0	9:25	(0.5) 50%	(0.0) 0%		(0.0) 0%	(0.0) 0%		1,538.3 CRYSTALLINE ROCK: Grey and Brown, Moderately Weathered, Moderately Hard Garnet-Mica Schist with Very Close Fracture Spacing 18.7
			N=46/0.3				(0.5) 71%			1,537.5 WEATHERED ROCK: Tan and Grey Garnet-Mica Schist 19.5
										1,532.7 24.3
										Boring Terminated at Elevation 1532.7 ft. in Weathered Rock: Garnet-Mica Schist

NCDOT CORE SINGLE 07105014NEWC.GPJ NC_DOT.GDT 8/30/07

SHEET 76

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 38068.1.1	**ID.** R-3622A	**COUNTY** Cherokee	**GEOLOGIST** T. Wells
SITE DESCRIPTION NC 294 Roadway Improvements			**GROUND WTR (ft)**
BORING NO. 51+60	**STATION** 51+60	**OFFSET** 40ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,558.0 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 516,257	**EASTING** 453,511	**24 HR.** Dry
DRILL MACHINE Mobile B-57 ATV	**DRILL METHOD** Wash/NQ		**HAMMER TYPE** 140lb Manual
START DATE 03/28/07	**COMP. DATE** 03/28/07	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 10.0 ft
CORE SIZE NQ	**TOTAL RUN** 16.0 ft	**DRILLER** K. Hicks	

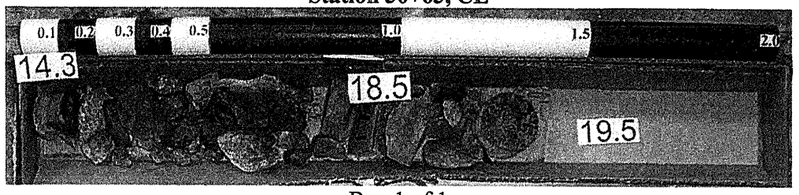
ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS (ELEV. (ft) / DEPTH (ft))
1549										Begin Coring @ 9.0 ft
1,549.0	9.0	3.7	1:15	(2.7) 73%	(2.0) 54%		(0.0) 0%	(0.0) 0%		1,549.0 WEATHERED ROCK: Metagraywacke Schist 9.0
1,545.3	12.7		7:05 6:15				(0.5) 100%			1,548.0 CRYSTALLINE ROCK: Grey, Moderately Weathered, Moderately Hard Metagraywacke Schist with Very Close Fracture Spacing 10.0
		5.0	3:15/0.7 4:25 5:00 5:05 5:10 5:45	(5.0) 100%	(4.7) 94%		(14.5) 100%	(13.1) 90%		1,547.5 CRYSTALLINE ROCK: Grey, Slightly to Very Slightly Weathered, Moderately Hard to Hard Metagraywacke Schist With Close to Moderately Close Fracture Spacing 10.5
1,540.3	17.7									Majority of Joints at 20° to 30° 2 Joints at 60° to 70°
		5.0	5:30 4:15 6:30 5:30 5:00	(5.0) 100%	(4.3) 86%					
1,535.3	22.7									
		2.3	4:55 4:50 1:55/0.3	(2.3) 100%	(2.1) 91%					
1,533.0	25.0									1,533.0 25.0
										Coring Terminated at Elevation 1533.0 ft. in Crystalline Rock: Metagraywacke Schist

NCDOT CORE SINGLE 07105014NEWC.GPJ NC_DOT.GDT 8/30/07

CORE PHOTOGRAPHS

NCDOT Project No. 38068.1.1 TIP No. R-3622A
NC 294 Roadway Improvements

Station 30+63, CL



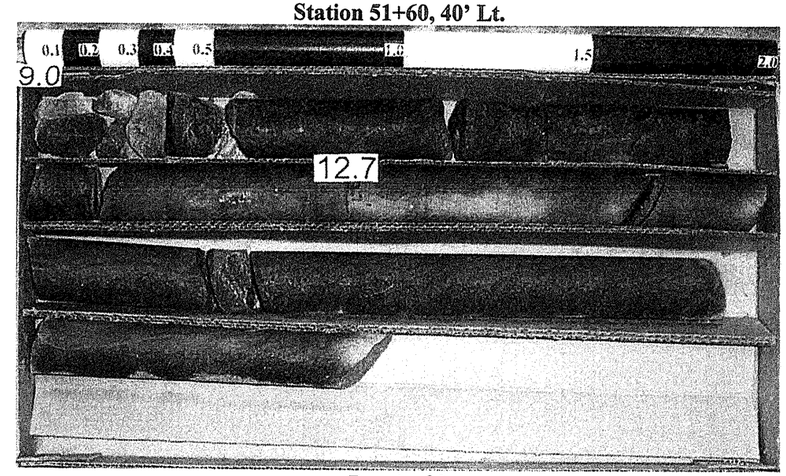
Box 1 of 1

(SCALE = 1:4)

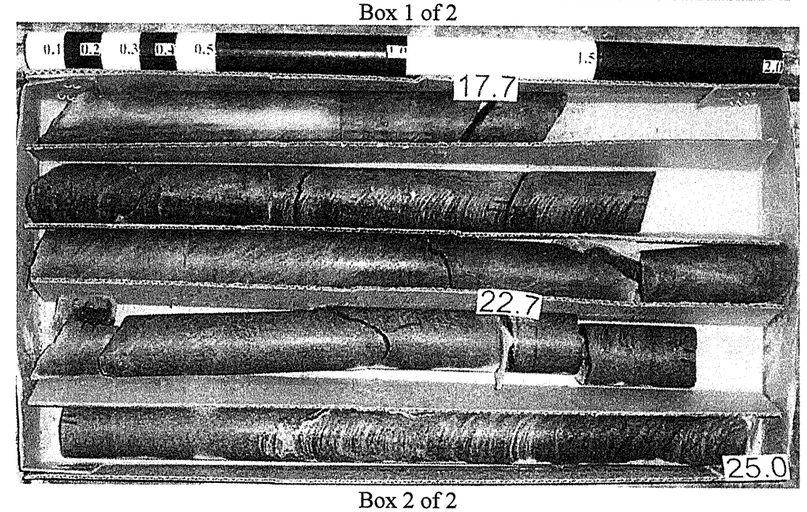
CORE PHOTOGRAPHS

NCDOT Project No. 38068.1.1 TIP No. R-3622A
NC 294 Roadway Improvements

Station 51+60, 40' Lt.



Box 1 of 2



Box 2 of 2

(SCALE = 1:4)

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: May 28, 2007

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Project No.: 38068.1.1 (R-3622A) Present at Site: W. Duggins

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: 16+62 Elevation: *1597.8' Surface Water Elev.: N/A
Station: 16+62 Offset: 32' LT.
Northing: 515925 Easting: 450465
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet) From	Depth (Feet) To	*Elev. (Feet) From	*Elev. (Feet) To	Soil Description	Depth	Blows per Foot
0.0		1597.8			0.0-1.0	9
					1.0-2.0	25
					2.0-3.0	55
					3.0-4.0	24
					4.0-5.0	54
					5.0-6.0	56
					6.0-7.0	38
					7.0-8.0	40
	8.3		1589.5		8.0-8.3	100/.3
				Sounding Rod Refusal at 8.3 feet (EL. 1589.5 ')		
				on Weathered Rock/Crystalline Rock: Schist		
				*Note: Ground surface elavation taken off of roadway		
				cross-sections. No ground surface surveying was		
				performed.		

SHEET 78

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Trigon Project No.: 071-05-014 Present at Site: E. Hedgecock, W. Duggins, K. Hicks
NCDOT Project No.: 38068.1.1 TIP No.: R-3622A
Date: May 29, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 37+90 Elevation: 1534.6' Surface Water Elev.: NA
Station: 37+90 Offset: 80' RT Ground Water @ T.O.B.: Dry
Northing: 515314 Easting: 452506
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		1534.6		Alluvial: Brown, Clayey SILT (A-4)					
					1.0	3	4	5	4
	2.0'		1532.6		2.0	50/0'			100+
				Hand Auger Refusal at 2.0' (Elevation					
				1532.6') on Weathered Rock/Crystalline					
				Rock: Schist					
				*Note: Seven attempts made to advance					
				hand auger boring. Hand auger refusal					
				encountered at or near 2.0' in all					
				attempts.					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Trigon Project No.: 071-05-014 Present at Site: E. Hedgecock, W. Duggins, K. Hicks
NCDOT Project No.: 38068.1.1 TIP No.: R-3622A
Date: May 29, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 39+72 Elevation: 1532.0' Surface Water Elev.: NA
Station: 39+72 Offset: 68' Rt. Ground Water @ T.O.B.: Dry
Northing: 515361 Easting: 452701
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
From	To	From	To						
0.0		1532.0		Aluvial: Brown, Silty CLAY (A-6)					
					1.0	6	50/.1		100+
	2.0		1530.0		2.0	50/0'			100+
				Hand Auger Refusal at 2.0' (Elevation					
				1530.0') on Weathered Rock/Crystalline					
				Rock: Schist					
				*Note: Two attempts made to advance					
				hand auger boring. Hand auger refusal					
				encountered at 2.0' in both attempts.					

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: May 28, 2007

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Project No.: 38068.1.1 (R-3622A) Present at Site: W. Duggins

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: 46+50 Elevation: *1554.8' Surface Water Elev.: N/A
Station: 46+50 Offset: 45' Lt.
Northing: 515887 Easting: 453134
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet)		*Elev. (Feet)		Soil Description	Depth	Blows per Foot
From	To	From	To			
0.0		1554.8			0.0-1.0	5
					1.0-2.0	9
					2.0-3.0	7
					3.0-4.0	9
					4.0-5.0	10
					5.0-6.0	16
					6.0-7.0	38
					7.0-8.0	36
					8.0-9.0	70
	9.3		1545.5		9.0-9.3	100/.3
				Sounding Rod Refusal at 9.3 feet (EL. 1545.5')		
				on Weathered Rock/Crystalline Rock: Schist		
				**Note: Ground surface elavation taken off of roadway*		
				cross-sections. No ground surface surveying was		
				performed.		

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Trigon Project No.: 071-05-014 Present at Site: E. Hedgecock, W. Duggins, K. Hicks
NCDOT Project No.: 38068.1.1 TIP No.: R-3622A
Date: May 29, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 57+50 Elevation: 1530.2 Surface Water Elev.: NA
Station: 57+50 Offset: CL Ground Water @ T.O.B.: 0.2'
Northing: 516298 Easting: 454100
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.5	1530.2	1529.7	Topsoil	1.0	1	1	1	1
0.5		1529.7		Alluvial: Grey & Tan, Sdy., Silty CLAY	2.0	W.O.H.	W.O.H.	W.O.H.	W.O.H.
				(A-7-5) with organics	3.0	W.O.H.	W.O.H.	W.O.H.	W.O.H.
	4.0		1526.2		4.0	W.O.H.	W.O.H.	W.O.H.	W.O.H.
				Hand Auger Boring Terminated at 4.0'					
				(Elevation 1526.2') Due to					
				Borehole Cave-In					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Trigon Project No.: 071-05-014 Present at Site: E. Hedgecock, W. Duggins, K. Hicks
NCDOT Project No.: 38068.1.1 TIP No.: R-3622A
Date: May 29, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 59+50 Elevation: 1532.2 Surface Water Elev.: NA
Station: 59+50 Offset: CL Ground Water @ T.O.B.: Dry
Northing: 516232 Easting: 454289
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.5	1532.2	1531.7	Topsoil	1.0	8	8	11	9
0.5				Alluvial: Tan and Brown to Grey, Silty	2.0	3	2	4	3
				CLAY (A-7-5)	3.0	5	2	4	3
					4.0	6	5	4	5
	5.0		1527.2		5.0	50/.1			100+
				Hand Auger Boring Terminated at 5.0'					
				(Elevation 1527.2') on Weathered					
				Rock/Crystalline Rock: Metasandstone					
				*Note: Two attempts made to advance					
				hand auger boring. Hand auger refusal					
				encountered at 3.5' in both attempts.					

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: May 28, 2007

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Project No.: 38068.1.1 (R-3622A) Present at Site: W. Duggins

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: 71+50 Elevation: *1657.8' Surface Water Elev.: N/A
Station: 71+50 Offset: 28' Lt.
Northing: 515289 Easting: 454966
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet)		*Elev. (Feet)		Soil Description	Depth	Blows per Foot
From	To	From	To			
0.0		1657.8			0.0-1.0	12
					1.0-2.0	10
	2.3		1655.5		2.0-2.3	100/.3
				Sounding Rod Refusal at 2.3 feet (EL. 1655.5')		
				on Weathered Rock/Crystalline Rock: Schist		
				Note: Ground surface elavation taken off of roadway cross-sections. No ground surface surveying was performed.		

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: May 28, 2007

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Project No.: 38068.1.1 (R-3622A) Present at Site: W. Duggins

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: 83+00 Elevation: *1672.8' Surface Water Elev.: N/A
Station: 83+00 Offset: 27' Lt.
Northing: 514845 Easting: 455980
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet)		*Elev. (Feet)		Soil Description	Depth	Blows per Foot
From	To	From	To			
0.0		1672.8			0.0-1.0	5
					1.0-2.0	11
					2.0-3.0	30
					3.0-3.3	100/.3
	3.3		1669.5	Sounding Rod Refusal at 3.3 feet (EL. 1669.5')		
				on Weathered Rock/Crystalline Rock: Schist		
				Note: Ground surface elavation taken off of roadway cross-sections. No ground surface surveying was performed.		

SHEET 82

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: May 28, 2007

Job Name: NC 294 Roadway Improvements Location: Cherokee County, North Carolina
Project No.: 38068.1.1 (R-3622A) Present at Site: W. Duggins

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: 94+00 Elevation: *1685.0' Surface Water Elev.: N/A
Station: 94+00 Offset: 30' Lt.
Northing: 514665 Easting: 457054
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet)		*Elev. (Feet)		Soil Description	Depth	Blows per Foot
From	To	From	To			
0.0		1685.0			0.0-1.0	16
					1.0-2.0	24
					2.0-3.0	33
					3.0-4.0	48
					4.0-4.3	100/.3
	4.3		1680.7	Sounding Rod Refusal at 4.3 feet (EL. 1680.7')		
				on Weathered Rock/Crystalline Rock: Schist		
				**Note: Ground surface elavation taken off of roadway*		
				cross-sections. No ground surface surveying was		
				performed.		