CONTRACT: _ ID: R-3622A

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
-	-	-	-	-
-	-	-	-	-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 14

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.)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3622A	1	82

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.

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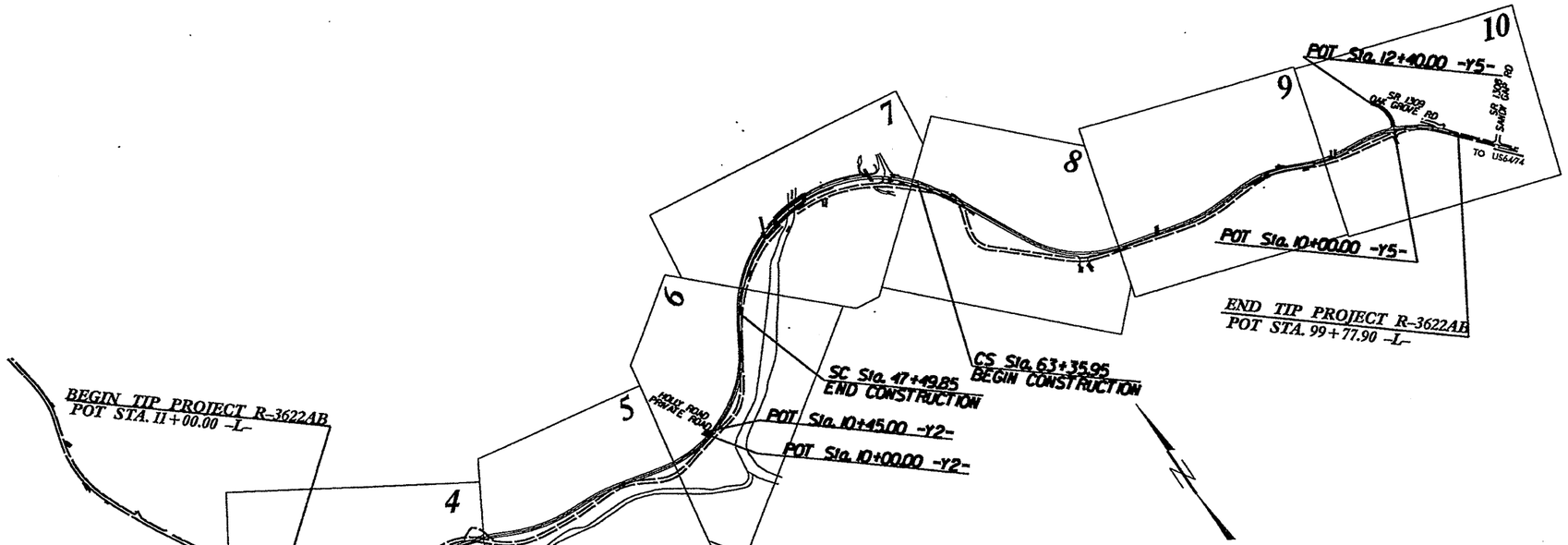
RECOMMENDATIONS



PERSONNEL

W. Duggins
K. Hicks
D. Kitchen
A. Hayes
W. Whichard
R. Boykin
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INVESTIGATED BY T. Wells
CHECKED BY J. Vinson
SUBMITTED BY P. Weaver
DATE 8/10/07

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

10/28/10

Paul M Weaver

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.

PROJECT REFERENCE NO.	SHEET NO.
R-3622A	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 14

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS	
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6		
SYMBOL													
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PLASTIC RANGE (PI)		
PL — PLASTIC LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE		
SL — SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- HAND AUGER/ DCP OR SOUNDING ROD
- SPT, CPT, SPT, CPT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS
S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RS - ROCK SAMPLE
RT - RECOMPACTED TRIAXIAL SAMPLE
CBR - CALIFORNIA BEARING RATIO SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] MOBILE B- 57
- [ ] BK-51
- [X] CME-45
- [ ] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [X] TRICONE 0.33 "-STEEL TEETH
- [ ] TRICONE _____ "TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [ ] AUTOMATIC [X] MANUAL

CORE SIZE:
- [ ] -B-
- [X] -N- 0
- [ ] -H-

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [X] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [X] DCP

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: _____

ELEVATION: _____ FT.

NOTES:
_____

REVISED 02/23/06

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.

ID: R-3622A

CONTRACT:

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

VICINITY MAP

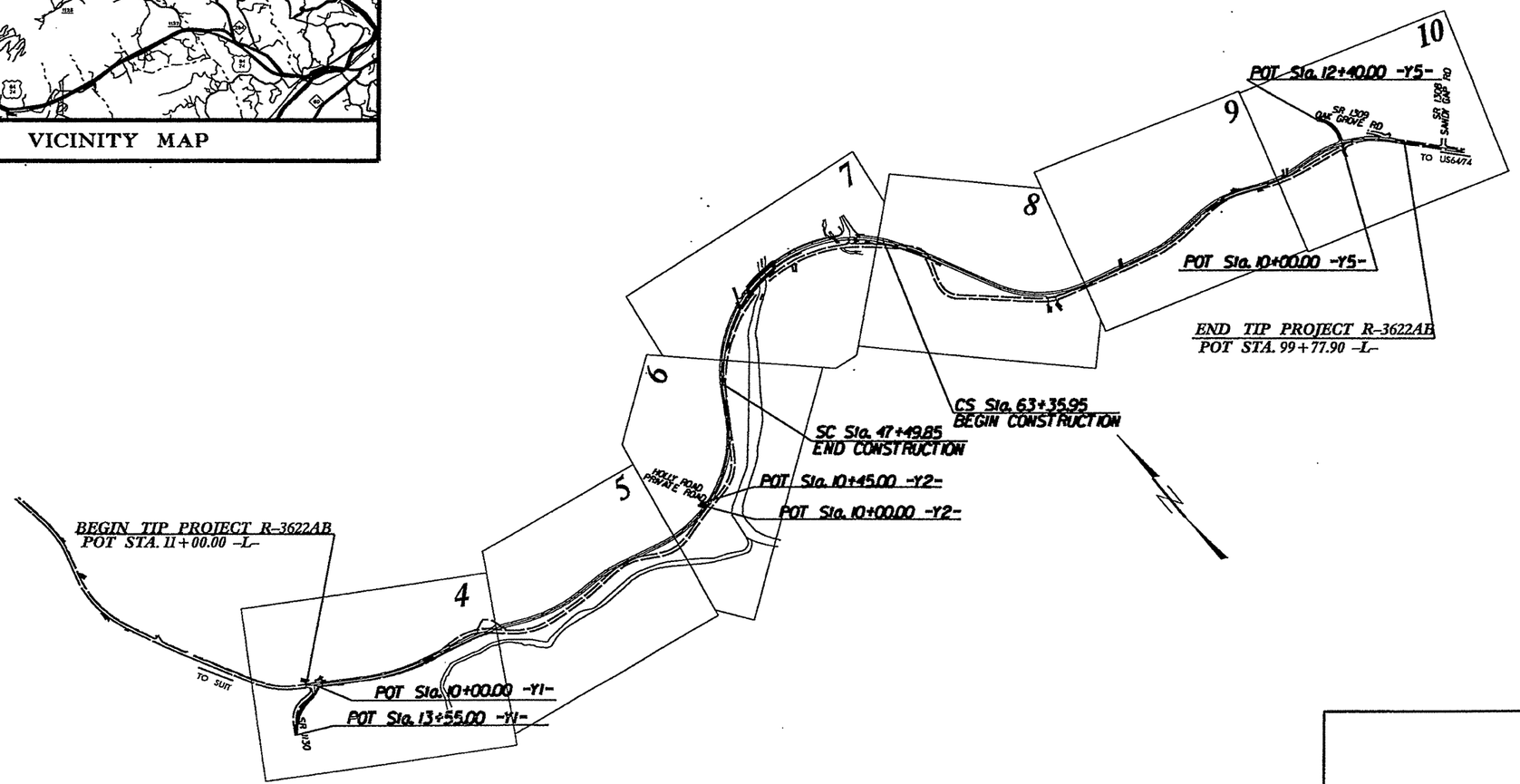
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 14

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

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.

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
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EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # R-3622AB COUNTY Cherokee DATE 10/19/2010 SHEET 1 OF 1 SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL EMB.	ROCK EMB.	UNDERCUT EMB.	EARTH EMB.	EMBANK. 20%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
-L-	11+00	41+00	70,045	43,950			26,095	5,616	5,616		0	5,616		38,334	26,095		64,429
-Y1-	10+00	13+55	337				337	186			186	223	0	0	114		114
-Y2-	10+00	10+45	121				121	0			0	0		0	121		121
	SUBTOTAL		70,503	43,950		0	26,553	5,802	5,616		186	5,839	0	38,334	26,330	0	64,664
-L-	41+00	47+49.85	14,005	9,603			4,402	980	980		0	980		8,623	4,402		13,025
	SUBTOTAL		14,005	9,603		0	4,402	980	980		0	980		8,623	4,402	0	13,025
-L-	63+35.95	93+00.00	133,698	99,185		1,539	32,974	1,920	1,920		0	1,920		97,265	32,974	1,539	131,778
	SUBTOTAL		133,698	99,185		1,539	32,974	1,920	1,920		0	1,920		97,265	32,974	1,539	131,778
-L-	93+00	110+00	4,340	519			3,821	1,087	519		568	1,201	0	0	3,139		3,139
-Y5-	10+00	12+60	349				349	27			27	32	0	0	317		317
-Y6-	10+00	10+50	204				204	0			0	0		0	204		204
	SUBTOTAL		4,893	519		0	4,374	1,114	519		595	1,233	0	0	3,660	0	3,660
PROJECT SUBTOTAL			223,099	153,257		1,539	68,303	9,816	9,035		781	9,972	0	144,222	67,366	1,539	213,127
LOSS DUE TO CLEARING & GRUBBING			-5,600				-5,600						0		-5,600		-5,600
PROJECT TOTAL			217,499	153,257	0	1,539	62,703	9,816	9,035	0	781	9,972	0	144,222	61,766	1,539	207,527
ADJUSTMENT FOR UNCOMPACTED ROCK WASTE													0	28,844			28,844
GRAND TOTAL			217,499	153,257	0	1,539	62,703	9,816	9,035	0	781	9,972	0	173,066	61,766	1,539	236,371
SAY			217,500										**0**				
DDE			440														
CONTENGENCY UNDERCUT			3,400										0				
PAVEMENT STRUCTURE VOLUME			8,265										0				
SHOULDER BORROW			9,176														

*** EARTHWORK QUANTITIES ARE CALCULATED BY DIVISION 14. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.**

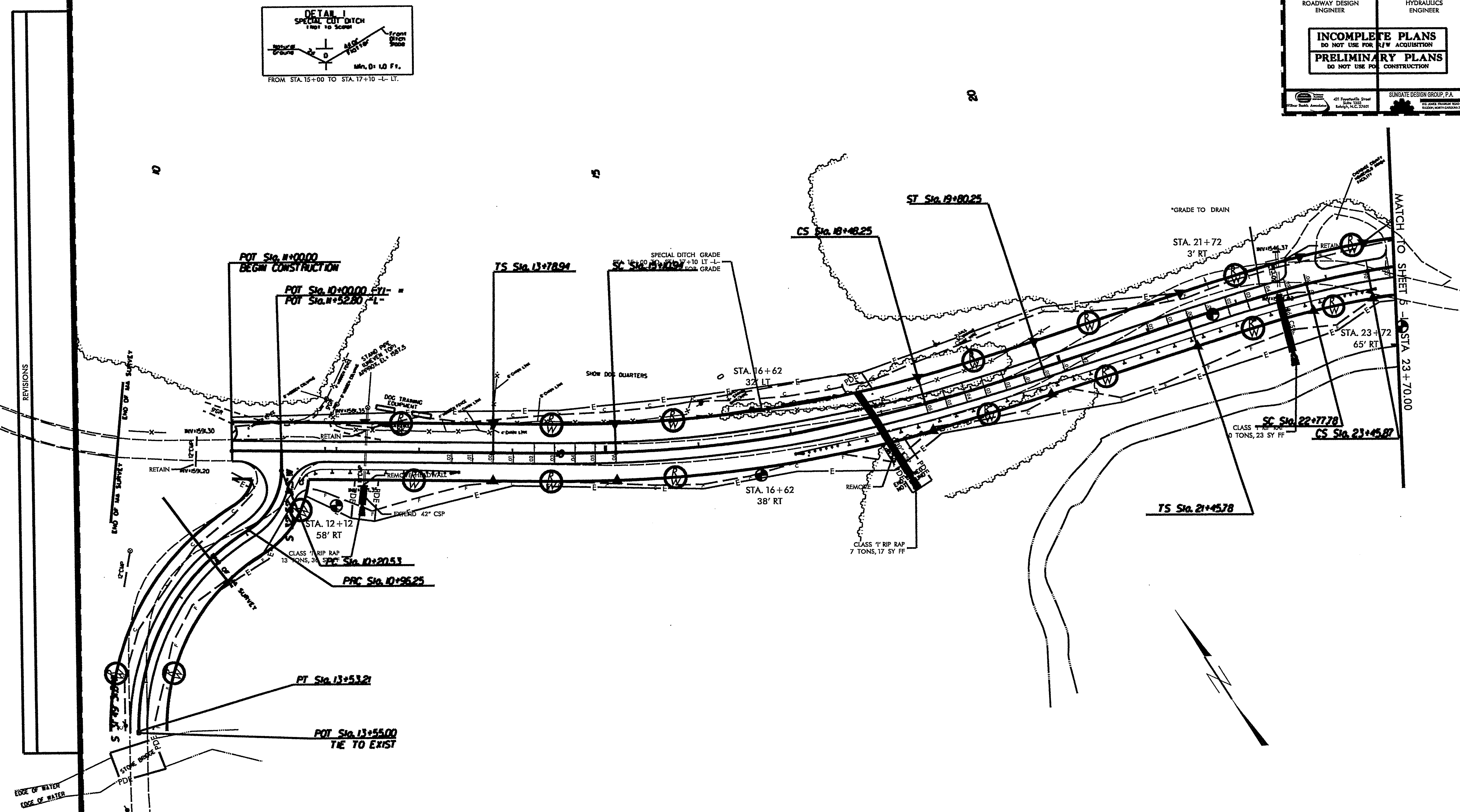
PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Wilbur Smith Associates — 421 Fayetteville Street, Suite 1303, Raleigh, N.C. 27601

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



-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-

PIs Sta 7+98.35	PI Sta 9+00.36	PIs Sta 10+01.99	PIs Sta 14+66.95	PI Sta 16+80.38	PIs Sta 18+92.26	PIs Sta 22+33.80	PI Sta 23+11.84	PIs Sta 23+89.89
θs = 7° 46' 22.5"	Δ = 13° 37' 11.1" (LT)	θs = 7° 46' 22.5"	θs = 2° 38' 24.0"	Δ = 13° 29' 32.7" (LT)	θs = 2° 38' 24.0"	θs = 3° 57' 36.0"	Δ = 4° 05' 07.4" (RT)	θs = 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

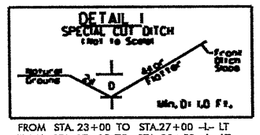
PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

421 Fayetteville Street Suite 1320 Raleigh, N.C. 27601

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

DETAIL I
SPECIAL CUT DITCH
(not to Scale)



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

REVISIONS

MATCH TO SHEET 4 -L- STA. 23+70.00

STA. 23+72
65' RT

FILL W/FLOWABLE MATERIAL OR REMOVE

SRS Sta. 24+77.87

CLASS 'I' RIP RAP
4 TONS, 12 SY FF

REMOVE HEADWALL

SPECIAL DITCH
STA 23+00 TO STA 27+00 -L- LT
SEE PROFILE FOR GRADE

SC Sta. 26+09.87

STA. 26+22
7' LT

STA. 26+27
4' LT

CS Sta. 28+78.05

REMOVE

REMOVE

SRS Sta. 30+10.05

SPECIAL DITCH
STA 27+85 TO STA 29+50 -L- LT
SEE PROFILE FOR GRADE

STA. 30+63
0' CL

REMOVE

CLASS 'B' RIP RAP
2 TONS, 7 SY FF

SC Sta. 31+42.05

STA. 32+53
55' RT

CS Sta. 32+42.14

TS Sta. 34+92.14

STA. 34+55
7' RT

ST Sta. 35+42.14

SC Sta. 36+24.14

MATCH TO SHEET 6 -L- STA. 36+50.00

-L-

Pts Sta 25+65.89	Pt Sta 27+44.85	Pts Sta 29+22.07	Pts Sta 30+98.07	Pt 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: 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

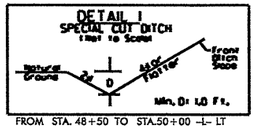
431 Fayetteville Street Suite 1210 Raleigh, N.C. 27601

SUNGATE DESIGN GROUP, P.A.
811 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27615

REVISIONS

FILE: STILES
DATE: STATES

DETAIL I
SPECIAL CUT DITCH
(Not To Scale)



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

MATCH TO SHEET 5 -L- STA. 36+50.00

POT Sta. 10+00.00 -Y2- =
POC Sta. 39+35.91 -L-

ELIMINATE CUT DITCH
STA. 37+00 TO STA 39+80 -L- LT
SEE X-SECTIONS

POT Sta. 10+45.00
TIE TO EXISTING

HEADWALL

REMOVE

STA. 37+90
80' RT

STA. 39+72
68' RT

CLASS 'I' RIP RAP

EDGE OF WATER

SRS Sta. 46+17.85

CS Sta. 44+85.85

SC Sta. 47+49.85
END CONSTRUCTION
TIE TO EXISTING

SPECIAL DITCH
STA 48+50 TO STA 50+00 -L- LT
SEE PROFILE FOR GRADE

MATCH TO SHEET 7

STA. 46+50
45' LT

STA. 44+65
39' LT

STA. 44+58
35' RT

STA. 49+00.00

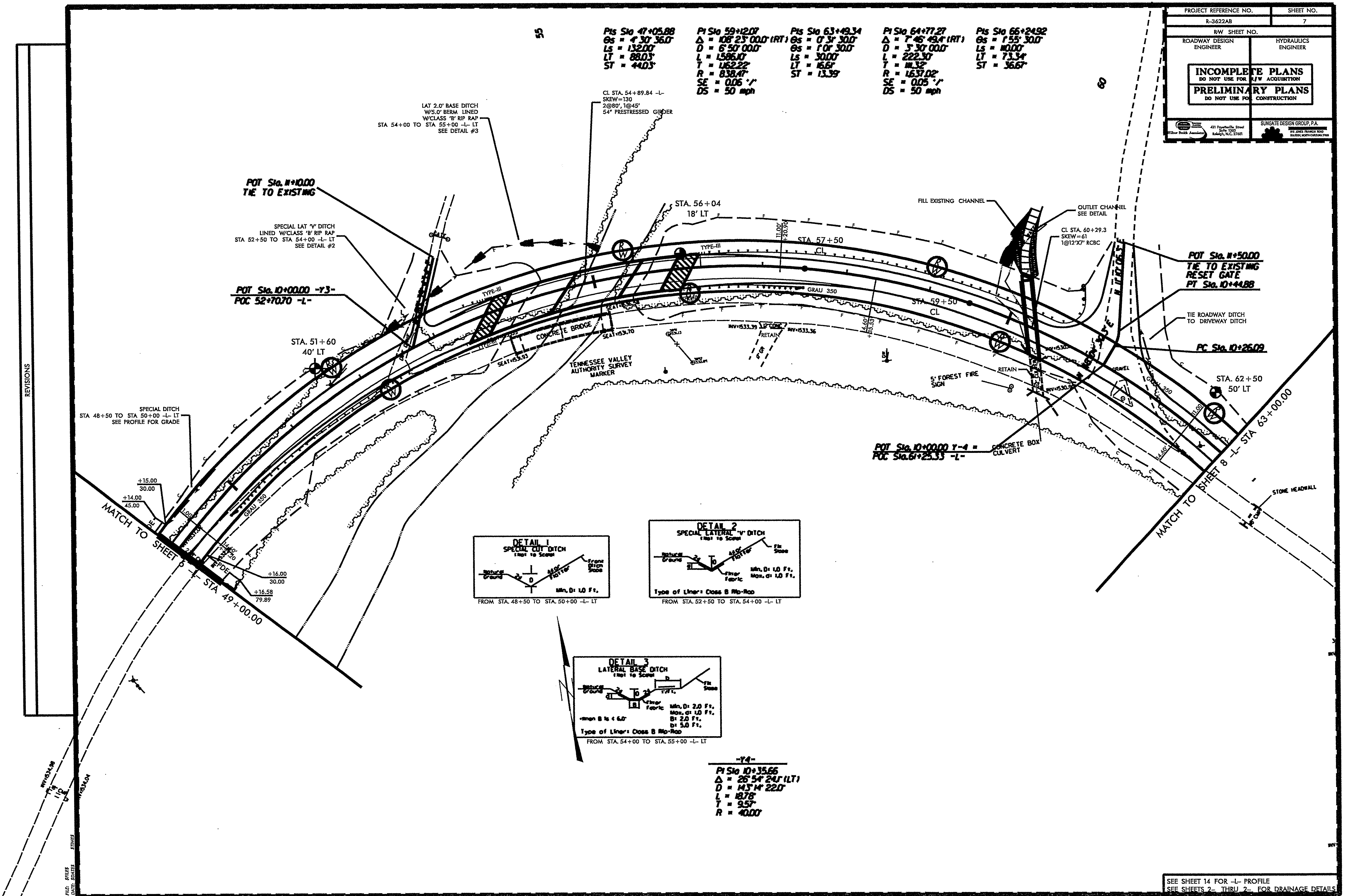
CLASS 'B' RIP RAP
3 TONS, 11 SY FF

CLASS B RIP-RAP
3 TONS, 11 SY FF

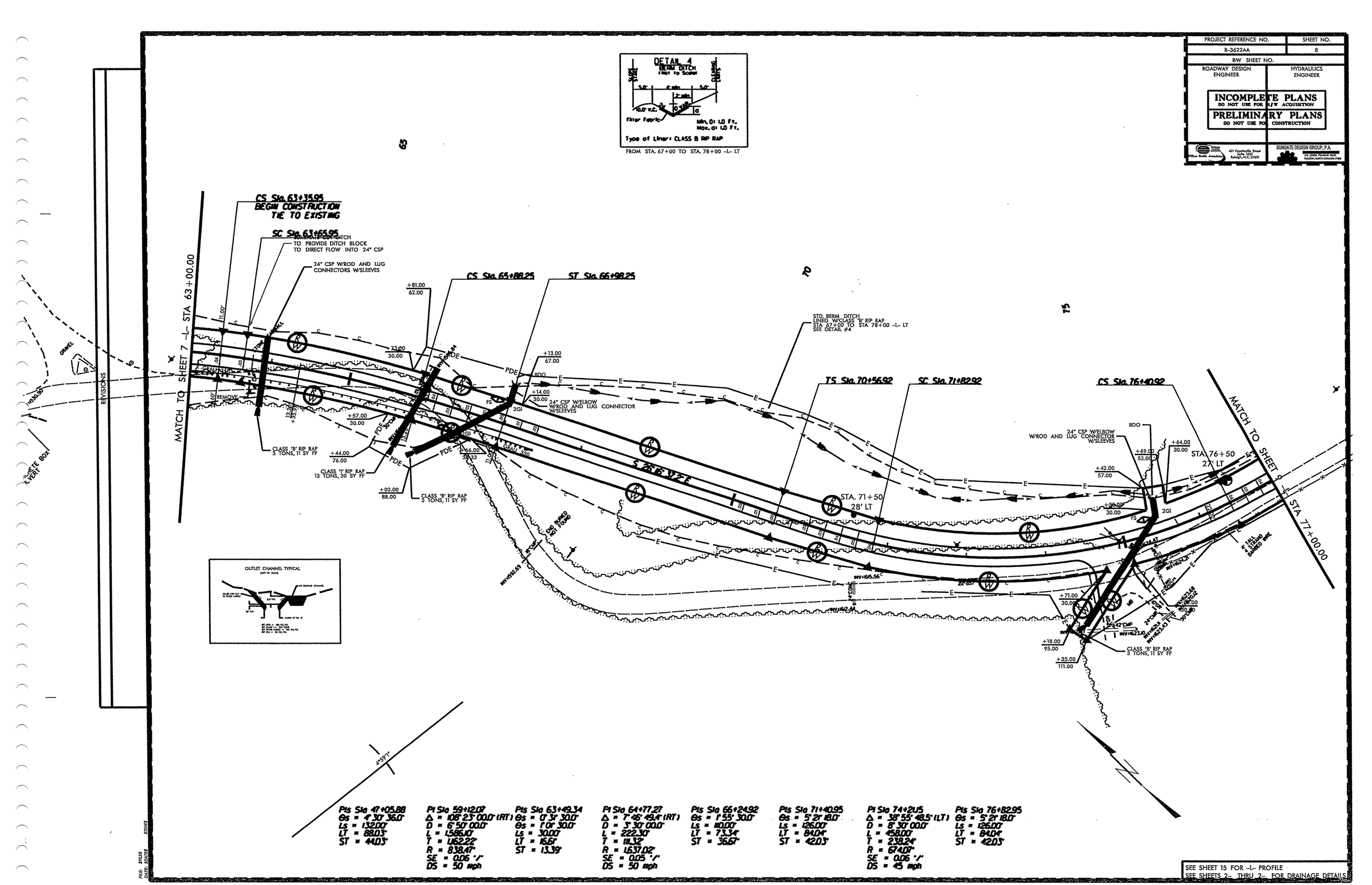
-L-

Pis Sta 35+80.17	Pi Sta 41+07.35	Pis 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



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
Wilbur Smith Associates
421 Fayetteville Street Suite 1303 Raleigh, N.C. 27601
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606
Pts Sta 47+05.88
Θs = 4° 30' 36.0"
Ls = 132.00'
LT = 88.03'
ST = 44.03'
PI Sta 59+12.07
Δ = 108° 23' 00.0" (RT)
D = 6° 50' 00.0"
L = 1,586.10'
T = 1,162.22'
R = 838.47'
SE = 0.06 '/'
DS = 50 mph
Pts Sta 63+49.34
Θs = 0° 31' 30.0"
Θs = 1° 01' 30.0"
Ls = 30.00'
LT = 16.61'
ST = 13.39'
PI Sta 64+77.27
Δ = 7° 46' 49.4" (RT)
D = 3° 30' 00.0"
L = 222.30'
T = 111.32'
R = 1,637.02'
SE = 0.05 '/'
DS = 50 mph
Pts Sta 66+24.92
Θs = 1° 55' 30.0"
Ls = 110.00'
LT = 73.34'
ST = 36.67'
CL STA. 54+89.84 -L-
SKEW=130
2@80', 1@45'
54" PRESTRESSED GIRDER
LAT 2.0' BASE DITCH W/5.0' BERM LINED W/CLASS 'B' RIP RAP
STA 54+00 TO STA 55+00 -L- LT
SEE DETAIL #3
POT Sta. 11+10.00
TIE TO EXISTING
SPECIAL LAT 'V' DITCH LINED W/CLASS 'B' RIP RAP
STA 52+50 TO STA 54+00 -L- LT
SEE DETAIL #2
POT Sta. 10+00.00 -Y3-
POC 52+70.70 -L-
STA. 51+60
40' LT
STA. 56+04
18' LT
STA. 57+50
CL
STA. 59+50
CL
TYPE-III
GRAU 350
CONCRETE BRIDGE
TENNESSEE VALLEY AUTHORITY SURVEY MARKER
RETAIN
FILL EXISTING CHANNEL
OUTLET CHANNEL SEE DETAIL
CL STA. 60+29.3
SKEW=61
1@12'X7' RCBC
POT Sta. 11+50.00
TIE TO EXISTING
RESET GATE
PT Sta. 10+44.88
TIE ROADWAY DITCH TO DRIVEWAY DITCH
PC Sta. 10+26.09
STA. 62+50
50' LT
5' FOREST FIRE SIGN
GRAVEL
POT Sta. 10+00.00 Y-4 =
POC Sta. 61+25.33 -L-
CONCRETE BOX CULVERT
STONE HEADWALL
MATCH TO SHEET 8 -L- STA 63+00.00
SPECIAL DITCH
STA 48+50 TO STA 50+00 -L- LT
SEE PROFILE FOR GRADE
MATCH TO SHEET 6 -L- STA 49+00.00
DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground
Min. D: 1.0 Ft.
FROM STA. 48+50 TO STA. 50+00 -L- LT
DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D: 1.0 Ft.
Max. d: 1.0 Ft.
Type of Liner: Class B Rip-Rap
FROM STA. 52+50 TO STA. 54+00 -L- LT
DETAIL 3
LATERAL BASE DITCH
(Not to Scale)
Natural Ground
Filter Fabric
Min. D: 2.0 Ft.
Max. d: 1.0 Ft.
B: 2.0 Ft.
b: 5.0 Ft.
Type of Liner: Class B Rip-Rap
FROM STA. 54+00 TO STA. 55+00 -L- LT
-Y4-
PI Sta 10+35.66
Δ = 26° 54' 24.1" (LT)
D = 143° 14' 22.0"
L = 18.78'
T = 9.57'
R = 40.00'
REVISIONS
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

Wilbur Smith Associates
421 Fayetteville Street
Suite 1303
Raleigh, N.C. 27601

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

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

Pls Sta 47+05.88
θs = 4°30' 36.0"
Ls = 132.00'
LT = 88.03'
ST = 44.03'

PI Sta 59+12.07
Δ = 108°25' 00.0" (RT)
D = 6°50' 00.0"
L = 1,586.10'
T = 1,162.22'
R = 838.47'
SE = 0.06 '/'
DS = 50 mph

Pls Sta 63+49.34
θs = 0°31' 30.0"
θs = 1°01' 30.0"
Ls = 30.00'
LT = 16.61'
ST = 13.39'

PI Sta 64+77.27
Δ = 7°46' 49.4" (RT)
D = 3°30' 00.0"
L = 222.30'
T = 111.32'
R = 1,637.02'
SE = 0.05 '/'
DS = 50 mph

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

Pls Sta 71+40.95
θs = 5°21' 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

PI Sta 74+21.15
Δ = 38°55' 48.5" (LT)
D = 8°30' 00.0"
L = 458.00'
T = 238.24'
R = 674.07'
SE = 0.06 '/'
DS = 45 mph

Pls Sta 76+82.95
θs = 5°21' 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

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

FILE: $FILES
DATE: $DATES
$TIMES

PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	9

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

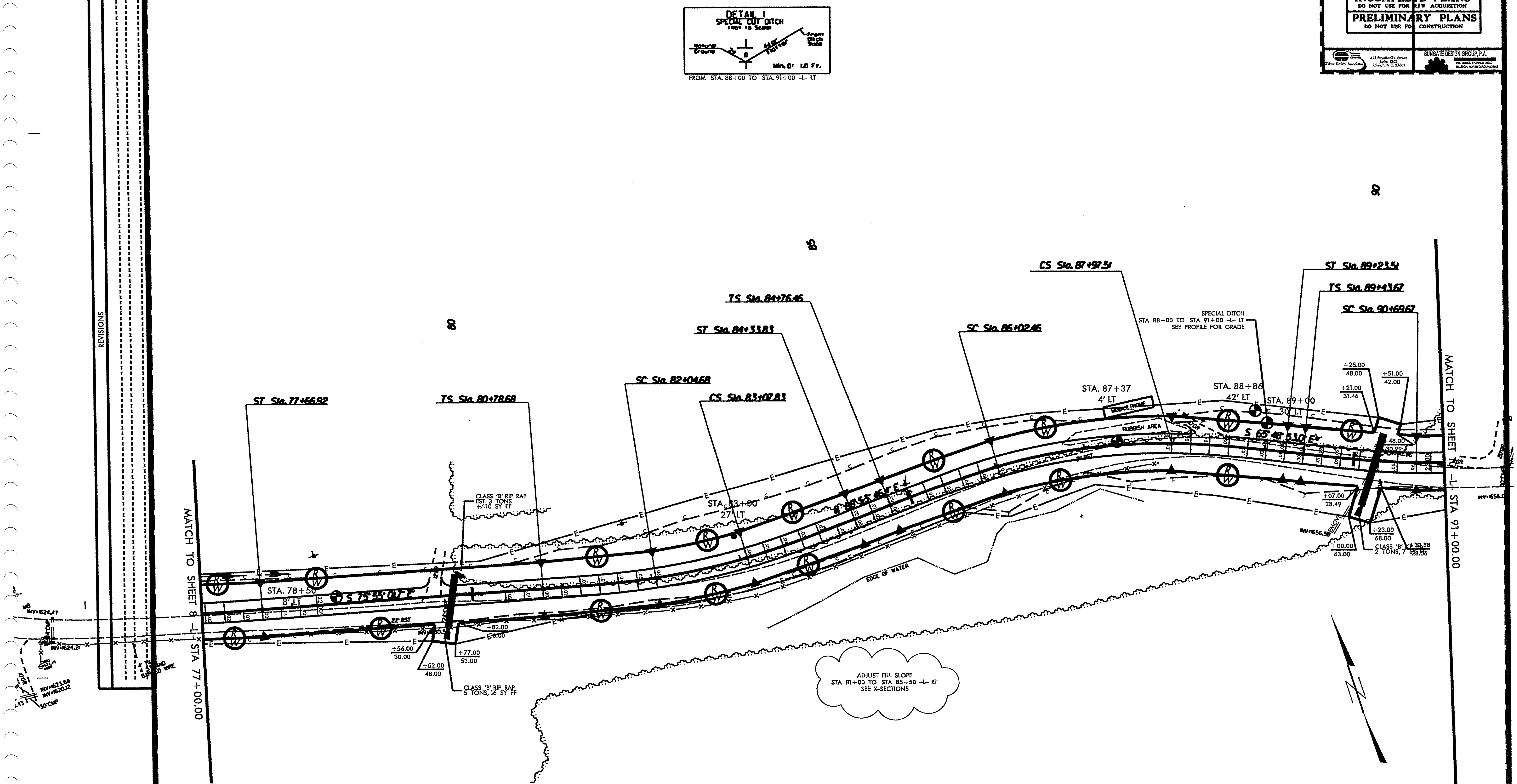
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Wilbur Smith Associates, 421 Fayetteville Street, Suite 1303, Raleigh, N.C. 27601

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

REVISIONS



Pts Sta 71+40.95
Θs = 5°21'18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

PI Sta 74+21.15
Δ = 38°55'48.5" (LT)
D = 8°30'00.0"
L = 458.00'
T = 238.24'
R = 674.07'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 76+82.95
Θs = 5°21'18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 81+62.71
Θs = 4°43'30.0"
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 = 51.66'
R = 763.94'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 83+49.86
Θs = 4°43'30.0"
Ls = 126.00'
LT = 84.03'
ST = 42.03'

Pts Sta 85+60.50
Θs = 5°21'18.0"
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 = 674.07'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 88+39.54
Θs = 5°21'18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 90+27.70
Θs = 5°21'18.0"
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+11.93
Θs = 5°21'18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

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

PROJECT REFERENCE NO.	SHEET NO.
R-3622AB	10

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

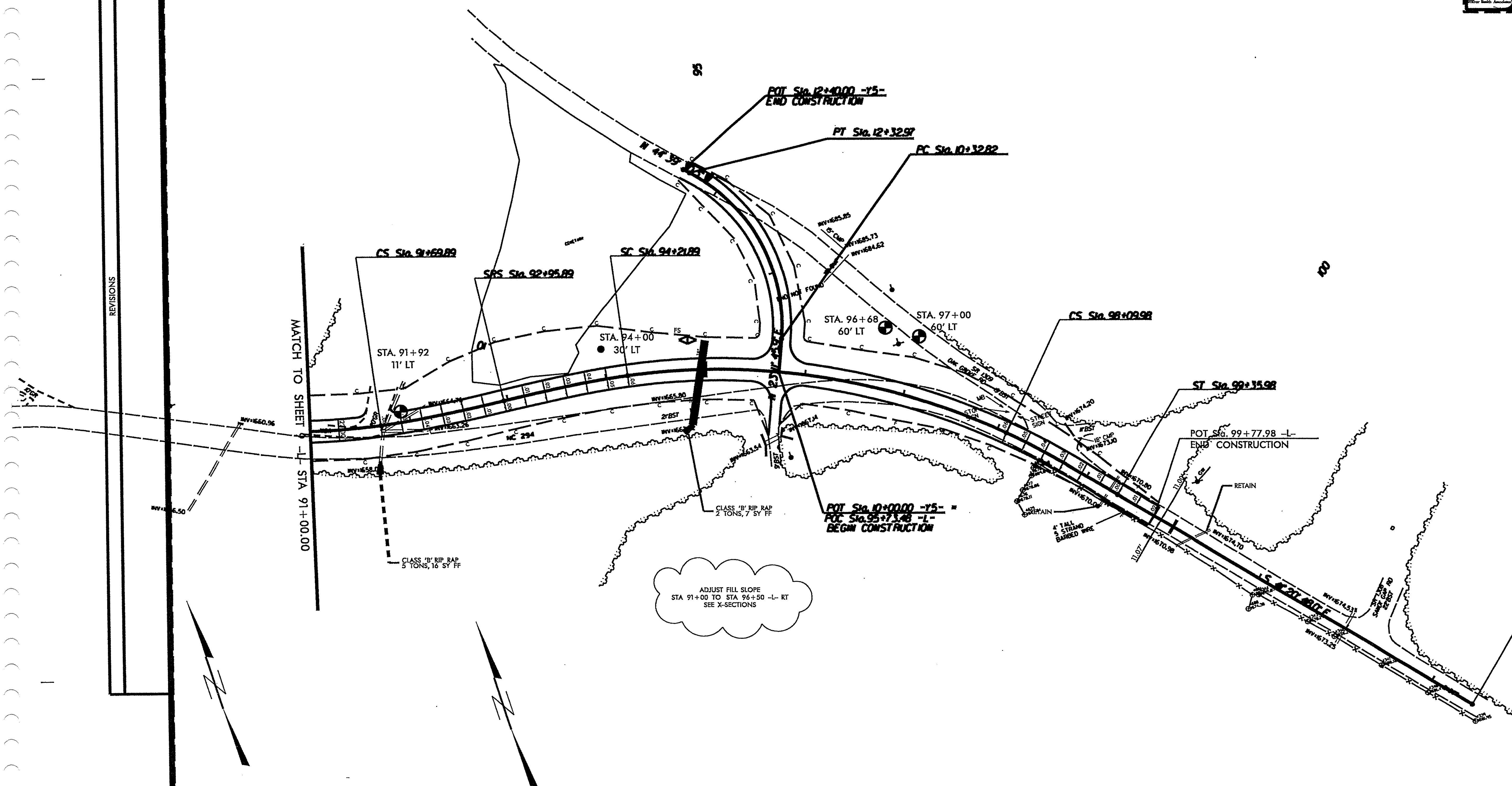
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Wilbur Smith Associates
421 Fayetteville Street
Suite 1303
Raleigh, N.C. 27601

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

REVISIONS



Pts Sta 90+27.70
Θs = 5° 21' 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+11.93
Θs = 5° 21' 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Pts Sta 93+79.93
Θs = 5° 21' 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

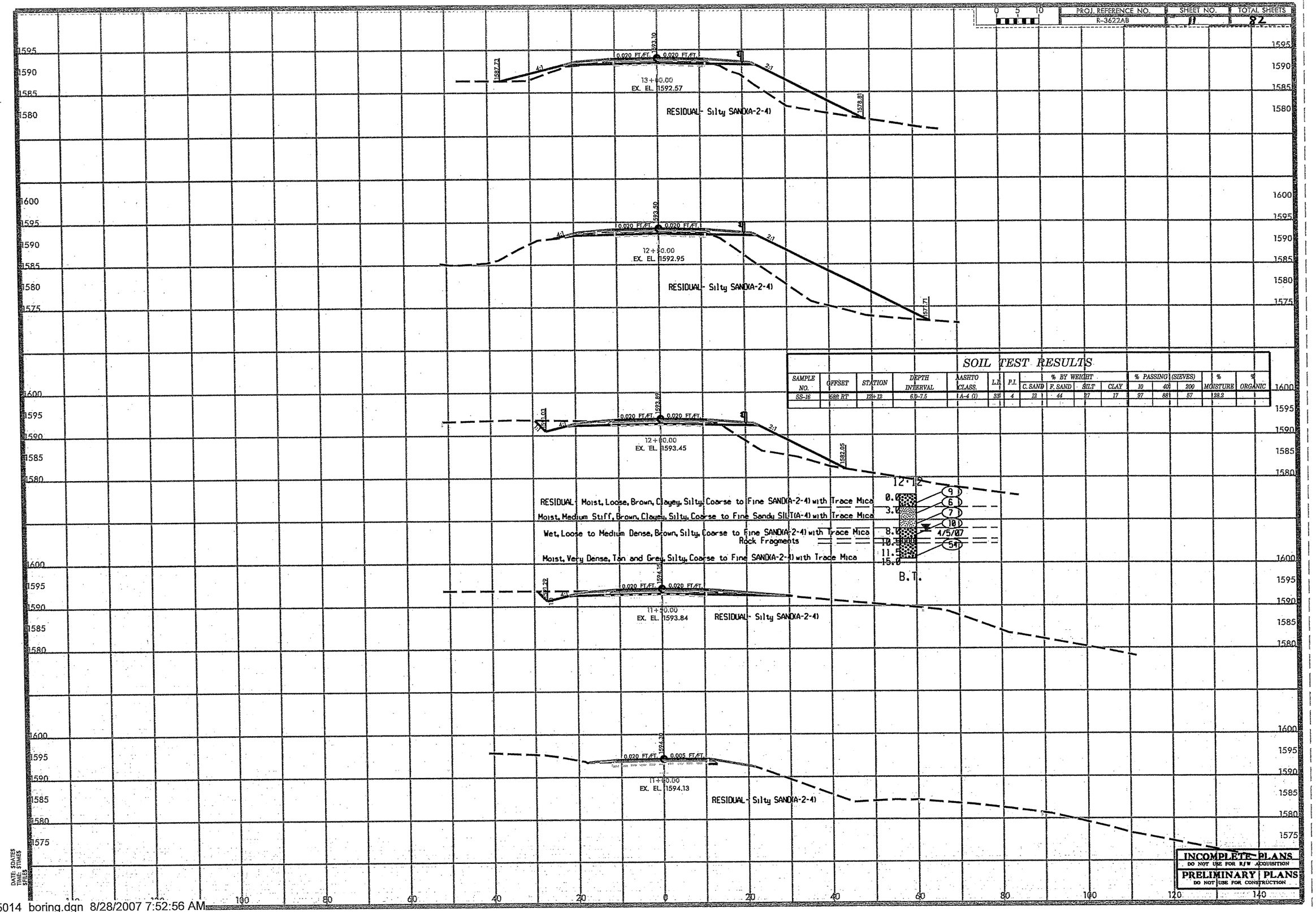
PI Sta 96+21.48
Δ = 32° 59' 14.5" (RT)
D = 8° 30' 00.0"
L = 388.09'
T = 199.59'
R = 674.07'
SE = 0.06 '/'
DS = 45 mph

Pts Sta 98+52.01
Θs = 5° 21' 18.0"
Ls = 126.00'
LT = 84.04'
ST = 42.03'

Y-5
PI Sta 11+46.50
Δ = 67° 51' 16.5" (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

0 5 10	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: $TIME$
$USER$

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

RESIDUAL- Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

15+50.00
EX. EL. 1590.34

0.060 FT/FT

0.060 FT/FT

1590.71

1587.41

1589.36

RESIDUAL- Sandy SILT(A-4) Over Silty SAND(A-2-4)

RESIDUAL- Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

15+50.00
EX. EL. 1591.17

0.055 FT/FT

0.055 FT/FT

1591.46

1588.22

1590.03

RESIDUAL- Silty SAND(A-2-4)

RESIDUAL- Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

14+50.00
EX. EL. 1591.48

0.032 FT/FT

0.032 FT/FT

1591.90

1588.90

1590.63

RESIDUAL- Silty SAND(A-2-4)

RESIDUAL- Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

14+50.00
EX. EL. 1591.86

0.020 FT/FT

0.010 FT/FT

1592.30

1589.44

1590.00

RESIDUAL- Silty SAND(A-2-4)

RESIDUAL- Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

13+50.00
EX. EL. 1592.23

0.020 FT/FT

0.013 FT/FT

1592.70

1589.84

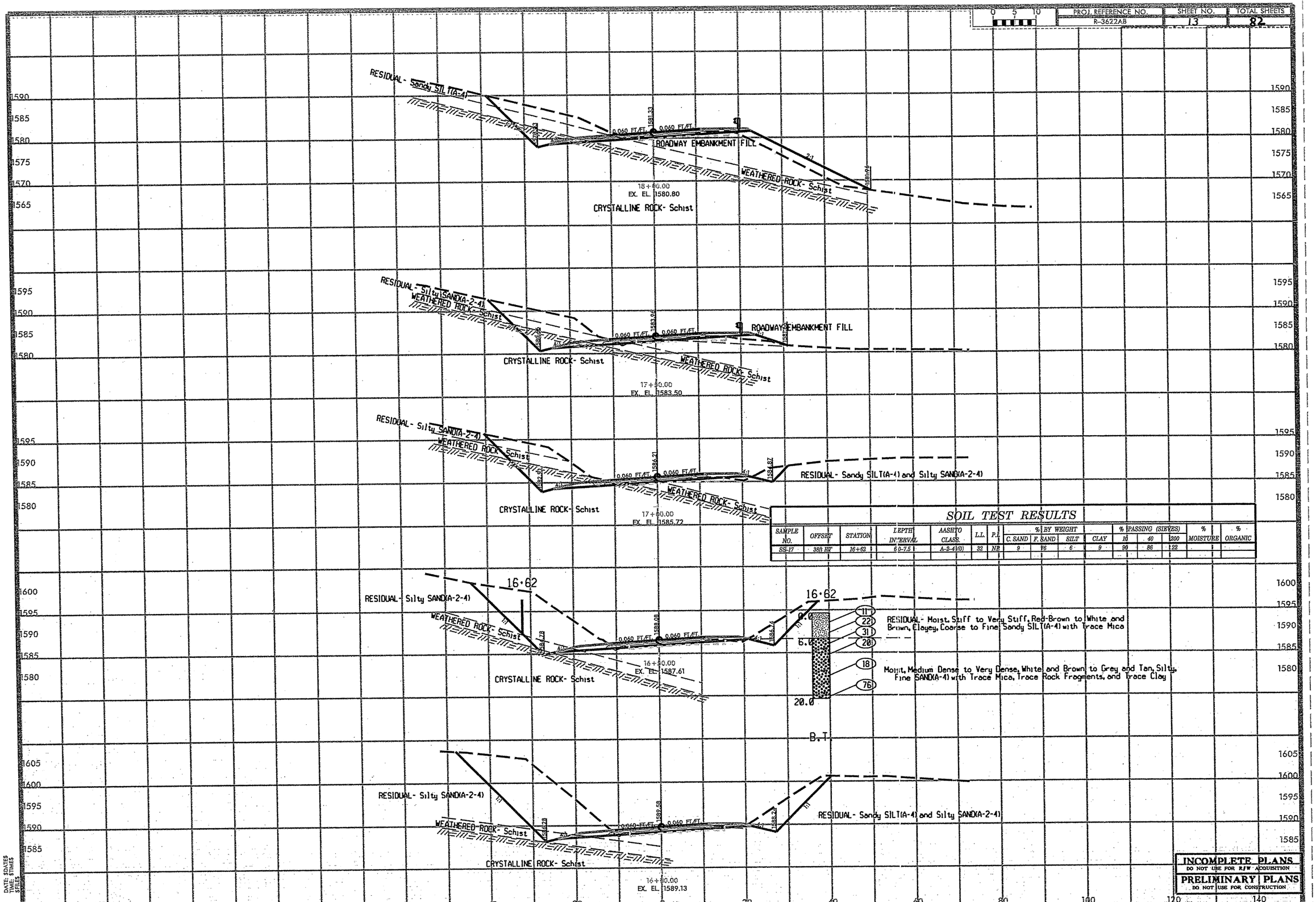
1587.44

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 3DATES
TIME: 3TIMES
3FILES

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	13	82



SOIL TEST RESULTS

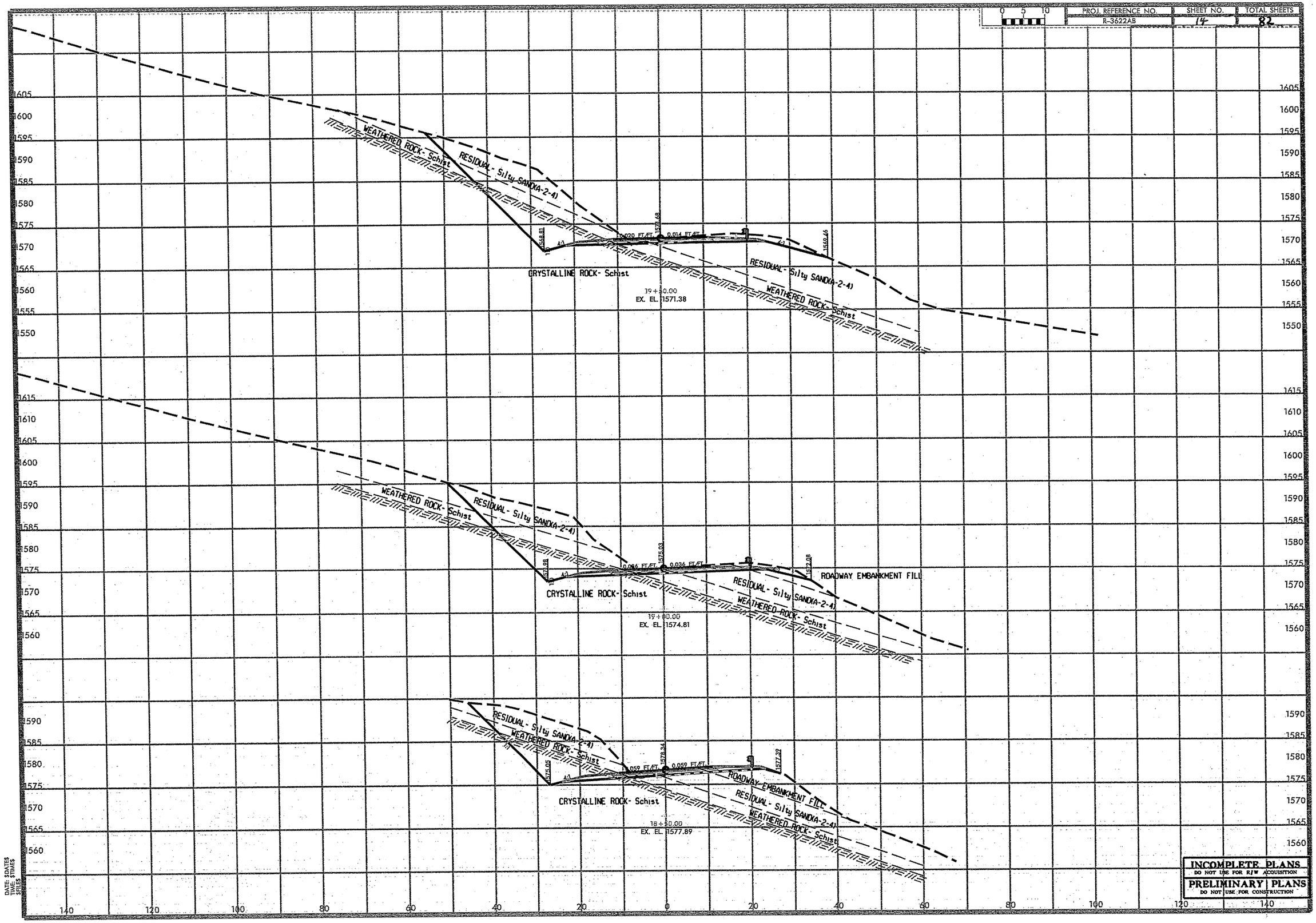
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-17	38ft RT	16+62	6.0-7.5	A-2-4(0)	32	NP	9	76	6	9	99	86	22		

DATE: STATES
TIME: STATES
SFILES

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	14	82



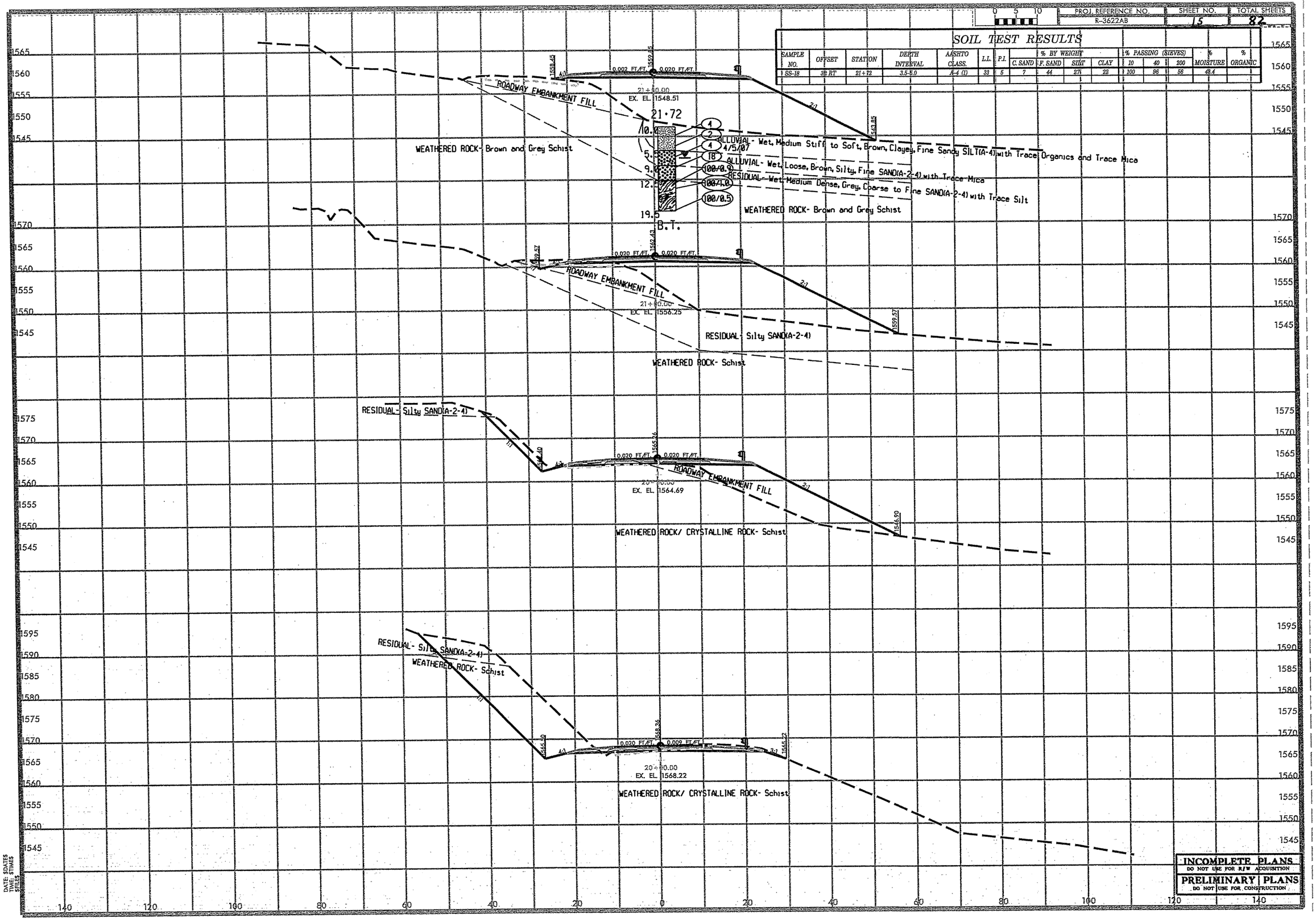
DATE: $DATE$
TIME: $TIME$
$FILE$

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.	LL.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-18	3B RT	21+72	3.5-5.0	A-4 (1)	33	5	7	44	27.4	22	100	96	56	43.4	



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

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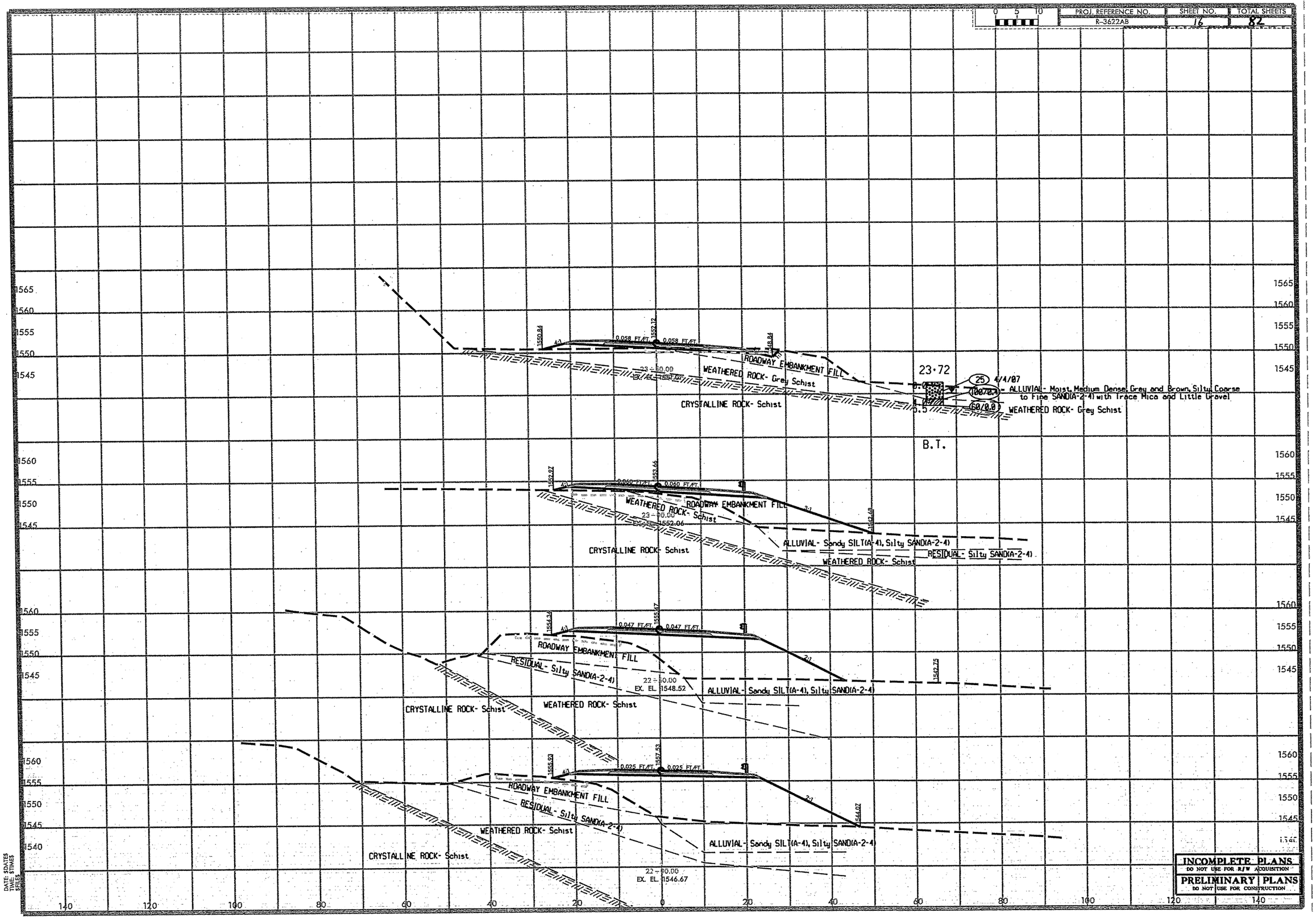
TIME: $TIME$
FILE: $FILE$



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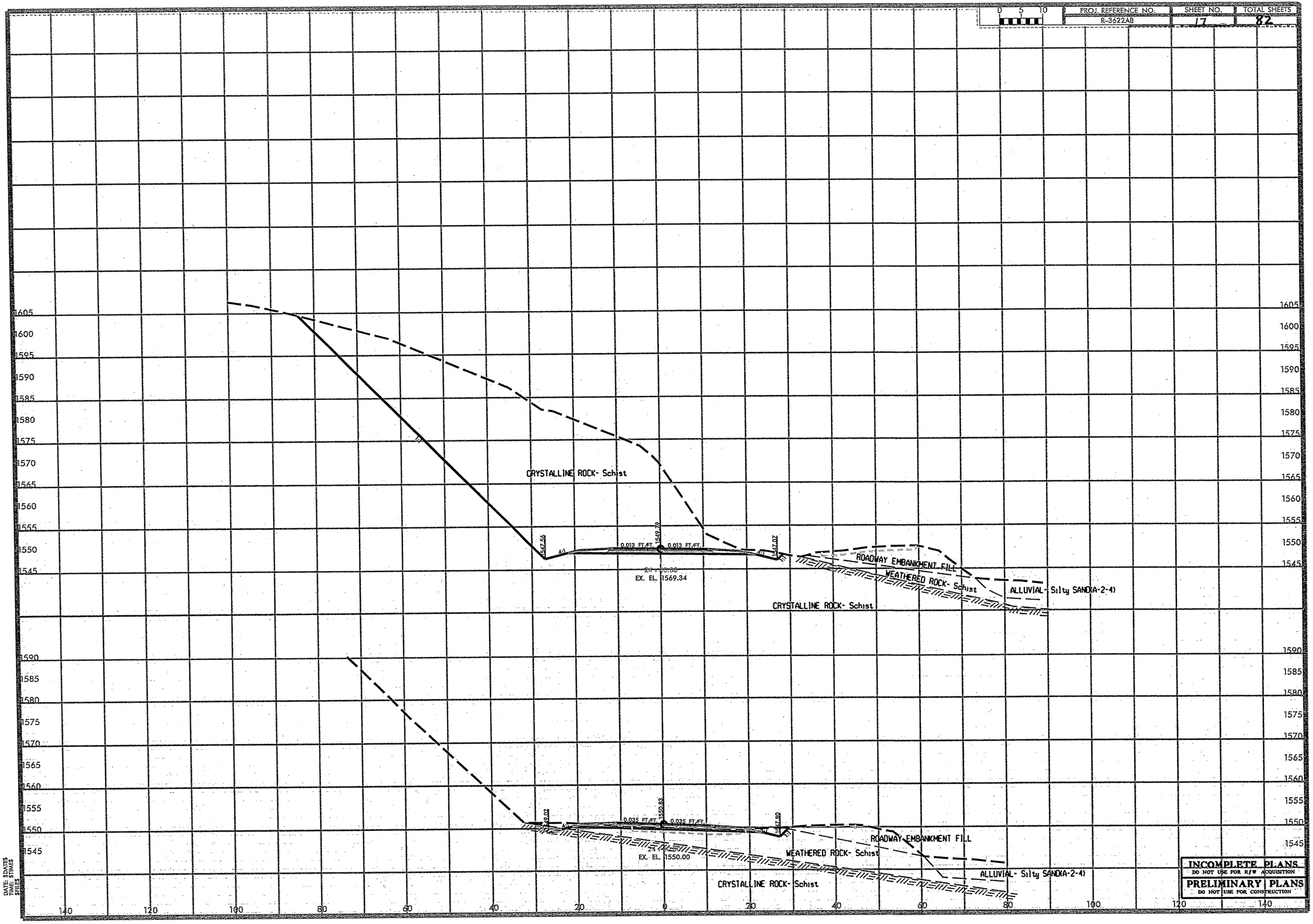
TIME: $TIME$
FILE: $FILE$

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

0 5 10

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

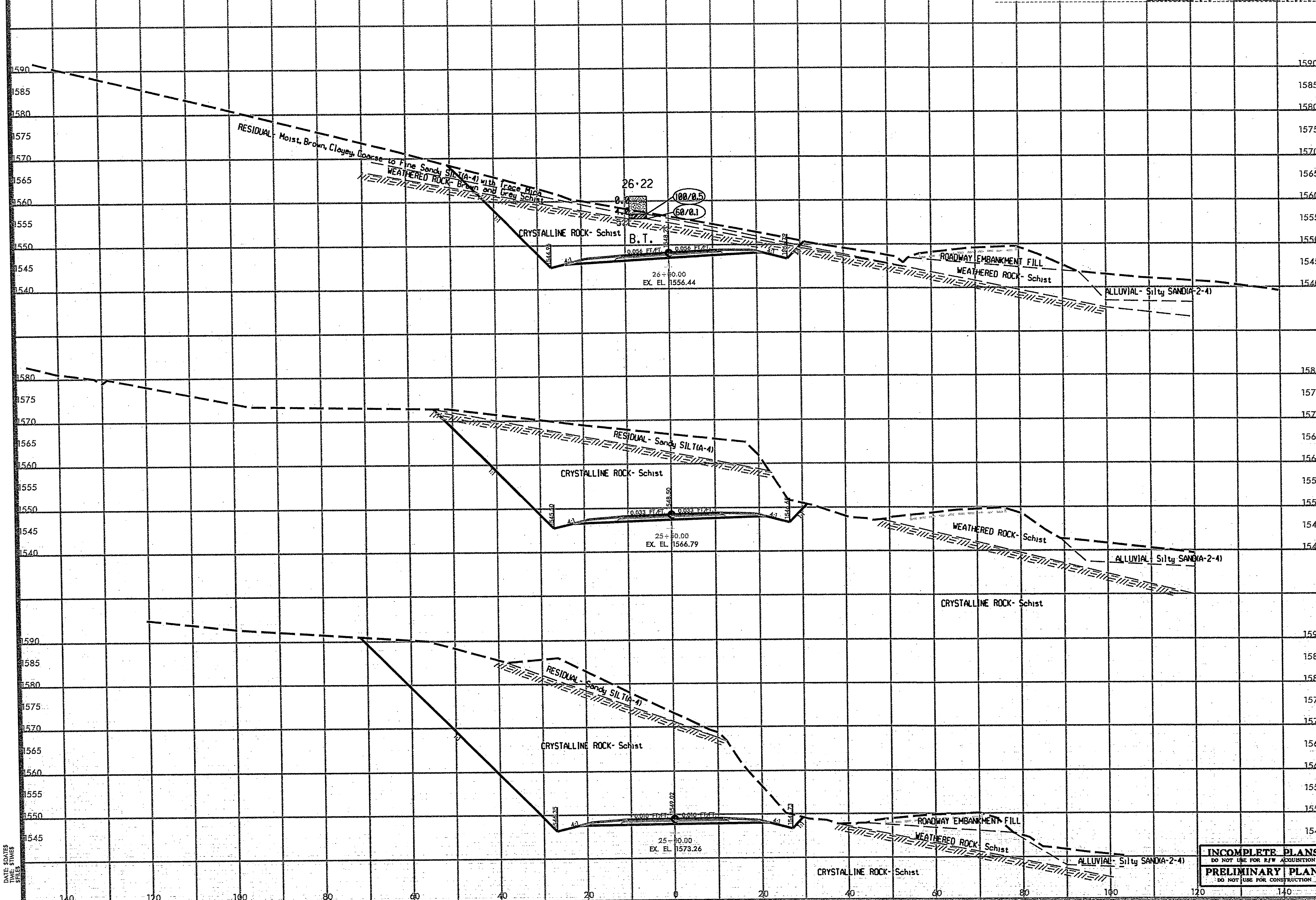


DATE: $DATE$
TIME: $TIME$
SERIES

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	18	82



0 5 10
RESIDUAL- Moist, Brown, Clayey, Coarse to Fine Sandy SILT(A-4) with Trace Mica
WEATHERED ROCK- Brown and Grey Schist
26+22
100/0.5
60/0.1
CRYSTALLINE ROCK- Schist
B.T.
0.056 FT/FT
0.056 FT/FT
26+50.00
EX. EL. 1556.44
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
ALLUVIAL- Silty SAND(A-2-4)
RESIDUAL- Sandy SILT(A-4)
CRYSTALLINE ROCK- Schist
0.033 FT/FT
0.033 FT/FT
25+50.00
EX. EL. 1566.79
WEATHERED ROCK- Schist
ALLUVIAL- Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
CRYSTALLINE ROCK- Schist
0.010 FT/FT
0.010 FT/FT
25+00.00
EX. EL. 1573.26
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
ALLUVIAL- Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
1590
1585
1580
1575
1570
1565
1560
1555
1550
1545
1540
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

RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1544.39
0.060 FT/FT
0.060 FT/FT
1546.35
A3
A1
27+90.00
EX. EL. 1557.61
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
ALLUVIAL - Sandy SILT(A-4), Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist

RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1544.45
0.060 FT/FT
0.060 FT/FT
1546.41
A3
A1
26+90.00
EX. EL. 1555.89
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
ALLUVIAL - Sandy SILT(A-4), Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist

1605 1600 1595 1590 1585 1580 1575 1570 1565 1560 1555 1550 1545 1540

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	20	82

0 5 10

RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
ROADWAY EMBANKMENT FILL
ALLUVIAL- Sandy SILT(A-4), Silty SAND(A-2-4)

28+90.00
EX. EL. 1556.63

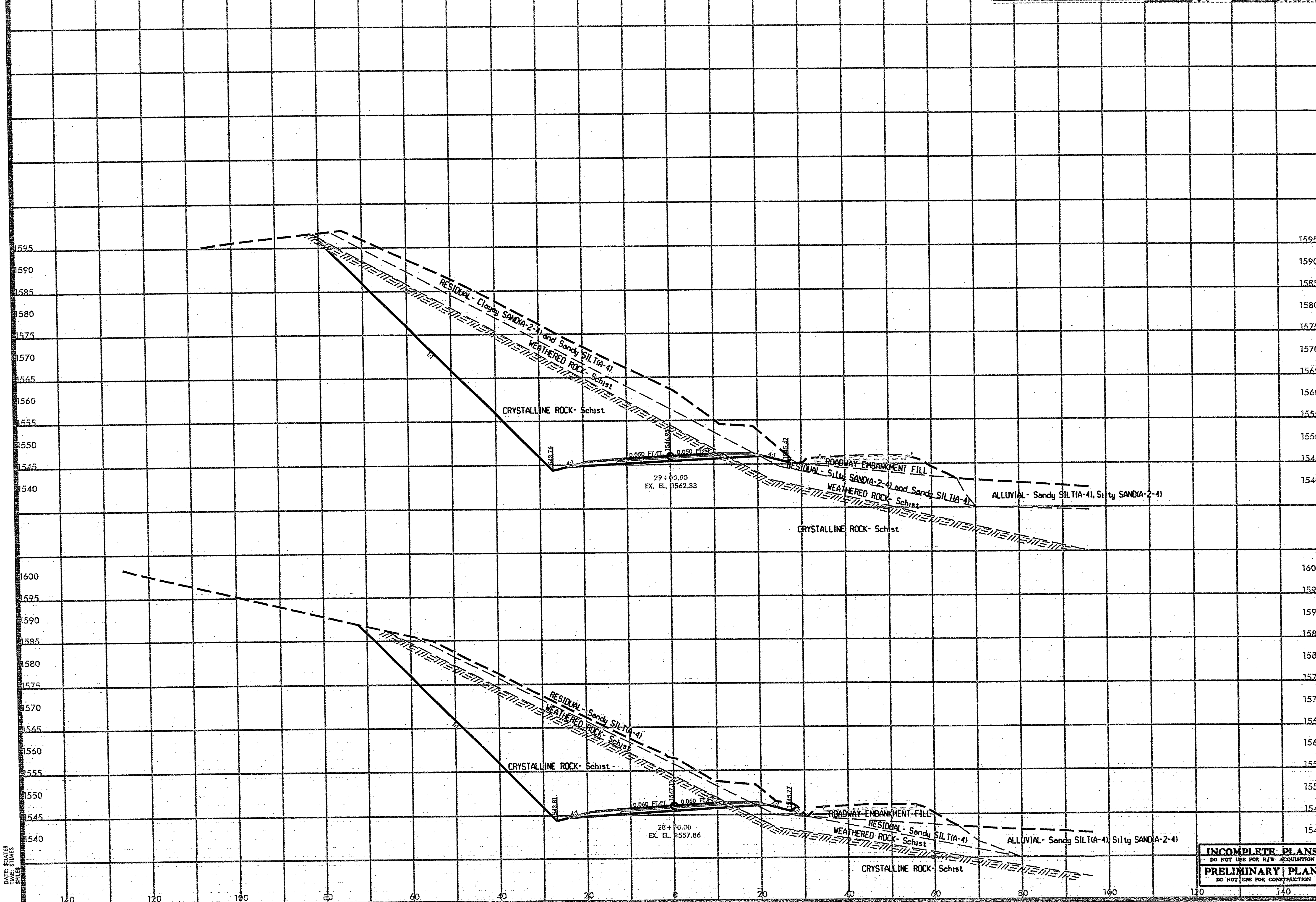
27+50.00
EX. EL. 1556.59

0.060 FT/FT

DATE: $DATES
TIME: $TIMES
$FILES

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

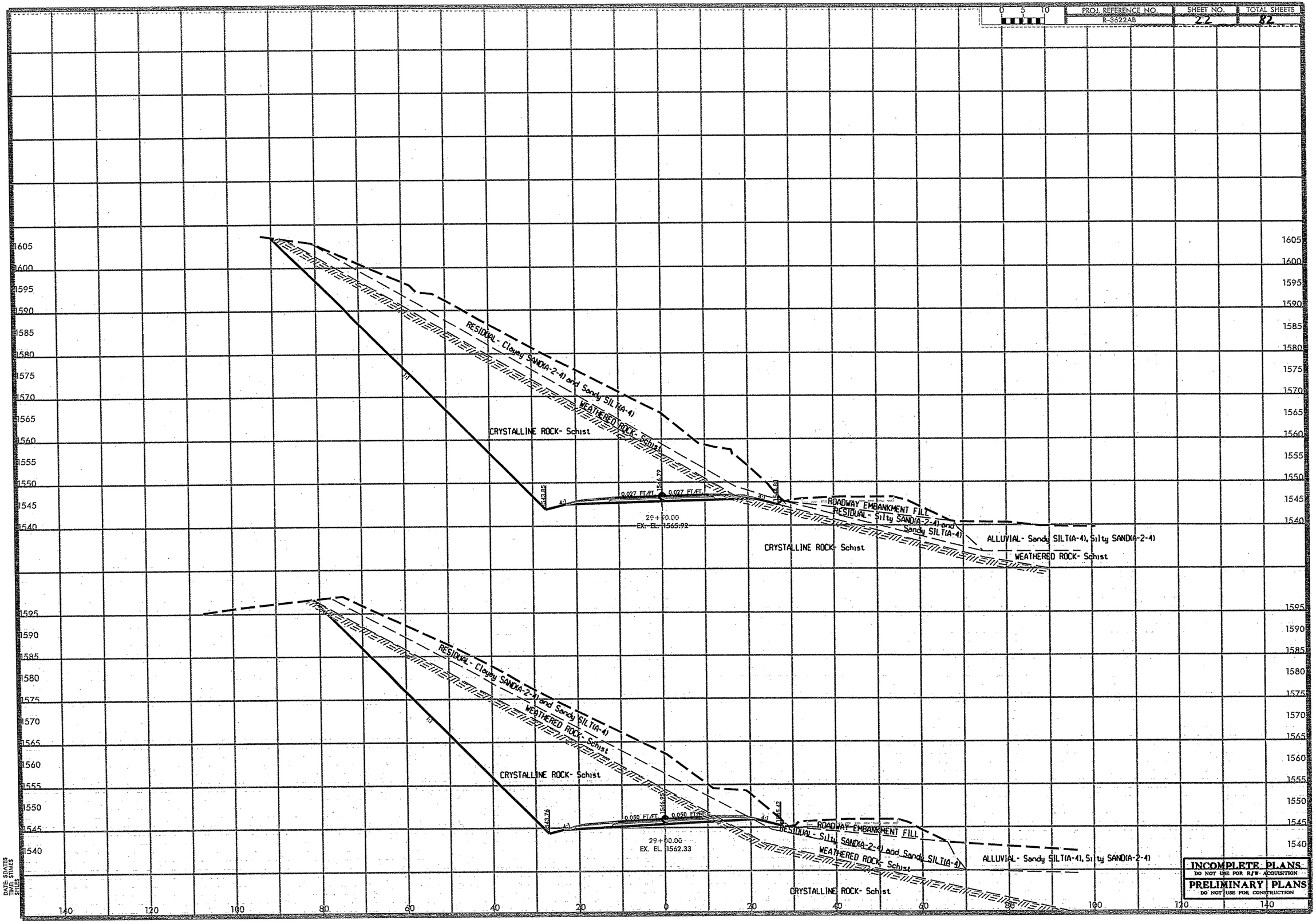
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	21	82


0 5 10
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
0.050 FT/FT
29+50.00
EX. EL. 1562.33
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)
CRYSTALLINE ROCK- Schist
1600
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060 FT/FT
28+50.00
EX. EL. 1557.86
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
ALLUVIAL- Sandy SILT(A-4) Silty SAND(A-2-4)
CRYSTALLINE ROCK- Schist
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: $DATE$
TIME: $TIME$

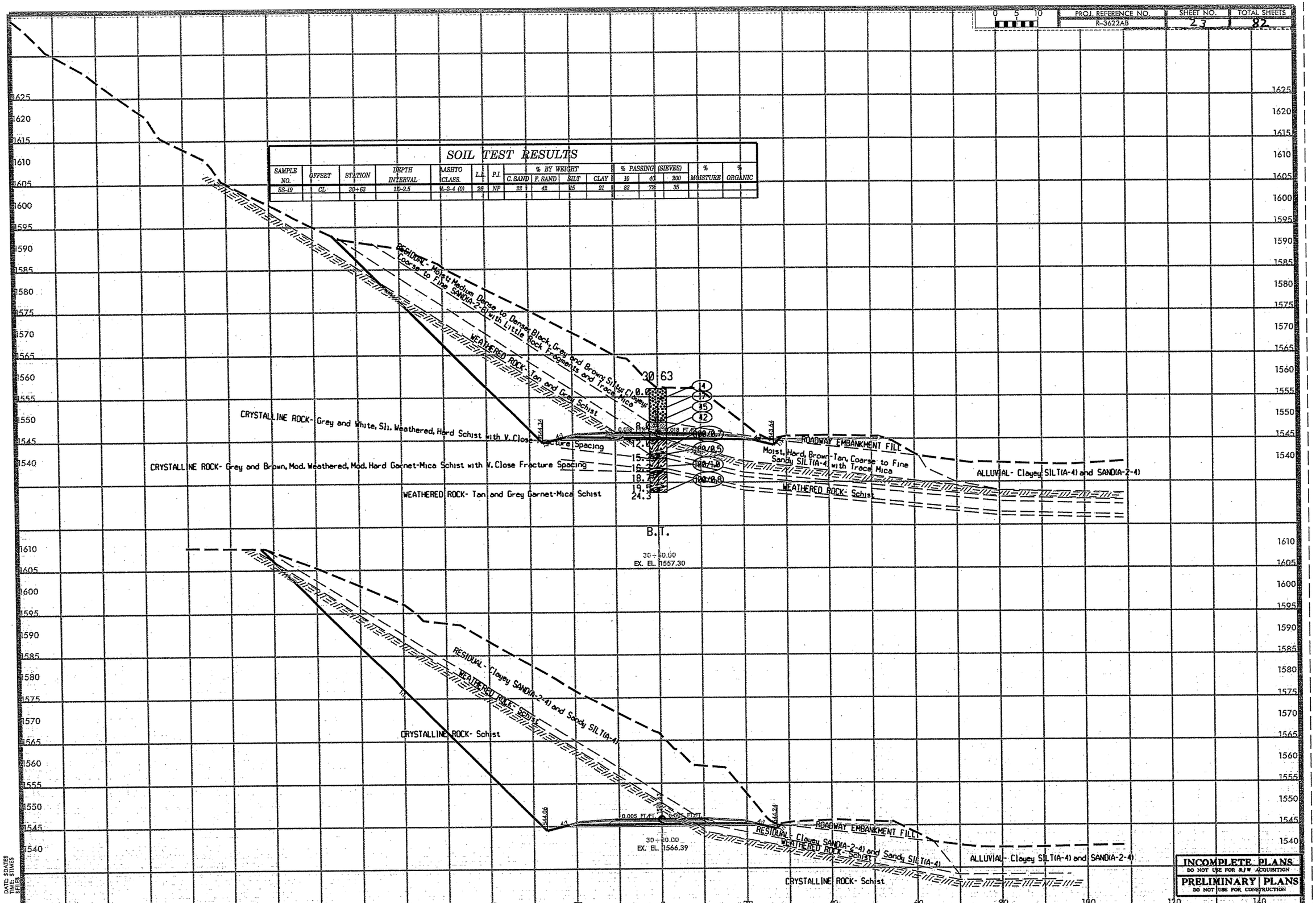
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	23	82

SOIL TEST RESULTS

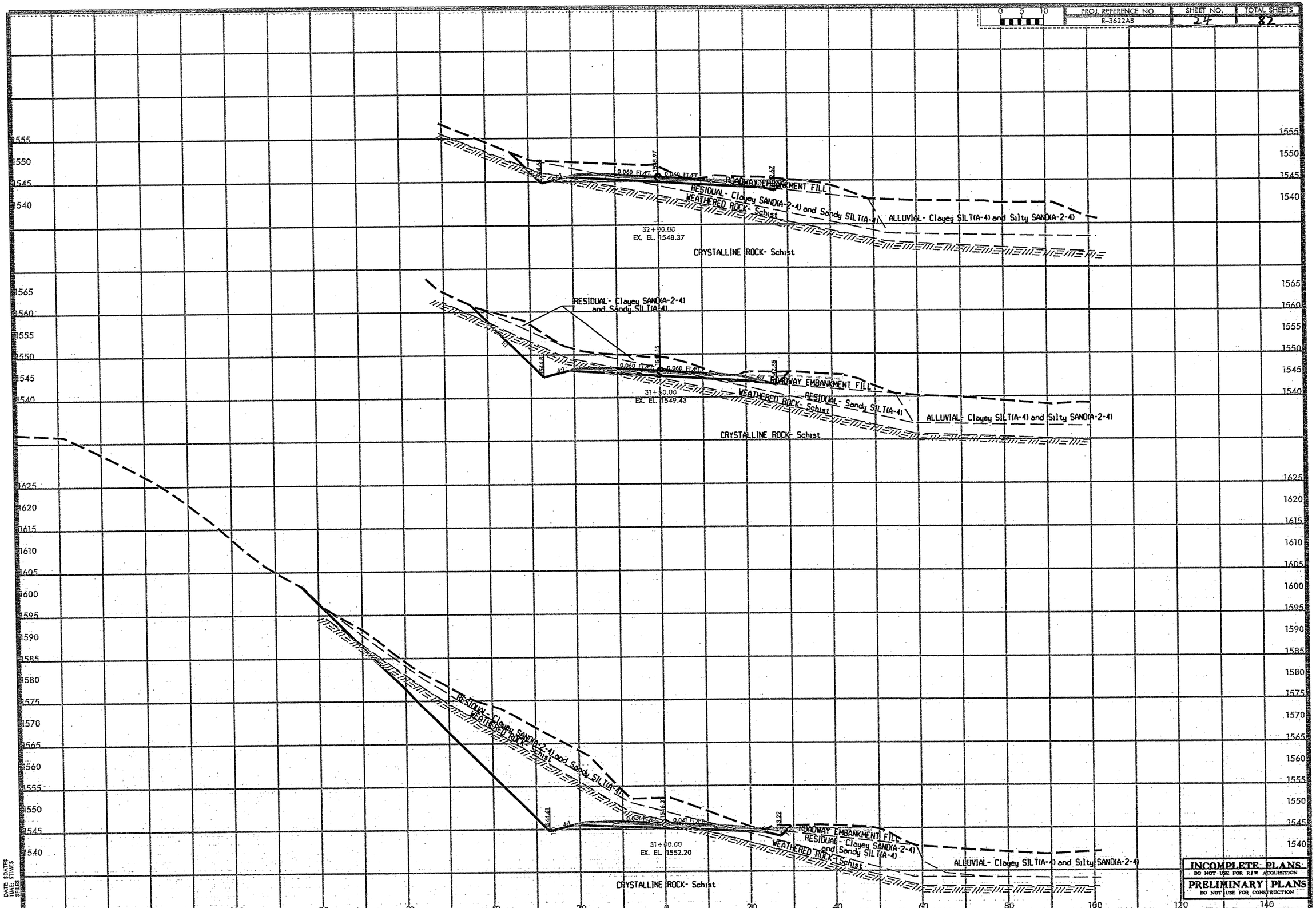
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-19	CL	30+63	10-25	A-2-4 (0)	26	NP	22	42	15	21	83	72	35		



DATE: $DATES
TIME: $TIMES
$FILES

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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	24	82



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TIME: $TIME$
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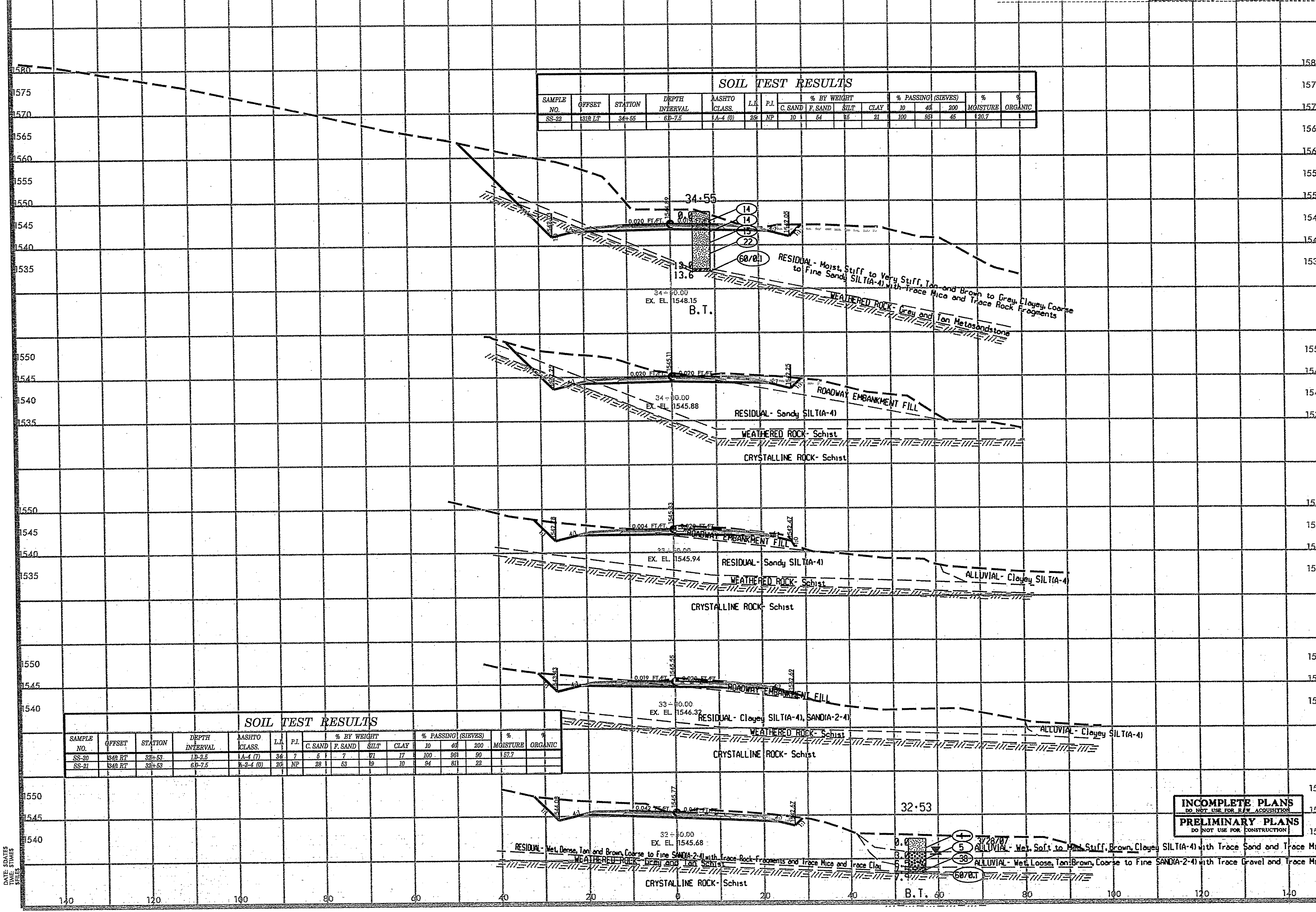
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



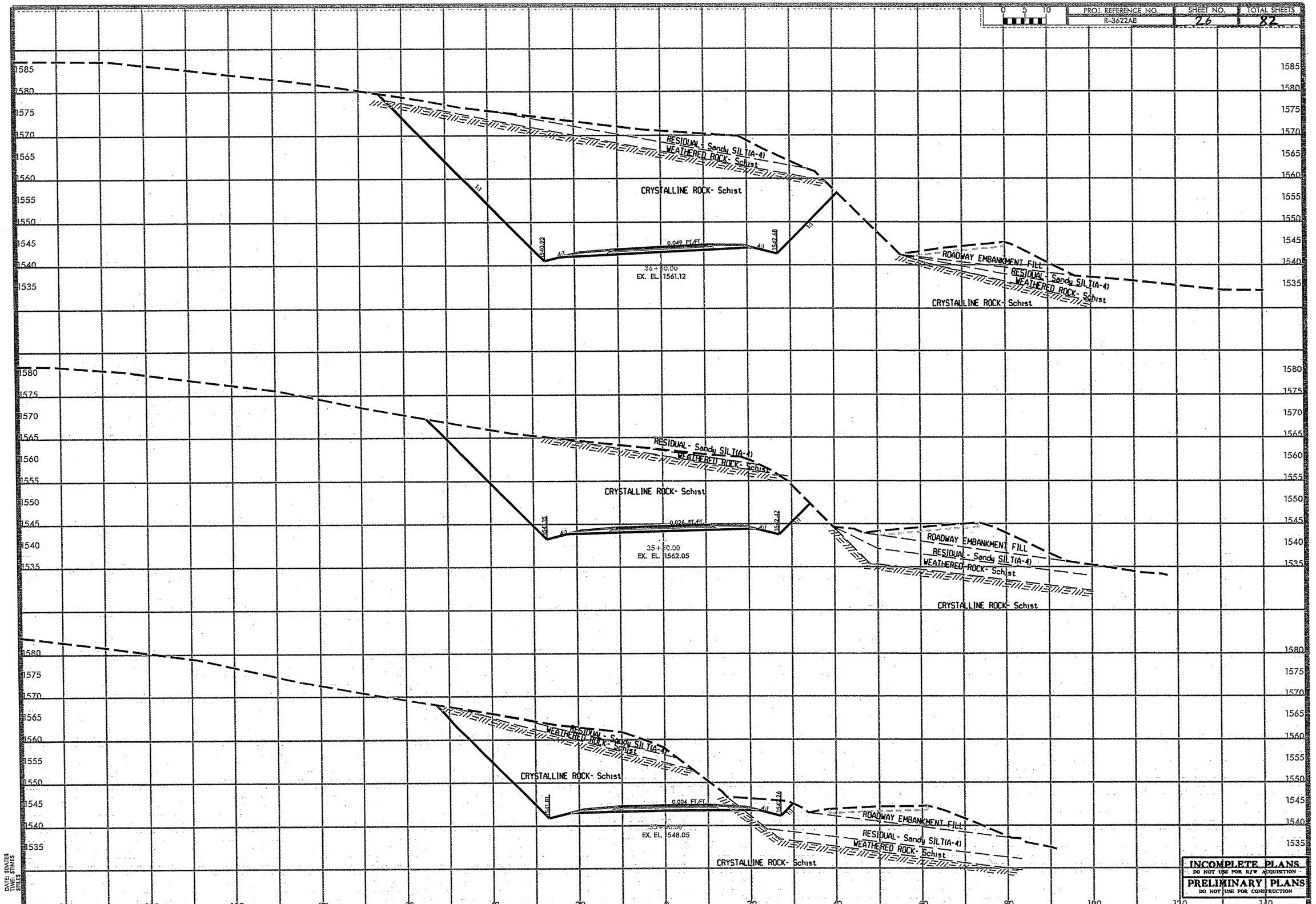
34+55
B.T.
34+60.00
EX. EL. 1548.15
RESIDUAL - Moist, Stiff to Very Stiff, Tan and Brown to Grey, Clayey, Coarse to Fine Sandy SILT(A-4) with Trace Mica and Trace Rock Fragments
WEATHERED ROCK - Grey and Tan Metasandstone
34+40.00
EX. EL. 1545.88
ROADWAY EMBANKMENT FILL
RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK - Schist
CRYSTALLINE ROCK - Schist
33+80.00
EX. EL. 1545.94
ALLUVIAL - Clayey SILT(A-4)
33+40.00
EX. EL. 1546.32
RESIDUAL - Clayey SILT(A-4), SAND(A-2-4)
32+53
32+60.00
EX. EL. 1545.68
RESIDUAL - Wet, Dense, Tan and Brown, Coarse to Fine SAND(A-2-4) with Trace Rock Fragments and Trace Mica and Trace Clay
WEATHERED ROCK - Grey and Tan Schist
ALLUVIAL - Wet, Soft to Med. Stiff, Brown, Clayey SILT(A-4) with Trace Sand and Trace Mica
ALLUVIAL - Wet, Loose, Tan, Brown, Coarse to Fine SAND(A-2-4) with Trace Gravel and Trace Mica
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-22	31ft LT	34+55	6.0-7.5	A-4 (0)	25	NP	10	54	15	21	100	95	45	20.7	

SOIL TEST RESULTS

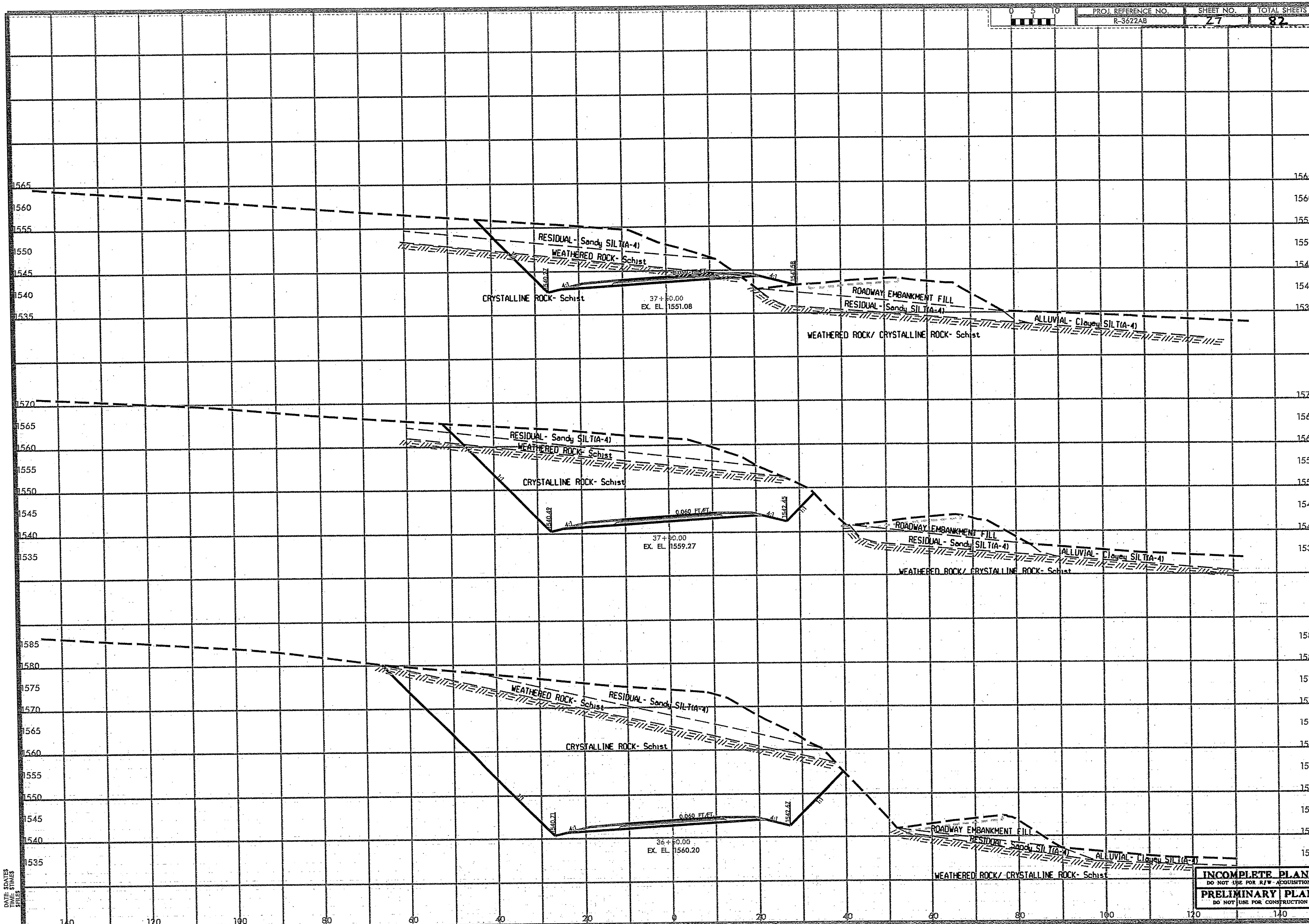
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-20	34ft RT	32+53	1.0-2.5	A-4 (7)	34	7	5	7	71	17	100	96	90	57.7	
SS-21	34ft RT	32+53	6.0-7.5	A-2-4 (0)	20	NP	28	53	9	10	94	81	22		



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	27	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
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060 FT/FT
37+00.00
EX. EL. 1559.27
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
ALLUVIAL- Clayey SILT(A-4)
WEATHERED ROCK/ CRYSTALLINE ROCK- Schist
WEATHERED ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
CRYSTALLINE ROCK- Schist
0.060 FT/FT
36+50.00
EX. EL. 1560.20
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
ALLUVIAL- Clayey SILT(A-4)
WEATHERED ROCK/ CRYSTALLINE ROCK- Schist

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	28	82

RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1539.17
1542.47
0.060 FT/FT
0.060 FT/FT
1541.44
4:1
ROADWAY EMBANKMENT FILL
40+80.00
EX. EL. 1545.00
CRYSTALLINE ROCK- Schist

RESIDUAL- Sandy SILT(A-4)
CRYSTALLINE ROCK- Schist
1539.39
1542.69
0.060 FT/FT
0.060 FT/FT
1544.67
4:1
ROADWAY EMBANKMENT FILL
39+80.00
EX. EL. 1542.26
37+12
ALLUVIAL- Wet Brown, Silty CLAY(A-6)
WEATHERED ROCK- Schist

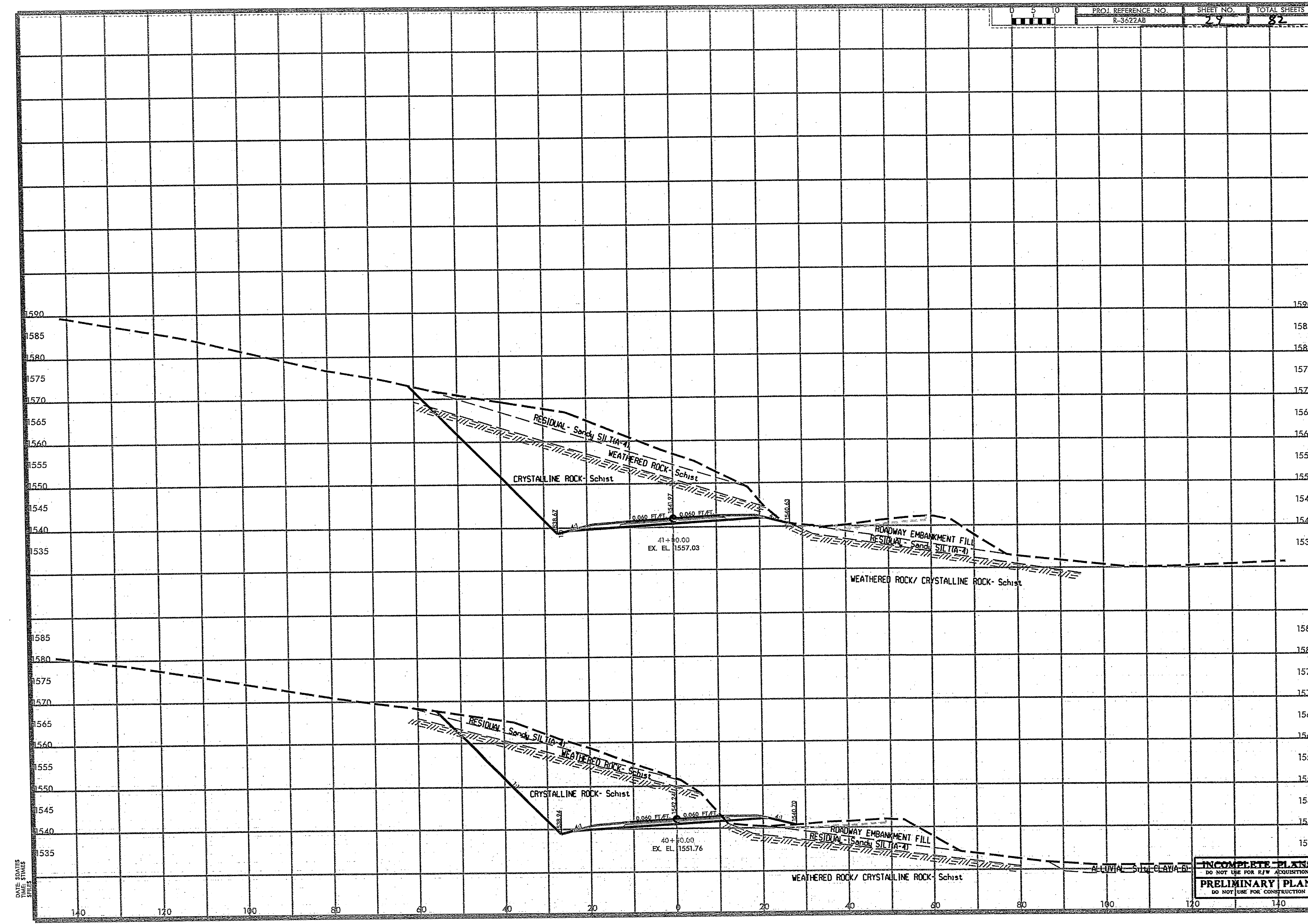
1538.77
1542.01
0.060 FT/FT
0.060 FT/FT
1545.57
4:1
ROADWAY EMBANKMENT FILL
CRYSTALLINE ROCK- Schist
39+80.00
EX. EL. 1539.17
ALLUVIAL- Silty CLAY(A-6)

1539.83
1540.13
0.060 FT/FT
0.060 FT/FT
1544.83
4:1
ROADWAY EMBANKMENT FILL
RESIDUAL- Sandy SILT(A-4)
38+80.00
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
1539.05
1543.35
0.060 FT/FT
0.060 FT/FT
1544.03
4:1
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
38+80.00
EX. EL. 1540.54
CRYSTALLINE ROCK- Schist
37+90
ALLUVIAL- Wet Brown, Clayey SILT(A-4)

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

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



PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
29
TOTAL SHEETS
82
0 5 10
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060 FT/FT
1538.67
1541.97
1540.63
41+50.00
EX. EL. 1557.03
ROADWAY EMBANKMENT FILL
WEATHERED ROCK/ CRYSTALLINE ROCK- Schist
1542.24
1538.94
1540.70
40+50.00
EX. EL. 1551.76
ALLUVIAL- Silty CLAY(A-6)
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.	SHEET NO.	TOTAL SHEETS
	R-3622AB	30	82

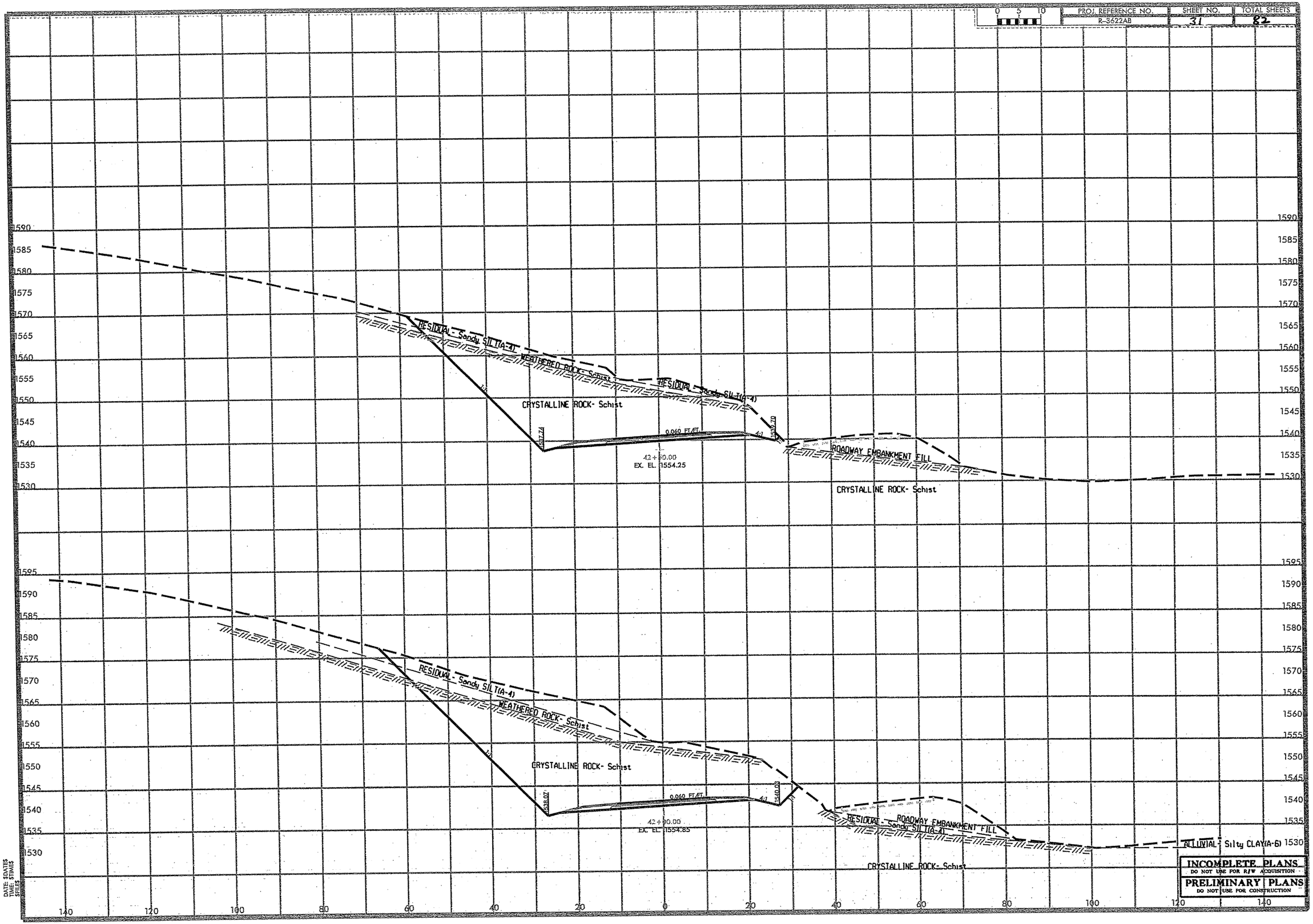
RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1538.07
0.060 Ft/Ft
4:1
1540.03
42+00.00
EX. EL. 1554.85
RESIDUAL - Sandy SILT(A-4)
ROADWAY EMBANKMENT FILL
ALLUVIAL - Silty CLAY(A-6)
CRYSTALLINE ROCK- Schist

RESIDUAL - Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1538.39
0.060 Ft/Ft
4:1
1540.35
41+50.00
EX. EL. 1561.36
RESIDUAL - Sandy SILT(A-4)
ROADWAY EMBANKMENT FILL
ALLUVIAL - Silty CLAY(A-6)
CRYSTALLINE ROCK- Schist

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

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

0 5 10	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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	32	82

RESIDUAL- Sandy SIL TIA-A

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

0.060 FT/FT

1537.08

1540.38

0.060 FT/FT

4:1

1539.43

ROADWAY EMBANKMENT FILL

43+50.00
EX. EL. 1541.00

CRYSTALLINE ROCK- Schist

RESIDUAL- Sandy SIL TIA-A

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

1537.41

1540.72

0.060 FT/FT

0.060 FT/FT

4:1

1539.72

ROADWAY EMBANKMENT FILL

43+50.00
EX. EL. 1548.20

CRYSTALLINE ROCK- Schist

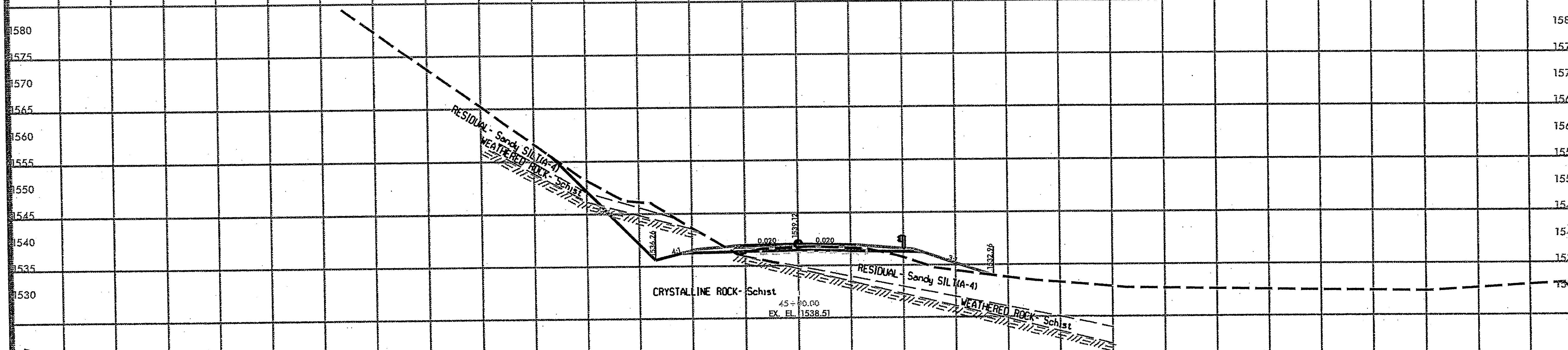
1590 1585 1580 1575 1570 1565 1560 1555 1550 1545 1540 1535 1530

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

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

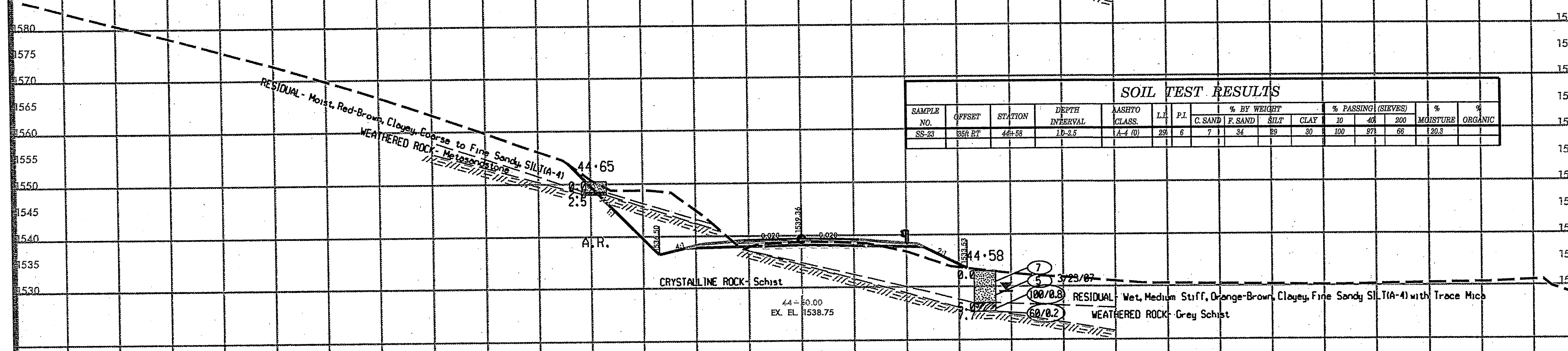
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

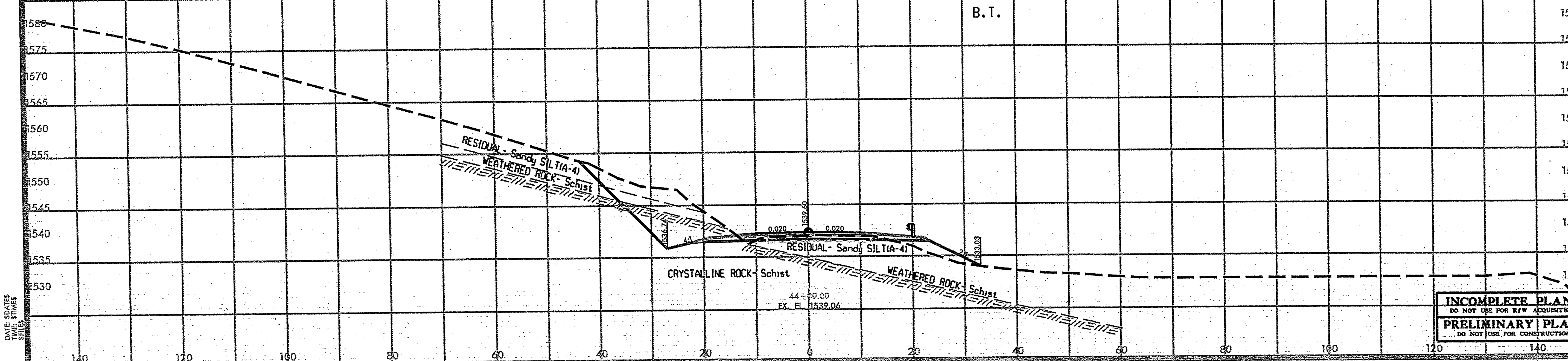
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



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	29	30	100	97	66	20.3	

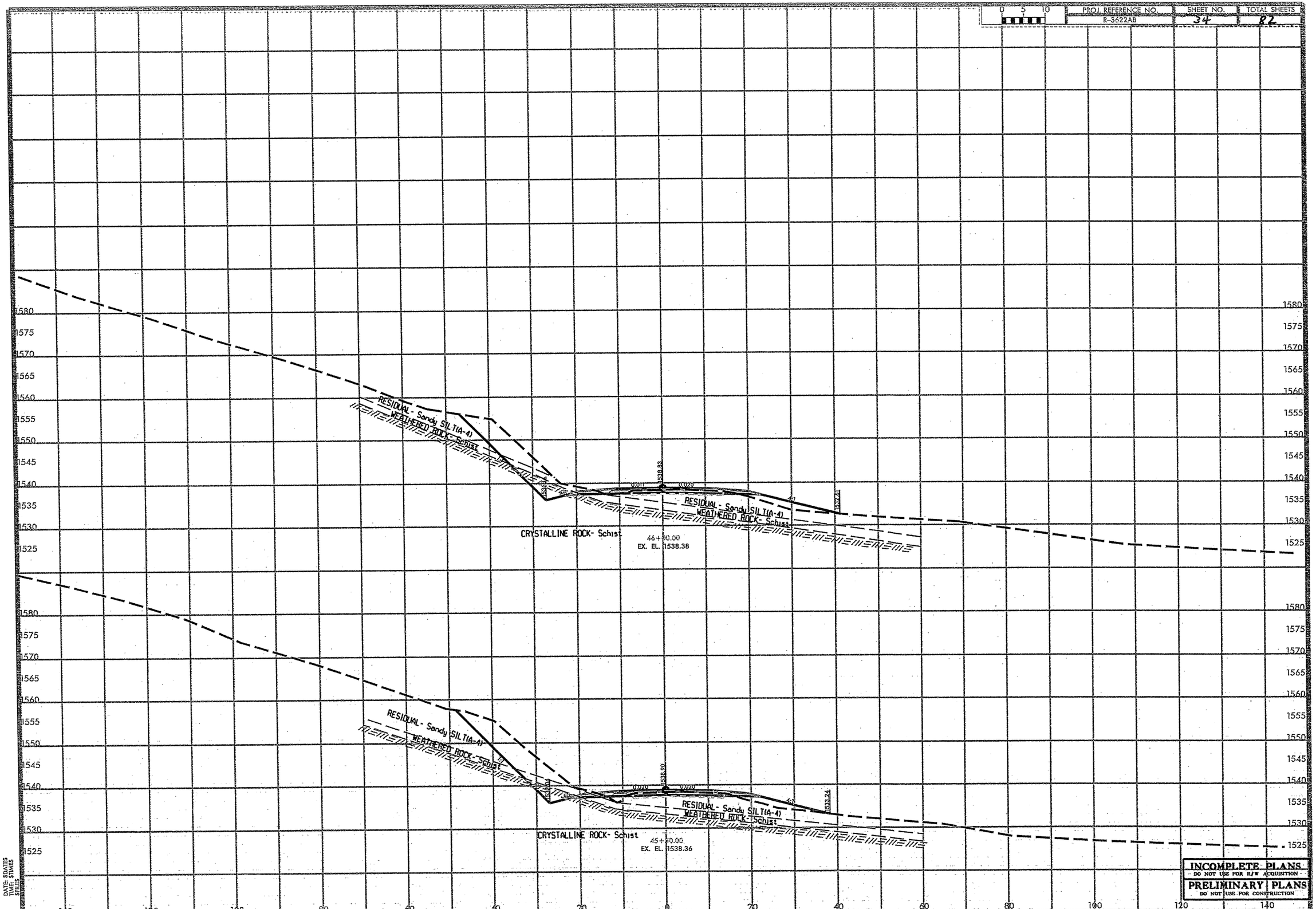




INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

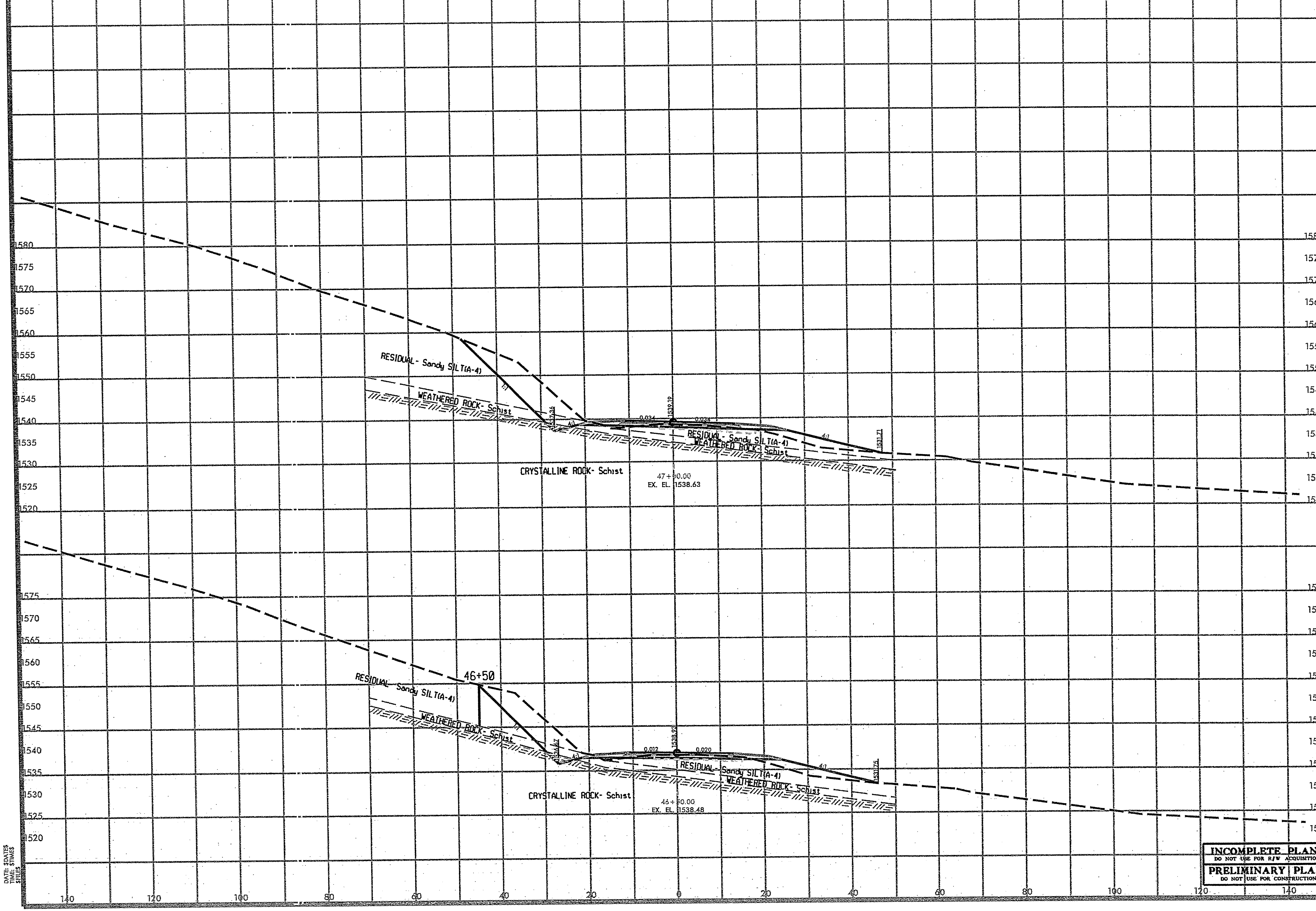
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	34	82



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	35	82



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	36	82

RESIDUAL - Sandy SILT(A-4) and Silty SAND(A-2-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

48+00.00
EX. EL. 1538.04

0.060 1540.20 0.060

4:1

1538.27

RESIDUAL - Sandy SILT(A-4)

WEATHERED ROCK- Schist

RESIDUAL - Sandy SILT(A-4) and Silty SAND(A-2-4)

WEATHERED ROCK- Schist

0.057 1539.62 0.057

4:1

1532.73

RESIDUAL - Sandy SILT(A-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

47+00.00
EX. EL. 1538.63

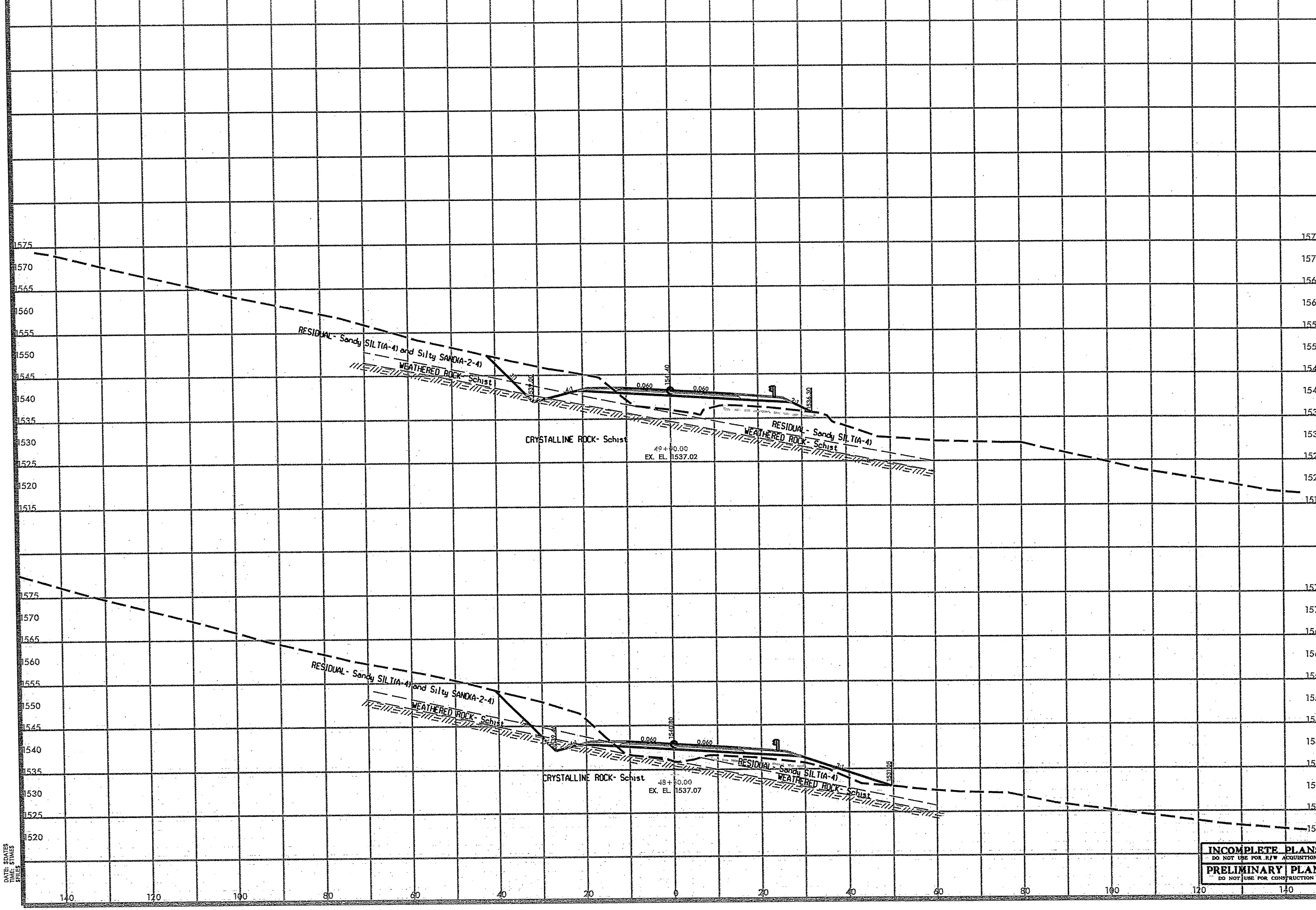
1575 1570 1565 1560 1555 1550 1545 1540 1535 1530 1525 1520

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	37	82



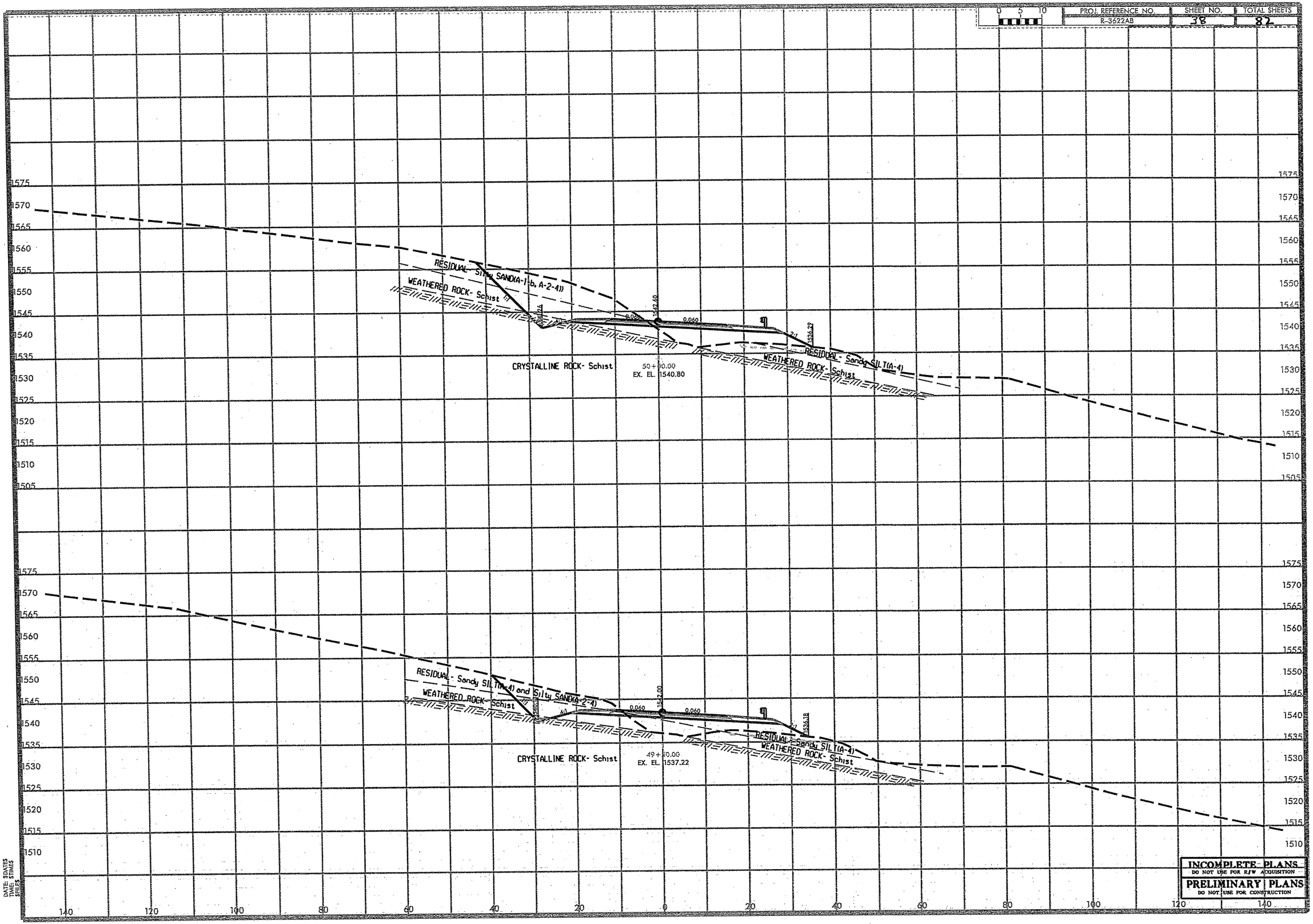
RESIDUAL- Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
49+50.00
EX. EL. 1537.02
0.060
0.060
1541.40
1536.30
RESIDUAL- Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
RESIDUAL- Sandy SILT(A-4)
WEATHERED ROCK- Schist
48+50.00
EX. EL. 1537.07
0.060
0.060
1540.80
1531.05
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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	38	82



DATE: $DATE$
TIME: $TIME$
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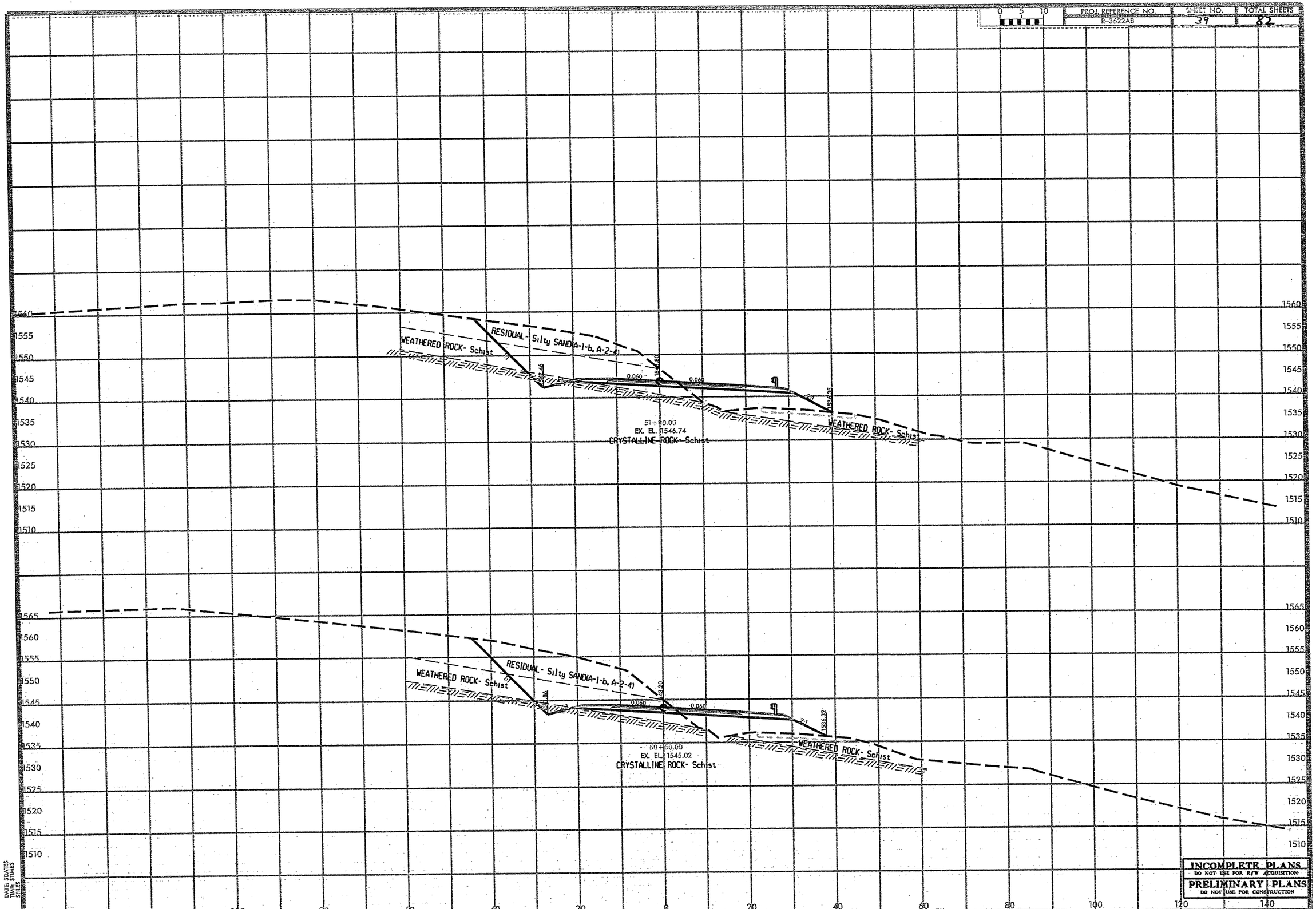
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	39	82



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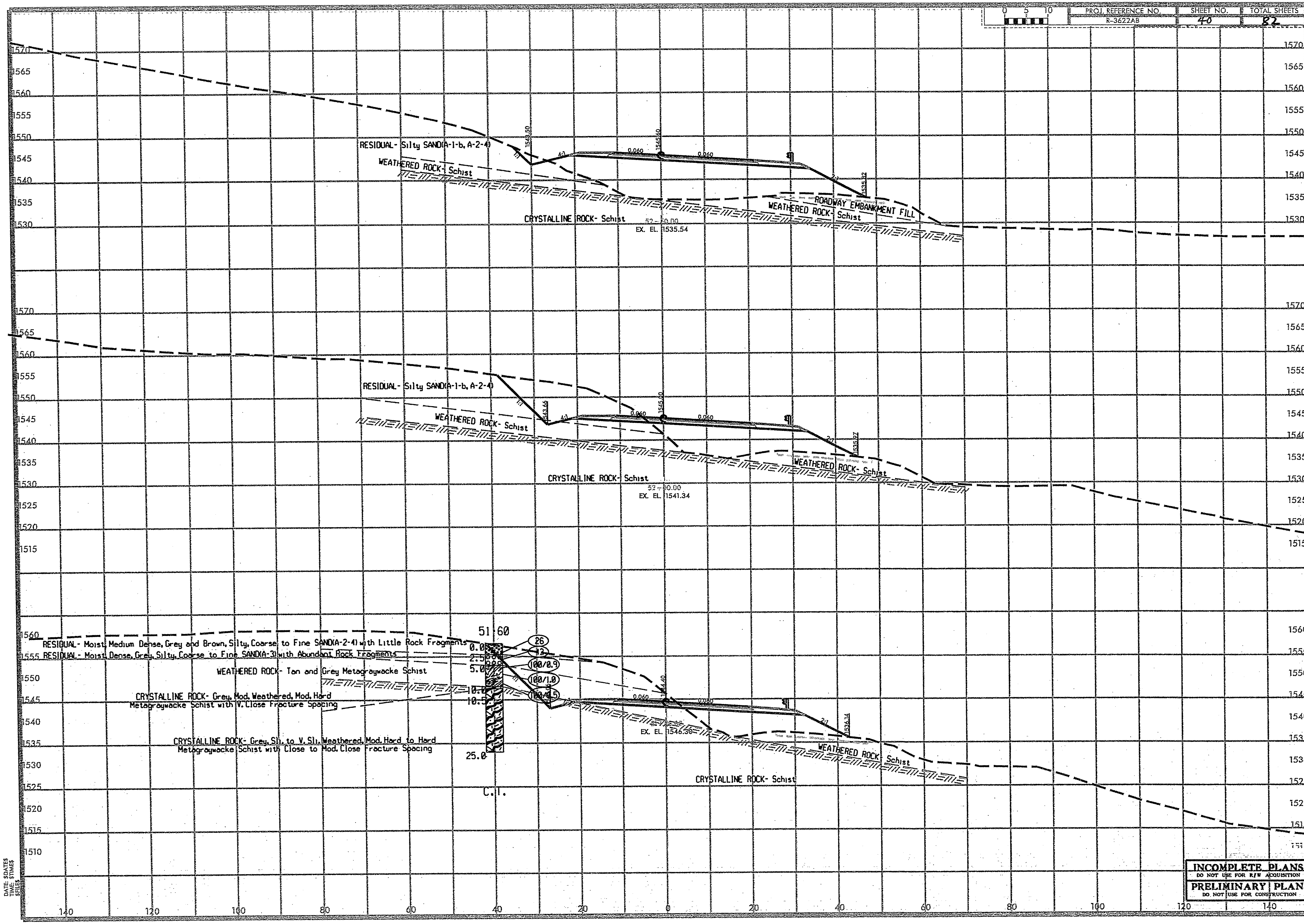
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

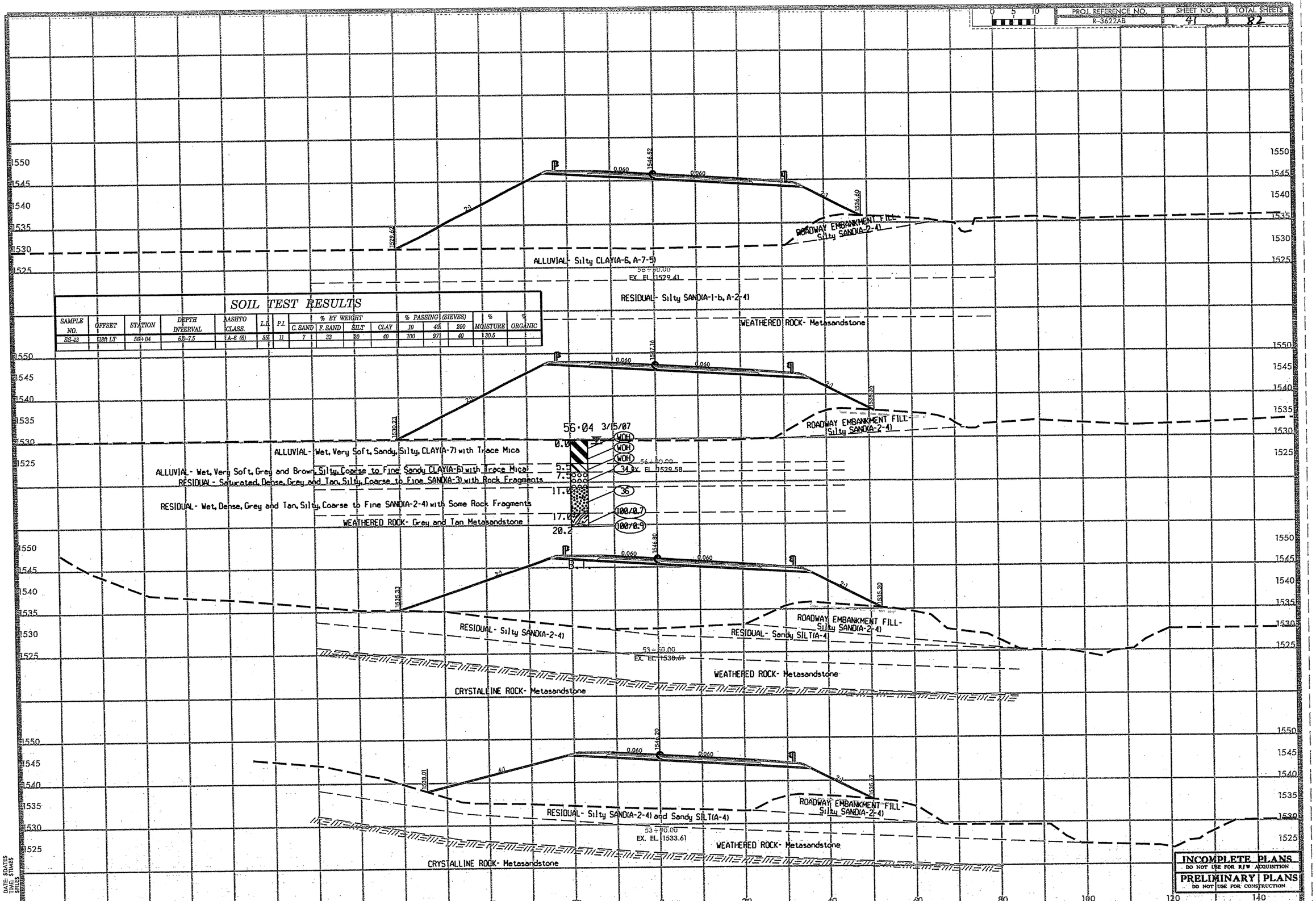


0 5 10
PROJ. REFERENCE NO. R-3622AB
SHEET NO. 40
TOTAL SHEETS 82
RESIDUAL- Silty SAND(A-1-b, A-2-4)
WEATHERED ROCK- Schist
ROADWAY EMBANKMENT FILL
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
52+50.00
EX. EL. 1535.54
RESIDUAL- Silty SAND(A-1-b, A-2-4)
WEATHERED ROCK- Schist
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
52+00.00
EX. EL. 1541.34
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, Sl. to V. Sl. 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
26
13
100/0.9
100/1.0
100/0.5
C.T.
EX. EL. 1546.30
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
0.060
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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	41	82

SOIL TEST RESULTS

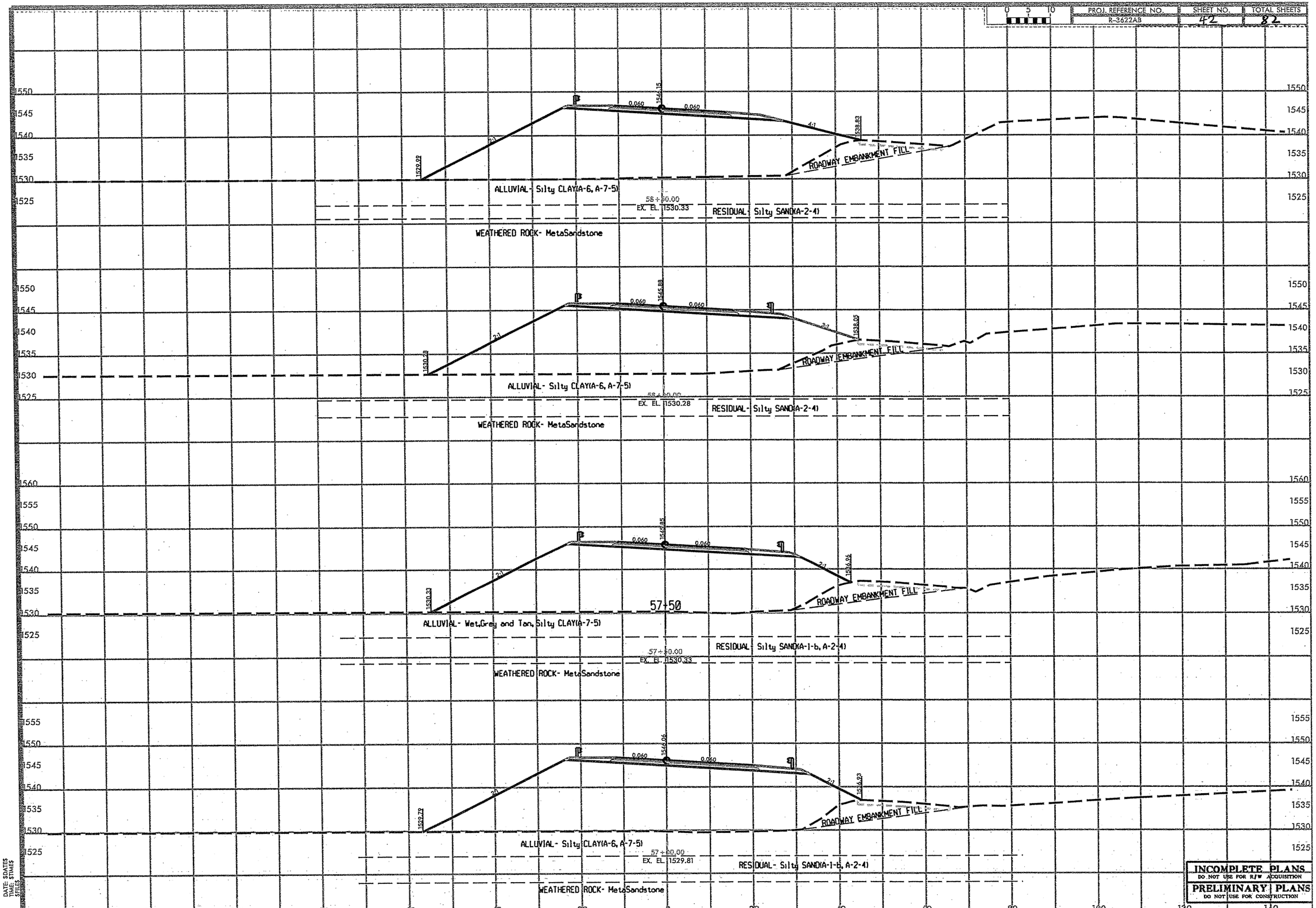
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-13	18ft LT	56+04	6.0-7.5	A-6 (6)	35	11	7	33	20	40	100	97	40	30.5	



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



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: $DATES
TIME: $TIMES
$FILES

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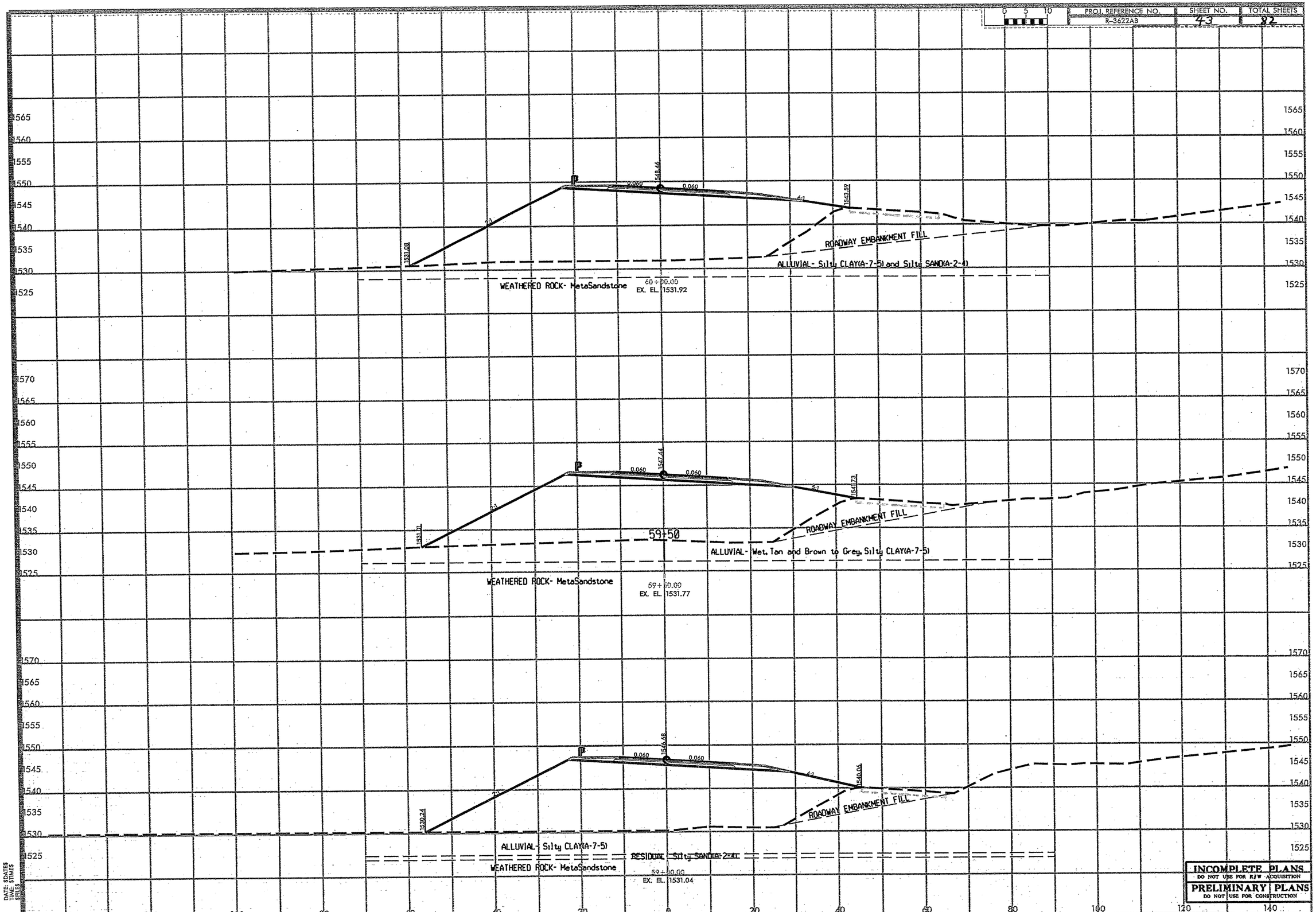
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	43	82



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

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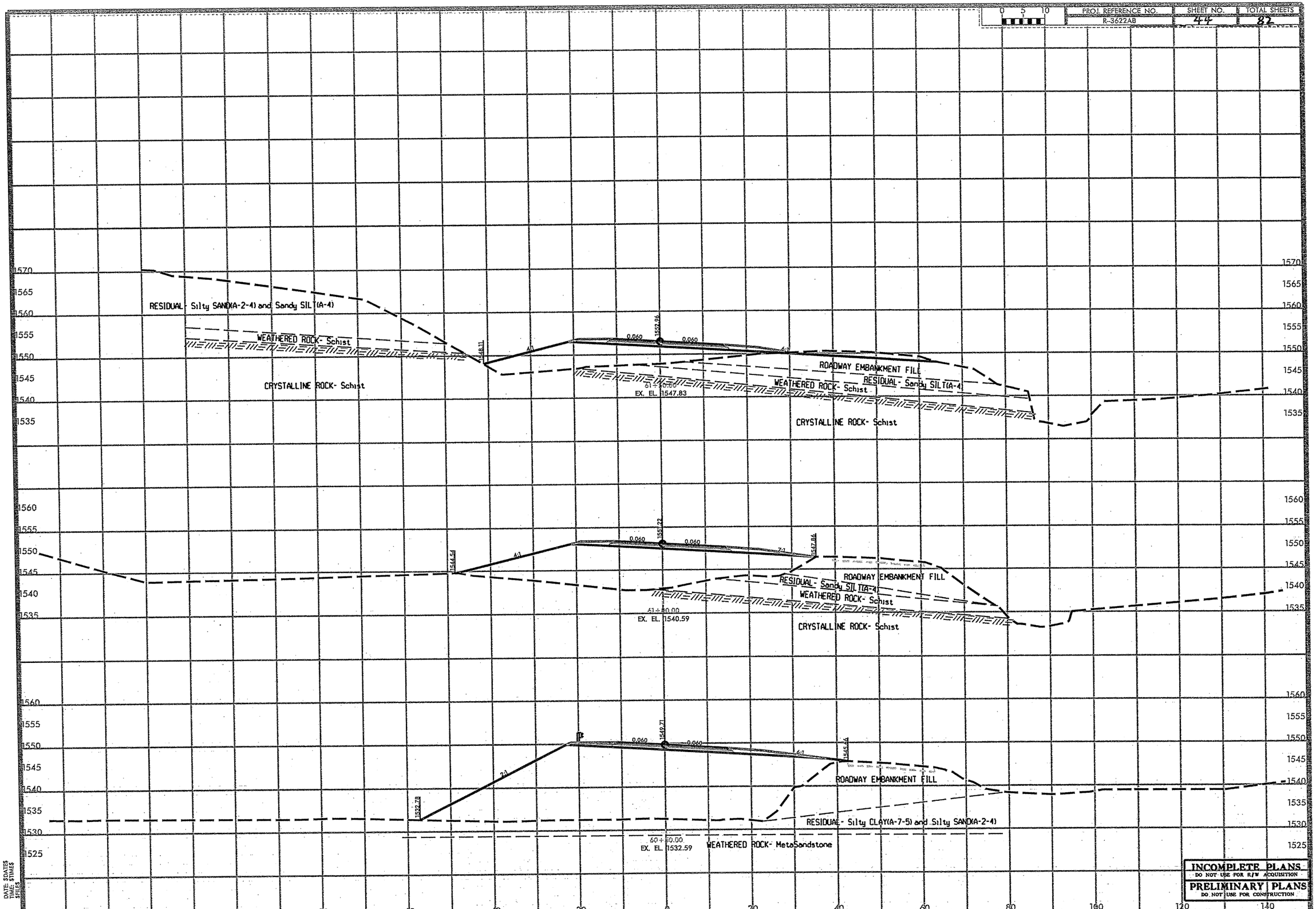
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	44	82



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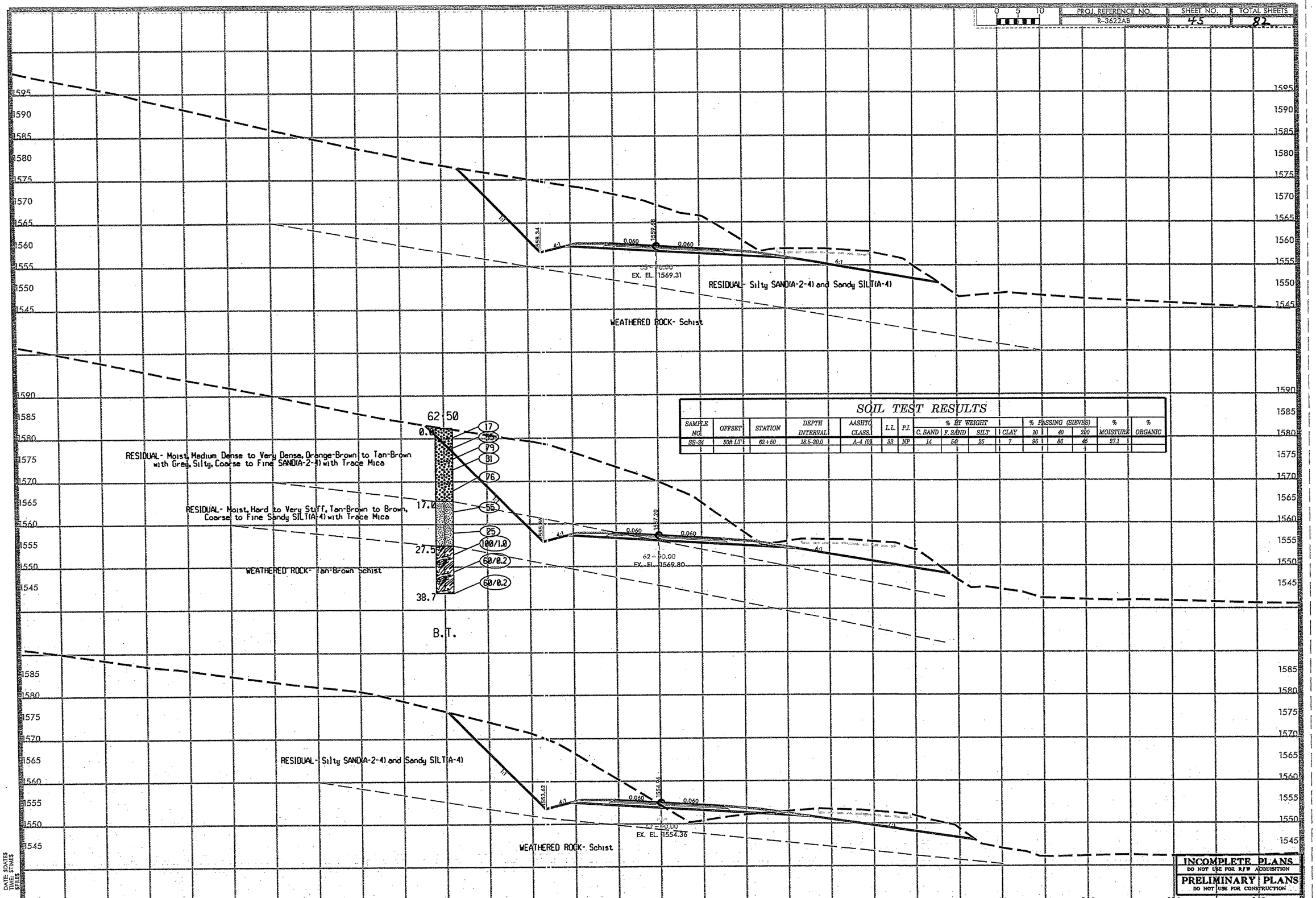
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	45	82



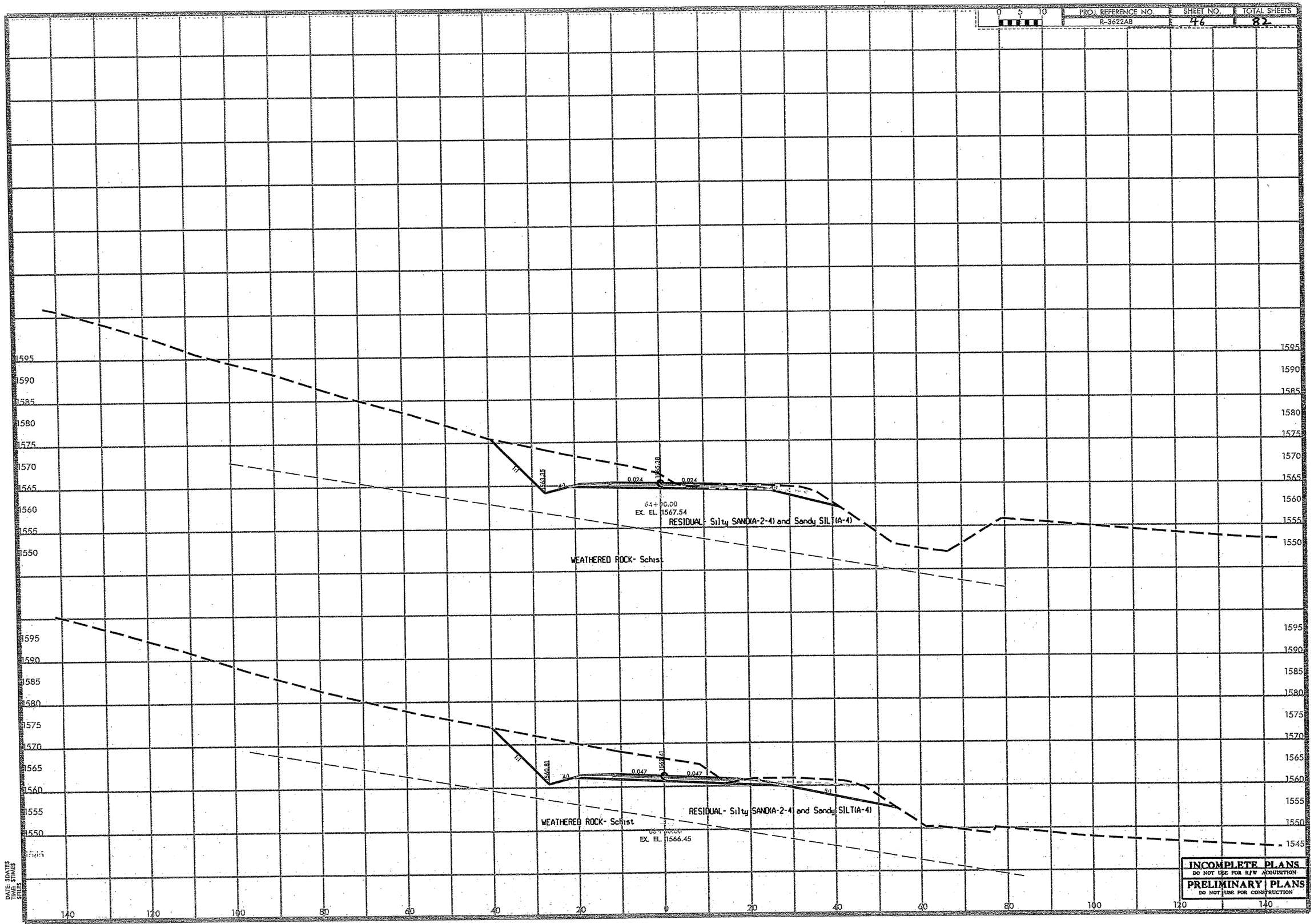
SOIL TEST RESULTS

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-24	50ft LT's	62+50	18.5-20.0	A-4 (0)	33	NP	14	54	25	7	96	66	45	27.1	

DATE: $DATES
FILES: $FILES
$TIMES

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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	46	82



DATE: $DATE$
TIME: $TIME$
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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	47	82

1600
1595
1590
1585
1580
1575
1570
1565
1560
1555
1550
1545

1:1
1569.97
A-1
0.020
1572.07
0.020
2:1
65+00.00
EX. EL. 1571.73
1553.88
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)

1:1
1566.50
A-1
0.020
1568.60
0.020
3:1
64+00.00
EX. EL. 1568.50
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)

WEATHERED ROCK- Schist

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

DATE: 5/24/05
TIME: 8:17 AM
FILES

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

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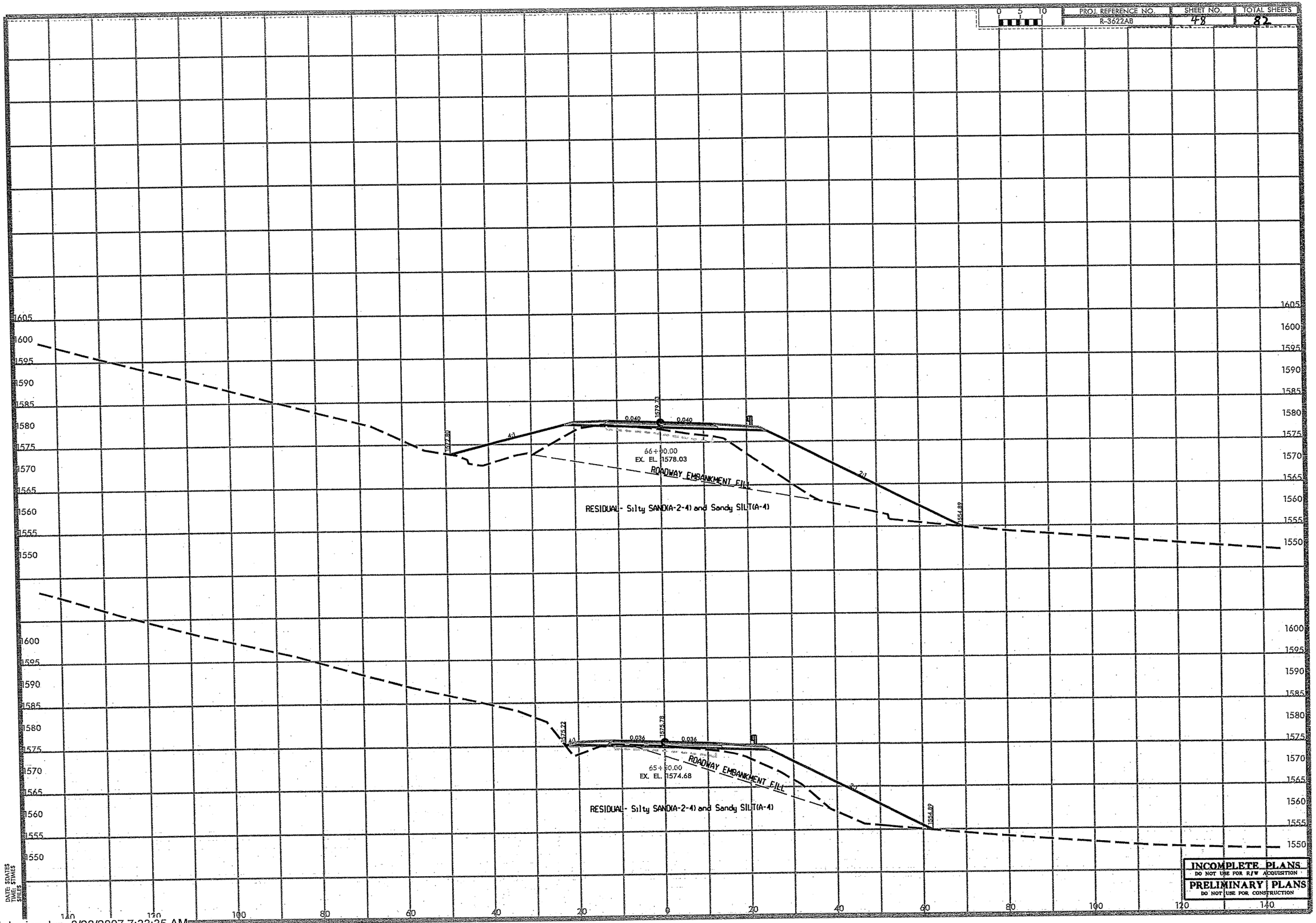
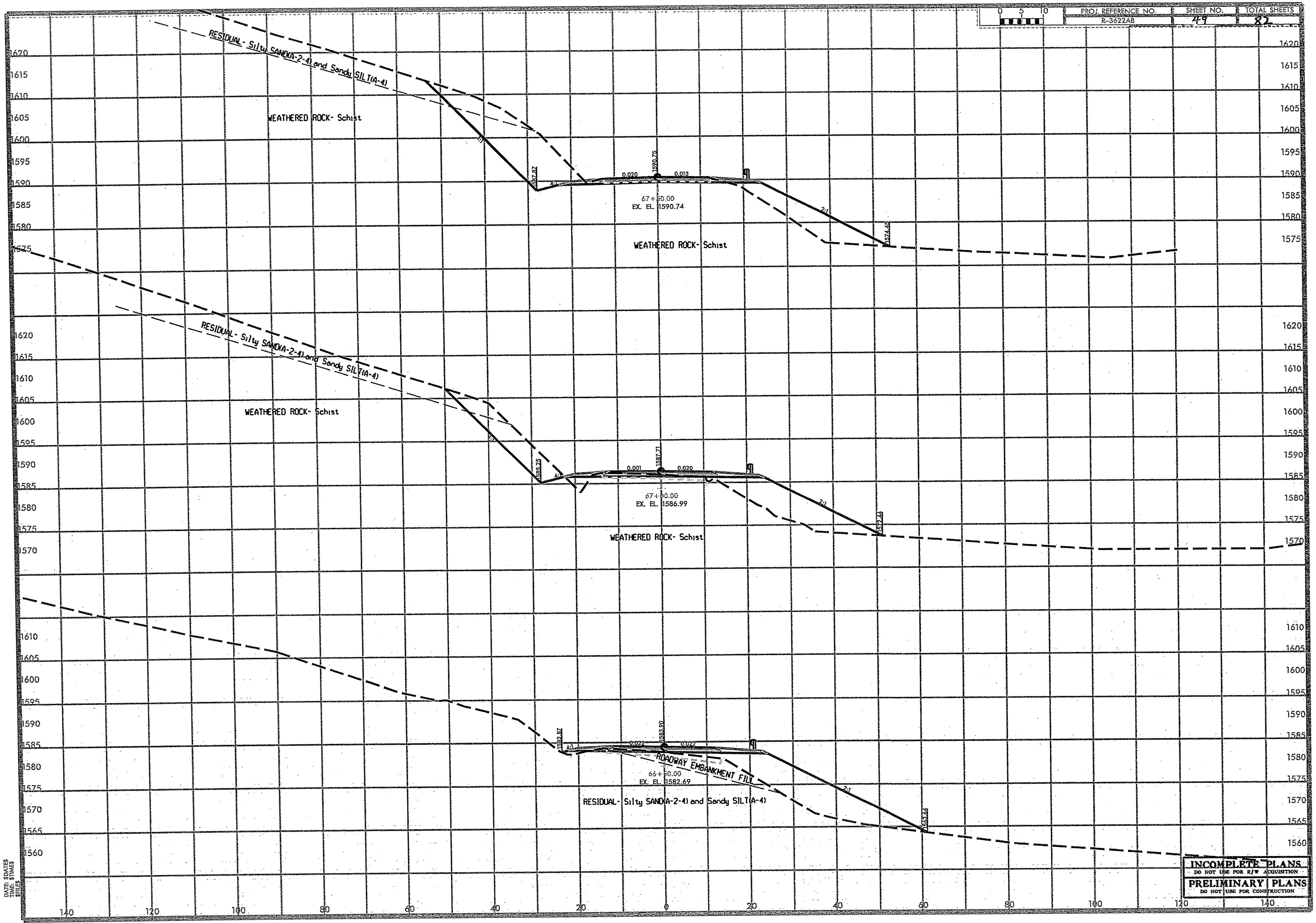
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	48	82



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

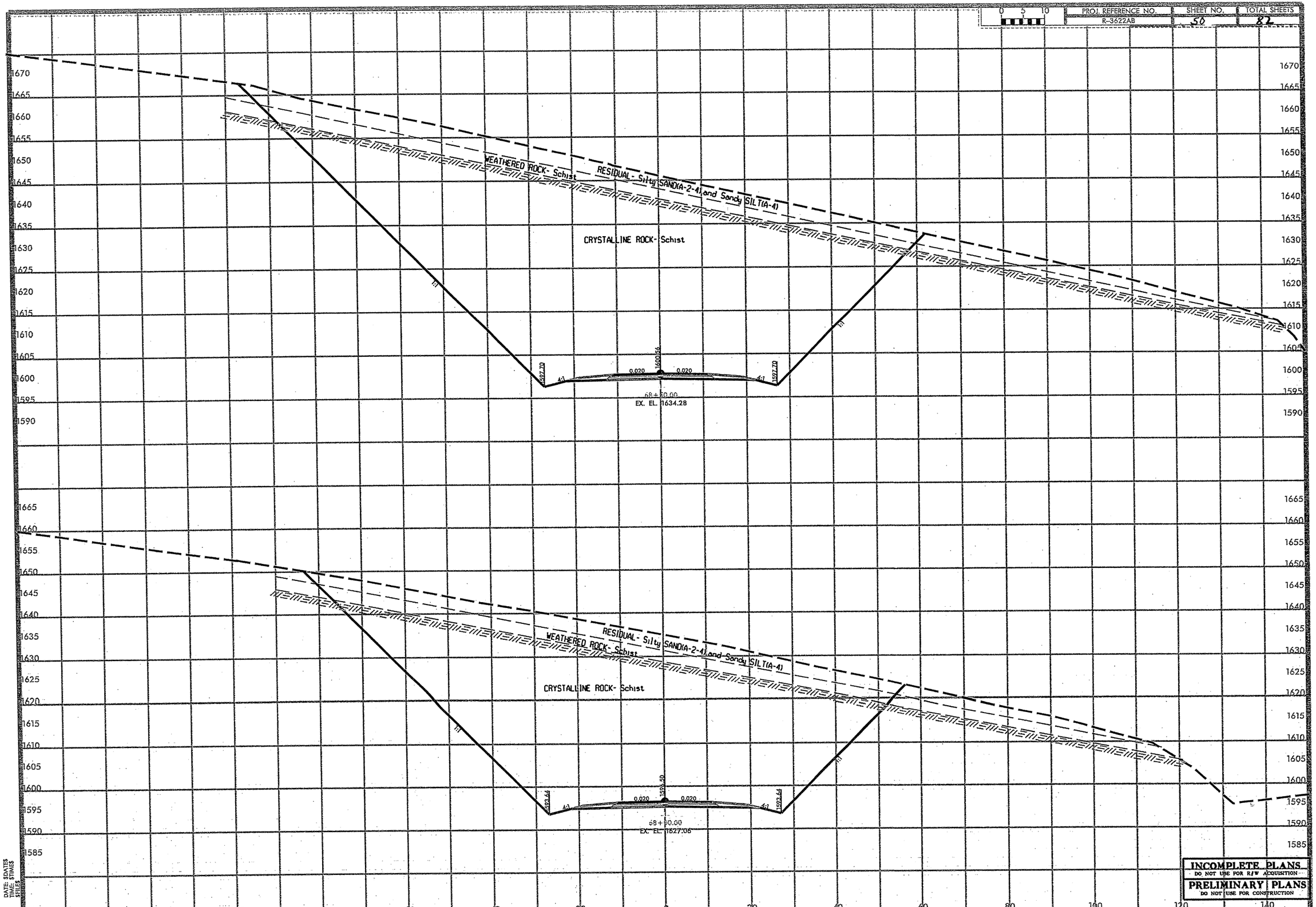
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: STATES
TIME: STIMES
SFILES



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
0.020
0.013
1590.75
1587.87
67+50.00
EX. EL. 1590.74
2:1
1574.46
WEATHERED ROCK- Schist
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
0.001
0.020
1587.71
1585.25
67+00.00
EX. EL. 1586.99
2:1
1572.44
WEATHERED ROCK- Schist
1582.87
0.022
0.022
1583.90
ROADWAY EMBANKMENT FILL
66+50.00
EX. EL. 1582.69
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
2:1
1565.82
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	56	82



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

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

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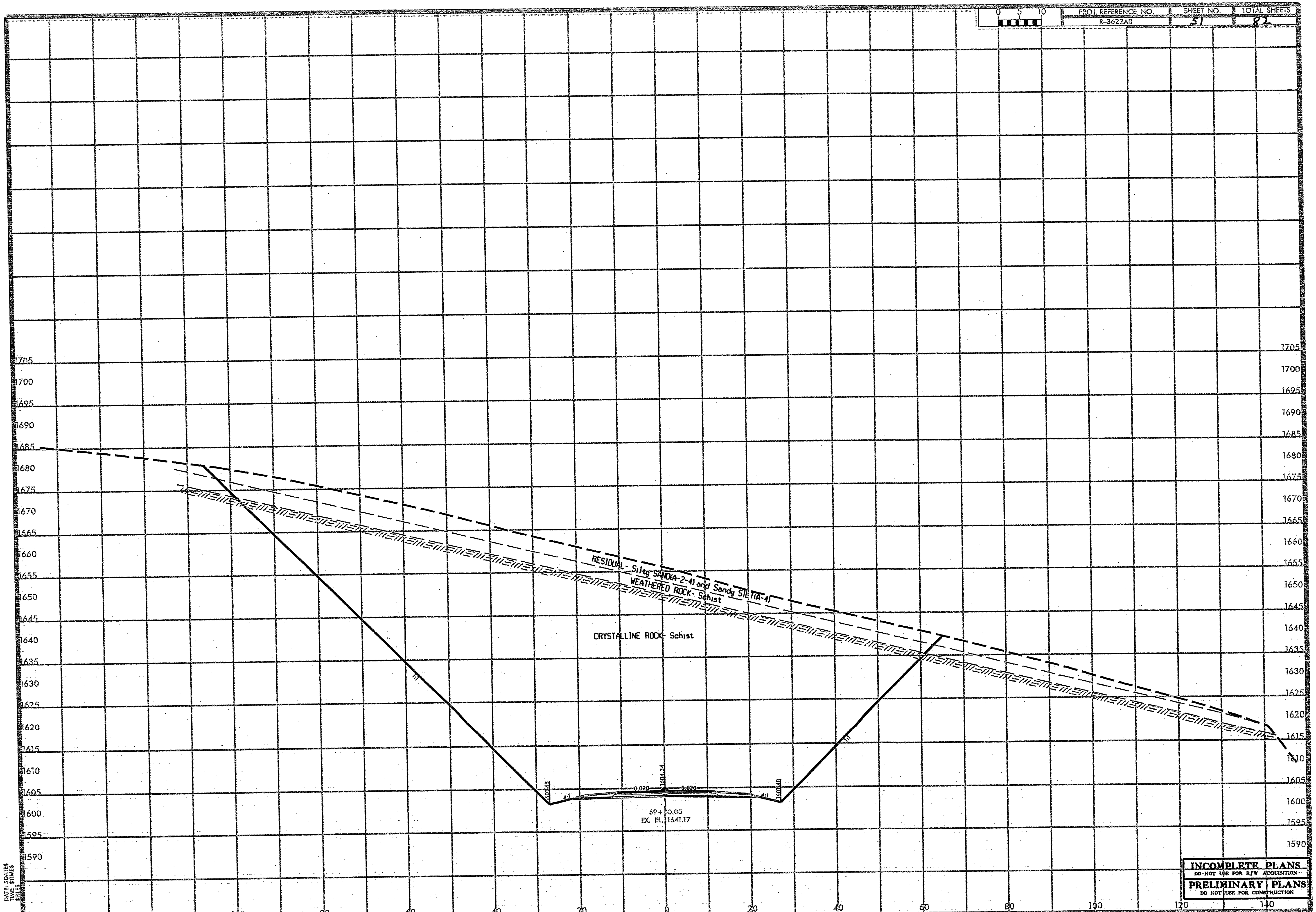
0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
51
TOTAL SHEETS
82
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1601.48
1604.34
1601.48
0.020
0.020
4:1
4:1
1:1
1:1
69+00.00
EX. EL. 1641.17
1705
1700
1695
1690
1685
1680
1675
1670
1665
1660
1655
1650
1645
1640
1635
1630
1625
1620
1615
1610
1605
1600
1595
1590
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
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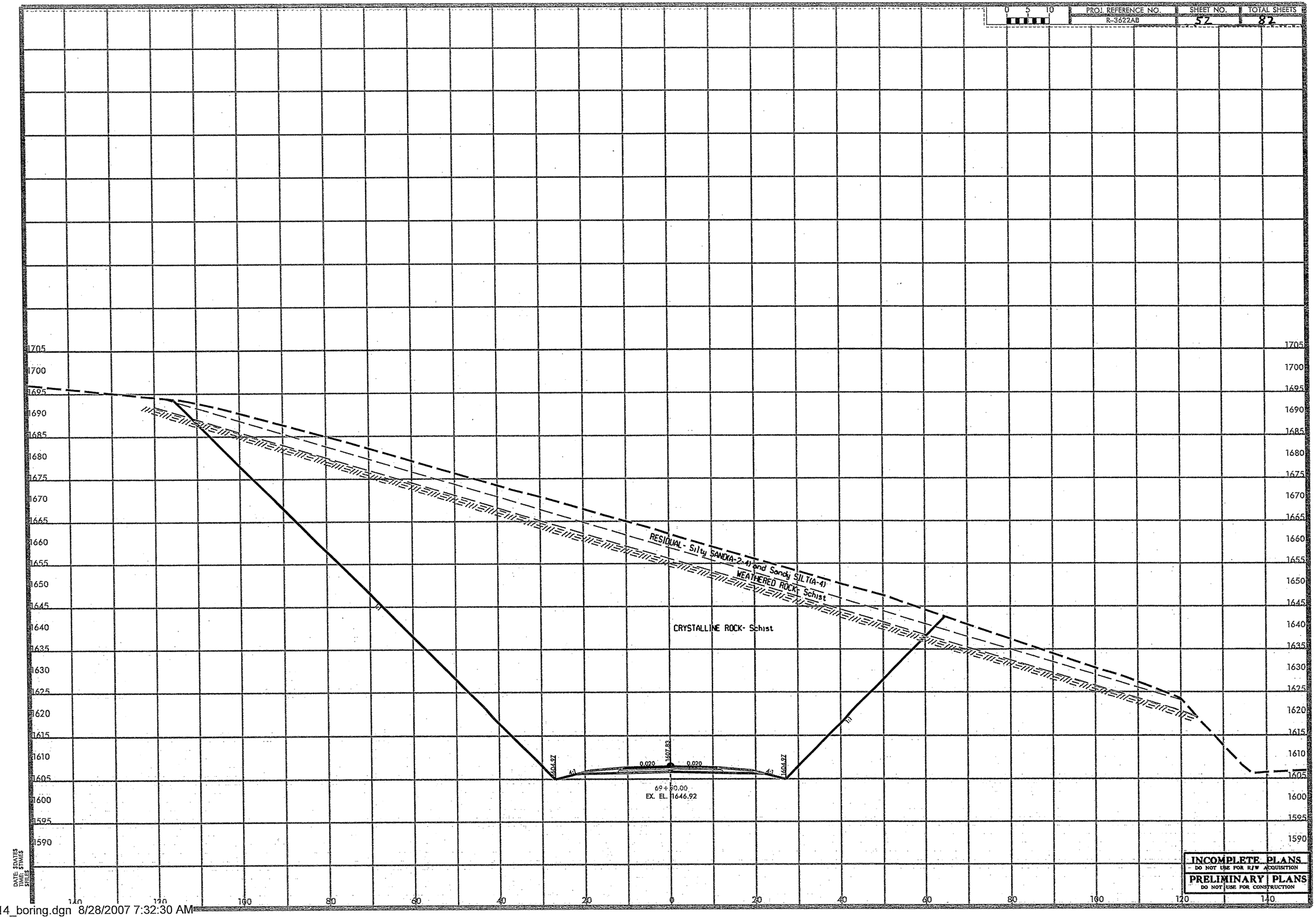
TIME: $TIME$
$FILE$

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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	52	82



DATE: $DATE$
TIME: $TIME$

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PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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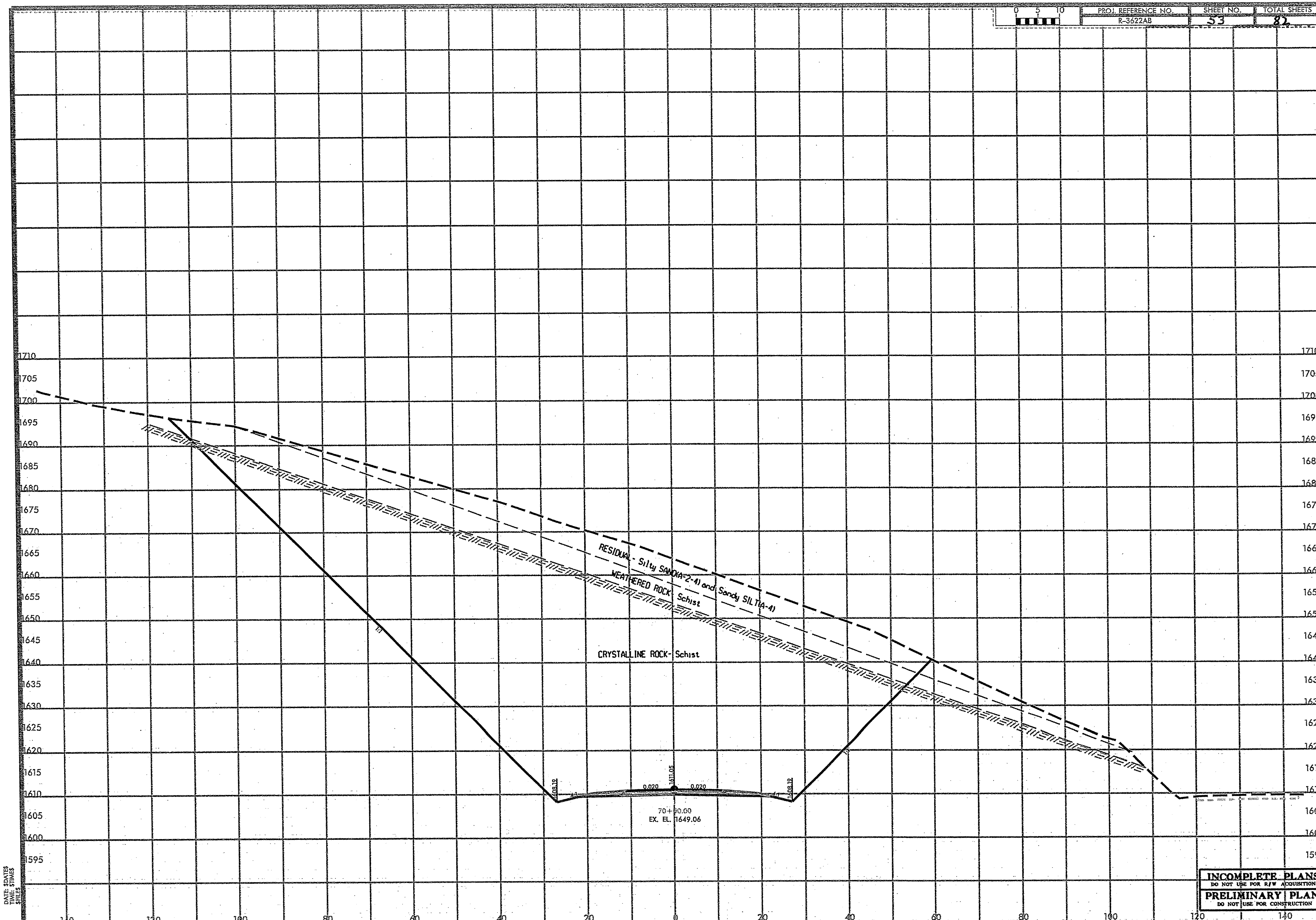
0 5 10
PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
53
TOTAL SHEETS
82
RESIDUAL - Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
1608.19
0.020
1611.05
0.020
1608.19
70+90.00
EX. EL. 1649.06
1710
1705
1700
1695
1690
1685
1680
1675
1670
1665
1660
1655
1650
1645
1640
1635
1630
1625
1620
1615
1610
1605
1600
1595
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
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DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
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TIME: $TIME$
$FILE$

\bridge 1\25014_boring.dgn 8/28/2007 7:32:15 AM

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3522AB	54	82

RESIDUAL - Silty SAND(A-2-4) and Sandy SILT(A-4)

WEATHERED ROCK - Schist

CRYSTALLINE ROCK - Schist

1611.12 4:1 0.020 1613.98 0.003 4:1 1611.46

70+50.00
EX. EL. 1655.37

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

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

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	55	82

RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

1613.77 4:1 0.020 1616.63 0.021 4:1 1614.54

71+50.00
EX. EL. 1650.57

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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

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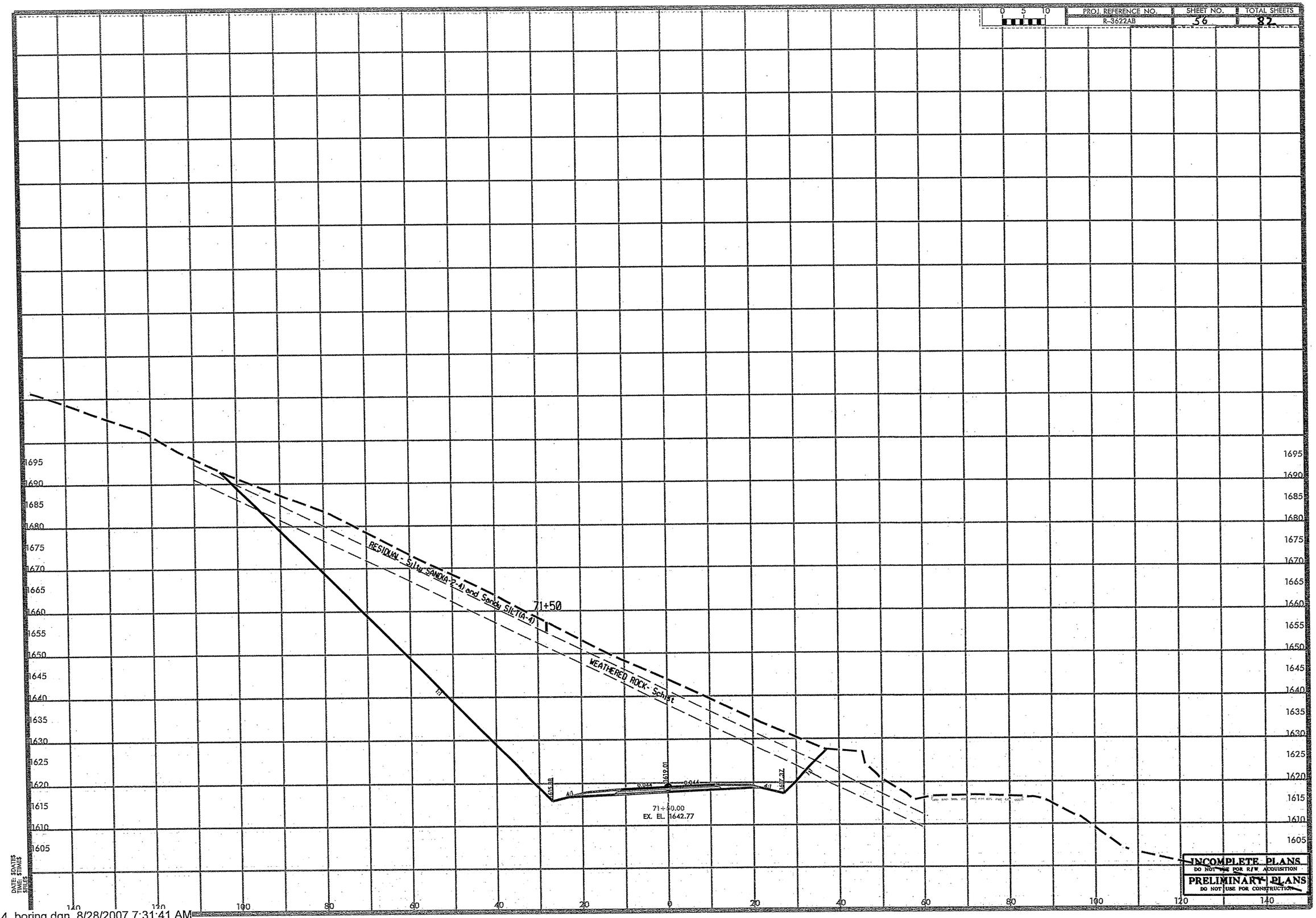
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	56	82



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DO NOT USE FOR CONSTRUCTION

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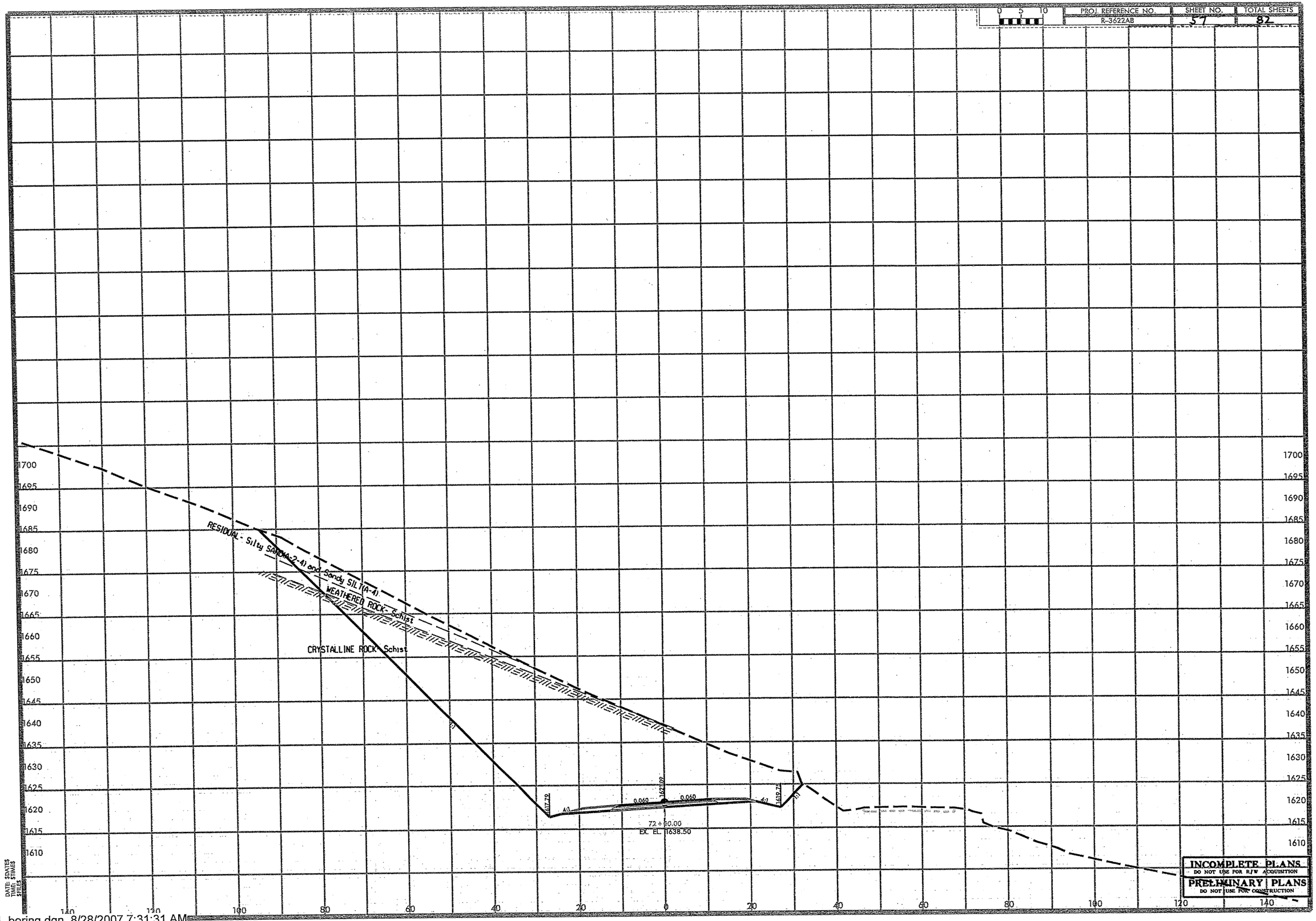
	R-3522AB	57	82



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DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 3DATES
TIMES: TIMES
USER: USER

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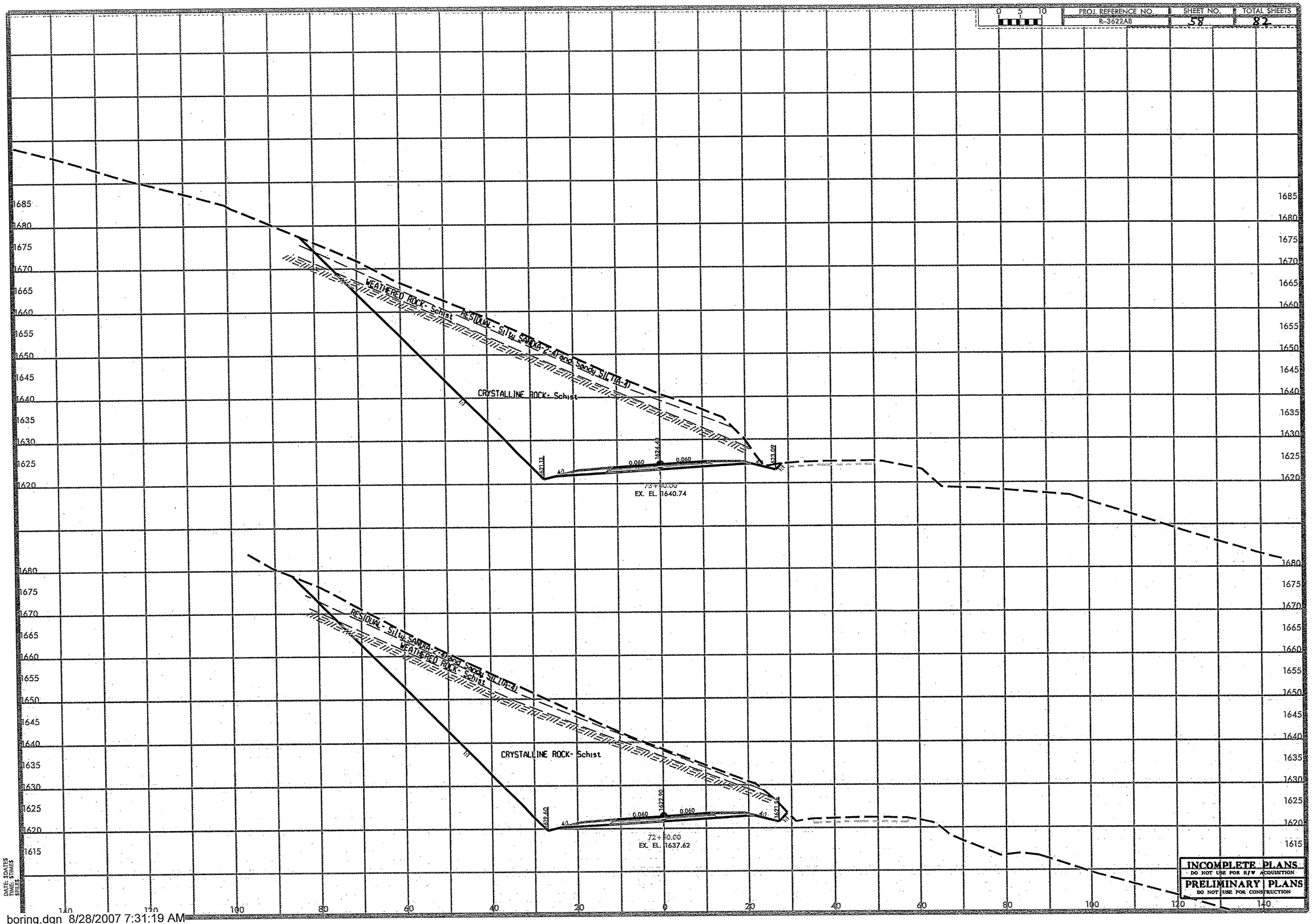
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	59	82



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

DATE: $DATE$
TIME: $TIME$
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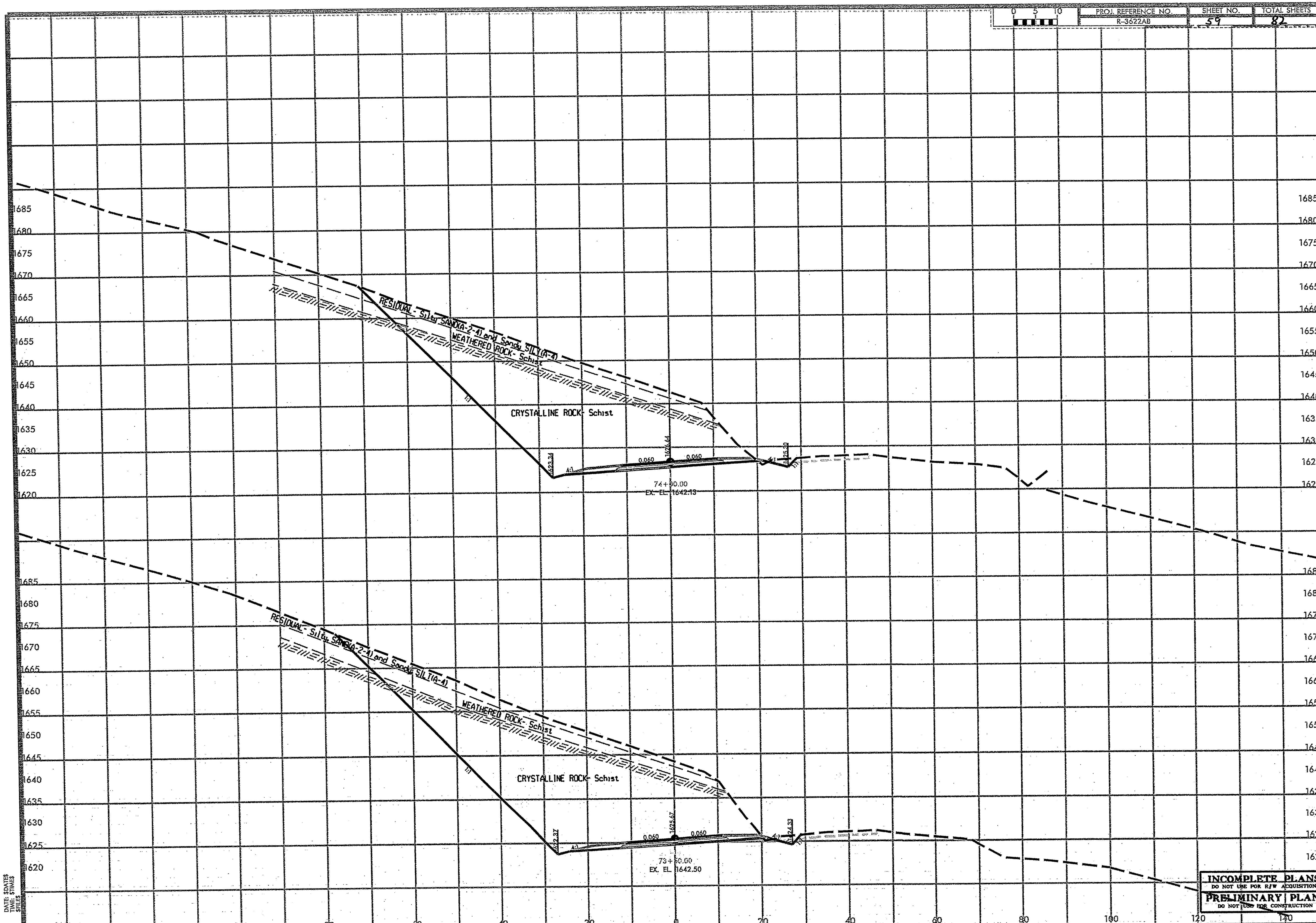
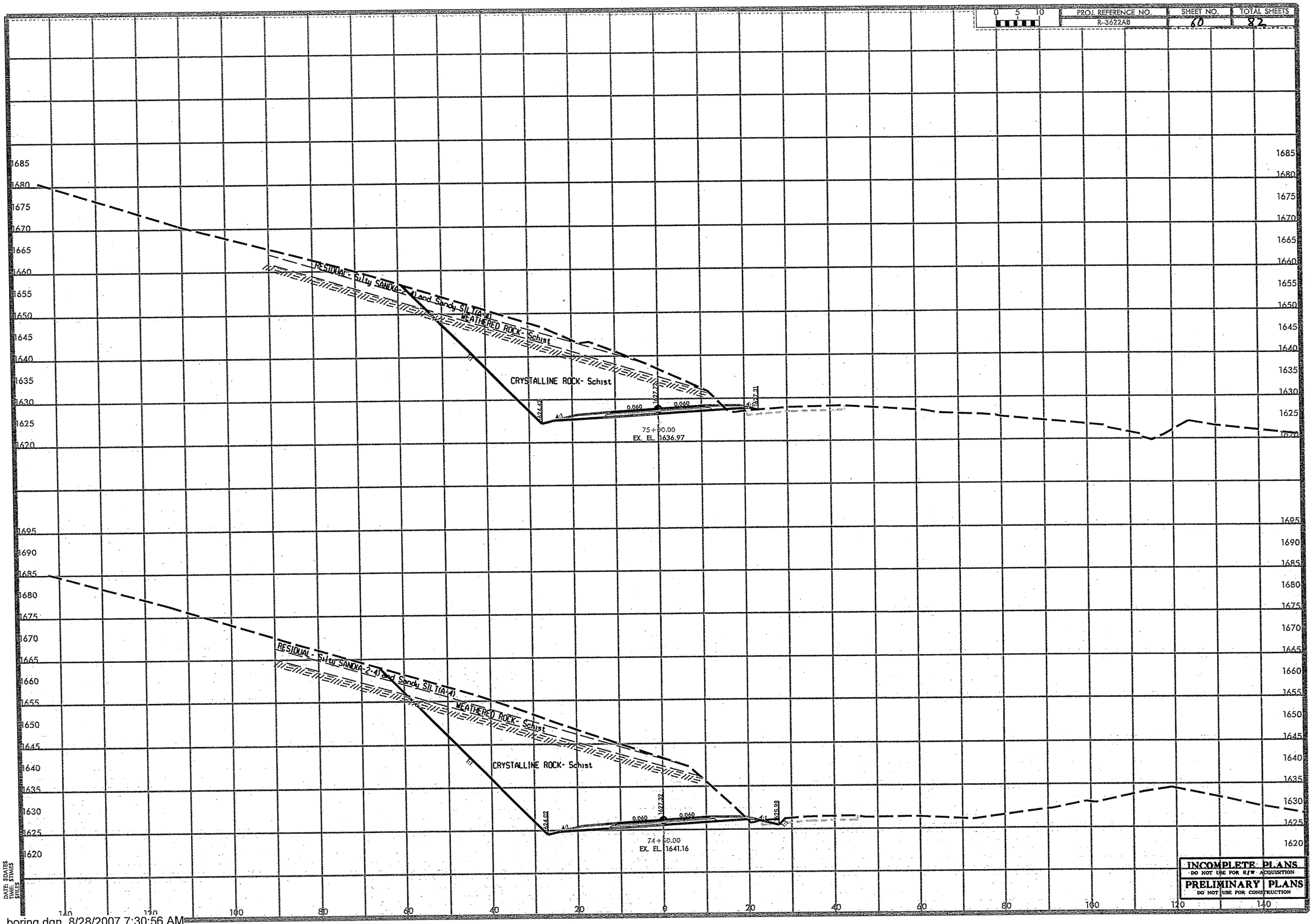


PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
59
TOTAL SHEETS
82
RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
74+00.00
EX. EL. 1642.13
73+50.00
EX. EL. 1642.50
0.060
0.060
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	60	82



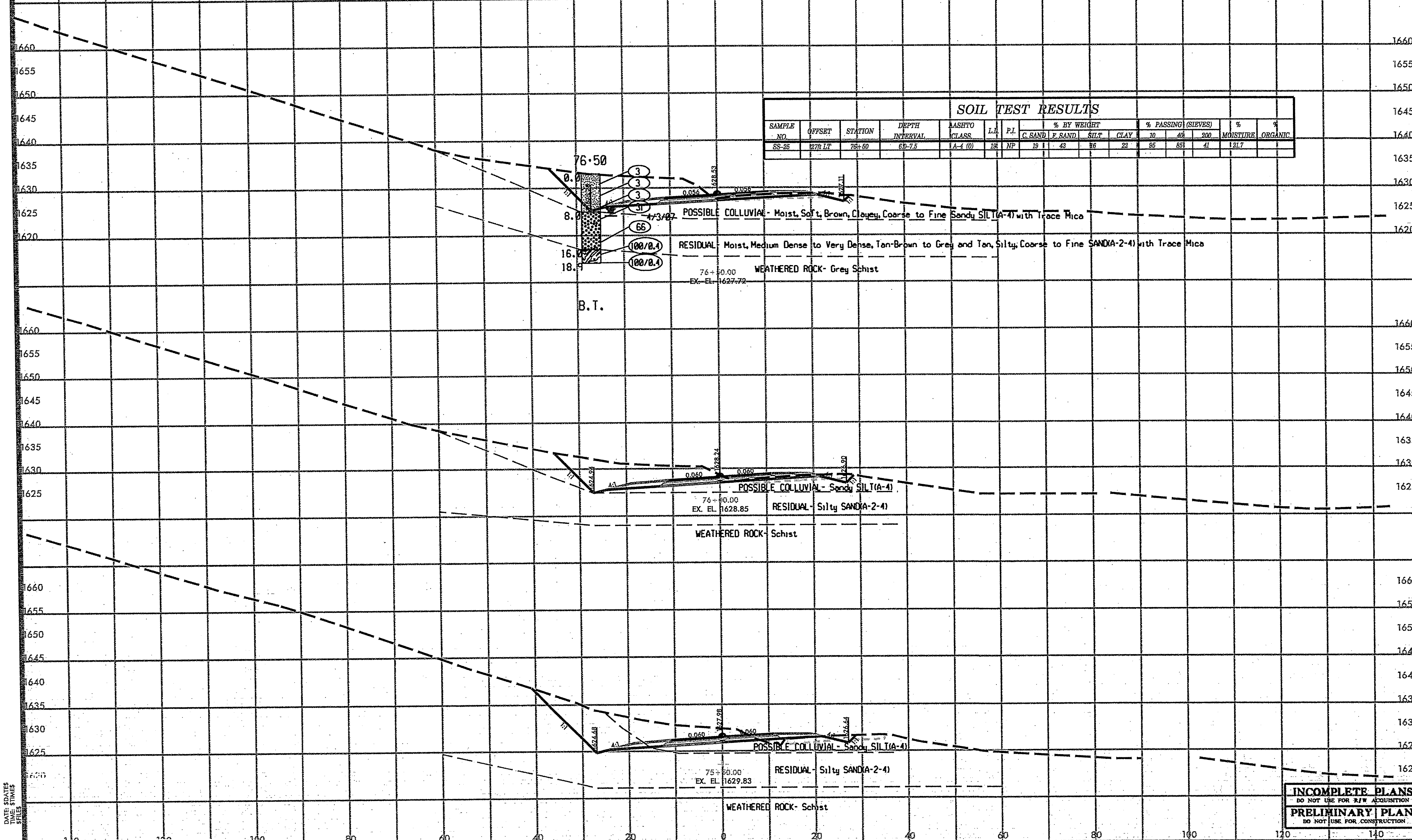
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

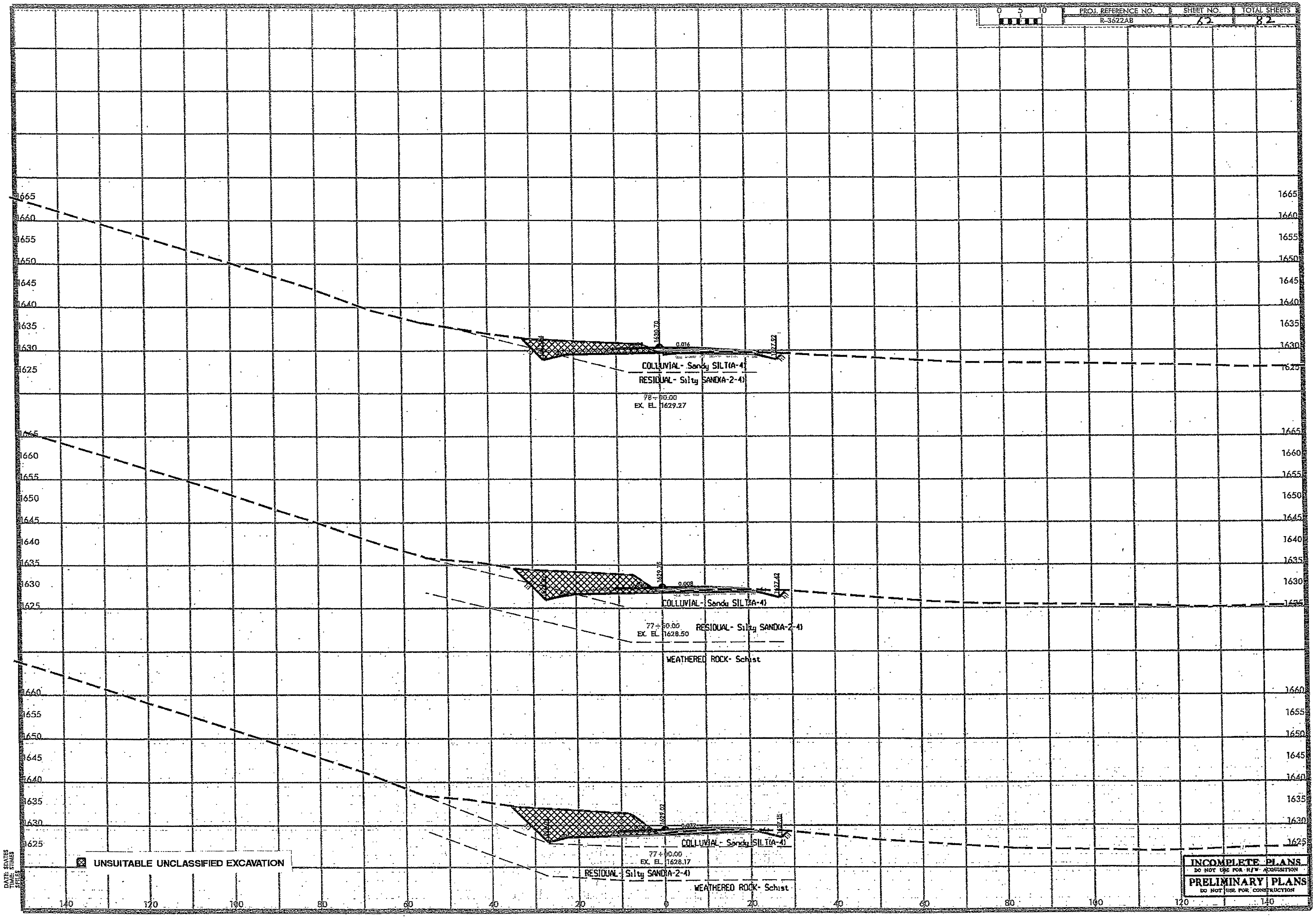
DATE: 8/24/05
DRAWN BY: S.PHILES
CHECKED BY: S.PHILES

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

SOIL TEST RESULTS

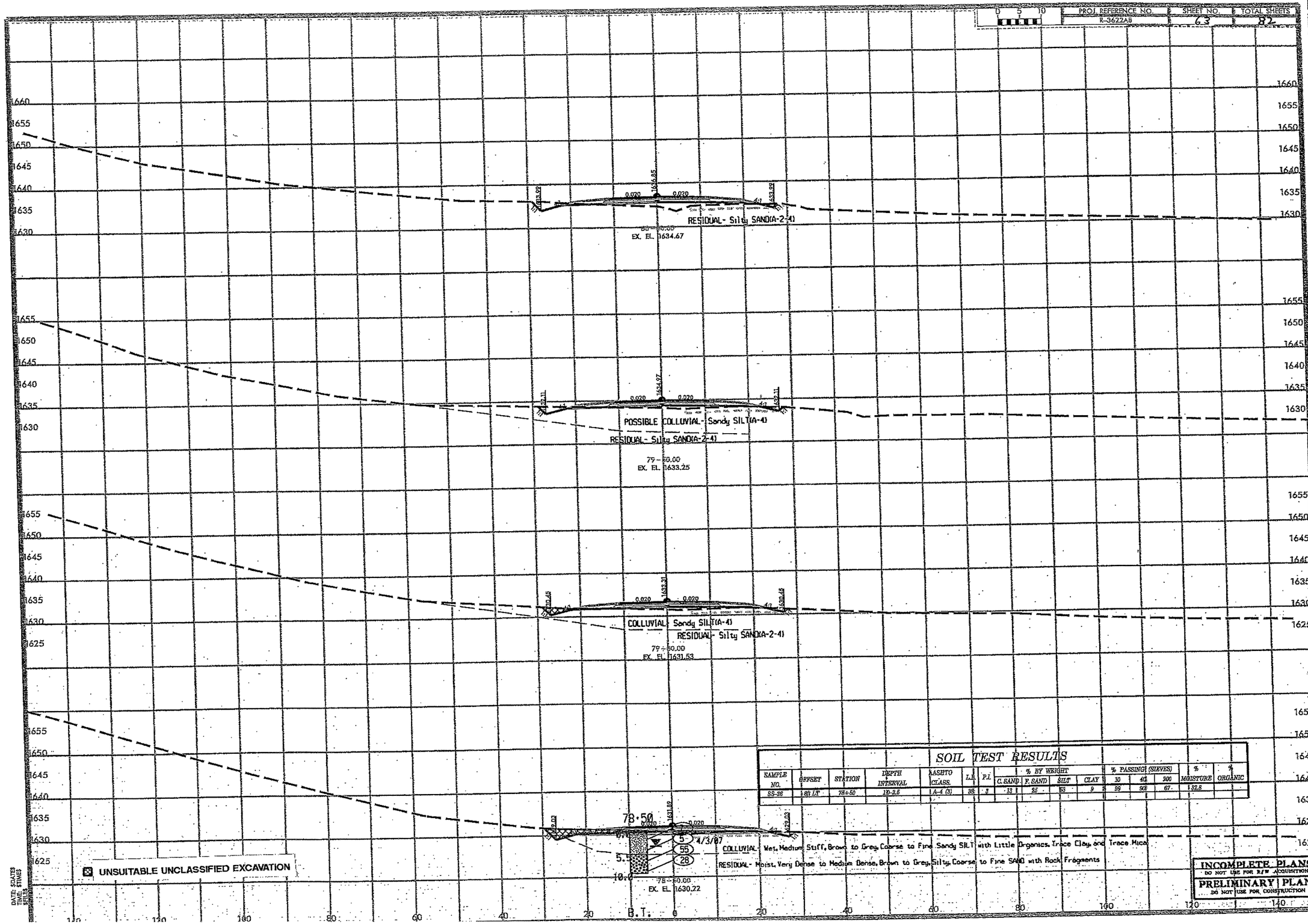
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-25	27ft LT	76+50	6.0-7.5	A-4 (0)	19	NP	19	43	16	22	95	85	41	21.7	


76·50
0.0
8.0
16.0
18.9
4/3/07
POSSIBLE COLLUVIAL- Moist, Soft, Brown, Clayey, Coarse to Fine Sandy SILT(A-4) with Trace Mica
RESIDUAL- Moist, Medium Dense to Very Dense, Tan-Brown to Grey and Tan, Silty, Coarse to Fine SAND(A-2-4) with Trace Mica
76+50.00
EX. EL. 1627.72
WEATHERED ROCK- Grey Schist
B.T.
POSSIBLE COLLUVIAL- Sandy SILT(A-4)
76+00.00
EX. EL. 1628.85
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
POSSIBLE COLLUVIAL- Sandy SILT(A-4)
75+50.00
EX. EL. 1629.83
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
62
TOTAL SHEETS
82
COLLUVIAL- Sandy SILT(A-4)
RESIDUAL- Silty SAND(A-2-4)
78+50.00
EX. EL. 1629.27
COLLUVIAL- Sandy SILT(A-4)
77+50.00
EX. EL. 1628.50
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
COLLUVIAL- Sandy SILT(A-4)
77+00.00
EX. EL. 1628.17
RESIDUAL- Silty SAND(A-2-4)
WEATHERED ROCK- Schist
UNSUITABLE UNCLASSIFIED EXCAVATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	63	82



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-26	18ft LT	78+50	10-2.6	A-4 (5)	38	3	13	25	53	9	99	90	67	32.8	

COLLUVIAL- Wet, Medium Stiff, Brown to Grey, Coarse to Fine Sandy SILT with Little Organics, Trace Clay, and Trace Mica

RESIDUAL- Moist, Very Dense to Medium Dense, Brown to Grey, Silty, Coarse to Fine SAND with Rock Fragments

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	64	82

RESIDUAL - Silty SAND(A-2-4) and Sandy SILT(A-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

1640.53 | A-1 | 0.034 | 0.034 | A-2 | 1640.64 | 1640.07

81+30.00
EX. EL. 1645.91

RESIDUAL- Silty SAND(A-2-4) and Sandy SILT(A-4)

WEATHERED ROCK- Schist

CRYSTALLINE ROCK- Schist

1638.82 | A-1 | 0.010 | A-2 | 1639.24

81+50.00
EX. EL. 1643.52

RESIDUAL- Silty SAND(A-2-4)

1636.41 | A-1 | 0.020 | 1638.97 | 0.014 | A-2 | 1636.64

80+50.00
EX. EL. 1636.67

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DATE: 5/DATES
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5/FILES

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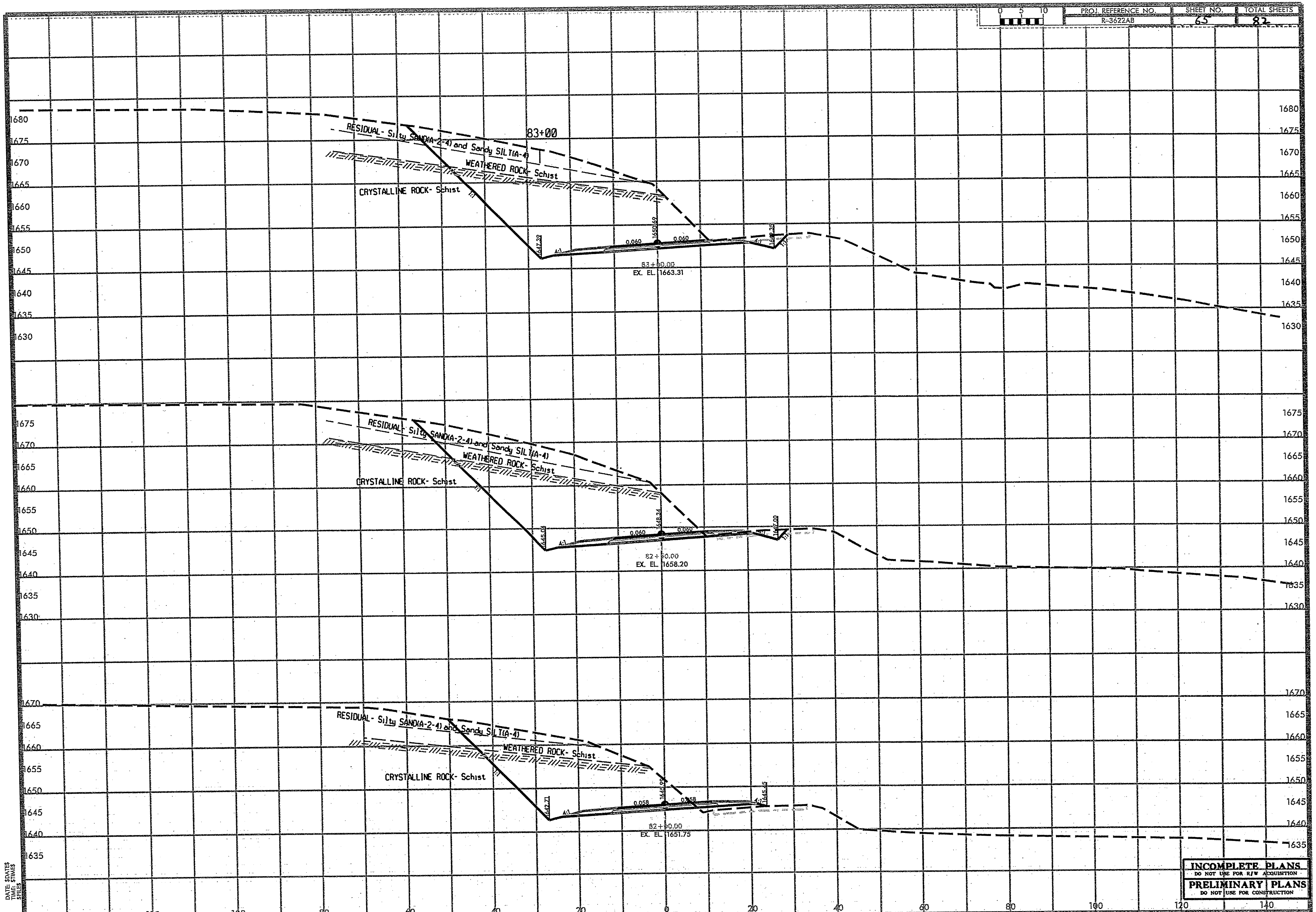

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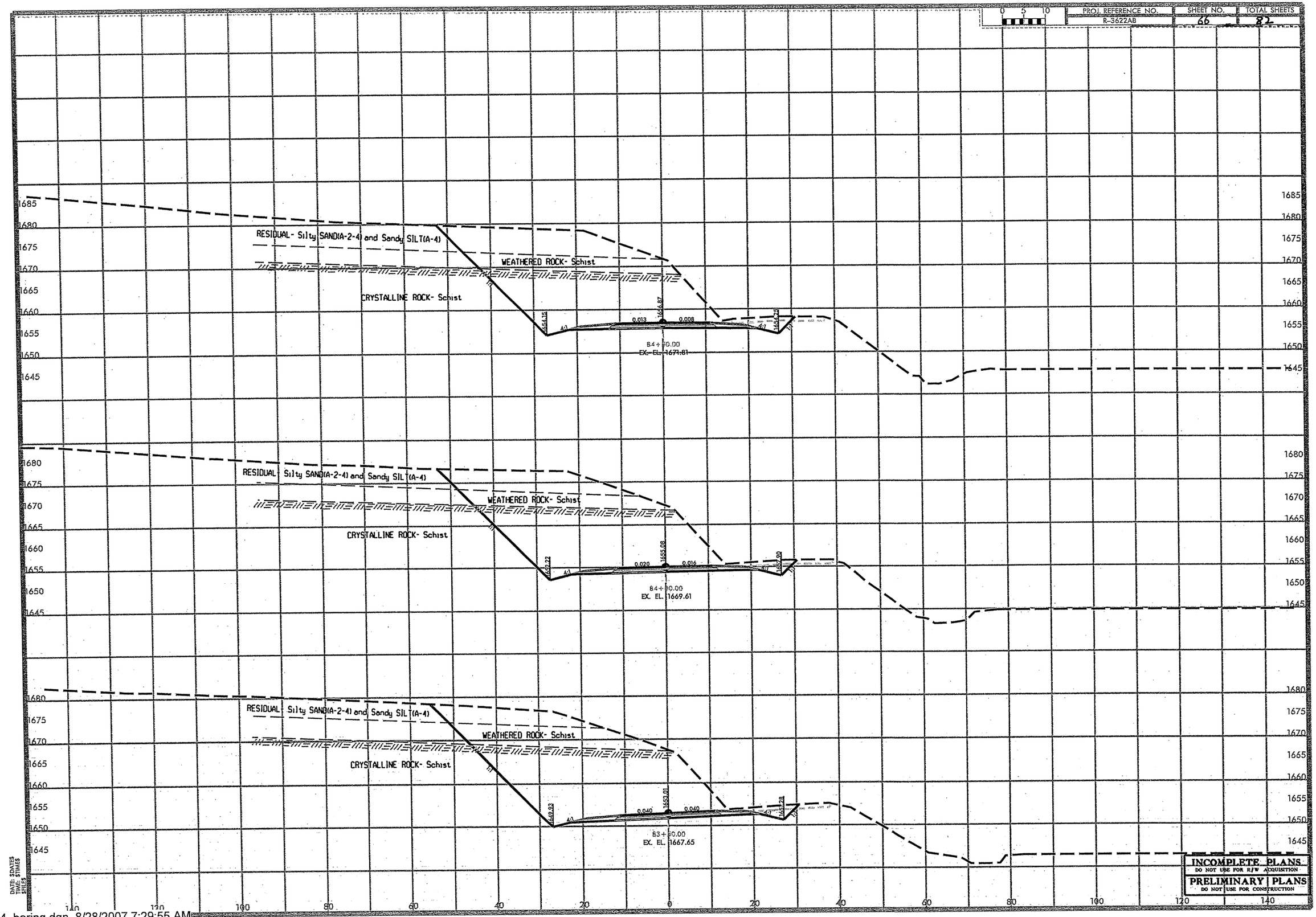
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	66	82



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

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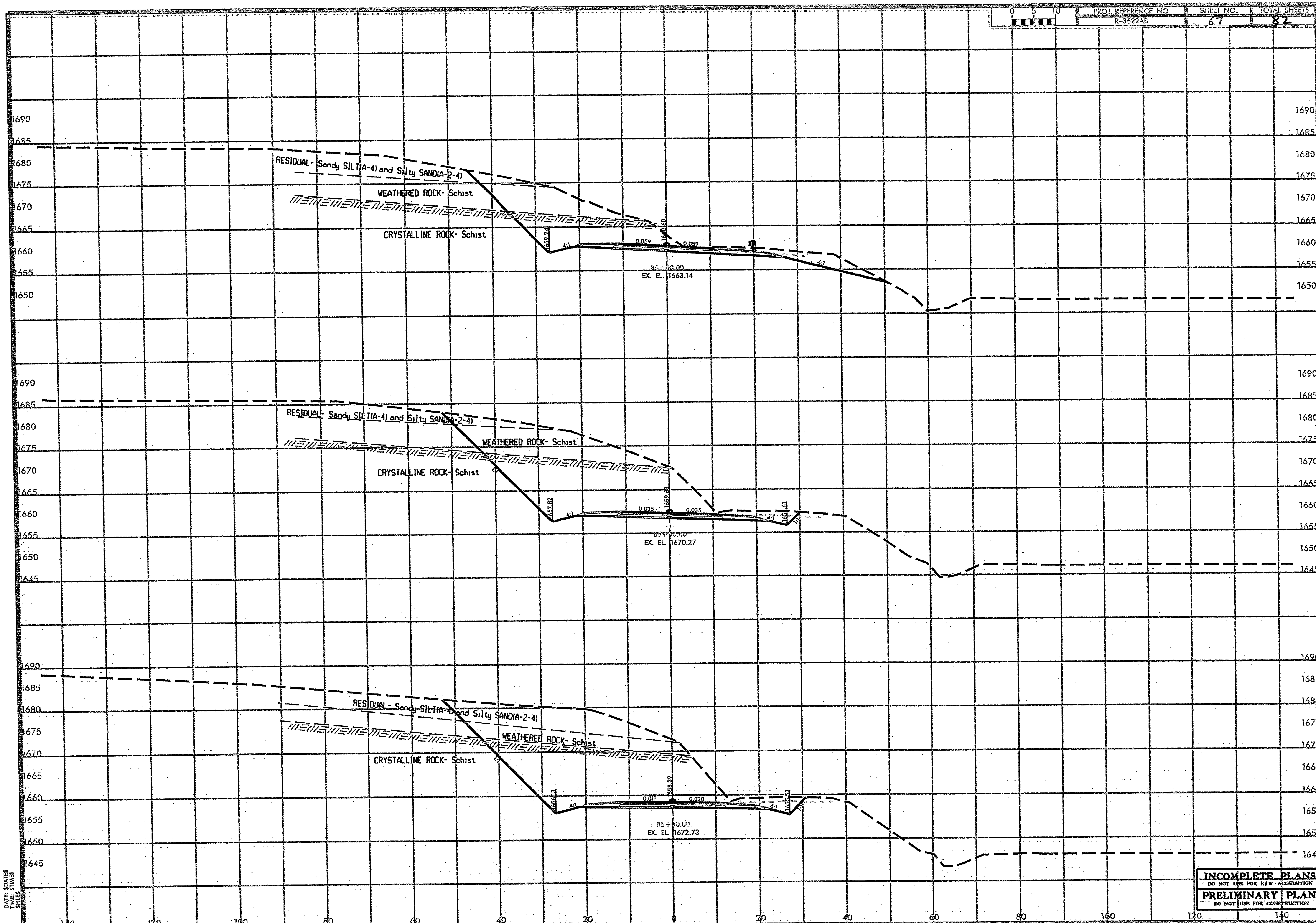
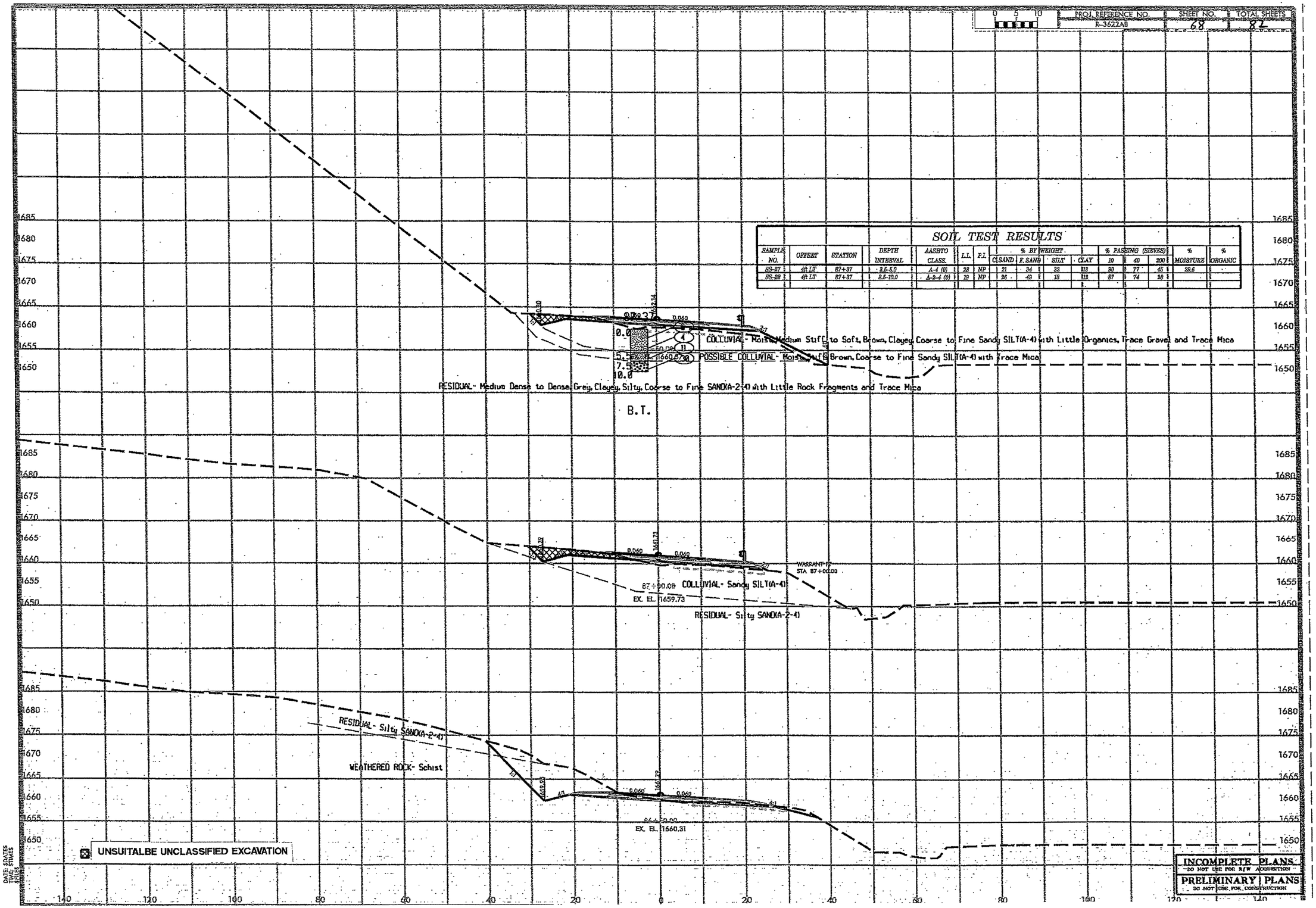

PROJ. REFERENCE NO. R-3622AB
SHEET NO. 67
TOTAL SHEETS 82
RESIDUAL- Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
86+00.00
EX. EL. 1663.14
RESIDUAL- Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
EX. EL. 1670.27
RESIDUAL- Sandy SILT(A-4) and Silty SAND(A-2-4)
WEATHERED ROCK- Schist
CRYSTALLINE ROCK- Schist
85+50.00
EX. EL. 1672.73
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

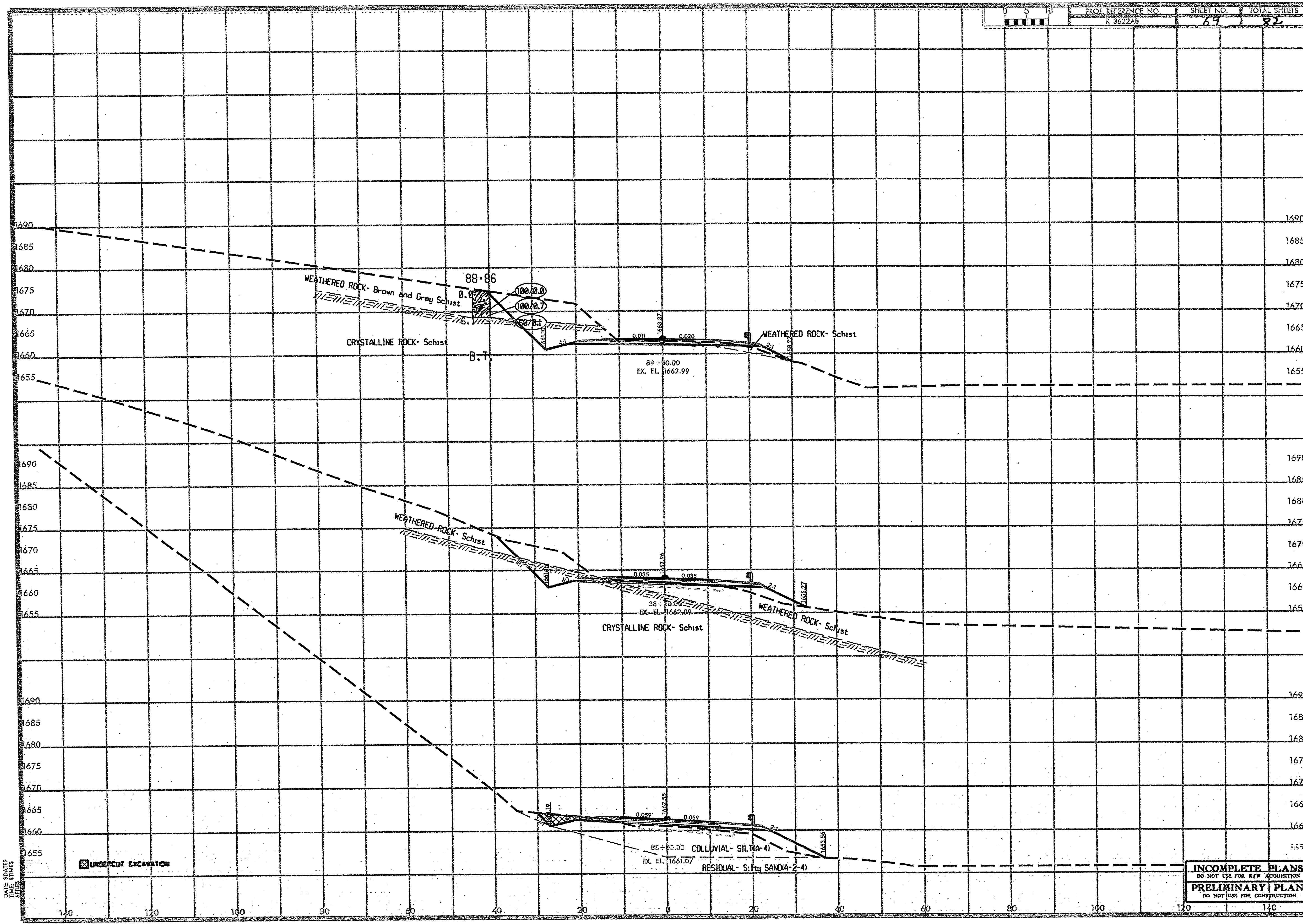
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	68	82

SOIL TEST RESULTS

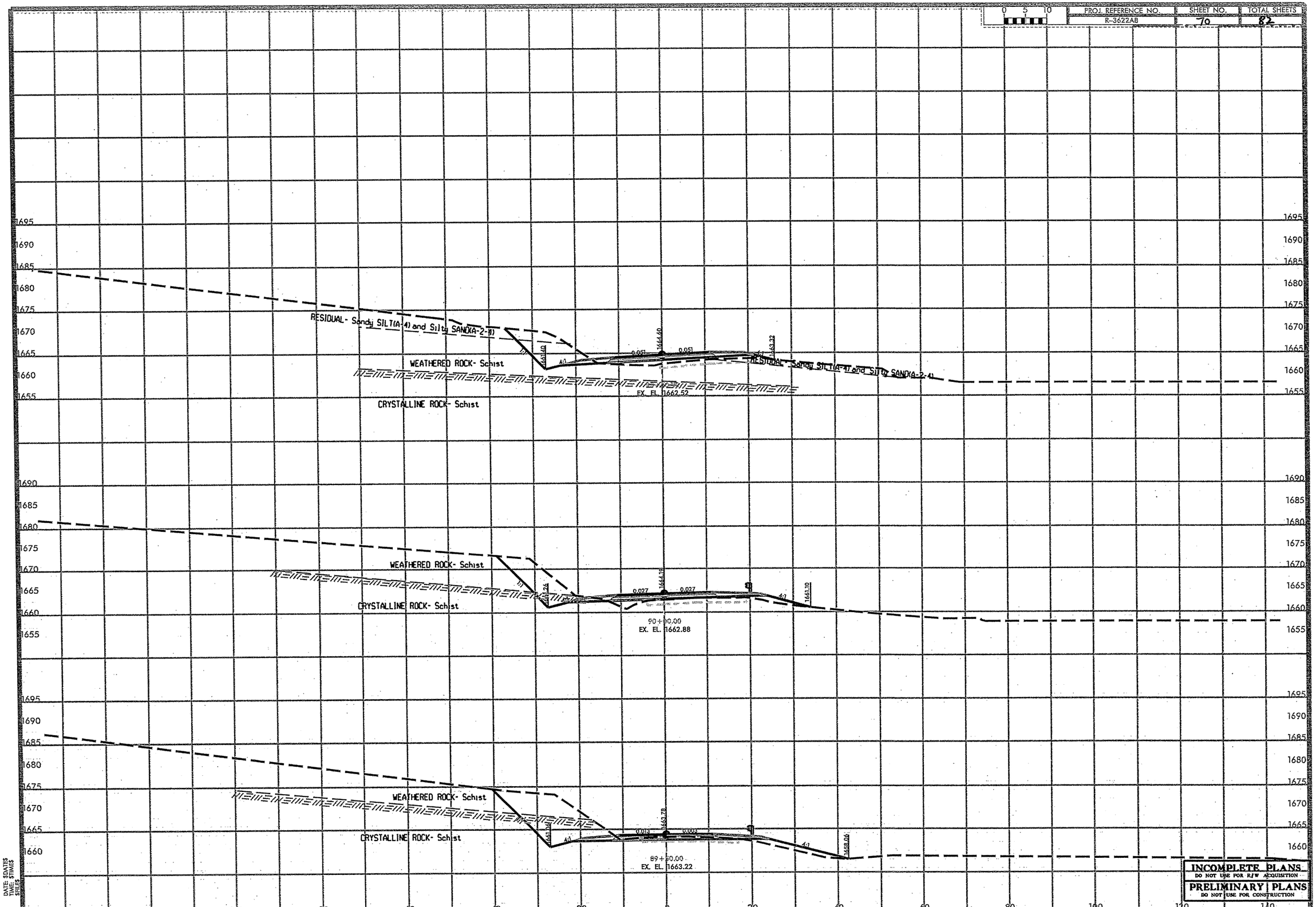
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT. C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-27	4ft LT	87+37	3.5-5.0	A-4 (0)	28	NP	21	34	32	13	90	77	45	22.6	
SS-28	4ft LT	87+37	8.5-10.0	A-2-4 (0)	19	NP	26	49	18	13	87	74	28		



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


PROJ. REFERENCE NO.
R-3622AB
SHEET NO.
69
TOTAL SHEETS
82
WEATHERED ROCK- Brown and Grey Schist
88+86
100/0.0
100/0.7
60/0.1
CRYSTALLINE ROCK- Schist
B.T.
WEATHERED ROCK- Schist
89+00.00
EX. EL. 1662.99
WEATHERED ROCK- Schist
88+50.00
EX. EL. 1662.09
CRYSTALLINE ROCK- Schist
WEATHERED ROCK- Schist
88+00.00
EX. EL. 1661.07
COLLUVIAL- SILT(A-4)
RESIDUAL- Silty SAND(A-2-4)
UNDERCUT EXCAVATION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	70	82



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

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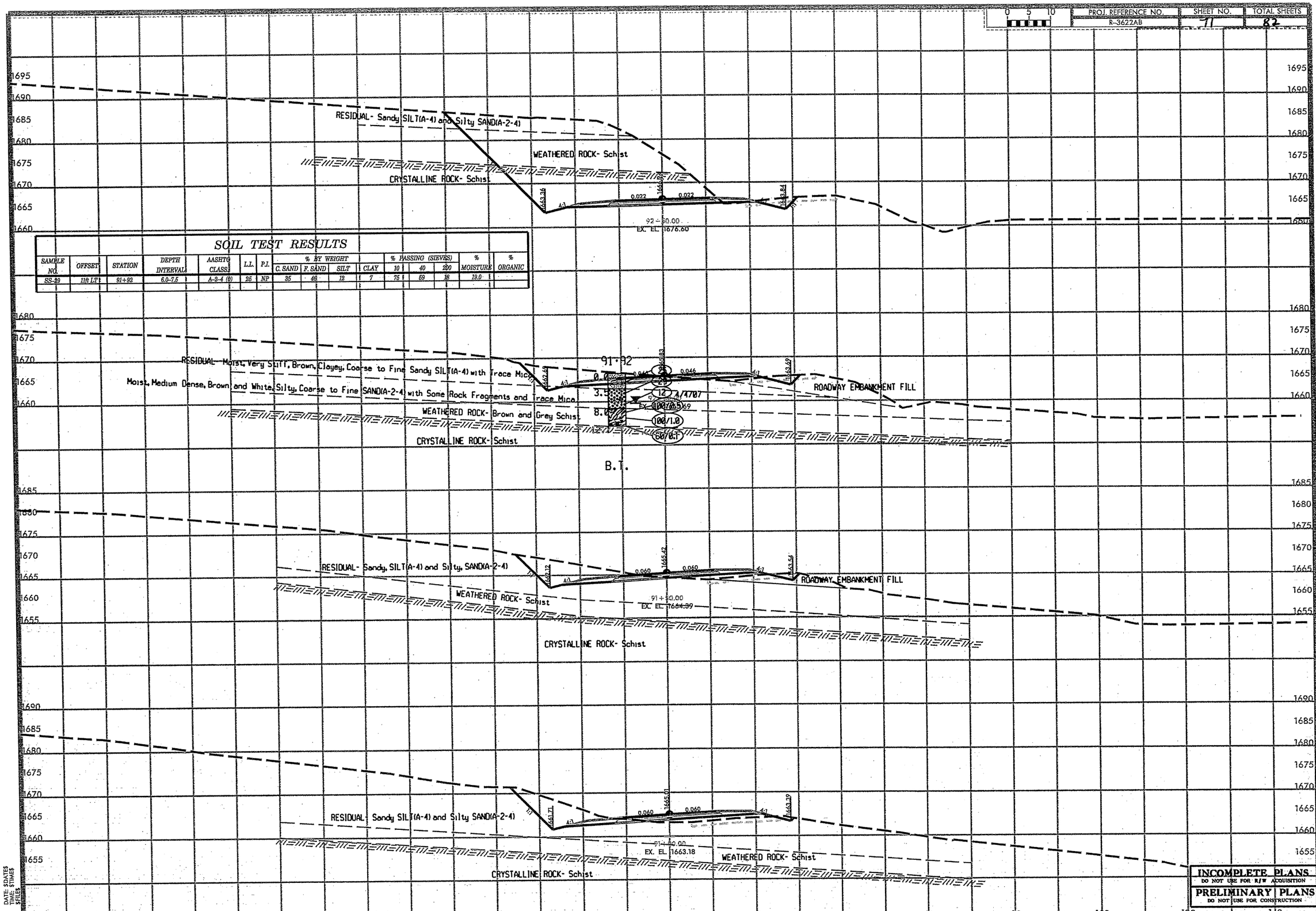
PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
R-3622AB	11	82

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-29	11ft LT	91+92	6.0-7.5	A-2-4 (0)	26	NP	35	46	12	7	75	69	18	19.0	



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DO NOT USE FOR R/W ACQUISITION
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DO NOT USE FOR CONSTRUCTION

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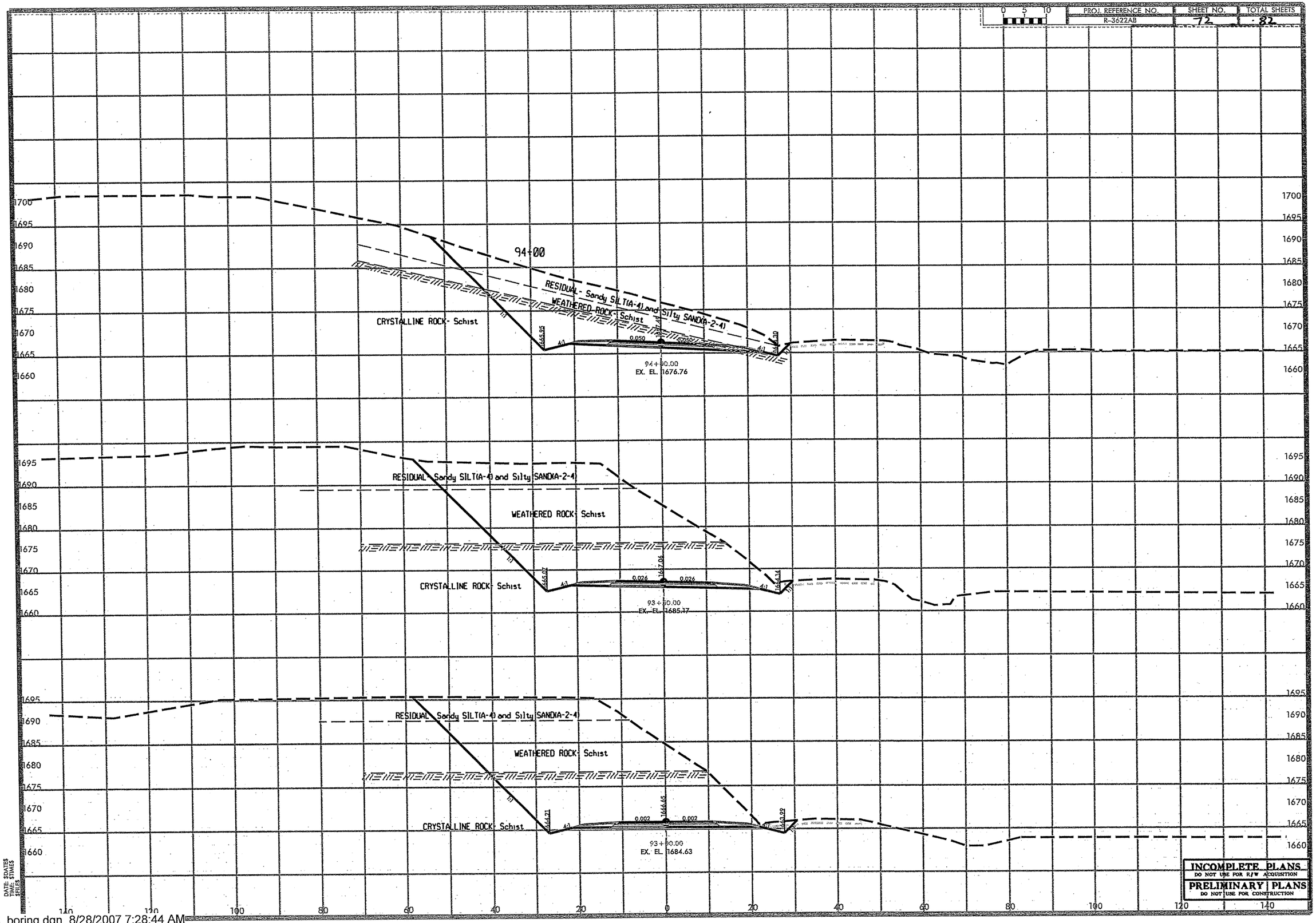
0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	72	82



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DO NOT USE FOR R/W ACQUISITION
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DO NOT USE FOR CONSTRUCTION

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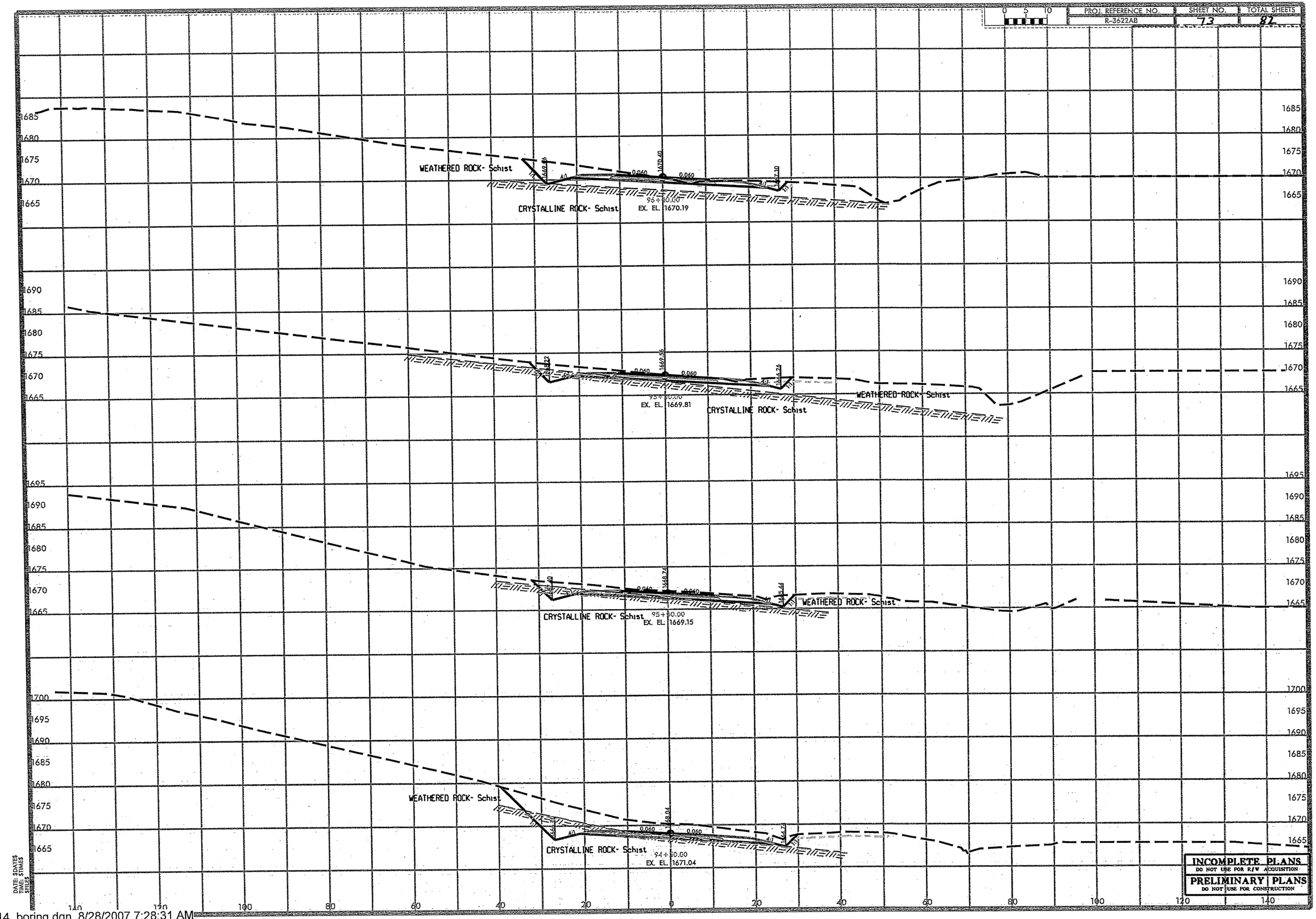
	R-3622AB	73	82



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WEATHERED ROCK- Schist

1672.42 1673.76 0.060 0.060 2.3:1

EX. EL. 1673.36

CRYSTALLINE ROCK- Schist

WEATHERED ROCK- Schist

1669.58 1672.92 0.060 0.060 3:1

97+60.00
EX. EL. 1672.07

CRYSTALLINE ROCK- Schist

97+00

RESIDUAL- Moist, Dense, Grey and Brown, Silty, Fine SAND(A-2-4) with Trace Mica

WEATHERED ROCK- Brown and Grey

WEATHERED ROCK- Brown and Grey Schist

100/0.8 50/0.3 85 50/0.3 50/0.0

B.T.

1670.24 1672.08 0.060 0.060 3:1

97+00.00
EX. EL. 1671.09

CRYSTALLINE ROCK- Schist

96+68

WEATHERED ROCK- Brown and Grey Schist

50/0.1

B.T.

1669.90 1672.24 0.060 0.060 3:1 1667.94

96+50.00
EX. EL. 1670.20

CRYSTALLINE ROCK- Schist

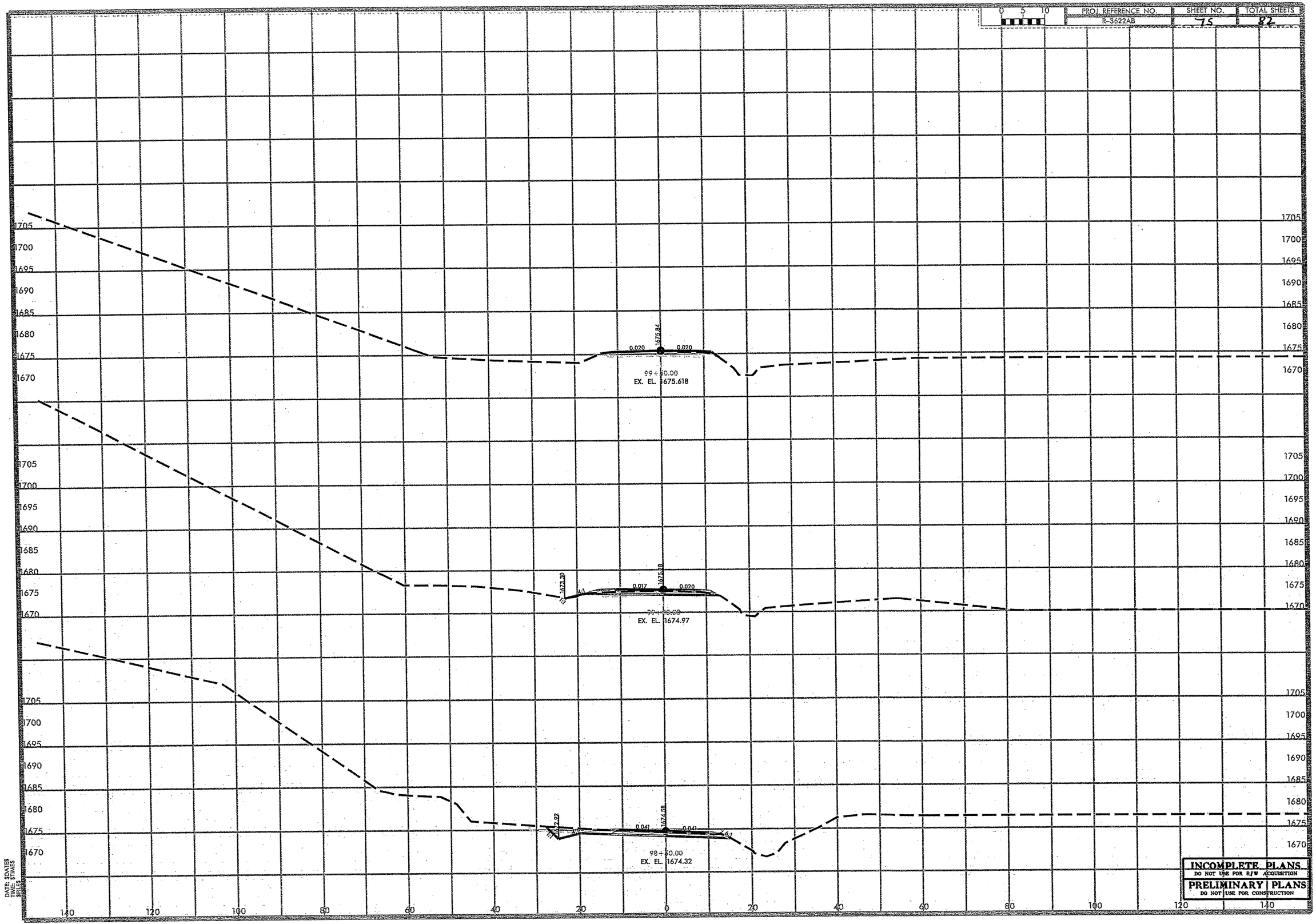
1705 1700 1695 1690 1685 1680 1675 1670 1665

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

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

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

0 5 10	PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	R-3622AB	75	82



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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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
1542.7										Begin Coring @ 14.3 ft
1542.7	14.3	2.7	4:30	(0.9) 33%	(0.0) 0%		(0.0) 0%	(0.0) 0%		WEATHERED ROCK: Metasandstone
1540.0	17.0		6:45				(0.9) 90%			CRYSTALLINE ROCK: Grey with White, Slightly Weathered, Hard, Metasandstone with Very Close Fracture Spacing
1538.5	18.5		5:45/0.7							WEATHERED ROCK: Metasandstone
1537.5	19.5	1.0	9:25	(0.5) 50%	(0.0) 0%		(0.0) 0%	(0.0) 0%		CRYSTALLINE ROCK: Grey and Brown, Moderately Weathered, Moderately Hard Garnet-Mica Schist with Very Close Fracture Spacing
							(0.5) 71%			WEATHERED ROCK: Tan and Grey Garnet-Mica Schist
										Boring Terminated at Elevation 1532.7 ft. in Weathered Rock: Garnet-Mica Schist

N=100/1.0

N=46/0.3

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		

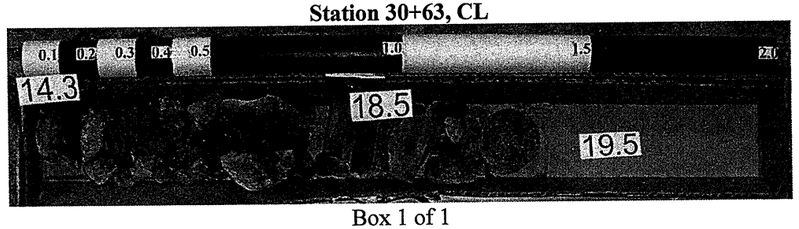
ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
1549										Begin Coring @ 9.0 ft
1549.0	9.0	3.7	1:15	(2.7) 73%	(2.0) 54%		(0.0) 0%	(0.0) 0%		WEATHERED ROCK: Metagraywacke Schist
1545.3	12.7		7:05				(0.5) 100%			CRYSTALLINE ROCK: Grey, Moderately Weathered, Moderately Hard Metagraywacke Schist with Very Close Fracture Spacing
		5.0	6:15				(14.5) 100%	(13.1) 90%		CRYSTALLINE ROCK: Grey, Slightly to Very Slightly Weathered, Moderately Hard to Hard Metagraywacke Schist With Close to Moderately Close Fracture Spacing
			3:15/0.7	(5.0) 100%	(4.7) 94%					
1540.3	17.7		4:25							Majority of Joints at 20° to 30°
			5:00							2 Joints at 60° to 70°
			5:05							
			5:10							
		5.0	5:45	(5.0) 100%	(4.3) 86%					
1535.3	22.7		5:30							
			4:15							
			6:30							
			5:30							
		2.3	5:00	(2.3) 100%	(2.1) 91%					
1533.0	25.0		4:55							
			4:50							
			1:55/0.3							
										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



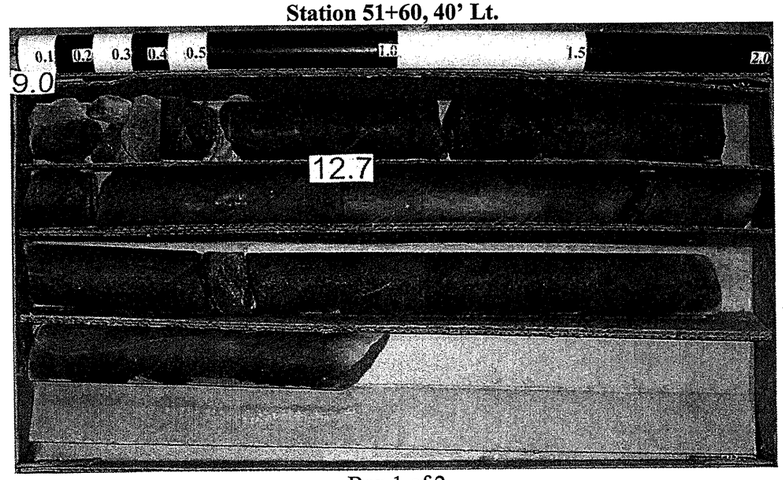
Box 1 of 1

(SCALE = 1:4)

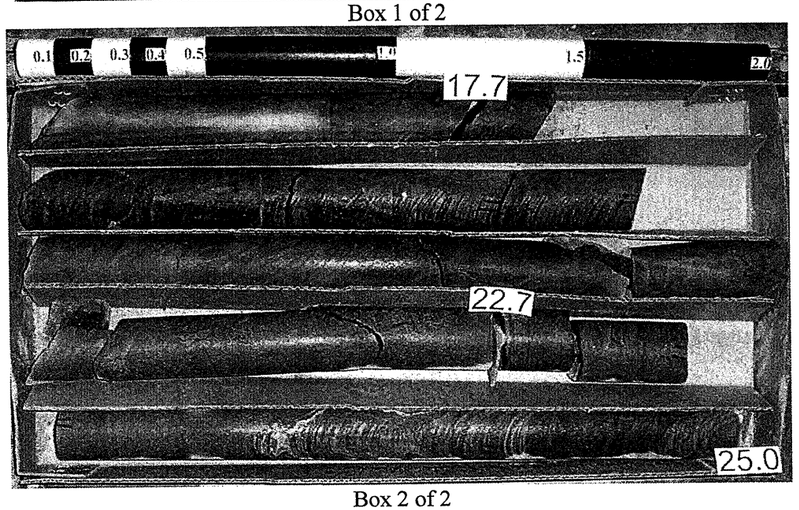
CORE PHOTOGRAPHS

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.		

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) 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		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) From	Depth (Feet) To	*Elev. (Feet) From	*Elev. (Feet) To	Soil Description	Depth	Blows per Foot
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) 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	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	W.O.H.	W.O.H.	W.O.H.	W.O.H.
	4.0		1526.2						
				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) 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	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) From	Depth (Feet) To	*Elev. (Feet) From	*Elev. (Feet) To	Soil Description	Depth	Blows per Foot
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) From	Depth (Feet) To	*Elev. (Feet) From	*Elev. (Feet) To	Soil Description	Depth	Blows per Foot
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.		

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.		