

PRELIMINARY DESIGN REPORT

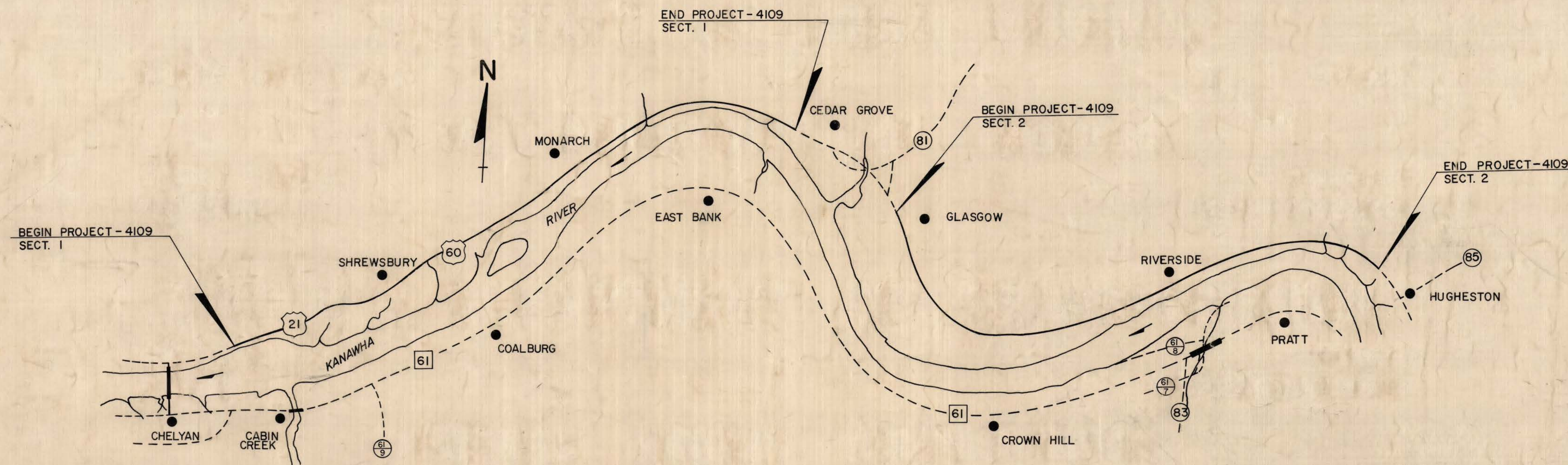
U. S. Routes 60 and 21

CHELYAN BRIDGE TO HUGHESTON

PROJECT NO. 4109

KANAWHA COUNTY

State Project 320-60-32.70



1971

prepared by,
VTH Inc.
Charleston, West Virginia

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	2	68

INDEX OF SHEETS

NUMBER	DESCRIPTION
1	COVER SHEET
2	INDEX OF SHEETS
3-5	TEXT
6-10	TYPICAL SECTION DETAILS
11-12	MISCELLANEOUS DETAILS
13-14	TRAFFIC SKETCH MAPS
15-16	ESTIMATED CONSTRUCTION COST
17-18	SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS
19-20	MASS DIAGRAMS
21-24	PLANS- RECOMMENDED LINE-SECTION I
25-27	PROFILE-RECOMMENDED LINE SECTION I
28-31	PLANS- RECOMMENDED LINE-SECTION II
32-35	PROFILE-RECOMMENDED LINE-SECTION II
36-39	PLANS- ALTERNATE STUDY LINE-SECTION I
40-43	PLANS- ALTERNATE STUDY LINE-SECTION II
44-47	RIGHT OF WAY PLANS-SECTION I
48-51	OWNERSHIP INDEX-SECTION I
52-55	RIGHT OF WAY PLANS-SECTION II
56-60	OWNERSHIP INDEX-SECTION II
61-64	UTILITIES-SECTION I
65-68	UTILITIES SECTION II

				THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA			
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INTRODUCTION

PRESENTED IN THIS REPORT ARE THE RESULTS OF A LINE LOCATION STUDY FOR THE UPGRADING OF U.S. ROUTE 60 AND U.S. ROUTE 21 TO A FOUR-LANE HIGHWAY BETWEEN A POINT APPROXIMATELY 0.2 MILES EAST OF THE CHELYAN BRIDGE AND HUGHESTON, ALL IN KANAWHA COUNTY. THE TOTAL LENGTH BETWEEN TERMINI IS APPROXIMATELY 7.2 MILES.

THE PRESENT U.S. ROUTE 60 AND U.S. ROUTE 21, REFERRED TO HEREAFTER AS U.S. ROUTE 60 FOR EASIER NOMENCLATURE, IS A TWO-LANE FACILITY WHICH FOLLOWS THE NORTH BANK OF THE MEANDERING KANAWHA RIVER WITHIN THE LIMITS OF THIS STUDY. ALTERNATE AREAS OF FLAT LAND AND OF STEEP HILLSIDES PRESENT DESIGN PROBLEMS. DWELLINGS, PUBLIC FACILITIES, AND COMMERCIAL ESTABLISHMENTS RESTRICT THE ALIGNMENT IN THE FLAT AREAS. THE STEEP HILLSIDE AREAS ALONG WITH STEEP RIVER BANKS AND LIMITED DEVELOPABLE AREA TEND TO CONFINE THE ALIGNMENT TO AVOID EXTENSIVE EXCAVATION WITH ITS ATTENDANT HIGH COSTS. THE NECESSITY OF PROVIDING A LOCATION FOR THE EXISTING PENN CENTRAL RAILROAD ALSO CONFINES THE ROUTE LOCATION. A CAREFUL STUDY AND BALANCING OF THE TOPOGRAPHY AND THE EXISTING PHYSICAL CONSTRUCTION RESULTED IN THE RECOMMENDED LINE PRESENTED HEREIN.

SOILS AND GEOLOGY

IN ORDER TO PROVIDE A BASIC CONCEPT FOR LOCATION AND DESIGN OF THE PROPOSED ROADWAY DURING THE DESIGN REPORT STAGE, IT WAS DETERMINED THAT SOME LIMITING PARAMETERS WOULD BE NEEDED TO ESTABLISH FEASIBLE ALTERNATES WITHIN THE CORRIDOR. FOR THIS REASON, BACKGROUND GEOLOGY WAS REVIEWED. A STUDY OF TOPOGRAPHIC MAPS AND AERIAL PHOTOS WAS MADE, AND FORMER FIELD INVESTIGATIONS WERE CHECKED. THE RESULTS OF THESE STUDIES WERE CONFIRMED BY FIELD RECONNAISSANCE AND ARE REPORTED HEREIN.

THE GENERAL PROJECT AREA IS SITUATED ON THE CUMBERLAND-ALLEGHENY PLATEAU. THIS PHYSIOGRAPHIC SECTION IS BOUNDED ON THE SOUTHEAST BY THE RIDGE AND VALLEY PROVINCE, AND LIKE THE LATTER, HAS A GENERAL STRUCTURAL TREND OCCURRING IN A NORTHEAST SOUTHWEST DIRECTION. FOR ALL PRACTICAL PURPOSES, HOWEVER, THE ROCK UNITS REPRESENTED IN THE PROJECT AREA ARE FLAT-LYING. LOCALLY, STRUCTURE IS CONTROLLED BY MINOR SYNCLINAL-ANTICLINAL SYSTEMS WHICH ARE GENERALLY DISCONTINUOUS OUTSIDE THE VICINITY OF THE DISTRICT. MOST SIGNIFICANT OF THESE ARE THE WARFIELD ANTICLINE TO THE WEST AND THE HANDLEY SYNCLINE TO THE EAST. COUPLED WITH OTHER STRUCTURAL FORMS, THESE SYSTEMS PROVIDE A FLAT-LYING SECTION FROM THE BEGINNING OF THE PROJECT TO THE VICINITY OF CEDAR GROVE. EAST OF CEDAR GROVE, DIPS OF 2 TO 4 PERCENT TO THE NORTHEAST ARE EVIDENT. WITH SOME APPARENT REVERSAL IN THE VICINITY OF HUGHESTON.

THE ROCK UNITS EXPOSED WITHIN THE PROJECT ARE PENNSYLVANIA AGE WITH THE LOWEST MEMBERS BEING IN THE KANAWHA FORMATION OF THE POTTSVILLE GROUP. THE MAJORITY OF CONSTRUCTION WORK IS EXPECTED TO BE IN THIS SERIES OF ROCKS. WHILE SOME OF THE MORE EXTENSIVE CUTS MAY EXTEND UPWARD THROUGH THE ALLEGHANY FORMATION TO THE LOWERMOST MEMBERS OF THE CONEMAUGH GROUP, WHICH CAPS THE HIGHER RIDGES. PINNACLE ROCKS, FORMED BY THE MASSIVE EAST LYNN SANDSTONE, ARE VISIBLE FLANKING THE KANAWHA RIVER VALLEY NEAR THE SUMMITS OF ALL THE RIDGES. BASED OF THE FOREGOING STUDIES, IT IS ESTIMATED THAT THE GENERAL SECTION INDICATED IN FIGURE 1, SHEET 12, IS A FAIR REPRESENTATION OF THE PREDOMINANT UNITS TO BE EXPECTED ALONG THE PROJECT. SEVERAL MINABLE COALS ARE LOCALLY PRESENT WITHIN THE CONSTRUCTION LIMITS, FROM THE STOCKTON-LEWISTON TO THE NO. 2 GAS.

EXCEPTIONS TO THE ABOVE SECTIONS ARE NOTED AT NUMEROUS LOCATIONS WHERE A SIGNIFICANT TALUS BUILDUP HAS OCCURED OR WHERE OLD SLIDE SCARS APPEAR TO EXTEND, QUITE FREQUENTLY, TO THE BASE OF THE EAST LYNN SANDSTONE. NOTABLY, THESE SCARS APPEAR TO BE MOST NUMEROUS ON THE SOUTH FACING SLOPES WHERE THE RIVER HAS UNDERCUT EXISTING TALUS, WHILE DEEP SOIL ACCUMULATIONS APPEAR TO REMAIN PREVALENT ON THE LOWER PORTIONS OF WEST FACING SLOPES WHERE ALLUVIAL BUILDUP IS PREVENTING THE UNDERCUTTING. THE STRUCTURAL CONTROL EXHIBITED UPON MAJOR DRAINAGE IN THE AREA IS QUITE APPARENT FROM THE FREQUENT, TIGHT, RIGHT-ANGLE BENDS IN THE PRESENT CHANNEL. ALTHOUGH THE ENTIRE REGION LIES WITHIN A ZONE FREE OF MAJOR TECTONIC ACTIVITY, IT IS NOW FELT THAT SEVERAL CROSS-FAULT ZONES OCCUR IN THIS REGION OF WEST VIRGINIA. THE PROJECT ITSELF LIES VERY NEAR THE INTERSECTION OF A POSSIBLE CROSS-APPALACHIAN FAULT ZONE AND A PROBABLE ZONE OF TRANSCURRENT FAULTING. THIS CLOSE DRAINAGE CONTROL AND EXCESSIVE SOIL ACCUMULATION MAY BE THE RESULT OF MANIFESTATIONS OF THIS OCCURENCE.

THE ALLUVIAL BUILDUP REFERRED TO ABOVE IS MOST PREVALENT, AS MENTIONED ABOVE, ALONG THE WEST-FACING VALLEY WALLS, AND ALSO ALONG THE NORTH-FACING WALLS FOLLOWING. FROM BORINGS PREVIOUSLY MADE BY THE DEPARTMENT OF HIGHWAYS, UP TO 30 TO 35 FEET OF LOOSE, COMPRESSIBLE ALLUVIAL SOILS OCCUR IN THE VALLEY AT ISOLATED LOCATIONS. IT WOULD, THEREFORE, SEEM REASONABLE TO ASSUME A RANGE IN THICKNESS OF THE MATERIAL ON THE ORDER OF 30 TO 40 FEET, PLUS OR MINUS, ALTHOUGH SOMEWHAT THINNER AT THE IMMEDIATE BASES OF THE SOUTH-FACING WALLS WHERE CURRENT DEPOSITION HAS BEEN PARTIALLY INHIBITED.

THE MOST DISTINCTIVE PROBLEM IN THE DESIGN AND CONSTRUCTION OF THIS SECTION OF HIGHWAY APPEARS TO BE THE COMPARATIVELY THICK SOIL ACCUMULATION ON THE LOWER SLOPES AND/OR IN THE SLIDE SCARS. OTHER THAN THESE AREAS, WHERE SPECIAL DESIGN CONSIDERATIONS MAY BE NECESSARY, IT IS EXPECTED THAT STANDARD DESIGN SLOPE-RATIOS, RISES, AND BENCH WIDTHS MAY BE APPLIED. HOWEVER, THE DEEP SOILS OCCURING THROUGHOUT MUCH OF THE PROJECT WILL REQUIRE LONG, FLAT (2:1±) SLOPES AND BENCHES TO PREVENT MASSIVE FAILURES. FIGURES 2 AND 3, SHEET 12, SHOW THE CONDITIONS EXPECTED TO BE PRE-

SENT IN DEEP SOIL AREAS AT THE APPROXIMATE STATIONS LISTED, AND THE PROPOSED DESIGN TO BE INCORPORATED AT THOSE SECTIONS. IT SHOULD BE RECOGNIZED THAT SOME EXTRAORDINARY MAINTENANCE MAY BE REQUIRED IN THESE AREAS DUE TO THE ABNORMAL DEPTHS OF TALUS PRESENT AT THIS TIME. SINCE SOME SLOPE BREAKDOWNS WILL ALMOST CERTAINLY OCCUR.

IT IS NOW CONTEMPLATED THAT THE MOST FEASIBLE ALIGNMENT AND GRADE WILL ENCOUNTER THE CONDITIONS OUTLINED ABOVE, WITH TWO (2) EXCEPTIONS. A HIGHER GRADE-LINE OR AN ALIGNMENT MORE TOWARD THE RIVER WILL RESULT IN PROBABLY RELOCATION OF MUCH OF THE RAILROAD TRACKAGE ADJACENT TO U.S. ROUTE 60 THROUGHOUT THE PROJECT. IN THE CASE OF THE TWO EXCEPTIONS NOTED ABOVE, THE RELOCATION OF THE RAILROAD AND THE PLACEMENT OF EMBANKMENT INTO THE RIVER WILL BE REQUIRED, ALONG WITH DREDGING ON THE OPPOSITE BANK. THE STABILITY OF THESE FILLS IS SOMEWHAT QUESTIONABLE AND WILL REQUIRE A THOROUGH ANALYSES OF THE LOCAL ALLUVIUM AND THE FILL TO BE PLACED. THIS IS ALSO TRUE FOR ANY MODERATELY HIGH ROADWAY EMBANKMENT TO BE PLACED ADJACENT TO THE TRACKS OR RIVER BANKS. IT IS POSSIBLE, HOWEVER, TO SUPPORT A SOMEWHAT ELEVATED GRADE-LINE WITH A RETAINING WALL, ALTHOUGH IT IS EXPECTED THAT ANY STRUCTURE OF THIS TYPE WILL REQUIRE PILE FOUNDATION SUPPORT THROUGH THE ALLUVIUM TO THE IN-PLACE ROCK. AS MENTIONED PREVIOUSLY, THE ALLUVIUM IS EXPECTED TO AVERAGE APPROXIMATELY 35 FEET IN THICKNESS, NECESSITATING 35 FEET OF PILE TO REACH EXISTING GROUND.

CONSOLIDATION OF THE SUBSOILS ON EITHER CASE MAY CREATE SOME PROBLEMS SINCE THE MATERIALS CLOSE TO THE RIVER ARE PROBABLY NORMALLY CONSOLIDATED, COMPRESSIBLE SILTS AND CLAYS AND THE MATERIALS NEAR THE SLOPE ARE GENERALLY DENSE, HETEROGENOUS COLLUVIUM WHICH WILL UNDERGO NEGLIGIBLE COMPRESSION. THIS WILL PROBABLY CREATE NUMEROUS AREAS OF DIFFERENTIAL SETTLEMENT WHICH MAY HAVE TO BE ACCOUNTED FOR PRIOR TO PAVING OR AS MAINTENANCE DURING THE FIRST FEW YEARS OF ROADWAY LIFE.

WHILE A PRIMARY LINE AND GRADE ARE RECOMMENDED HEREIN, A THOROUGH INVESTIGATIVE PROGRAM SHOULD BE INITIATED TO DETERMINE, IN MORE DETAIL, THE CRITERIA WHICH WILL DICTATE FINAL DESIGN CONCEPTS. THE IDEAS AND EXAMPLES PRESENTED IN THIS REPORT ARE ONLY PRELIMINARY JUDGEMENTS OF WHAT IS TO BE EXPECTED ALONG THE FACILITY, BUT WERE UTILIZED TO DETERMINE THE MOST PRACTICAL LOCATION WITHIN RECOGNIZED LIMITATIONS.

DESIGN CRITERIA

THE DESIGN CRITERIA USED FOR THE VARIOUS STUDY SCHEMES IN THIS REPORT ARE THOSE SET FORTH IN THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS "GEOMETRIC DESIGN CRITERIA FOR RURAL HIGHWAYS" AND "A POLICY ON GEOMETRIC DESIGN OF RURAL HIGHWAYS", 1965 EDITION AASHO.

ROAD CROSS SECTION - THE ROADWAY NORMALLY CONSISTS OF TWO (2) 24 FOOT PAVEMENTS SEPERATED BY AN 18 FOOT RAISED, GRASS-ED MEDIAN WITH STORAGE BAYS PROVIDED FOR LEFT-TURNING VEHICLES AT POINTS OF ACCESS. IN AREAS WHERE THE CORRIDOR IS RESTRICTED, THE MEDIAN HAS BEEN REDUCED TO 8 FEET AND A WEST VIRGINIA BARRIER MEDIAN, TYPE V, HAS BEEN USED FOR INCREASED SAFETY. THIS COMBINATION ALLOWS A THREE (3) FOOT PAVED SHOULDER TO BE CARRIED ON THE MEDIAN SIDE WITH A TWO (2) FOOT SHOULDER PROVIDED WITH THE 18 FOOT MEDIAN. A 10 FOOT PAVED SHOULDER IS PROVIDED THROUGHOUT ON THE OUTSIDE.

ACCESS - THIS ROADWAY IS BEING DESIGNED AS A LIMITED ACCESS FACILITY. ACCESS WILL BE PROVIDED, WHERE POSSIBLE, TO EXISTING DEVELOPED AREAS AND TO THOSE AREAS WHERE SUFFICIENT DEVELOPABLE LAND EXISTS TO WARRANT. AN ATTEMPT IS BEING MADE TO LIMIT ACCESS POINTS TO AN AVERAGE OF TWO (2) PER SIDE PER MILE OF ROADWAY WITH A MINIMUM OF 1000 FEET BETWEEN THOSE LOCATED ON THE SAME SIDE OF THE ROADWAY. AN EXCEPTION TO THIS WILL BE IN THE TOWNS OF GLASGOW AND CEDAR GROVE, WHERE AN URBAN SECTION IS BEING UTILIZED TO PROVIDE ACCESS TO SEVERAL BUSINESSES, LOCATED ALONG THE PROPOSED ROAD.

DESIGN SPEED - THIS FACILITY IS BEING DESIGNED FOR A SPEED OF 60 MILES PER HOUR.

VERTICAL ALIGNMENT -FOR A 60 MILE PER HOUR DESIGN SPEED WITH FLAT TERRAIN, THE MAXIMUM ALLOWABLE GRADE IS THREE (3) PERCENT. DUE TO THE FLAT VALLEY FLOOR TRAVERSED BY THE ROADWAY, THE MAXIMUM GRADE USED WILL BE ONLY TWO (2) PERCENT.

HORIZONTAL ALIGNMENT - FOR A 60 MILE PER HOUR DESIGN SPEED, THE MAXIMUM ALLOWABLE HORIZONTAL CURVATURE IS FIVE (5) DEGREES. BY FOLLOWING THE BANKS OF THE KANAWHA RIVER, THE MAXIMUM HORIZONTAL CURVE REQUIRED FOR THIS FACILITY WILL BE ONLY TWO (2) DEGREES 30 MINUTES.

					THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA			
					TEXT			
					DESIGNED BY: RDF	vti inc. ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 4-71	
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SIGHT DISTANCE - MINIMUM SIGHT DISTANCE SHALL BE STOPPING SIGHT DISTANCE AND SHALL BE BASED ON A HEIGHT OF EYE OF 3.75 FEET AND A HEIGHT OF OBJECT OF 0.5 FEET. AT HORIZONTAL CURVES AND AT BOTH SUMMIT AND SAG VERTICAL CURVES THE MINIMUM STOPPING SIGHT DISTANCE, INCLUDING HEADLIGHT SIGHT DISTANCE, SHALL BE 475 FEET. THE MINIMUM LENGTH OF VERTICAL CURVES SHALL BE 800 FEET. ALL INTERSECTIONS OF RELOCATED ROUTE 60 AND ACCESS ROADS SHALL HAVE MINIMUM SIGHT DISTANCE AT LEAST EQUAL TO THAT REQUIRED BY AASHO AND THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS DESIGN DIRECTIVE 113, DATED AUGUST 12, 1970.

SUPERELEVATION AND TRANSITIONS - THE RATE OF SUPERELEVATION, LENGTHS OF TRANSITIONS AND SPIRALS, WHERE REQUIRED, SHALL BE AS A MINIMUM, THOSE RECOMMENDED IN "A POLICY ON GEOMETRIC DESIGN OF RURAL HIGHWAYS - 1965" OF AASHO. CURVES OF 0° 30' AND OVER SHALL BE SUPERELEVATED WITH THE MAXIMUM RATE OF SUPERELEVATION BEING 0.080 FEET PER FOOT. SPIRALS SHALL BE USED ON ALL HORIZONTAL CURVES SHARPER THAN 1° 00'. TRANSITIONS FOR OBTAINING THE PROPER RATE OF SUPERELEVATION SHALL BE MADE BY ROTATING AROUND THE MEDIAN EDGE OF PAVEMENT. SEPARATE PROFILES SHALL BE PROVIDED ON THE INSIDE EDGE OF PAVEMENT THROUGH MEDIAN CROSSEOVERS, ON SUPERELEVATED SECTIONS, SO A CONSTANT PAVEMENT SLOPE CAN BE MAINTAINED.

GUARD RAILS - GUARD RAIL SHALL BE INSTALLED ON EMBANKMENTS IN ACCORDANCE WITH DETAILS SHOWN ON THE TYPICAL SECTION SHEETS. ALSO AT STRUCTURE PIERS; NON-BREAKAWAY SIGN SUPPORTS; AT AREAS WHERE THE EMBANKMENT HEIGHT IS BELOW THAT SHOWN ON THE TYPICAL SECTIONS, BUT WHERE THE NATURAL GROUND SLOPES STEEPLY AWAY FROM THE TOE OF FILL; WHERE WOODED AREAS, STREAMS, RIVERS, RAILROADS AND OTHER SIMILAR HAZARDOUS OBJECTS ARE NEAR THE TOE OF FILL; AND AT CULVERT ENDS NEARER THAN 30 FEET TO THE EDGE OF PAVEMENT. ALL EFFORTS, CONSISTENT WITH GOOD SAFETY PRACTICES, SHALL BE MADE TO ELIMINATE GUARD RAIL.

SIGNS, PAVEMENT MARKINGS AND DELINEATORS - THE LOCATION, SIZE AND MESSAGE FOR REGULATORY AND GUIDE SIGNS, PAVEMENT LANE MARKINGS, AND LOCATION AND TYPE OF DELINEATORS SHALL BE SET FORTH IN "A MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", AND THE SPECIFICATIONS, SPECIAL PROVISIONS, AND SIGN FABRICATION MANUAL OF WEST VIRGINIA DEPARTMENT OF HIGHWAYS.

FENCES - THE RIGHT -OF-WAY SHALL BE FENCED ACCORDING TO THE AASHO PAMPHLET, "A POLICY ON FENCING CONTROLLED ACCESS HIGHWAYS" DATED 1968. FENCING WILL BE ERECTED IN ACCORDANCE WITH THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS DESIGN DIRECTIVE 26-3.

PUBLIC TRANSPORTATION- SPECIAL TURNOUTS WILL BE PROVIDED AT MOST POINTS OF ACCESS TO PROVIDE FOR LOADING AND DISCHARGING OF PASSENGERS, PARTICULARLY SCHOOL CHILDREN. DUE TO SAFETY CONSIDERATIONS, THE STOPPING OF PUBLIC TRANSPORTATION VEHICLES UPON THE TRAVELED WAY WILL NOT BE ALLOWED.

UTILITY ADJUSTMENTS - RELOCATION AND ADJUSTMENT OF UTILITY LINES SHALL BE OF THE SAME TYPE CONSTRUCTION AS THE EXISTING LINES, EXCEPT WHERE THE UTILITY COMPANY SHALL REQUEST, AND MAKE PAYMENT FOR, BETTERMENT OF FACILITIES. THE RELOCATION SHALL BE MADE SO THE UTILITY CAN BE MAINTAINED WITHOUT ENTRY ON THE ROADWAY RIGHT-OF-WAY WHERE POSSIBLE.

DESIGN PROCEDURES

GENERAL - THIS STUDY, MADE ON 1"-200' TOPOGRAPHIC MAPS, IS PRESENTED IN TWO (2) PARTS. PART 1 EXTENDS FROM A POINT APPROXIMATELY 0.2 MILES EAST OF THE CHELYAN BRIDGE EASTWARD TO THE WESTERN LIMITS OF THE EXISTING FOUR-LANE FACILITY IN CEDAR GROVE. PART 2 EXTENDS FROM THE EASTERN LIMITS OF THE EXISTING FOUR-LANE FACILITY IN CEDAR GROVE EASTWARD TO THE WESTERN LIMITS OF THE EXISTING FOUR LANE FACILITY AT HUGHESSTON. THE TOTAL LENGTH OF PART 1 IS 3.15 MILES AND THE TOTAL LENGTH OF PART 2 IS 3.32 MILES.

PART I - CHELYAN BRIDGE TO CEDAR GROVE - A BASE LINE, DESIGNATED AS LINE "A" ON THE PLANS, WAS SELECTED TO REPRESENT WHAT WAS FELT TO BE THE BEST ALIGNMENT AT AN EARLY STAGE OF THIS REPORT. CROSS SECTIONS WERE TAKEN FROM THE 1"- 200' TOPOGRAPHIC MAPS AND PLACED IN AN IBM 1130 COMPUTER USING A DIGITAL TERRAIN MODEL PROGRAM. THE DTM PROGRAM PERMITS THE DESIGNER TO SELECT VARIOUS ALIGNMENT AND GRADE COMBINATIONS WITH THE COMPUTER ADJUSTING THE EXISTING GROUND TO FIT THE PARTICULAR ALIGNMENT UNDER STUDY. THE COMPUTER THEN USES A TYPICAL CROSS SECTION, WHICH WAS ENTERED FOR THE PROJECT BEING STUDIED, AND COMPUTES THE CUT AND FILL BASED ON THE ALIGNMENT AND GRADE ENTERED. BY USING A PLOTTER CONNECTED ON LINE WITH THE COMPUTER, THE CROSS SECTION CAN BE DRAWN FOR THE DESIGNERS INFORMATION AND USE.

IN AN ATTEMPT TO MINIMIZE THE ACQUISITION OF VALUABLE FLAT LAND, AN ALTERNATE LINE, DESIGNATED LINE "B" ON THE PLANS, WAS STUDIED. DUE TO THE CONSTRICTION OF THE CORRIDOR IN THE VICINITY OF THE VALLEY CAMP COAL MINE AND THE EXISTENCE OF TWO (2) CONVEYOR SYSTEMS, A LINE LOCATED APPROXIMATELY 90' NORTHERLY OF LINE "A" WAS INVESTIGATED, AND DESIGNATED AS LINE "C" ON THE PLANS. THIS LINE ALLOWS THE CONVEYORS TO REMAIN IN OPERATION BY REMOVING ONE PIER ON EACH CONVEYOR AND INCREASING THE TRUSS SIZES TO SPAN THE ROADWAY. AS A RESULT OF THE COST ESTIMATES PREPARED FOR THESE ALTERNATES, IT WAS DETERMINED THAT AN ADDITIONAL LINE, DESIGNATED AS LINE "F" ON THE PLANS SHOULD BE STUDIED. LINE "F" RESULTS IN THE DREDGING OF THE SOUTH BANK OF THE KANAWHA RIVER FOR A DISTANCE OF APPROXIMATELY 0.44 MILES AND

THE LOSS OF FLAT LAND IN EAST BANK. HOWEVER, DUE TO THE DIFFERENCE IN COST, LINE "CAFD" IS RECOMMENDED, AND IS IDENTIFIED AS "RECOMMENDED LINE" ON THE PLANS.

PART II - CEDAR GROVE TO HUGHESSTON

THE BASE LINE, DESIGNATED AS LINE "A" ON THE PLANS, WAS CONTINUED THROUGH THIS SECTION. IT WAS AGAIN SELECTED TO REPRESENT WHAT WAS FELT TO BE THE BEST ALIGNMENT. AS IN THE CASE OF THE PRIOR SECTION, CROSS SECTIONS WERE TAKEN AND FED INTO AN IBM 1130 COMPUTER UTILIZING THE DTM PROGRAM. IN ORDER TO REDUCE A HEAVY CUT, AN ALTERNATE LINE, DESIGNATED AS LINE "B" ON THE PLANS, WAS STUDIED IMMEDIATELY EAST OF GLASGOW. IN ORDER TO FURTHER REDUCE THE EXCAVATION, A LINE DESIGNATED AS LINE "C" ON THE PLANS, ALONG WITH A RAILROAD RELOCATION, WERE STUDIED. IN ORDER TO STILL FURTHER REDUCE EXCAVATION, A LINE DESIGNATED AS LINE "D" ON THE PLANS, WAS STUDIED. THIS LINE RESULTS IN A LONGER RAILROAD RELOCATION AS WELL AS ENCROACHING ON APPALACHIAN POWER COMPANY PROPERTY. TO REDUCE THE EXCAVATION STILL FURTHER, A LINE, DESIGNATED AS LINE "E" ON THE PLANS, WAS STUDIED, WHICH AGAIN INCREASES THE LENGTH OF THE RAILROAD RELOCATION AND ENCROACHES INTO THE KANAWHA RIVER. AFTER A REVIEW OF ALL FACTORS, WE RECOMMEND THE ACCEPTANCE OF LINE "ACE" WHICH HAS BEEN IDENTIFIED AS "RECOMMENDED LINE" ON THE PLANS. IN ADDITION TO THE STUDIES SHOWN ABOVE, AN INVESTIGATION INTO INDEPENDENT ROADWAY ALIGNMENTS WAS CONDUCTED. THIS WAS REJECTED DUE TO THE TERRAIN, SOILS CONDITIONS, AND THE INABILITY TO PROVIDE ACCESS IN SEVERAL LOCATIONS. AN INVESTIGATION INTO THE POSSIBLE USE OF RETAINING WALLS IN CONJUNCTION WITH DIFFERENTIAL ROADWAY GRADES WAS CONDUCTED. THIS WAS DISCARDED DUE TO THE NEED OF SUPPORTING THE RETAINING WALLS ON PILING APPROXIMATELY 35 FEET IN LENGTH. IN ADDITION, AN INVESTIGATION OF COSTS ON SEVERAL OF THE LINES REFERRED TO ABOVE, WAS CONDUCTED USING BOTH AN OPEN AND A CLOSED DITCH SECTION. ROAD USERS COSTS WERE NOT DETERMINED SINCE THE DIFFERENCE FOR ALL LINES STUDIED WOULD BE INSIGNIFICANT.

STUDY RESULTS - PART I - CHELYAN BRIDGE TO CEDAR GROVE

LINE "A" RESULTED IN A QUANTITY OF 13,890,000 C.Y. OF UNCLASSIFIED EXCAVATION, OF WHICH ALL BUT 50,000 C.Y. WOULD BE WASTED. ANOTHER PROBLEM WAS ENCOUNTERED IN THE VICINITY OF STATION 703+50 WHERE THIS ALIGNMENT WOULD TAKE A CRITICAL SECTION OF THE CONVEYOR SYSTEM OPERATED BY VALLEY CAMP COAL COMPANY. THIS SYSTEM CARRIES THE MINE WASTES TO THE TOP OF A MOUNTAIN NEARLY A MILE FROM THE PLANT. TAKING THIS SECTION OF THE CONVEYOR SYSTEM WOULD RESULT IN MAJOR MODIFICATIONS BEING REQUIRED AND A GREAT DEAL OF DOWN TIME TO THE MINE. THIS, OF COURSE, WOULD BE HIGHLY EXPENSIVE. LINE "A" ALSO TAKES A LUMBER MILL LOCATED IN THE VICINITY OF STATION 740 TO STATION 746 AND MOST OF THE HOMES AND BUSINESSES LOCATED NORTH OF THE EXISTING PENN CENTRAL RAILROAD. THE ADVANTAGES OF THIS LINE ARE THAT NO RAILROAD RELOCATION WOULD BE REQUIRED AND THAT THE MOST STABLE SOILS CONDITION WOULD RESULT. ALSO, ACCESS COULD READILY BE PROVIDED TO THE REMAINING DEVELOPED AREAS AND THE SHEARER DOCKS LOCATED RIGHT OF STATION 795 WOULD NOT BE AFFECTED. LINE "B" WAS STUDIED IN AN EFFORT TO REDUCE OR ELIMINATE THE ACQUISITION OF THE LUMBER YARD REFERRED TO ABOVE. THIS LINE RESULTED IN AN INCREASE OF APPROXIMATELY 2,400,000 C.Y. OF UNCLASSIFIED EXCAVATION. A STUDY OF LINE "ABA" WITH A CLOSED DITCH SECTION WAS MADE AND THE UNCLASSIFIED EXCAVATION WAS REDUCED TO 12,510,000 C.Y. THIS IS CONSIDERED UNACCEPTABLE SINCE ALL BUT 50,000 C.Y. IS WASTE, WITH NO AREA IN THE IMMEDIATE VICINITY AVAILABLE TO PLACE THIS MATERIAL.

MODIFICATIONS "C" AND "D" RESULTED IN THE STUDY OF LINE "CAD" WHICH REDUCES THE DAMAGE TO THE OPERATIONS OF VALLEY CAMP COAL COMPANY TO A MINIMUM. THIS IS ESSENTIALLY THE ONLY DIFFERENCE IN THE SEGMENT OF LINE "A" MODIFIED BY LINE "C" WITH THE EXCEPTION OF SLIGHTLY MORE DESIRABLE SOILS CONDITIONS AND A SMALL INCREASE IN EXCAVATION. LINE "D" WAS INTRODUCED TO REDUCE THE EXCAVATION IN THE VICINITY OF STATION 805 TO STATION 840. THIS ALIGNMENT REQUIRES THE CONSTRUCTION OF AN EMBANKMENT INTO THE KANAWHA RIVER AND THE RELOCATION OF APPROXIMATELY 4600 FEET OF THE PENN CENTRAL RAILROAD TRACKS ALONG WITH DREDGING THE SOUTH BANK OF THE KANAWHA RIVER. AS THIS IS ONE OF THE EXCEPTIONS REFERRED TO IN THE GEOLOGICAL SECTION OF THIS REPORT, AN EXTENSIVE STUDY OF THE SOILS CONDITIONS SHOULD BE ANTICIPATED ALONG WITH HIGHER THAN AVERAGE MAINTENANCE COSTS CAUSED BY POOR SOILS CONDITIONS. HOWEVER, UTILIZING A CLOSED DITCH SECTION, THE UNCLASSIFIED EXCAVATION WAS REDUCED TO ONLY 3,530,000 C.Y. AND THE ESTIMATED CONSTRUCTION COST TO \$10,592,700.

MODIFICATION "F" WAS THEN INTRODUCED. THIS RESULTS IN THE RELOCATION OF AN ADDITIONAL 2450 FEET OF PENN CENTRAL RAILROAD, THE CONSTRUCTION OF ADDITIONAL EMBANKMENT INTO THE KANAWHA RIVER WITH ITS ASSOCIATED SOILS AND MAINTENANCE PROBLEMS, AND THE DREDGING OF ADDITIONAL MATERIAL FROM THE SOUTH BANK OF THE KANAWHA RIVER TO PROVIDE THE SAME SHIPPING CHANNEL WIDTH AND TO MAINTAIN THE SAME RIVER VELOCITY.

					THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA				
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REVISION NUMBER		SHEET NUMBER		REVISIONS		DATE		BY	

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	1	4109		1972	KANAWHA	5	68

DUE TO THIS MODIFICATION, AND AGAIN UTILIZING THE CLOSED DITCH SECTION, THE UNCLASSIFIED EXCAVATION WAS REDUCED TO 538,638 C.Y. OF WHICH 64,000 C.Y. WILL BE WASTE. THE TOTAL ESTIMATED CONSTRUCTION COST WAS REDUCED TO ONLY \$4,173,540. HOWEVER, THE SHEARER DOCKS WILL HAVE TO BE RELOCATED DUE TO THE EMBANKMENT CONSTRUCTED ON THIS ALIGNMENT. ALSO, IT APPEARS THAT SOME ACTIVE SLIDES EXIST THROUGH THIS AREA AND NO CORRECTIVE ACTION WILL BE TAKEN ON THIS ALIGNMENT.

STUDY RESULTS - PART II - CEDAR GROVE TO HUGHESTON

LINE "A" RESULTED IN A QUANTITY OF 5,258,000 C.Y. OF EXCAVATION, OF WHICH ALL BUT 130,000 C.Y. IS WASTED. LINE "A" RESULTS IN THE LEAST PROPERTY DAMAGE, HAS MINIMUM EFFECT ON THE PENN CENTRAL RAILROAD, AND RESULTS IN THE BEST SOILS CONDITIONS.

LINE "B" WAS INTRODUCED TO REDUCE THE UNCLASSIFIED EXCAVATION, HOWEVER, DUE TO THE REQUIREMENT OF LOWERING THE GRADE TO MATCH THE PENN CENTRAL RAILROAD, THE OPPOSITE EFFECT WAS ACHIEVED. THEREFORE, NO FURTHER CONSIDERATION WAS GIVEN TO LINE "B".

LINE "C", WHILE REDUCING THE UNCLASSIFIED EXCAVATION BY APPROXIMATELY 1,200,000 C.Y. RESULTS IN THE RELOCATION OF 2,300 FEET OF DOUBLE TRACK ON THE PENN CENTRAL RAILROAD, IT ALSO ENCROACHES ON THE RALEIGH JUNK COMPANY AND RESULTS IN SOMEWHAT POORER SOILS CONDITIONS BEING ENCOUNTERED.

LINE "C-1" WAS STUDIED IN AN EFFORT TO REDUCE EXCAVATION IN THE DEGO BEND AREA. THE HORIZONTAL ALIGNMENT IS IDENTICAL TO LINE "C" WHILE THE VERTICAL ALIGNMENT DIFFERS IN THE DEGO BEND AREA. THE EXCAVATION WAS REDUCED BY APPROXIMATELY 3,400,000 C.Y. BY USING DIFFERENTIAL GRADE LINES AND AN EXTENSIVE SYSTEM OF RETAINING WALLS. DUE TO THE EXISTING SOIL CONDITIONS, IT IS FELT THAT ALL OF THE RETAINING WALLS WOULD HAVE TO BE SUPPORTED WITH PILING. THE TOTAL COST OF RETAINING WALLS AND PILING IS ESTIMATED AT \$3,000,000, RESULTING IN A TOTAL COST OF LINE "C-1" OF \$6,470,000.


LINE "BDE" UTILIZING AN OPEN DITCH SECTION, REDUCES THE UNCLASSIFIED EXCAVATION TO 569,400 C.Y. PLUS 115,800 C.Y. OF BORROW REQUIRED FOR AN EARTHWORK BALANCE. THE TOTAL ESTIMATED CONSTRUCTION COST IS \$4,830,230. AS A RESULT OF THIS ALIGNMENT, APPROXIMATELY 9,200 FEET OF THE PENN CENTRAL RAILROAD WILL HAVE TO BE RELOCATED. THIS ALIGNMENT ALSO RESULTS IN AN EMBANKMENT BEING BUILT INTO THE KANAWHA RIVER JUST DOWNSTREAM FROM DEGO BEND. THIS IS THE SECOND EXCEPTION NOTED IN THE GEOLOGICAL SECTION OF THIS REPORT, AND DUE TO THE ANTICIPATED POOR SOILS CONDITIONS, WILL REQUIRE AN EXTENSIVE INVESTIGATION ALONG WITH HIGHER THAN AVERAGE MAINTENANCE COSTS. DREDGING WILL BE REQUIRED ON THE SOUTH BANK OF THE KANAWHA RIVER TO PROVIDE THE SAME SHIPPING CHANNEL WIDTH AND THE SAME STREAM VELOCITY.

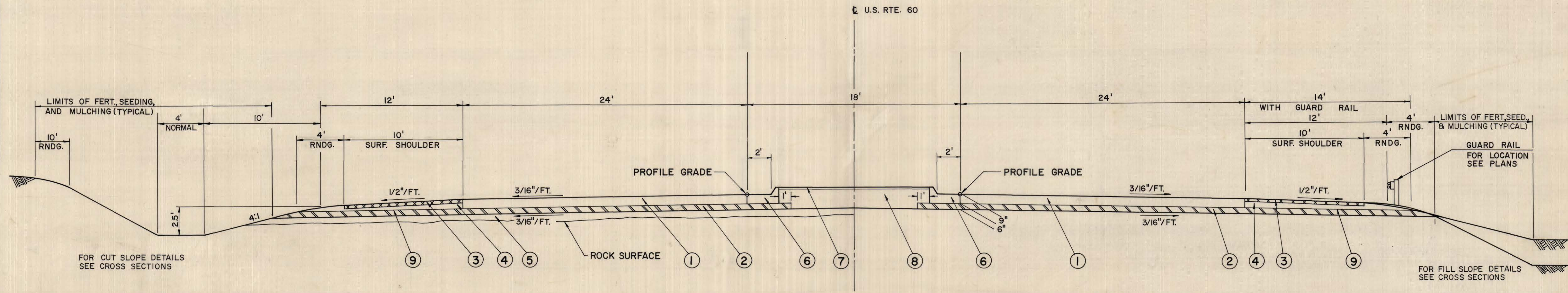
LINE "ACE" UTILIZING A CLOSED DITCH SECTION RESULTS IN A QUANTITY OF 733,778 C.Y. OF UNCLASSIFIED EXCAVATION OF WHICH 82,738 C.Y. WILL BE WASTE. THE TOTAL ESTIMATED CONSTRUCTION COST IS \$4,815,450. THIS ALIGNMENT RESULTS IN THE RELOCATION OF APPROXIMATELY 9,200 FEET OF THE PENN CENTRAL RAILROAD BUILT ON AN EMBANKMENT PLACED INTO THE KANAWHA RIVER JUST DOWNSTREAM FROM DEGO BEND. AS WITH LINE "BDE" THIS IS THE SECOND EXCEPTION NOTED IN THE GEOLOGICAL SECTION OF THIS REPORT, AND DUE TO THE ANTICIPATED POOR SOILS CONDITIONS, WILL REQUIRE AN EXTENSIVE INVESTIGATION ALONG WITH HIGHER THAN AVERAGE MAINTENANCE COSTS. DREDGING WILL ALSO BE REQUIRED ON THE SOUTH BANK OF THE KANAWHA RIVER TO PROVIDE THE SAME SHIPPING CHANNEL WIDTH AND THE SAME STREAM VELOCITY.

RECOMMENDED LINE

BASED ON THE ESTIMATED CONSTRUCTION COSTS AND OTHER PERTINENT DATA DISCUSSED IN THE PRECEDING TEXT, THE FOLLOWING LINES ARE RECOMMENDED FOR CONSTRUCTION:

- SECTION I - LINE "CAFD" - CONSTRUCTION COST - \$4,173,540
- SECTION II - LINE "ACE" - CONSTRUCTION COST - \$4,815,450

					THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA					
					TEXT					
				DESIGNED BY: RDF		 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA		DATE: 4-71		
				DRAWN BY: GWE				SCALE: NONE		
				CHECKED BY: AVH				FILE NO.		
REVISION NUMBER	SHEET NUMBER	REVISIONS			DATE	BY				

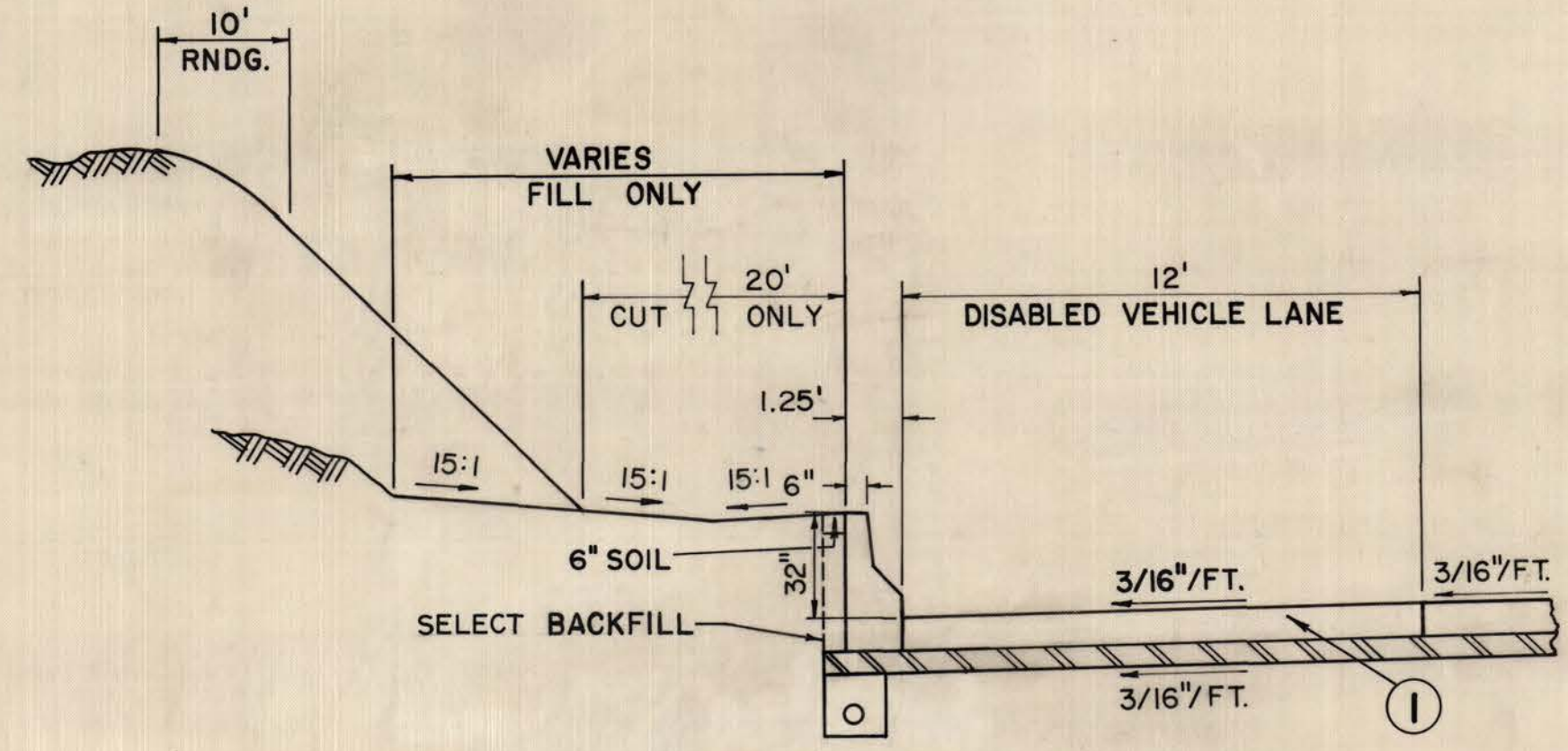


NORMAL SECTION

SECTION I			
P.O.T. STA. 675+00	TO	P.C. STA. 682+00.33	
P.T. STA. 698+48.61	TO	P.C. STA. 707+32.71	
P.T. STA. 729+52.04	TO	P.C. STA. 751+03.30	
P.T. STA. 759+43.74	TO	P.C. STA. 799+56.27	

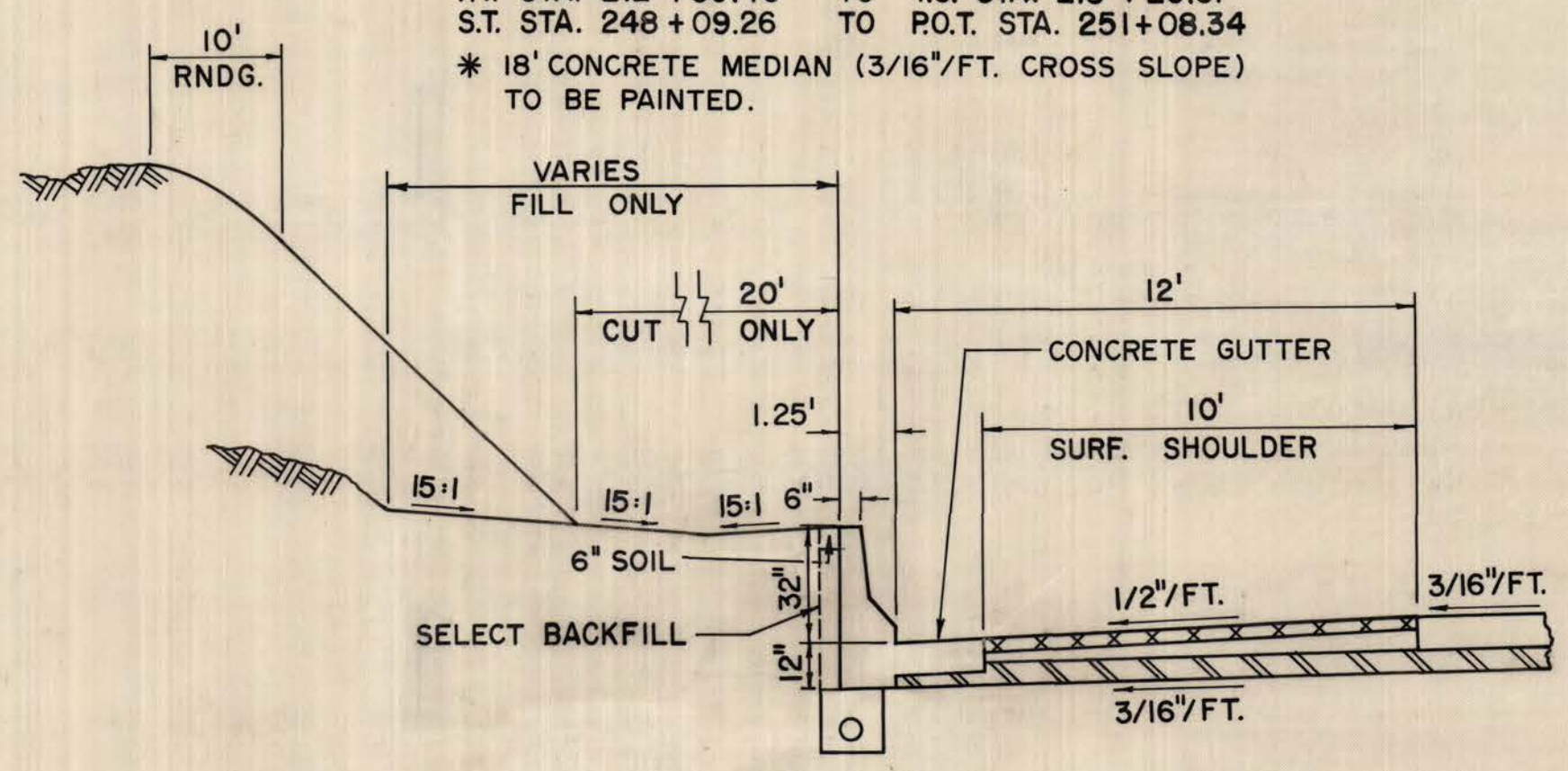
SECTION II			
P.O.T. STA. 76+34	TO	P.C. STA. 81+76.35 *	
P.T. STA. 92+90.46	TO	T.S. STA. 105+41.54	
P.T. STA. 160+03.61	TO	P.C. STA. 205+06.54	
P.T. STA. 212+00.46	TO	T.S. STA. 218+26.61	
S.T. STA. 248+09.26	TO	P.O.T. STA. 251+08.34	

* 18' CONCRETE MEDIAN (3/16"/FT. CROSS SLOPE)
TO BE PAINTED.



DETAIL-URBAN CLOSED DITCH SECTION

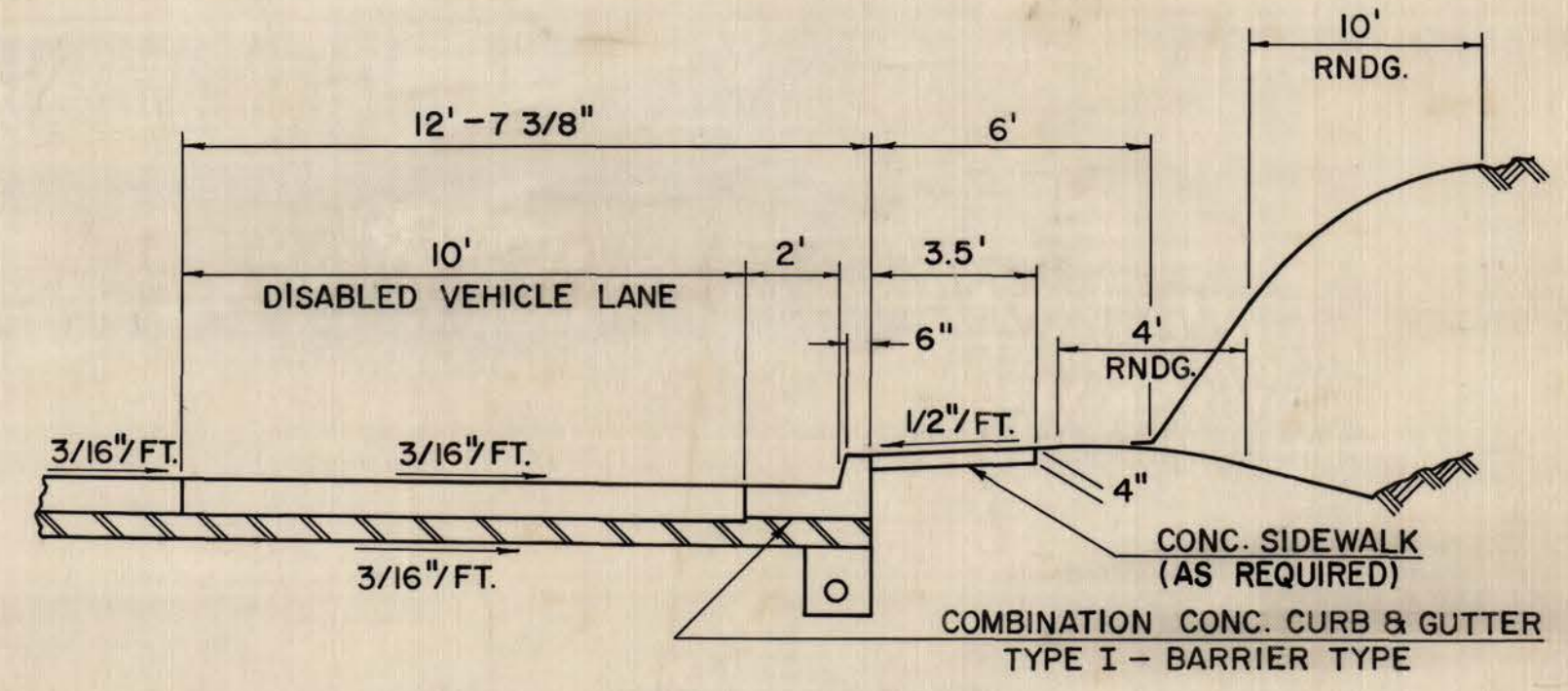
SECTION II
STA. 76+34 TO STA. 95+00



DETAIL-RURAL CLOSED DITCH SECTION

SECTION I			
STA. 675+00	TO	STA. 701+50	
STA. 705+50	TO	STA. 740+50	
STA. 752+50	TO	STA. 803+50	
STA. 807+50	TO	STA. 840+50	

SECTION II			
STA. 95+75	TO	STA. 104+30	
STA. 105+80	TO	STA. 114+50	
STA. 116+50	TO	STA. 176+00	
STA. 178+00	TO	STA. 230+50	
STA. 238+50	TO	STA. 250+50	



DETAIL-URBAN SECTION


SECTION II
STA. 76+34 TO STA. 95+00

- LEGEND
- 1 9" PORTLAND CEMENT CONCRETE PAVEMENT (ITEM 501-1(9))
 - 2 6" CLASS 2 AGGREGATE BASE COURSE (ITEM 307-2)
ALT. NO. 1-6" HOT MIXED, HOT LAID BITUMINOUS TREATED BASE COURSE AGGREGATE (ITEM 302-1 & 302-2)
ALT. NO. 2-6" CEMENT TREATED BASE COURSE AGGREGATE (ITEM 301-1, 301-2, 301-3)
 - 3 3" PENETRATION MACADAM COURSE (ITEM 403-4(3))
 - 4 6" CLASS 1 AGGREGATE BASE COURSE (ITEM 307-1)
 - 5 6" EARTH BACKFILL IN ROCK CUTS (AS REQUIRED)
 - 6 COMBINATION CONCRETE CURB & GUTTER (ITEM 610-3(III))
 - 7 SEEDING (ITEM 652-3)
 - 8 14" EARTH BACKFILL
 - 9 BITUMINOUS MATERIAL (ITEM 409-2)

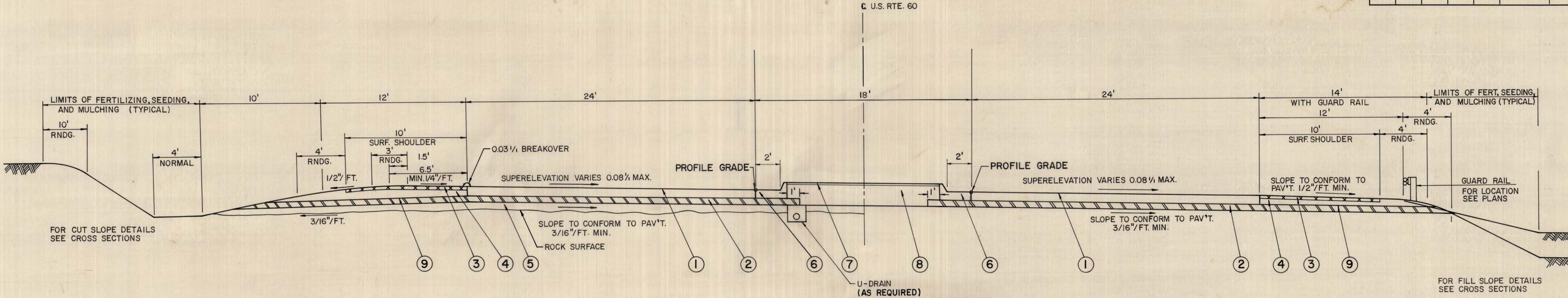
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

TYPICAL SECTION DETAILS

DESIGNED BY: AVH	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 10-70
DRAWN BY: RMM		SCALE: NONE
CHECKED BY: RDF		FILE NO.

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	7	68



SUPERELEVATED SECTION

SECTION I			
P.C. STA. 682+00.33	TO	P.T. STA. 698+48.61	
P.C. STA. 707+32.71	TO	P.T. STA. 729+52.04	
P.C. STA. 751+03.30	TO	P.T. STA. 759+43.74	
P.C. STA. 799+56.27	TO	P.T. STA. 841+01.96	
SECTION II			
P.C. STA. 81+76.35	TO	P.T. STA. 92+90.46	
T.S. STA. 105+41.54	TO	P.T. STA. 160+03.61	
P.C. STA. 205+06.54	TO	P.T. STA. 212+00.46	
T.S. STA. 218+26.61	TO	S.T. STA. 248+09.26	

LEGEND

- ① 9" PORTLAND CEMENT CONCRETE PAVEMENT (ITEM 501-1(9))
- ② 6" CLASS 2 AGGREGATE BASE COURSE (ITEM 307-2)
ALT. NO. 1— 6" HOT MIXED, HOT LAID BITUMINOUS TREATED BASE COURSE AGGREGATE (ITEM 302-1, 302-2)
ALT. NO. 2— 6" CEMENT TREATED BASE COURSE AGGREGATE (ITEM 301-1, 301-2, 301-3)
- ③ 3" PENETRATION MACADAM COURSE (ITEM 403-4(3))
- ④ 6" CLASS 1 AGGREGATE BASE COURSE (ITEM 307-1)
- ⑤ 6" EARTH BACKFILL IN ROCK CUTS (AS REQUIRED)
- ⑥ COMBINATION CONCRETE CURB AND GUTTER (ITEM 610-3(III))
- ⑦ SEEDING (ITEM 652-3)
- ⑧ 14" EARTH BACKFILL
- ⑨ BITUMINOUS MATERIAL (ITEM - 409-2)

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

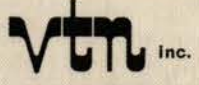
THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS

CHARLESTON, WEST VIRGINIA

U.S. ROUTE 60

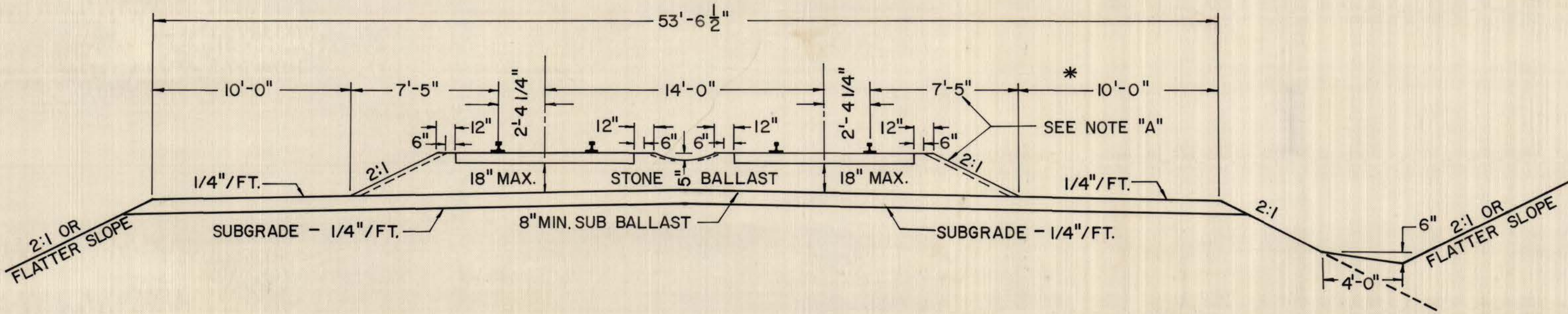
TYPICAL SECTION DETAILS

DESIGNED BY:	AVH	DATE:	10-70
DRAWN BY:	RMM	SCALE:	NONE
CHECKED BY:	RDF	FILE NO.:	

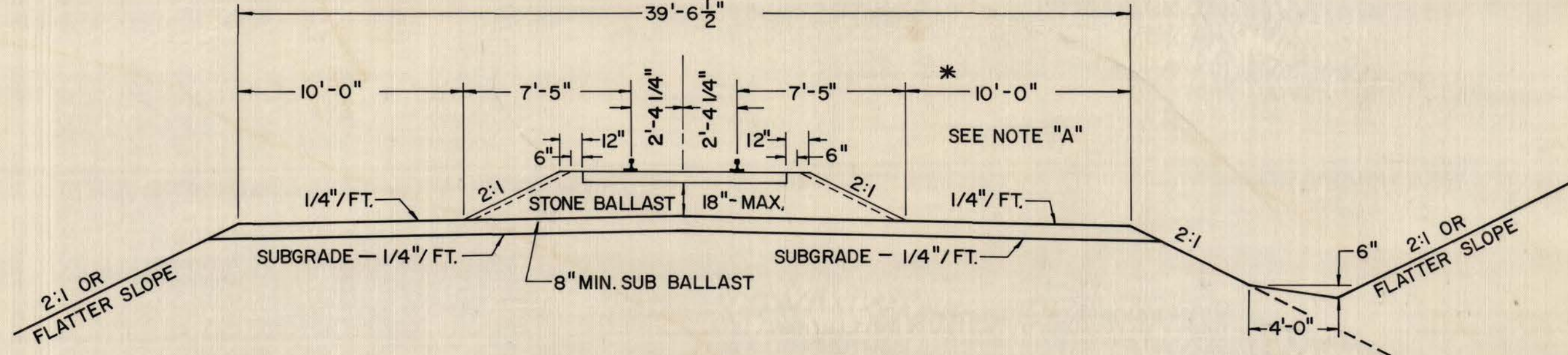


ENGINEERS, PLANNERS, SURVEYORS

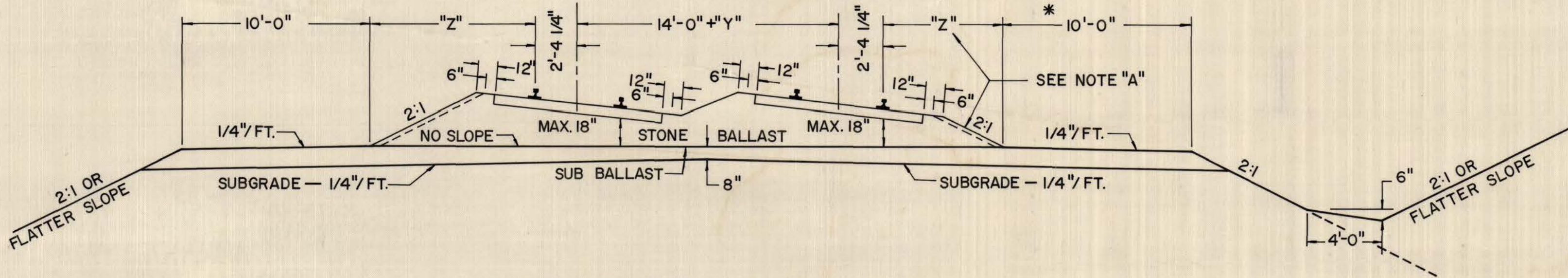
CHARLESTON, WEST VIRGINIA



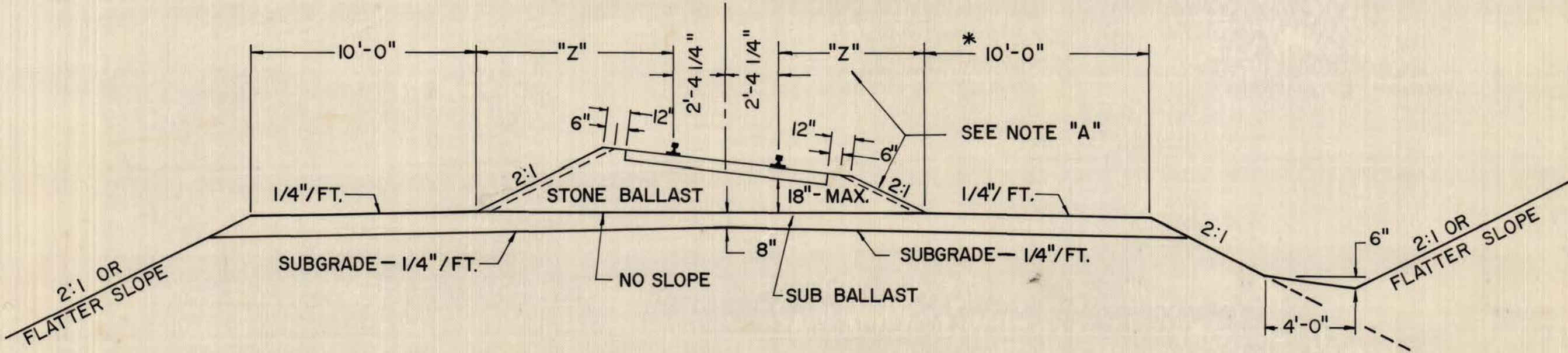
2 MAIN TRACKS—TANGENT



1 MAIN TRACK—TANGENT



2 MAIN TRACKS—CURVE



1 MAIN TRACK—CURVE

Y= ON ADJACENT TRACKS—WHERE SUPER ELEVATION IS THE SAME OR THE OUTER TRACK HAS THE LESSER, THIS DIMENSION SHALL BE INCREASED 1" FOR EVERY DEGREE OF CURVATURE.
WHERE SUPER ELEVATION ON OUTER IS GREATER, THIS DIMENSION SHALL BE INCREASED AS ABOVE, PLUS 3 1/2 TIMES THE AMOUNT OF DIFFERENCE IN SUPER ELEVATION.

NOTE "A"— BALLAST SECTION SHOWN IN SOLID IS FOR TRACK IN CONTINUOUS WELDED RAIL TERRITORY. IN BOLTED RAIL TERRITORY BALLAST SECTION WITH SHOULDERS INDICATED BY SHORT DASHED LINES MAY BE USED, AND DIMENSIONS DESIGNATED "Z" SHALL BE REDUCED BY 6."


* — 10' BERM HAS NOT BEEN PROVIDED ON THE RIVER SIDE OF RELOCATIONS EXTENDING INTO THE KANAWHA RIVER.

TABLE OF DIMENSIONS "Z"		
OUTSIDE EDGE OF BALLAST FROM GAGE OF NEAR RAIL FOR CURVED TRACK		
SUPER ELEVATION	INSIDE OF CURVE	OUTSIDE OF CURVE
1"	7' - 0"	7' - 5"
2"	6' - 10"	7' - 7"
3"	6' - 9"	7' - 10"
4"	6' - 8"	8' - 1"
5"	6' - 7"	8' - 4"
6"	6' - 6"	8' - 7"

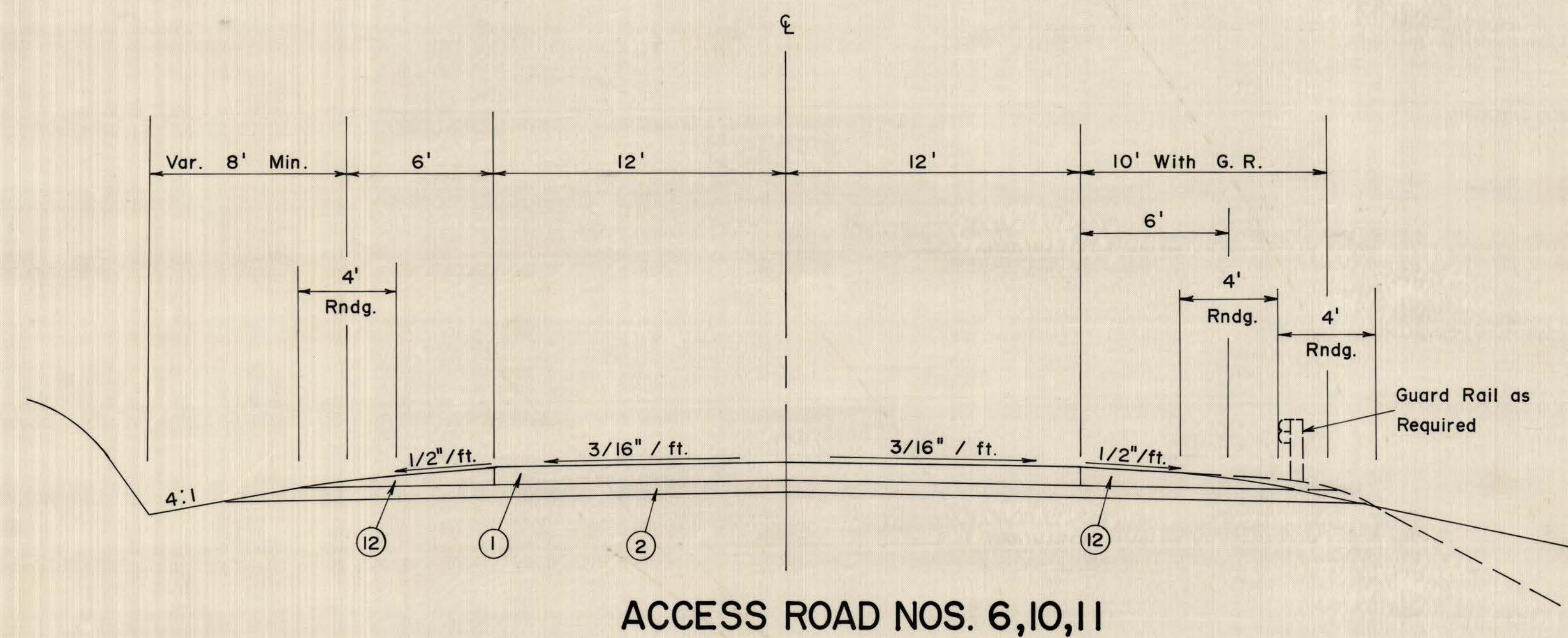
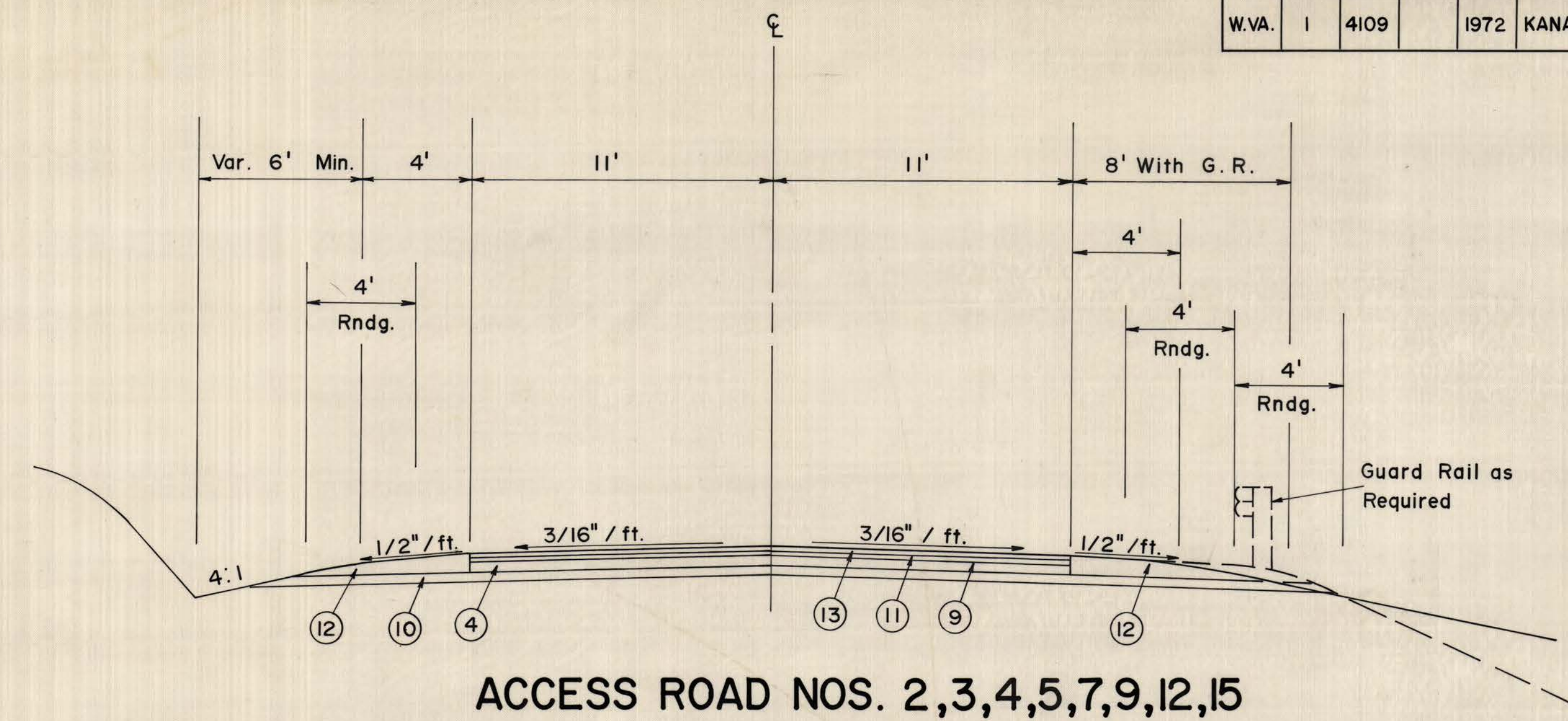
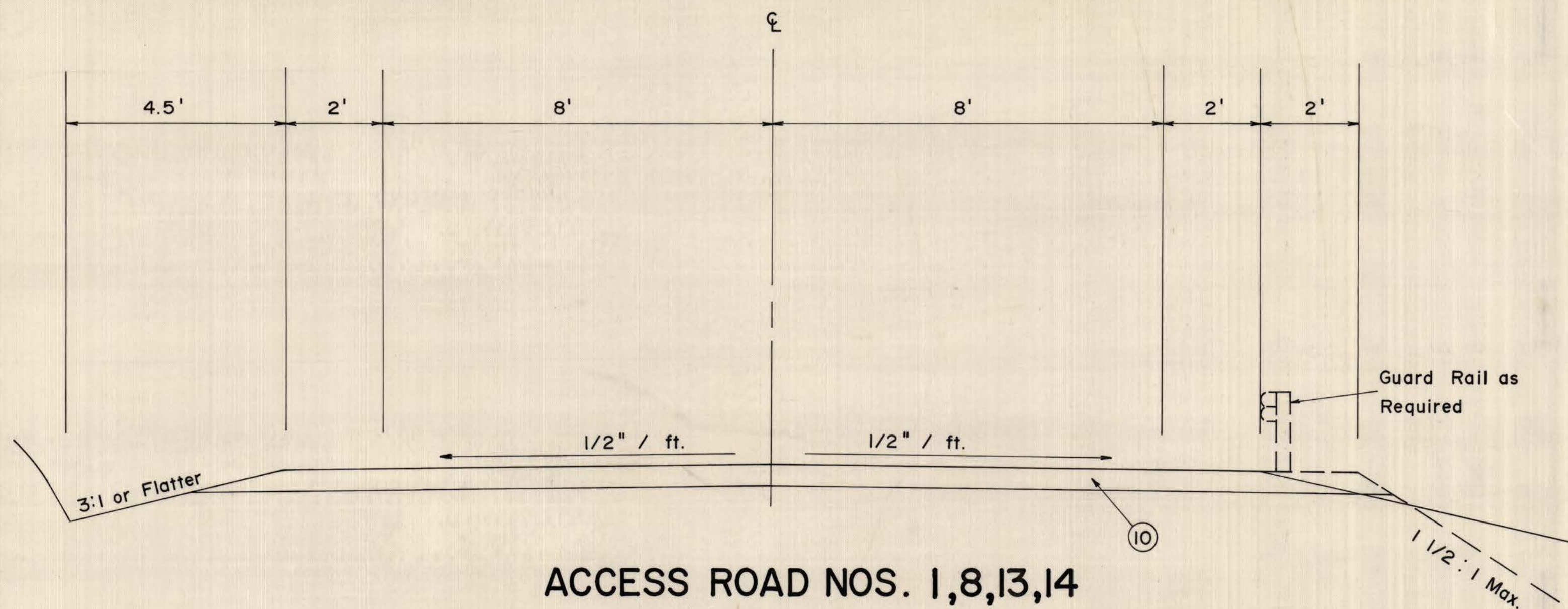
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

TYPICAL SECTION DETAILS

DESIGNED BY: PMR	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 10-70
DRAWN BY: RMM		SCALE: NONE
CHECKED BY: RDF		FILE NO.

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	9	68



- (1) 9" PORTLAND CEMENT CONCRETE PAVEMENT (ITEM 501-1(9))
- (2) 6" CLASS 2 AGGREGATE BASE COURSE (ITEM 307-2)
ALT. NO.1 - 6" HOT MIXED, HOT LAID BITUMINOUS TREATED BASE COURSE AGGREGATE (ITEM 302-1 & 302-2)
ALT. NO.2 - 6" CEMENT TREATED BASE COURSE AGGREGATE (ITEM 301-1, 301-2, 301-3)
- (4) 6" CLASS 1 AGGREGATE BASE COURSE (ITEM 307-1)
- (9) BITUMINOUS MATERIAL (ITEM 409-2)
- (10) 6" CLASS 3 AGGREGATE BASE COURSE (ITEM 307-3)
- (11) 2-1/2" HOT LAID BITUMINOUS CONCRETE BASE COURSE (ITEM 401-1(2))
- (12) CLASS 1 AGGREGATE BASE COURSE (ITEM 307-1)
- (13) 1-1/2" HOT LAID BITUMINOUS CONCRETE WEARING COURSE (ITEM 401-2(1))

[illegible]

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA

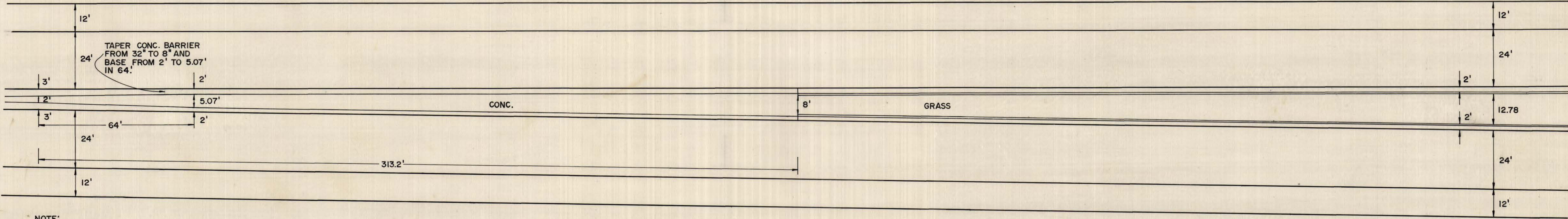
TYPICAL SECTION DETAILS

DESIGNED BY:	RDF
DRAWN BY:	JTB
CHECKED BY:	AVH

vtn inc.
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

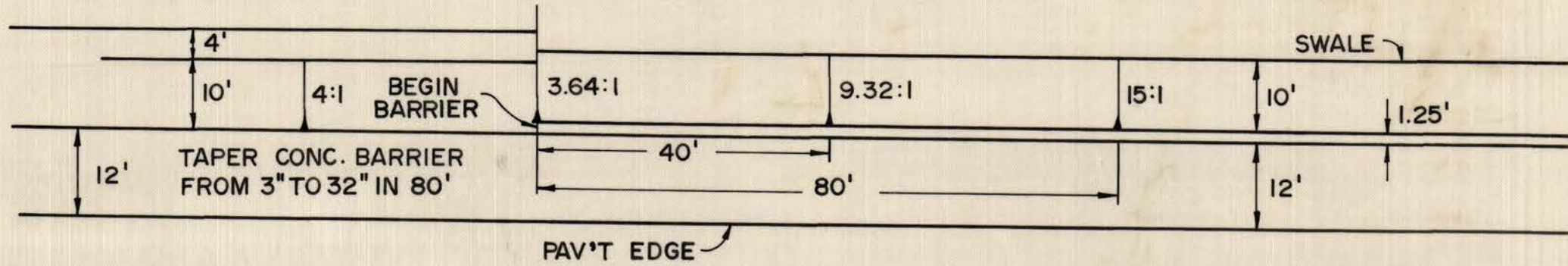
DATE:	3-71
SCALE:	NONE
FILE NO.	

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	10	68

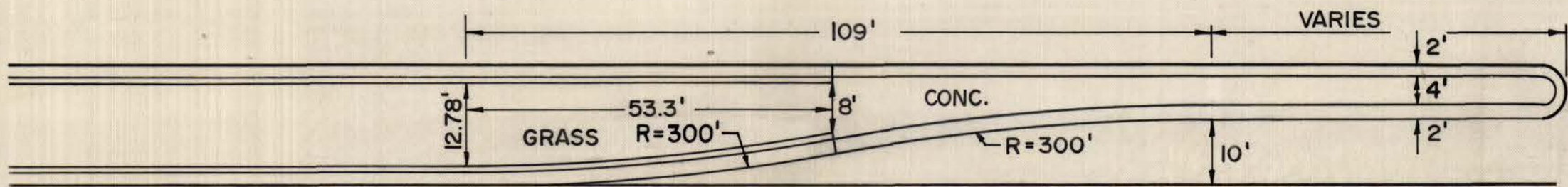


NOTE:
MEDIAN WIDTH TRANSITIONS ARE
ACCOMPLISHED WITH REVERSE
0°20'00" CURVES.

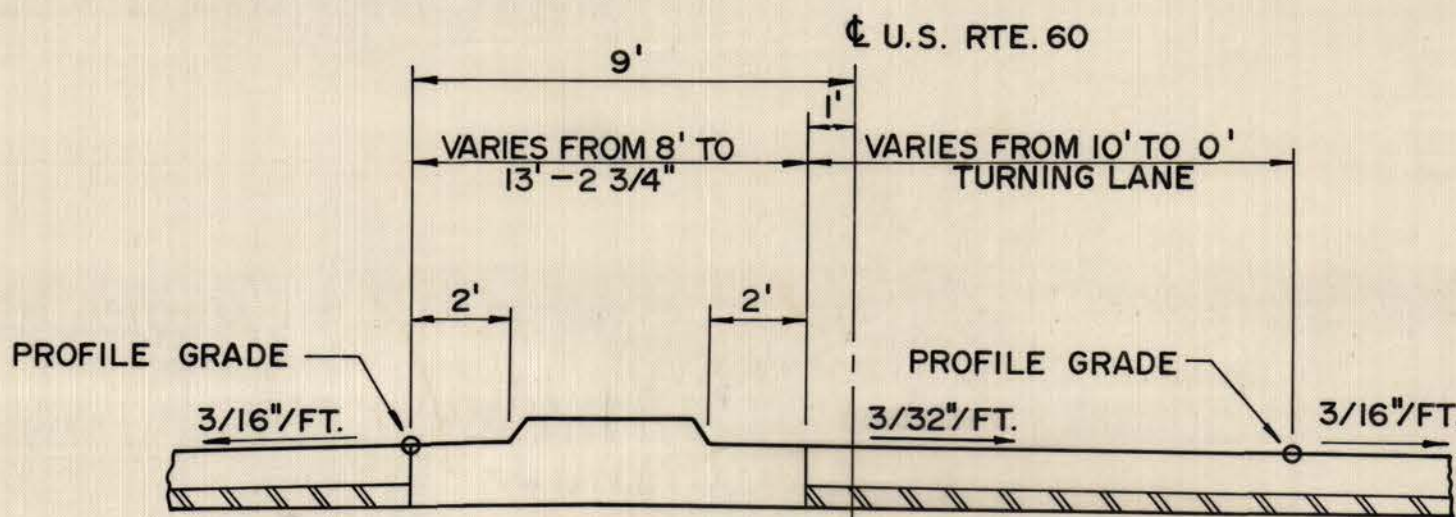
DETAIL MEDIAN TRANSITION 8' TO 18'



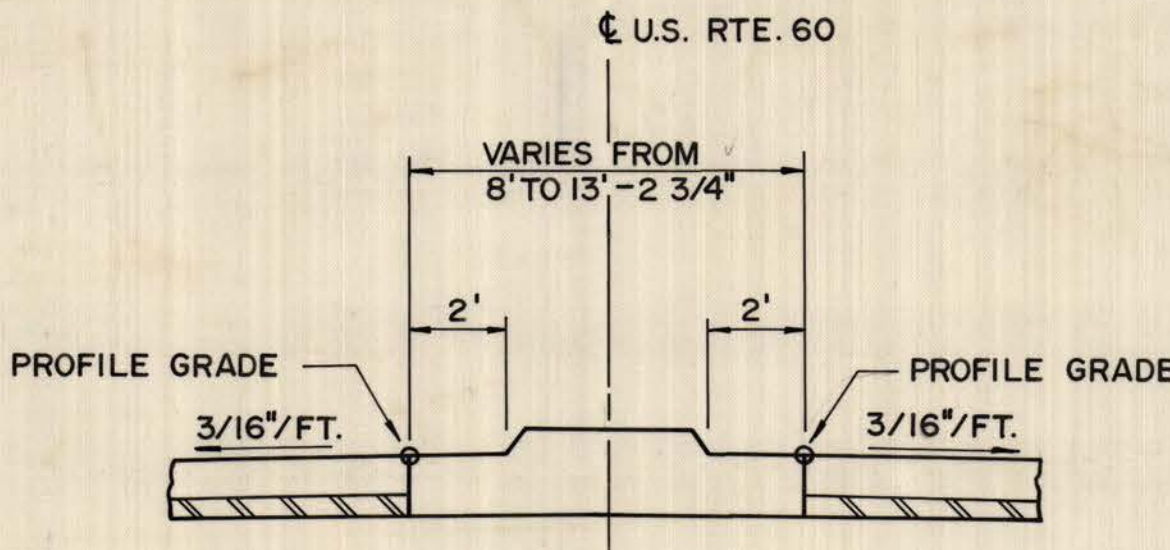
DETAIL TRANSITION OPEN DITCH TO CLOSED DITCH



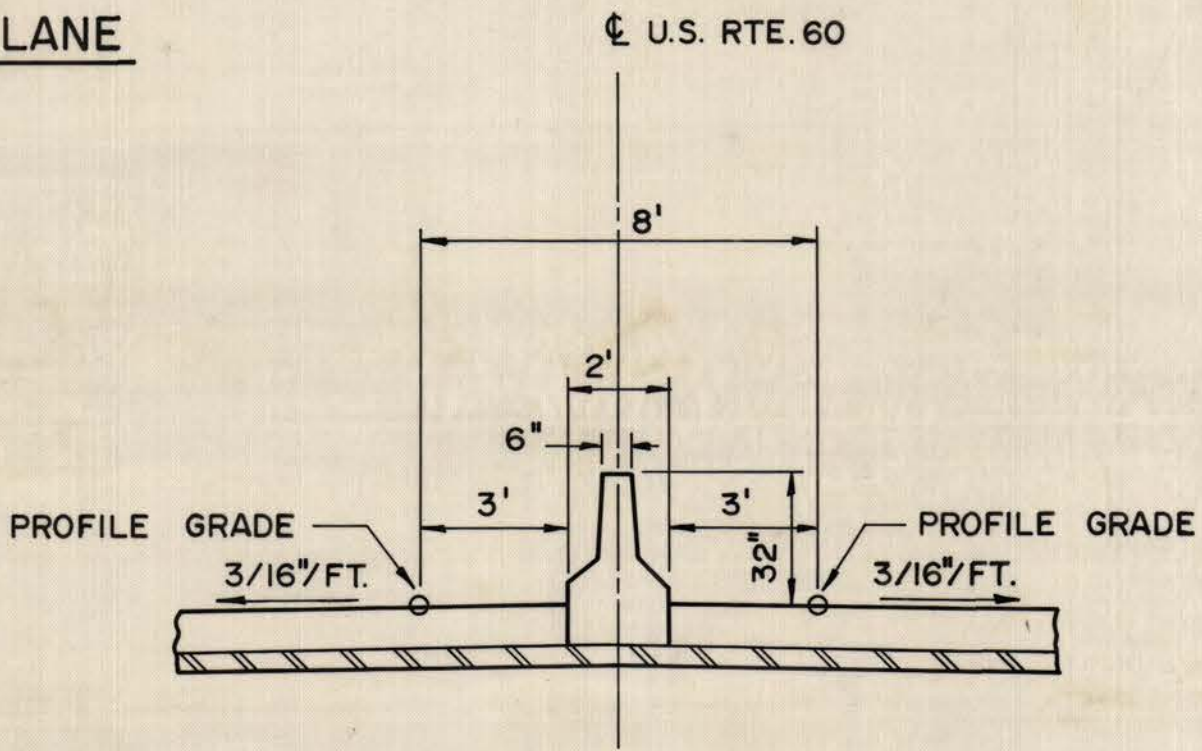
DETAIL TURNING LANE



DETAIL TURNING LANE



DETAIL CONCRETE MEDIAN



DETAIL TYPE V CONCRETE BARRIER MEDIAN

SECTION I			
STA. 675+00	TO	STA. 678+00	
STA. 773+00	TO	STA. 797+00	
STA. 810+00	TO	STA. 841+00	
SECTION II			
STA. 121+00	TO	STA. 152+00	
STA. 184+00	TO	STA. 251+00	

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

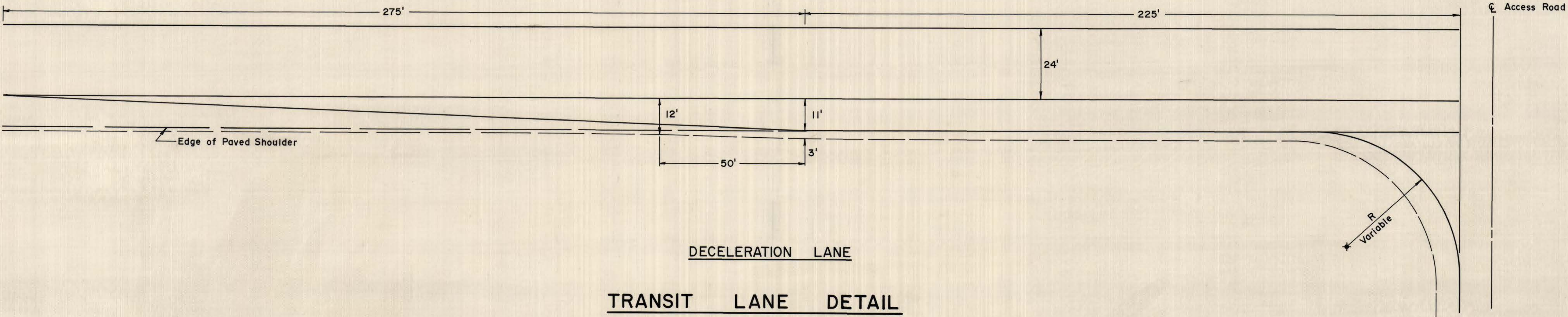
TYPICAL SECTION DETAILS

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

DESIGNED BY: RDF	DATE: 3-71
DRAWN BY: RMM	SCALE: NONE
CHECKED BY: AVH	FILE NO.

vtm inc.
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	11	68



DECELERATION LANE
TRANSIT LANE DETAIL

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

MISCELLANEOUS DETAILS

DESIGNED BY: GWE

DRAWN BY: PMR

CHECKED BY: AVH

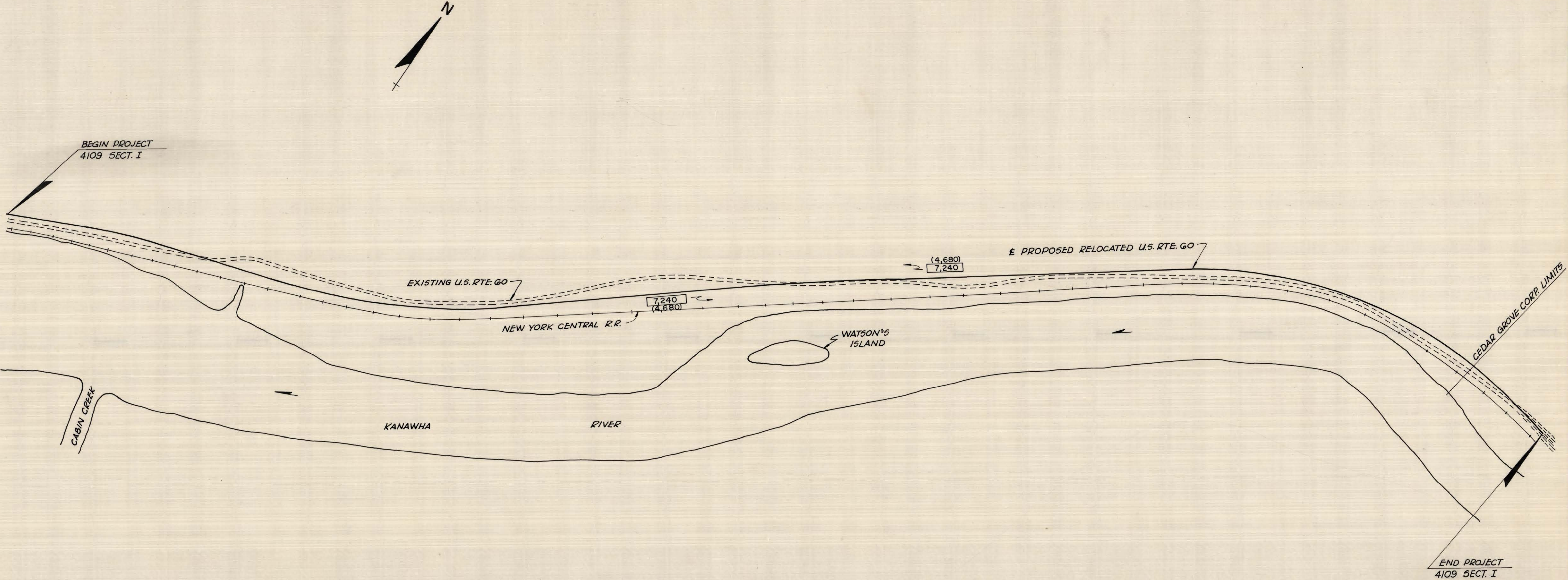
vtm inc.
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

DATE: 12-71

SCALE: 1" = 20'

FILE NO.

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	13	68



DESIGN DESIGNATION

A.D.T.(1971)..... 9,360
A.D.T.(1991)..... 14,480
D.H.V. 1,880
D..... 55%
T..... 12.5%
V..... 60 MPH

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

TRAFFIC SKETCH MAP

DESIGNED BY: **RDF**

DRAWN BY: **RMM**

CHECKED BY: **AVH**

VTI Inc.
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

DATE: 10-70

SCALE: NONE

FILE NO.

TABLE 1
COMPARISON OF CONSTRUCTION COSTS
CHELYAN BRIDGE TO CEDAR GROVE

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	15	68

			RECOMMENDED LINE		LINE "CAFD"		LINE "A"		LINE "B"		LINE "B"		LINE "CAD"		LINE "CAD"			
			CLOSED DITCH LENGTH = 3.14 MILE		OPEN DITCH LENGTH = 3.14 MILE		OPEN DITCH LENGTH = 3.15 MILE		OPEN DITCH LENGTH = 3.16 MILE		CLOSED DITCH LENGTH = 3.16 MILE		OPEN DITCH LENGTH = 3.16 MILE		CLOSED DITCH LENGTH = 3.16 MILE			
ITEM	UNIT	UNIT COST	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
CLEARING & GRUBBING	ACRE	\$ 760	93	\$ 70,680	106	\$ 80,560	170	\$ 129,200	227	\$ 172,520	189	\$ 143,640	127	\$ 96,520	106	\$ 80,560		
UNCLASSIFIED EXCAVATION	C.Y.	2.25	538,638	1,211,940	1,960,600	4,411,350							4,952,000	11,142,000	3,530,000	7,942,500		
UNCLASSIFIED EXCAVATION	C.Y.	1.75					13,890,000	24,307,500	16,310,000	28,542,500	12,510,000	21,892,500						
SPECIAL ROCK FILL	C.Y.		207,500		207,500								107,130		107,130			
RIPRAP	C.Y.	5.00	35,000	175,000	35,000	175,000							19,000	95,000	19,000	95,000		
MAINLINE PAVING	MILE	463,000	3.14	1,453,820	3.14	1,453,820	3.15	1,458,450	3.16	1,463,080	3.16	1,463,080	3.16	1,463,080	3.16	1,463,080		
RAILROAD RELOCATION (2 TRACKS)	MILE	264,000																
RAILROAD RELOCATION (1 TRACK)	MILE	158,400	1.33	210,670	1.33	210,670							.87	137,800	.87	137,800		
GUARD RAIL	L.F.	3.60	16,500	59,400	16,500	59,400	12,000	43,200	7,500	27,000	7,500	27,000	14,150	50,940	14,150	50,940		
MINOR DRAINAGE (OPEN DITCH) (CLOSED DITCH)	MILE	25,000 50,000	3.14	157,000	3.14	78,500	3.15	78,750	3.16	79,000	3.16	158,000	3.16	79,000	3.16	158,000		
MAJOR DRAINAGE	L.S.	L.S.	L.S.	79,000	L.S.	79,000	L.S.	81,000	L.S.	67,000	L.S.	65,000	L.S.	79,000	L.S.	79,000		
ACCESS ROADS	L.S.	L.S.	L.S.	30,000	L.S.	30,000	L.S.	30,000	L.S.	30,000	L.S.	30,000	L.S.	30,000	L.S.	30,000		
SEEDING & MULCHING	ACRE	460	40	18,400	45	20,700	109	50,140	166	76,360	138	63,480	54	24,840	45	20,700		
R/W FENCE	MILE	29,500	3.14	92,630	3.14	92,630	3.15	92,930	3.16	93,220	3.16	93,220	3.16	93,220	3.16	93,220		
MAINTAINING TRAFFIC	L.S.	L.S.	L.S.	300,000	L.S.	300,000	L.S.	300,000	L.S.	400,000	L.S.	400,000	L.S.	300,000	L.S.	300,000		
BORROW	C.Y.	2.25																
WASTE	C.Y.		64,194		1,486,000		13,840,000		16,260,000		12,460,000		4,634,900		3,209,400			
DREDGING	C.Y.	2.25	140,000	315,000	140,000	315,000							63,048	141,860	63,048	141,860		
RETAINING WALLS	L.S.	L.S.																
SUBTOTAL, ROADWAYS				4,173,540		7,306,630		26,571,170		30,950,680		24,335,920		13,733,260		10,592,660		
ENGINEERING & CONTINGENCIES (10%)				417,400		730,700		2,657,100		3,095,100		2,433,600		1,373,300		1,059,300		
TOTAL CONSTRUCTION COST				4,590,940		8,037,330		29,228,270		34,045,780		26,769,520		15,106,560		11,651,960		
RIGHT-OF-WAY				1,092,610		1,092,610		861,640		789,890		789,890		920,240		920,240		
UTILITIES				195,039		195,039		195,040		195,040		195,040		218,225		218,225		
TOTAL ESTIMATED COST				\$ 5,878,589		\$ 9,324,979		\$ 30,284,950		\$ 35,030,710		\$ 27,754,450		\$ 16,245,025		\$ 12,790,425		

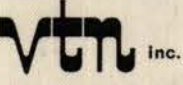
REVISION NUMBER	SHEET NUMBER	REVISIONS		DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
ESTIMATED CONSTRUCTION COST	
DESIGNED BY: RDF	DATE: 4 - 71
DRAWN BY: JCW	SCALE: NONE
CHECKED BY: AVH	FILE NO.
vtm Inc. ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	

TABLE 2
COMPARISON OF CONSTRUCTION COSTS
CEDAR GROVE TO HUGHESTON

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	16	68

			RECOMMENDED LINE		LINE "ACE"		LINE "A"		LINE "B"		LINE "C"		LINE "C-I"		LINE "BDE"		LINE "BDE"	
			CLOSED DITCH LENGTH = 3.31 MILE		OPEN DITCH LENGTH = 3.31 MILE		OPEN DITCH LENGTH = 3.32 MILE		OPEN DITCH LENGTH = 3.32 MILE		OPEN DITCH LENGTH = 3.32 MILE		OPEN DITCH LENGTH = 3.32 MILE		OPEN DITCH LENGTH = 3.33 MILE		CLOSED DITCH LENGTH = 3.33 MILE	
ITEM	UNIT	UNIT COST	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
CLEARING & GRUBBING	ACRE	\$ 760	94	\$ 71,440	124	\$ 94,240	222	\$ 168,720	167	\$ 126,920	214	\$ 162,640	104	\$ 79,040	120	91,200	110	83,600
UNCLASSIFIED EXCAVATION	C.Y.	2.25	733,778	1,651,000	1,531,000	3,444,750									569,400	1,281,150	144,800	325,800
UNCLASSIFIED EXCAVATION	C.Y.	1.75					5,258,000	9,201,500	5,303,600	9,281,300	4,044,000	7,077,000	622,000	1,088,500				
SPECIAL ROCK FILL	C.Y.		259,222		259,222										259,222		259,222	
RIPRAP	C.Y.	5.00	27,000	135,000	27,000	135,000									27,000	135,000	27,000	135,000
MAINLINE PAVING	MILE	463,000	3.31	1,532,530	3.31	1,532,530	3.32	1,537,160	3.32	1,537,160	3.32	1,537,160	3.32	1,537,160	3.33	1,541,790	3.33	1,541,790
RAILROAD RELOCATION (2 TRACKS)	MILE	264,000	.35	92,400	.35	92,400	.29	76,560	.29	76,560	.43	113,520	.43	113,520	.96	253,440	.96	253,440
RAILROAD RELOCATION (1 TRACK)	MILE	158,400	.77	121,970	.77	121,970									.77	121,970	.77	121,970
GUARD RAIL	L.F.	3.60	11,500	41,400	11,500	41,400	5,100	18,360	5,100	18,360	9,000	32,400	9,000	32,400	16,500	59,400	16,500	59,400
MINOR DRAINAGE (OPEN DITCH) (CLOSED DITCH)	MILE	25,000 50,000	3.31	165,500	3.31	82,750	3.32	83,000	3.32	83,000	3.32	83,000	3.32	83,000	3.33	83,250	3.33	166,500
MAJOR DRAINAGE	L.S.	L.S.	L.S.	84,000	L.S.	84,000	L.S.	80,000	L.S.	85,000	L.S.	77,000	L.S.	84,000	L.S.	78,000	L.S.	78,000
ACCESS ROADS	L.S.	L.S.	L.S.	35,000	L.S.	35,000	L.S.	35,000	L.S.	35,000	L.S.	35,000	L.S.	35,000	L.S.	35,000	L.S.	35,000
SEEDING & MULCHING	ACRE	460	40	18,400	48	22,080	158	72,680	103	47,380	150	69,000	40	18,400	48	22,080	42	19,320
R/W FENCE	MILE	29,500	3.31	97,645	3.31	97,645	3.32	97,940	3.32	97,940	3.32	97,940	3.32	97,940	3.33	98,235	3.33	98,235
MAINTAINING TRAFFIC	L.S.	L.S.	L.S.	300,000	L.S.	300,000	L.S.	400,000	L.S.	400,000	L.S.	300,000	L.S.	300,000	L.S.	300,000	L.S.	300,000
BORROW	C.Y.	2.25													115,800	260,550	540,420	1,215,945
WASTE	C.Y.		82,738		835,880		5,129,000		5,162,300		3,900,000		540,000					
DREDGING	C.Y.	2.25	208,517	469,165	208,517	469,165									208,517	469,165	208,517	469,165
RETAINING WALLS	L.S.	L.S.											L.S.	3,000,000				
SUBTOTAL, ROADWAY				4,815,450		6,552,930		11,770,920		11,788,620		9,584,660		6,468,960		4,830,230		4,903,165
ENGINEERING & CONTINGENCIES (10%)				481,550		655,300		1,177,100		1,178,900		958,500		646,900		483,000		490,300
TOTAL CONSTRUCTION COST				5,297,000		7,208,200		12,948,000		12,967,500		10,543,100		7,115,900		5,313,200		5,393,500
RIGHT-OF-WAY				1,124,760		1,124,760		1,096,600		1,118,640		1,090,860		1,090,860		1,129,550		1,129,550
UTILITIES				575,578		575,578		550,676		550,676		550,676		550,676		550,676		550,676
TOTAL ESTIMATED COST				\$ 6,997,338		\$ 8,908,538		\$ 14,595,276		\$ 14,636,816		\$ 12,184,636		\$ 8,757,436		\$ 6,993,426		\$ 7,073,726

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60				
ESTIMATED CONSTRUCTION COST				
DESIGNED BY: RDF	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 4 - 71		
DRAWN BY: JCW		SCALE: NONE		
CHECKED BY: AVH		FILE NO.		
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	1	4109		1972	KANAWHA	17	68

PROJECT 4109
U.S. ROUTE 60
CHELYAN BRIDGE TO HUGHESTON
SOCIAL, ECONOMIC AND ENVIRONMENTAL EFFECTS

1. THE UPGRADING OF U.S. ROUTE 60 AND U.S. ROUTE 21, HEREINAFTER REFERRED TO AS U.S. ROUTE 60 FOR EASIER NOMENCLATURE, WILL PROVIDE A MEANS OF FAST, SAFE, AND EFFICIENT TRANSPORTATION. THE PROPOSED HIGHWAY WILL BE A FOUR-LANE FACILITY DESIGNED FOR A SAFE SPEED OF 60 MILES PER HOUR IN ACCORDANCE WITH THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS GEOMETRIC DESIGN CRITERIA FOR RURAL HIGHWAYS AND THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. A POLICY ON GEOMETRIC DESIGN OF RURAL HIGHWAYS DATED 1965. ADEQUATE SIGHT DISTANCES WILL BE PROVIDED FOR THE DRIVER ON ALL HORIZONTAL AND VERTICAL CURVES AND AT INTERSECTIONS WITH EXISTING AND PROPOSED LOCAL STREETS AND ACCESS ROADS. THE GRADES AND HORIZONTAL CURVES PROPOSED IN THE RECOMMENDED ALIGNMENT WILL ALSO REDUCE TRAVEL TIME AND TRAVEL COSTS IN THE IMMEDIATE AREA. TRAVEL TIME FOR INTERSTATE TRAVEL ON U.S. ROUTE 60 WILL ALSO BE DECREASED.

2. SOME BENEFIT WOULD BE DERIVED FROM THE FOUR LANE FACILITY IN TIMES OF NATIONAL EMERGENCY. IT COULD BE USED FOR MOVEMENT OF PERSONNEL AND MILITARY SUPPLIES AND WOULD SERVE AS A FAST, SAFE EVACUATION ROUTE FOR CIVIL DEFENCE EMERGENCIES.

3. THE ECONOMY OF THE IMMEDIATE AREA MAY BE ADVERSELY AFFECTED INITIALLY, DUE TO THE LOSS OF SEVERAL BUSINESSES SUCH AS MOTELS, SERVICE STATIONS, RESTURANTS, AND STORES. HOWEVER, SUFFICIENT DEVELOPABLE LAND IS AVAILABLE FOR THE ESTABLISHMENT OF RELOCATED AND/OR NEW BUSINESSES TO REPLACE THOSE TAKEN BY CONSTRUCTION.

4. EMPLOYMENT MAY BE ADVERSELY AFFECTED IN THE IMMEDIATE AREA DUE TO THE LOSS OF THE SMALL BUSINESSES MENTIONED ABOVE. HOWEVER, THE MAJOR EMPLOYERS IN THE AREA SUCH AS VALLEY CAMP COAL COMPANY AND APPALACHIAN ELECTRIC POWER COMPANY WILL NOT BE AFFECTED. THEREFORE, THE SHORT TERM LOSS OF JOBS WILL BE IN THE SELF-EMPLOYED AND RETAIL EMPLOYEE CATAGORIES. WITH THE EXCELLENT RAILROAD AND WATER TRANSPORTATION FACILITIES CURRENTLY AVAILABLE, AND WITH FAST, SAFE HIGHWAY FACILITIES TO BE PROVIDED, IT SHOULD BE ANTICIPATED THAT ADDITIONAL INDUSTRY CAN BE BROUGHT TO THE AREA, THUS CREATING A GREAT MANY NEW JOBS AND BUSINESS OPPORTUNITIES FOR RESIDENTS OF THE AREA.

5. RECREATIONAL AND PARK FACILITIES ARE LACKING IN THE AREA. THE CONSTRUCTION OF THIS HIGHWAY WILL PROVIDE FASTER ACCESS TO STATE PARKS WITHIN A 25 MILE RADIUS AND ALSO CONNECTIONS TO INTERSTATE AND APPALACHIAN HIGHWAYS LEADING TO STATE AND NATIONAL PARKS AT GREATER DISTANCES. FAST AND EASY ACCESS TO MAJOR RECREATIONAL AND CULTURAL AREAS SUCH AS CHARLESTON WILL ALSO BE PROVIDED.

6. FIRE PROTECTION WOULD BE GREATLY INCREASED BY THE UPGRADED FACILITY THROUGH FASTER AND SAFER ACCESS PROVIDED TO THE VARIOUS COMMUNITY FIRE DEPARTMENTS. THIS WOULD ENABLE MORE EQUIPMENT TO RAPIDLY REACH A MAJOR FOREST OR BUILDING FIRE.

7. THE LOCATION OF THE PROPOSED HIGHWAY IS SUCH THAT A MINIMUM OF DEEP CUTS WITH THEIR RESULTANT LARGE EXPANSES OF ROCK AND EARTH WILL OCCUR. THROUGHOUT THE PROJECT, THE HARSHNESS OF THE CUTS THAT DO OCCUR WILL BE SUBDUED BY SEEDING AND PLANTING. ALTHOUGH THE HIGHWAY IS TO BE PROVIDED FOR TRANSPORTATION, SEVERAL ATTRACTIVE VISTAS OF THE KANAWHA RIVER VALLEY WILL BE AFFORDED THE TRAVELING PUBLIC AS A RESULT OF THE ENCROACHMENTS INTO THE RIVER AND THE PROXIMITY TO IT IN OTHER AREAS. CONSIDERATION HAS ALSO BEEN GIVEN TO RETAINING THE RUGGED BEAUTY OF THE AREA.

8. THE PROPOSED ALIGNMENT UTILIZES AS MUCH OF THE EXISTING RIGHT-OF-WAY AS POSSIBLE TO MINIMIZE DAMAGE TO PUBLIC UTILITIES, HOMES AND BUSINESSSESS. HOWEVER, DUE TO THE NARROWNESS OF THE VALLEY AND THE SEMI-URBAN NATURE OF THE DEVELOPMENT ALONG THE ALIGNMENT, SOME PUBLIC UTILITIES WILL BE AFFECTED. THE REQUIRED UTILITY RELOCATIONS WILL BE PHASED IN SUCH A MANNER THAT MINIMUM DISRUPTIONS TO SERVICE WILL RESULT.

9. PUBLIC HEALTH AND SAFETY WILL BE BENIFICIALLY AFFECTED BY THIS PROJECT SINCE IMPROVED SEWAGE TREATMENT WILL RESULT. THE OPERATIONAL FEATURES OF SEPTIC TANKS SERVING SOME OF THE EXISTING HOMES THAT ARE BEING ACQUIRED, ARE SUCH, THAT COMPLETE TREATMENT IS NOT BEING OBTAINED. FEDERAL REQUIREMENTS FOR DECENT, SAFE AND SANITARY RELOCATION HOUSING WILL IMPROVE THIS CONDITION. ALSO MEDICAL ATTENTION AND AMBULANCE SERVICE WILL BE AVAILABLE MORE QUICKLY AS A RESULT OF CONSTRUCTION OF THIS FAST, SAFE FACILITY.

10. THE RESIDENTIAL AND NEIGHBORHOOD CHARACTER AND LOCATION WILL BE GREATLY AFFECTED BY THE ACQUISITION OF HOMES CLOSE TO THE EXISTING U.S. ROUTE 60. GENERALLY ALL HOMES AND BUSINESSES LOCATED IN THE AREA NORTH OF THE PENN CENTRAL RAILROAD TRACKS WILL BE ACQUIRED WITH THE EXCEPTION OF THOSE LOCATED UP HOLLOWES. THE CHARACTER OF RESIDENCES IN THE AREA SHOULD IMPROVE AS NEWLY ATTRACTED INDUSTRY AND BUSINESSES LOCATE NEARBY.

11. IT IS BELIEVED THAT THE RELOCATION OF THREE CHURCHES WILL BE REQUIRED BY THIS PROJECT. WHILE SOME DISRUPTION

OF RELIGIOUS PRACTICES SHOULD BE ANTICIPATED. THERE IS SUFFICIENT DEVELOPABLE LAND IN THE AREA FOR RELOCATION. SEVERAL OTHER CHURCHES ARE LOCATED IN THE IMMEDIATE VICINITY OF THIS PROJECT AND DUE TO RELOCATION OF HOUSING, SOME OF THESE CHURCHES COULD EXPECT TO LOSE MEMBERSHIP. HOWEVER, IF INDUSTRIAL EXPANSION TAKES PLACE, NEW RESIDENTS WILL BE ATTRACTED TO OFFSET THESE LOSSES.

12. WHILE THE TAX BASE WILL BE LOWERED INITIALLY, THE ACCESS PROVIDED BY THE PROPOSED ROADWAY SHOULD ATTRACT NEW INDUSTRY INTO THE AREA WHICH WILL BROADEN THE TAX BASE. SINCE A HIGHER WAGE LEVEL WILL ALMOST CERTAINLY ACCOMPANY INCREASED INDUSTRIAL ACTIVITY, AN INCREASE IN THE VALUE OF EXISTING PROPERTY THROUGH IMPROVEMENTS BY THE MORE AFFLUENT CITIZENRY WILL RESULT IN AN INCREASE IN TAXES. ALSO, IT COULD BE EXPECTED THAT NEW HOMES WILL BE BUILT BY PERSONS ATTRACTED TO THE AREA BY INDUSTRY AS WELL AS PEOPLE BEING RELOCATED BY THIS PROJECT. ALL OF THESE ITEMS WILL INCREASE THE LOCAL TAXES AND DECREASE THE SOCIAL SERVICE COSTS BY PROVIDING A MORE SELF SUFFICIENT CITIZENRY.

13. WILDLIFE SHOULD NOT BE ADVERSELY AFFECTED BY THIS PROJECT SINCE THE EXISTING AREA IS SEMI-URBAN AND CONTAINS LITTLE WILDLIFE. EROSION SHOULD NOT BE A PROBLEM SINCE STANDARD ENGINEERING PRACTICES EMPLOYED IN THE DESIGN ENSURE COLLECTION OF RUNOFF WATERS IN CHANNELS AND DIVERT IT TO NATURAL STREAMBEDS. STEEP RUNOFF CHANNELS WILL BE PROTECTED BY SEEDING OR PAVING AS REQUIRED, TO GUARD AGAINST EROSION. IN ADDITION, THE ENGINEERING ECONOMICS OF THIS PROJECT NECESSITATE THE CONSTRUCTION OF ROCK FILLS INTO THE KANAWHA RIVER AT SELECTED LOCATIONS WHICH WILL ELIMINATE SOME OF THE HIGH CUTS AND THE ASSOCIATED BARE CUT SLOPES, THEREBY REDUCING THE POSSIBILITY OF EROSION. ADDITIONALLY, SPECIAL PROVISIONS FOR THE TEMPORARY CONTROL OF WATER POLLUTION DURING CONSTRUCTION WILL BE IN EFFECT TO CONTROL EROSION. DUE TO THESE FACTORS, IT IS ANTICIPATED THAT THE GENERAL ECOLOGY OF THE AREA WILL BE UNCHANGED AS A RESULT OF THIS CONSTRUCTION.

14. ONLY ONE HISTORIC MARKER IS AFFECTED BY THIS PROJECT. A MARKER FOR MR. W.H. EDWARDS HAS BEEN ERECTED ALONG THE EXISTING U.S. ROUTE 60 ON THE WESTERLY EDGE OF SHREWSBURY. MR. EDWARDS WAS A LEADING AUTHORITY ON MOTHS AND BUTTERFLYS. IT IS ANTICIPATED THAT THIS MARKER CAN BE RELOCATED SINCE IT MARKS COALBURG AS THE BIRTHPLACE AND HOME OF MR. EDWARDS.


15. IT IS ANTICIPATED THAT NOISE WILL BE REDUCED SINCE THE SHIFTING OF GEARS ON HEAVY TRUCKS SHOULD BE NEARLY ELIMINATED. WATER POLLUTION FROM EROSION ON THIS PROJECT WILL BE HELD TO A MINIMUM, THROUGH THE METHODS OUTLINED UNDER ITEM 13, ABOVE. SOME WATER POLLUTION MAY RESULT FROM THE EMBANKMENT BEING PLACED IN THE RIVER. HOWEVER THIS WILL BE HELD TO A MINIMUM BY USING ROCK FILLS. THE DREDGING REQUIRED FOR WIDENING THE CHANNEL WILL CAUSE WATER POLLUTION BUT THIS WILL BE RESTRICTED TO A RELATIVELY SHORT TIME PERIOD AND MUCH OF THE SEDIMENT WILL SETTLE OUT AS IT MOVES DOWNSTREAM. AIR POLLUTION DUE TO VECICULAR TRAFFIC, SHOULD BE REDUCED DUE TO INCREASED OPERATING SPEEDS AS SHOWN BY A STUDY CONDUCTED AT TEXAS TECH.

16. WHILE SUFFICIENT DEVELOPABLE LAND EXISTS TO ASSURE THE RELOCATION OF EXISTING HOMES AND BUSINESSES, IT SHOULD BE ANTICIPATED THAT PROPERTY VALUES IN THE AREA WILL INCREASE DUE TO THE EXPANSION OF INDUSTRY AND THE ACCOMPANYING DEMAND FOR MORE HOMES AND HOMESITES. THE DEMAND FOR INDUSTRIAL SITES SHOULD ALSO TEND TO INCREASE PROPERTY VALUES DUE TO THE RATHER LIMITED SUPPLY OF LAND SUITABLE FOR INDUSTRIAL DEVELOPMENT IN THE UPPER KANAWHA VALLEY.

17. DUE TO THE TOPOGRAPHY OF THE AREA, IT IS UNLIKELY AT THIS TIME, THAT ANY MULTIPLE USE OF SPACE CAN BE ACCOMPLISHED. THE EXCEPTION WOULD BE CONVEYORS FROM THE VARIOUS COAL MINES USING AIR SPACE OVER THE NEW FACILITY. POSSIBLE FUTURE USE OF THIS SPACE COULD OCCUR IF INDUSTRIAL DEVELOPMENT WARRANTS.

18. WHILE APPROXIMATELY 127 FAMILIES WILL BE AFFECTED BY CONSTRUCTION OF THE PROPOSED ROADWAY, THOSE FAMILIES AFFECTED CAN BE ASSURED THAT DECENT, SAFE AND SANITARY REPLACEMENT HOUSING WILL BE MADE AVAILABLE TO THEM. THE RELOCATION ADVISORY ASSISTANCE SECTION OF THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS WILL ASSIST IN FINDING RELOCATION HOUSING. IF SUCH HOUSING IS NOT AVAILABLE, IT WILL BE PROVIDED BY CONSTRUCTION IF NECESSARY.

19. SINCE THIS IS A LIMITED ACCESS FACILITY, WITH ACCESS PROVIDED AT ESSENTIAL POINTS, NO DISRUPTION OF SCHOOL DISTRICTS IS ANTICIPATED. ON THE CONTRARY, THE NEW FACILITY WILL PROVIDE FASTER AND SAFER TRANSPORTATION TO SCHOOLS IN THE AREA. PICKUP AND DELIVERY OF SCHOOL CHILDREN, AS WELL AS USERS OF PUBLIC TRANSPORTATION, WILL BE FACILITATED THROUGH THE USE OF SPECIAL DECELERATION AND ACCELERATION LANES AND PAVED SHOULDERS TO BE PROVIDED AT MOST OF THE POINTS OF ACCESS.

					THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60				
					SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS				
DESIGNED BY: RDF		 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA			DATE: 4-71				
DRAWN BY: GWE					SCALE: NONE				
CHECKED BY: AVH					FILE NO.				
REVISION NUMBER	SHEET NUMBER	REVISIONS			DATE	BY			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	1	4109		1972	KANAWHA	18	68

19. CONTINUED

THE PROJECT AREA IS SERVED BY THE MIDLAND TRAIL ELEMENTARY, CEDAR GROVE COMMUNITY AND THE GRANT-HUGHESTON ELEMENTARY SCHOOLS. WHILE THE RELOCATION OF POPULATION COULD AFFECT THESE SCHOOL DISTRICTS, NO MAJOR PROBLEMS IN HOUSING THE SCHOOL POPULATION ARE FORESEEN AS A RESULT OF THIS PROJECT. SINCE ALL OF THE SECONDARY AGE STUDENTS WITHIN THE PROJECT LIMITS ARE SERVED BY THE CEDAR GROVE COMMUNITY SCHOOL AND DUPONT SENIOR HIGH SCHOOL, THE RELOCATION OF POPULATION WITHIN THE AREA WILL HAVE NO EFFECT ON THESE SCHOOLS.

20. AN ESTIMATED 28 BUSINESSES WILL BE FORCED TO RELOCATE DUE TO CONSTRUCTION OF THIS PROJECT. SOME 127 HOMES WILL BE TAKEN AND APPROXIMATELY 30 MOBILE HOMES WILL BE FORCED TO RELOCATE DUE TO THE CONSTRUCTION. ALSO AFFECTED WILL BE PARKING FOR THE GLASGOW TOWN HALL AND MEDICAL CLINIC.

WHILE THIS IS A SIZEABLE DISRUPTION, THE INDIVIDUAL AFFECTED CAN BE ASSURED THAT REPLACEMENT HOUSING WILL BE AVAIL-
ABLE EITHER THROUGH UTILIZATION OF EXISTING HOUSING, OR CONSTRUCTION BY PRIVATE INDIVIDUALS AND/OR PUBLIC AGENCIES
AND THAT RELOCATION ASSISTANCE WILL BE PROVIDED.

21. THE ESTIMATED COSTS FOR NEW CONSTRUCTION ON THE RECOMMENDED ALIGNMENT SHOWN WITHIN THE REPORT ARE AS FOLLOWS:

CONSTRUCTION	RIGHT-OF-WAY	ENGINEERING CONTINGENCIES	TOTAL
\$8.99 MILLION	\$ 2.22 MILLION	\$0.90 MILLION	\$ 12.11 MILLION

CONCLUSIONS REACHED FROM STUDIES MADE IN THE DEVELOPMENT OF THIS REPORT INDICATE THAT THE ALIGNMENT RECOMMENDED
HEREIN IS THE MOST FEASIBLE, PARTICULARLY FROM AN ECONOMIC STANDPOINT.

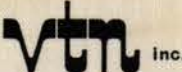
22. IT IS ANTICIPATED THAT BY CAREFUL INVESTIGATION DURING THE DESIGN PHASE OF THIS PROJECT AND FOLLOWING GOOD
DESIGN AND CONSTRUCTION PRACTICES, THE AVERAGE MAINTENANCE COST PER MILE FOR THIS FACILITY WILL BE NEARLY THE SAME
AS THAT FOR ANY APPALACHIAN CORRIDOR. OPERATING COSTS ON THE NEW FACILITY SHOULD ALSO COMPARE FAVORABLE WITH THOSE
ON THE APPALACHIAN SYSTEM.

MAINTENANCE COSTS ON THE NEW FACILITY ARE EXPECTED TO BE HIGHER THEN THOSE ON THE EXISTING FACILITY DUE TO THE
INCREASED AREA TO BE MAINTAINED, HOWEVER, OPERATING COSTS SHOULD BE LOWER WHICH WILL TEND TO BALANCE THESE ITEMS.

23. OPERATION AND USE OF THE EXISTING HIGHWAY WILL BE ADVERSLY AFFECTED DURING THE CONSTRUCTION PERIOD. HOWEVER
TRAFFIC WILL BE DETOURED FROM THE EXISTING FACILITY TO THE NEW AS CONSTRUCTION IS COMPLETED. IT IS ANTICIPATED
THAT SOME SHORT DISRUPTIONS OF TRAFFIC WILL OCCUR AS BLASTING TAKES PLACE. HOWEVER, EVERY EFFORT WILL BE MADE TO
HOLD DISRUPTIONS TO A MINIMUM. ACCESS TO EXISTING ACCESS POINTS THAT ARE TO CONTINUE SERVICING THE PUBLIC WILL BE
CONTINUOUSLY MAINTAINED. FOLLOWING THE COMPLETION OF CONSTRUCTION, ALL TRAFFIC WILL OPERATE ON THE NEW FACILITY.
SINCE THE PRESENT ROADWAY WILL BE REMOVED THROUGHOUT MOST OF THE PROJECT LENGTH.

OPERATIONS ON THE PENN CENTRAL RAILROAD WILL NOT BE AFFECTED EXCEPT FOR SHORT PERIODS OF TIME WHILE CONNECTIONS
ARE MADE FROM THE EXISTING TO THE RELOCATED TRACKS. AS THIS WILL BE DONE BY RAILROAD FORCES, IT CAN BE SCHEDULED
AT A TIME WHEN LITTLE OR NO EFFECT ON TRAIN TRAFFIC WILL OCCUR.

NO ADVERSE EFFECT ON RIVER TRANSPORTATION WILL RESULT FROM THE CONSTRUCTION OF THIS FACILITY.

					THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60						
					SOCIAL, ECONOMIC, AND ENVIRONMENTAL EFFECTS						
					DESIGNED BY: RDF		 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA		DATE: 4-71		
					DRAWN BY: GWE				SCALE: NONE		
					CHECKED BY: AVH				FILE NO.		
REVISION NUMBER	SHEET NUMBER	REVISIONS			DATE	BY					

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	I	4109		1971	KANAWHA	20	68

PROFILE	DATE
SURVEYED	BY
GRADES CHECKED	
B. M.'S. NOTED	
STRUCTURE NOTATIONS CHECKED	
NO.	

600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0

600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0

TOTAL EXCAVATION 733,778 C. Y.
TOTAL EMBANKMENT 651,040 C. Y.
WASTE 82,738 C. Y.

STA. 251+08.34
+ 82,738 C. Y.

70+00 80+00 90+00 100+00 110+00 120+00 130+00 140+00 150+00 160+00 170+00 180+00 190+00 200+00 210+00 220+00 230+00 240+00 250+00

MASS DIAGRAM
SECTION II

SCALE VERT. 1"= 50,000 C.Y.
HORZ. 1"= 1,000'

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	22	68

P.I. NO. 1
P.I. = STA. 690+25.89
 Δ = 08°14' 29" RT.
D = 0° 30'
R = 11,459.16'
L = 1648.28'
T = 825.56'
E = 29.70'
S.E. = R.C.

P.I. NO. 2
P.I. = STA. 718+25.89
 Δ = 22°11' 36" LT.
D = 1°00'
R = 5729.58'
L = 2219.33'
T = 1123.75'
E = 109.16'
S.E. = 029%

REMOVE EXISTING 2'x4' BOX CULVERT
INSTALL 160 L.F. 54" PIPE

Power poles
to be relocated
outside of
Right-of-Way.

INSTALL 140 L.F. 108" PIPE

NOTE:
Pier lines supporting
conveyor at C
of roadway to be
removed and trusses
to be reinforced
or enlarged as
needed to span
entire roadway.

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

PLAN
STA. 676+00 TO STA. 736+00

DESIGNED BY: RDF
DRAWN BY: RMM
CHECKED BY: AVH

DATE: 3-71
SCALE: 1"=200'
FILE NO.

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	I	4109		1972	KANAWHA	24	68



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

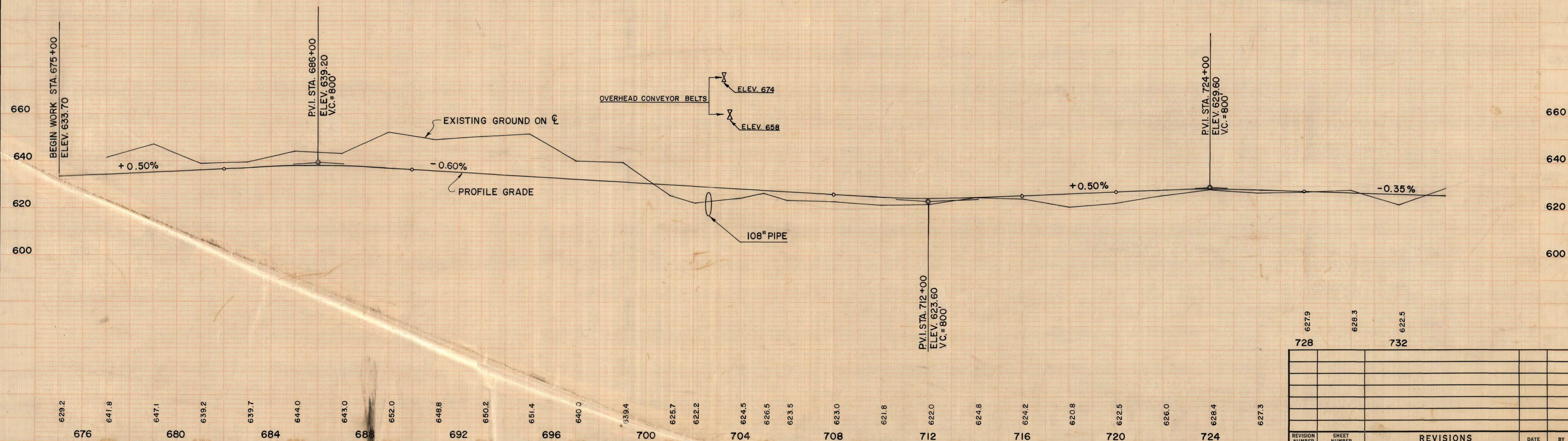
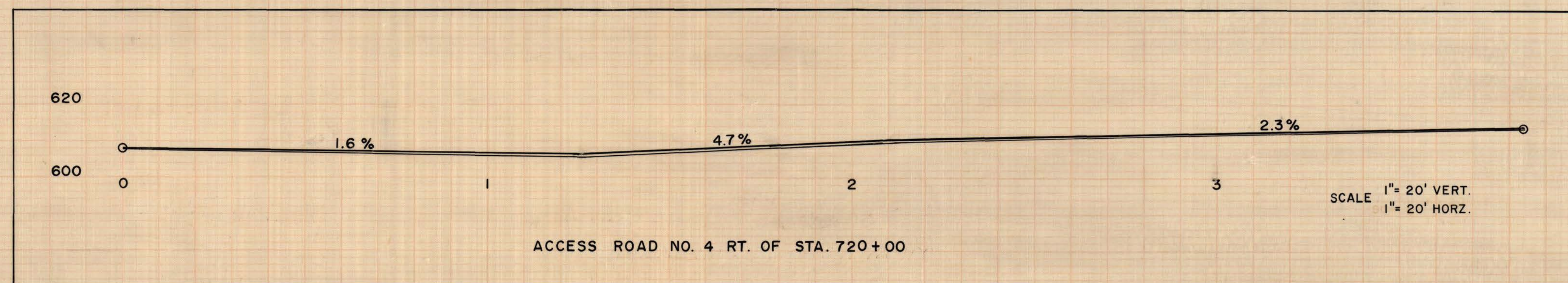
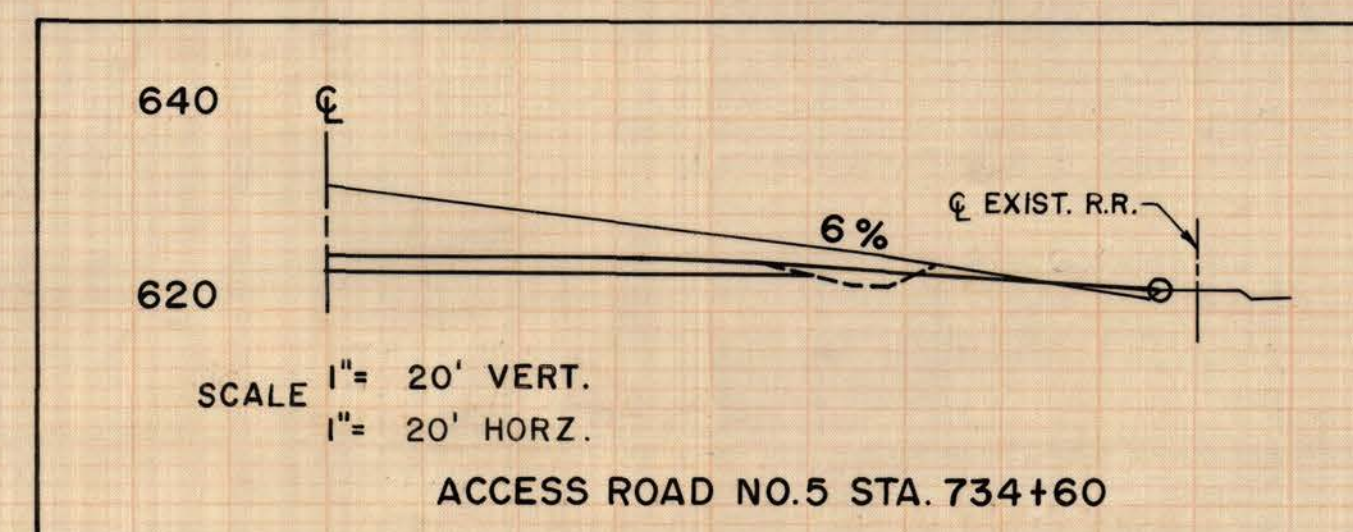
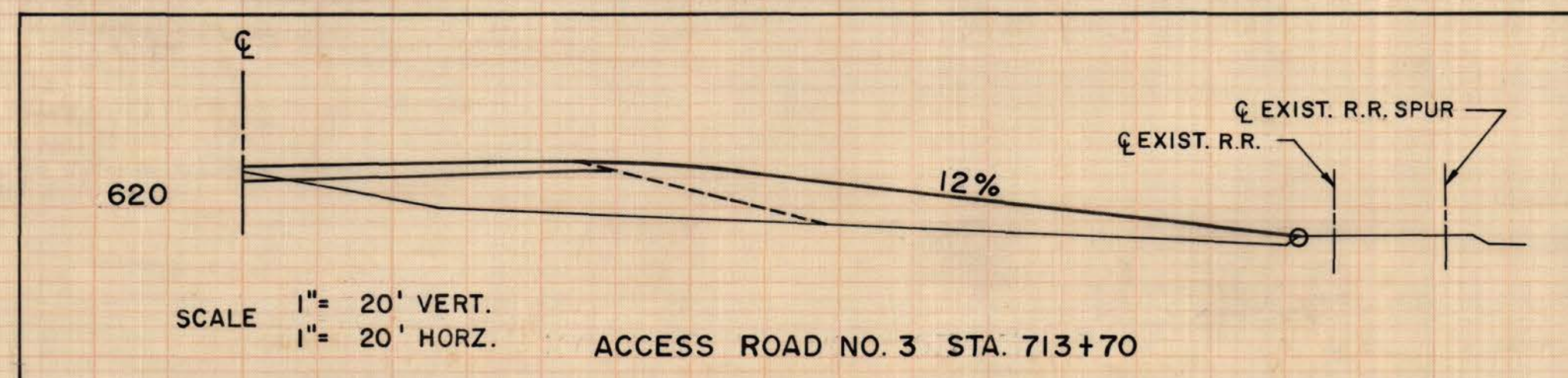
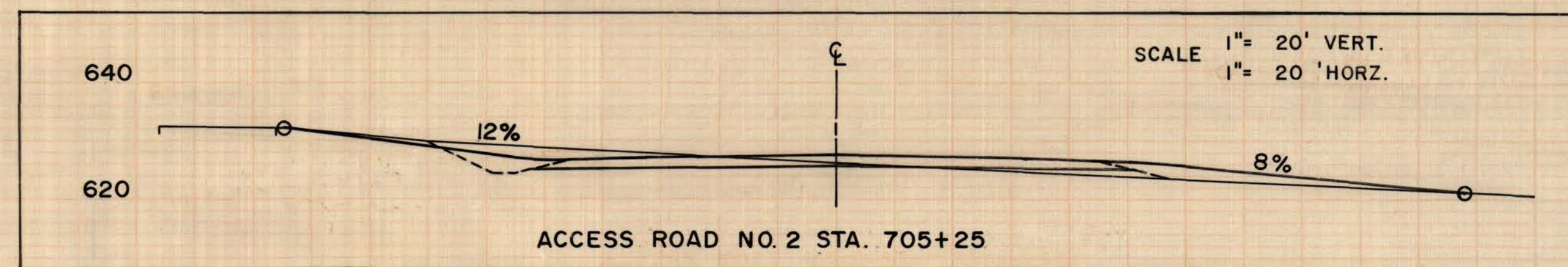
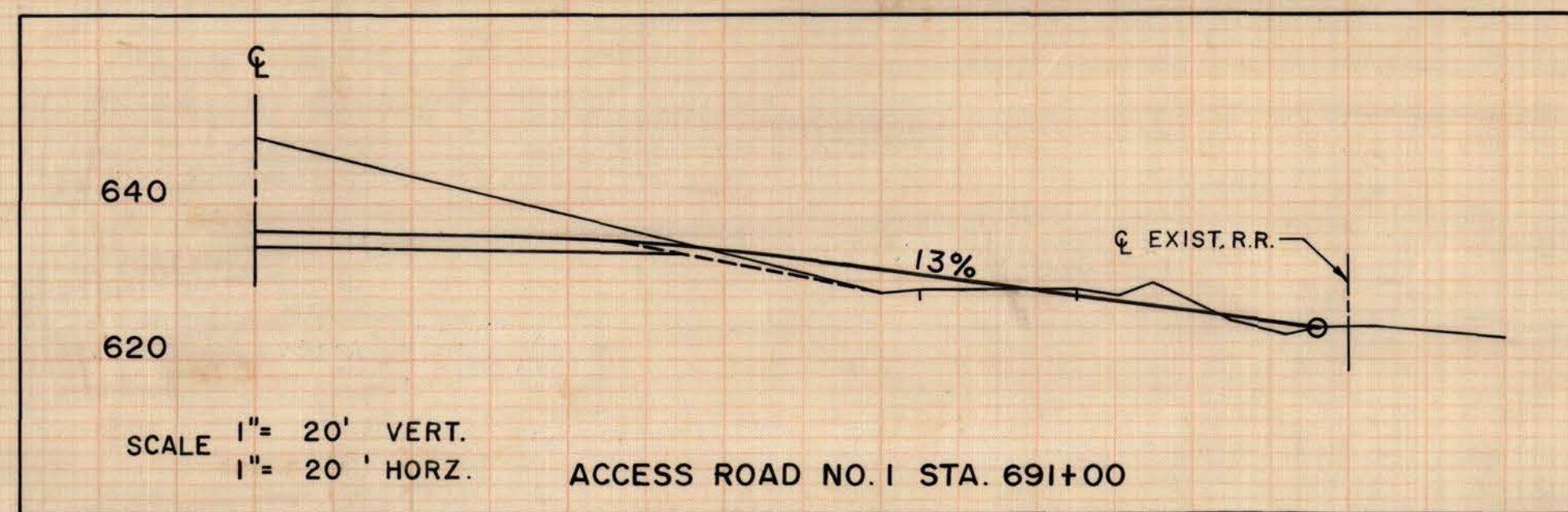
PLAN
STA.783+00 TO STA.841+00

DESIGNED BY: RDF	DATE: 3-71
DRAWN BY: JTB	SCALE: 1"=200'
CHECKED BY: AVH	FILE NO.

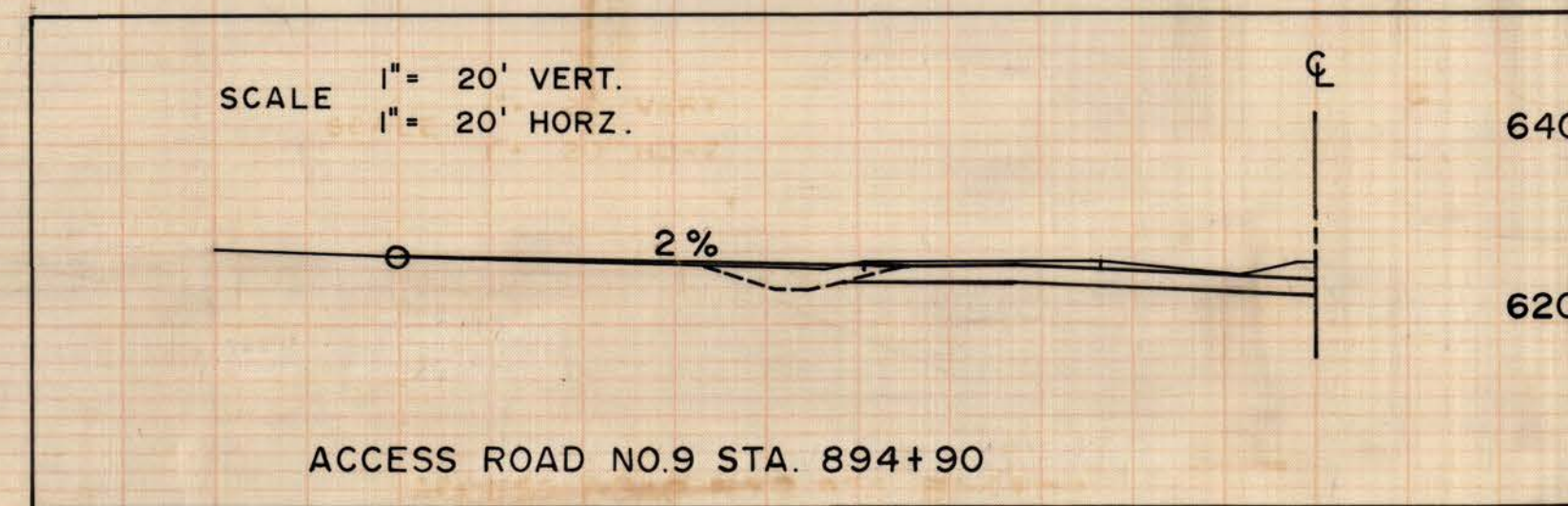
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

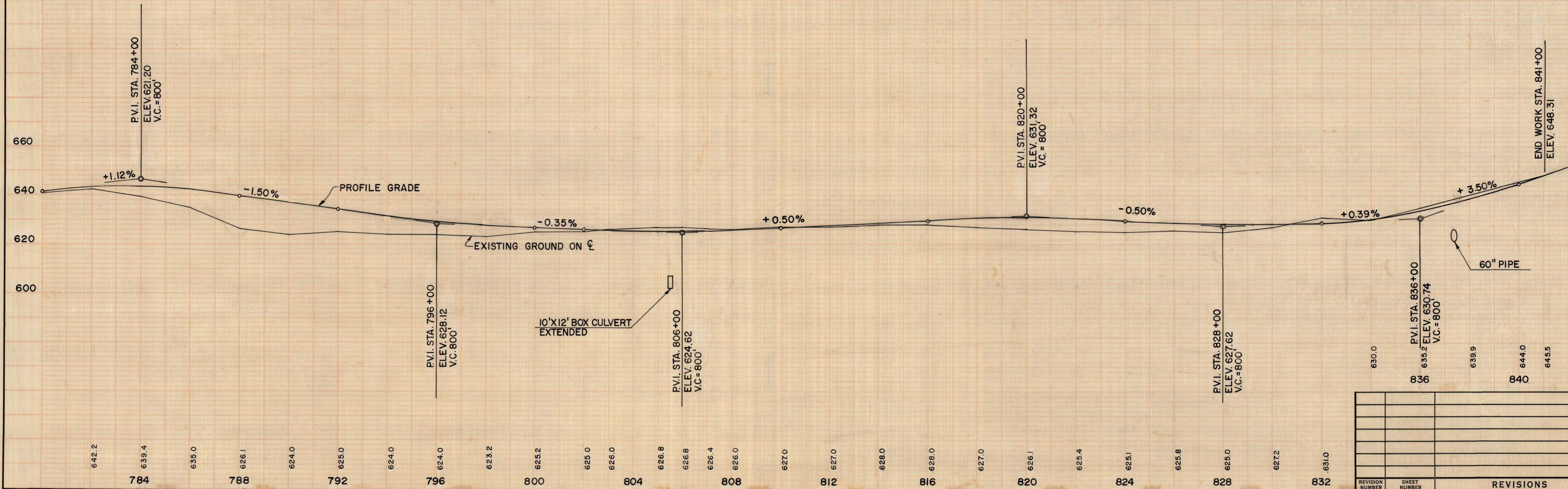
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	I	4109	1972		KANAWHA	25	68



PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	1	4109		1972	KANAWHA	27	68

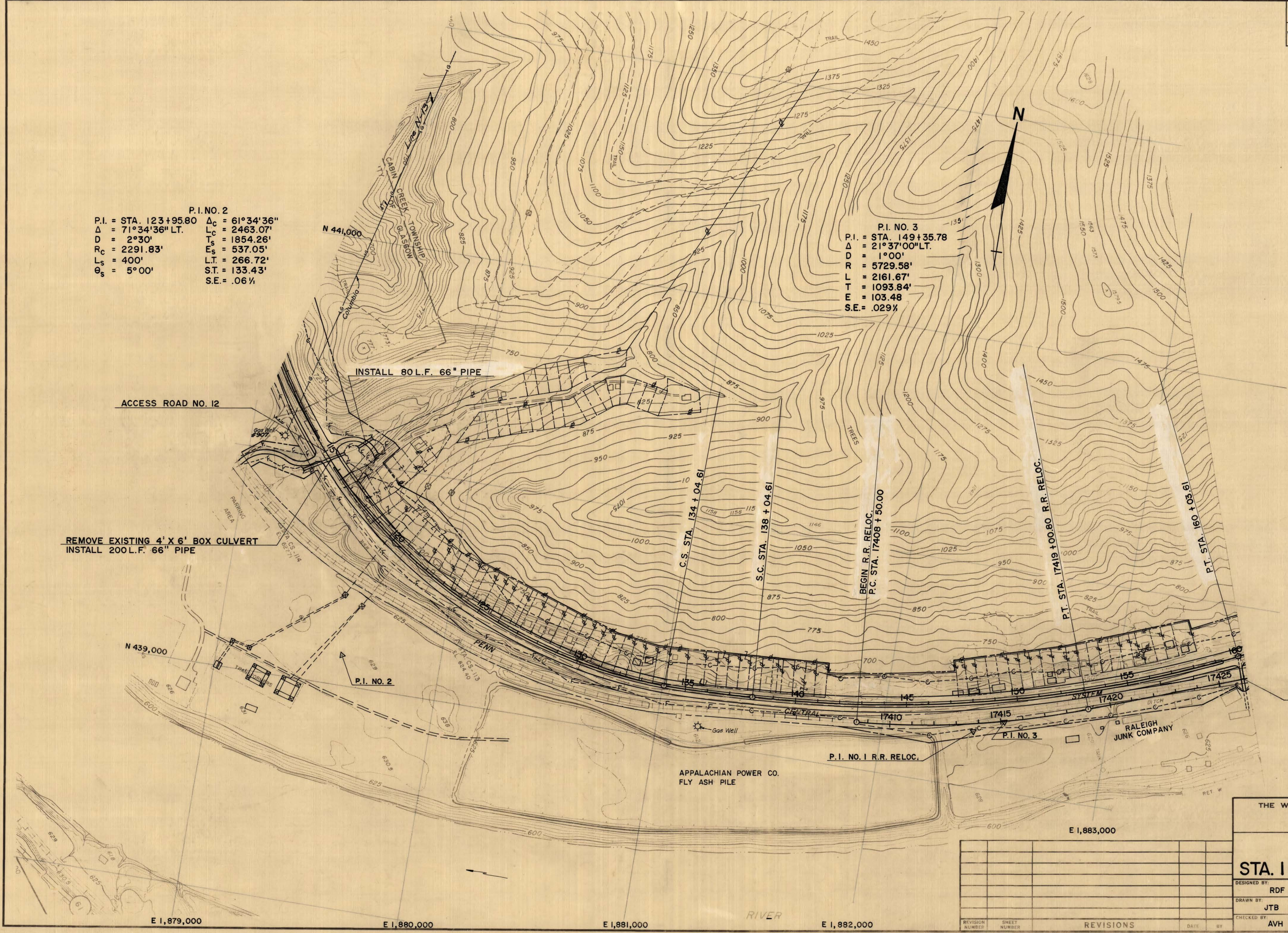


SCALE 1" = 20' VERT.
1" = 200' HORZ.

[illegible]

PROFILE	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B. M.'S. NOTED		
STRUCTURE NOTATIONS CHKD.		
NO.		

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	I	4109		1972	KANAWHA	29	68



REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

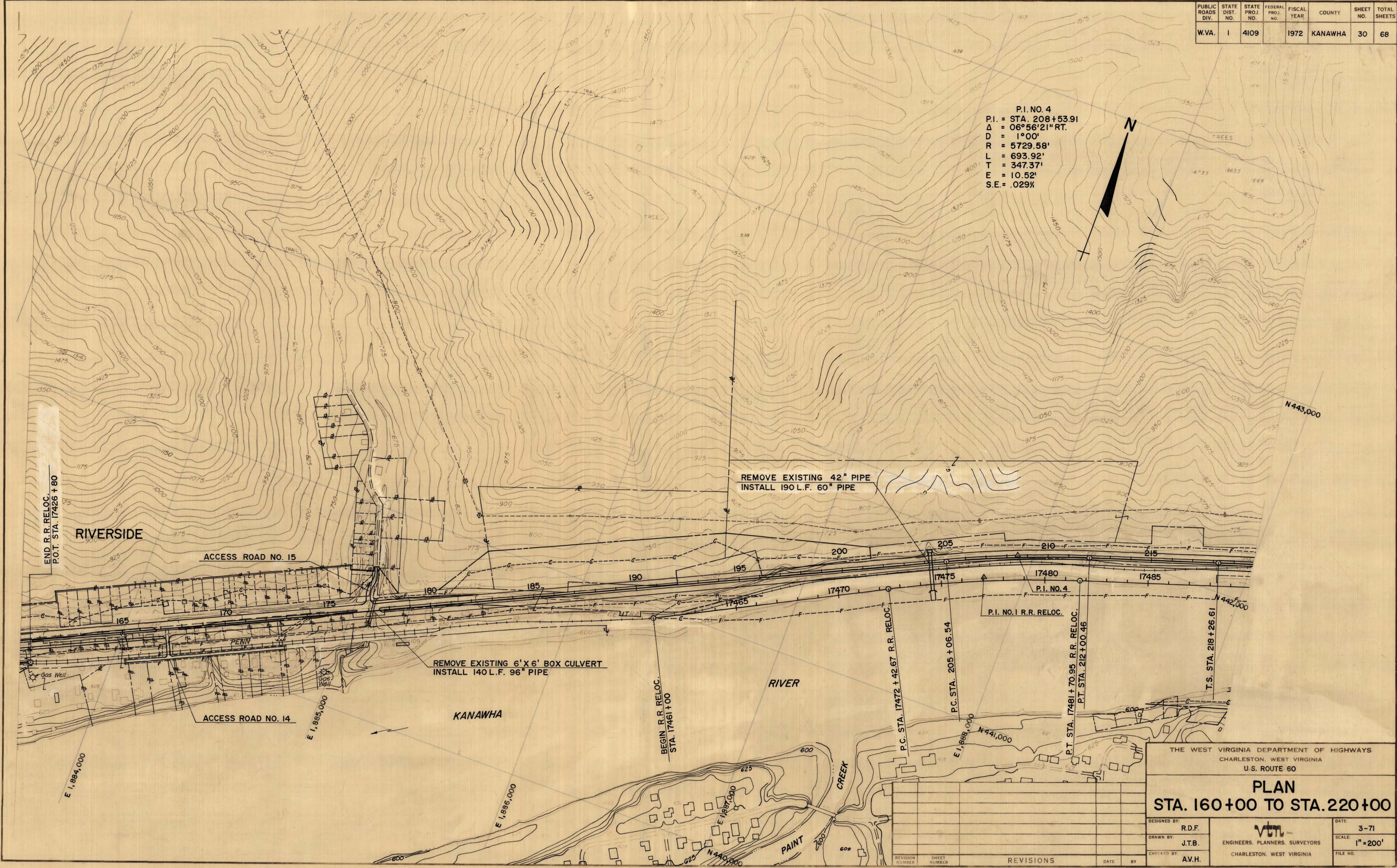
THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

PLAN
STA. 110 +00 TO STA 160 +00

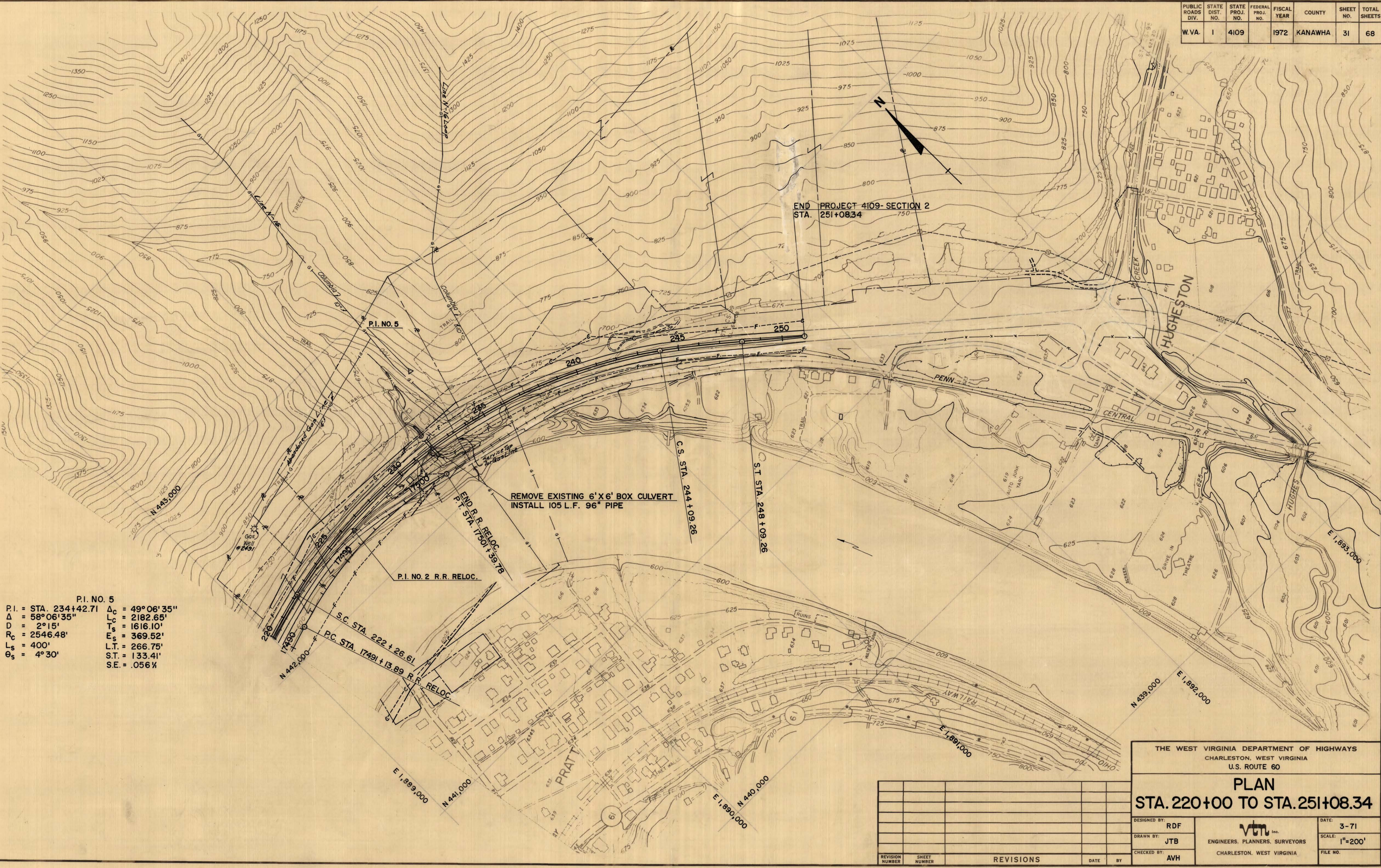
DESIGNED BY: RDF	DATE: 3-71
DRAWN BY: JTB	SCALE: 1" = 200'
CHECKED BY: AVH	FILE NO.

VUT Inc.
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	I	4109		1972	KANAWHA	30	68



PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	31	68



P.I. = STA. 234+42.71
 Δ = 58°06'35"
 D = 2°15'
 R_c = 2546.48'
 L_s = 400'
 θ_s = 4°30'

P.I. NO. 5
 Δ_c = 49°06'35"
 L_c = 2182.65'
 T_s = 1616.10'
 E_s = 369.52'
 $L.T.$ = 266.75'
 $S.T.$ = 133.41'
 $S.E.$ = .056%

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
 CHARLESTON, WEST VIRGINIA
 U.S. ROUTE 60

PLAN
 STA. 220+00 TO STA. 251+08.34

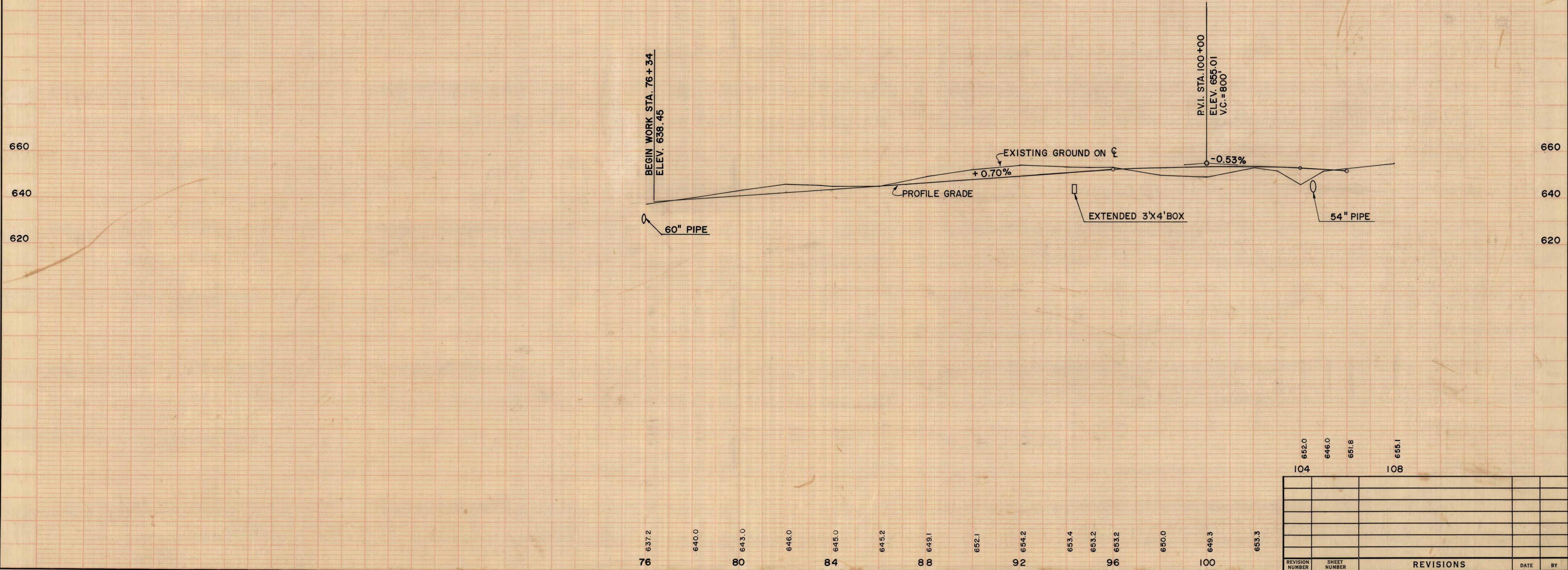
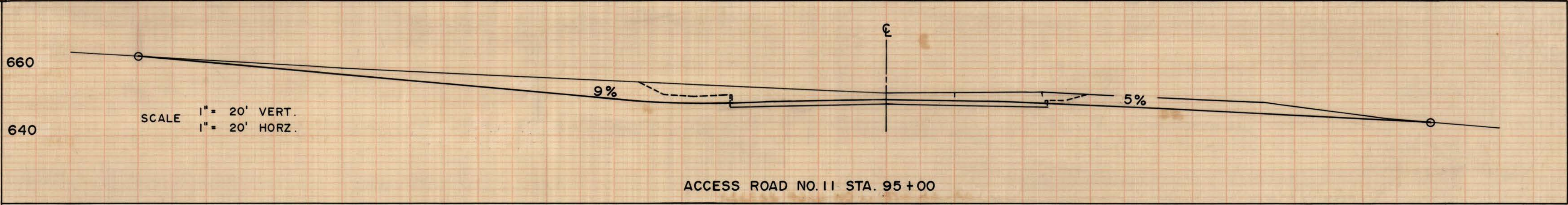
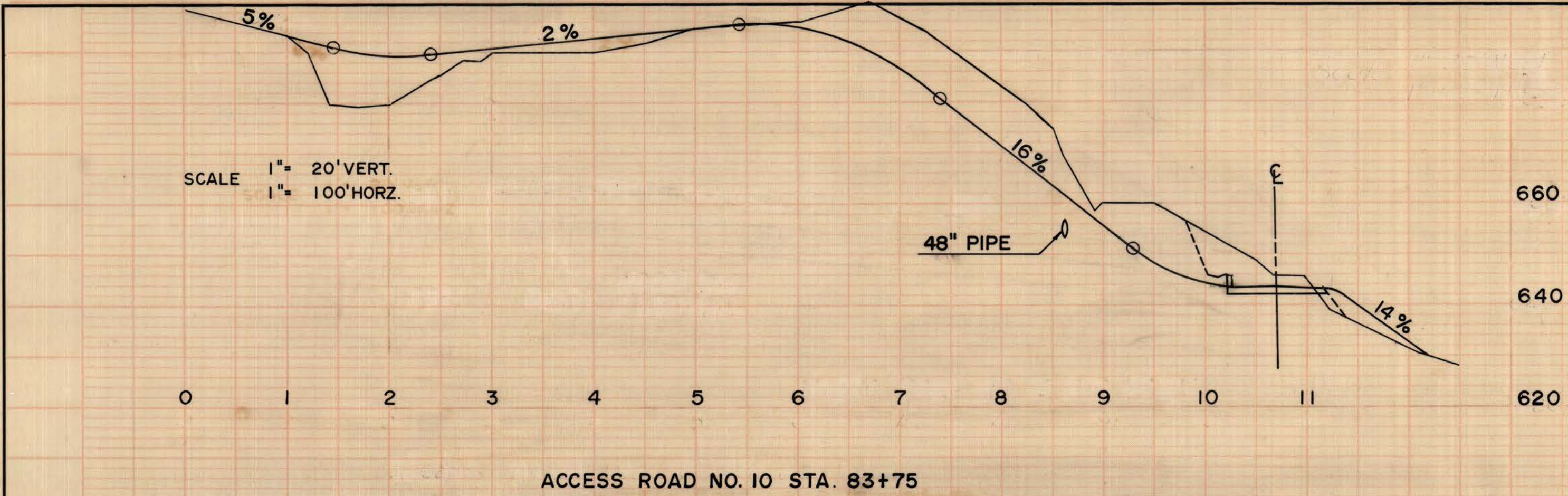
DESIGNED BY: RDF
 DRAWN BY: JTB
 CHECKED BY: AVH

DATE: 3-71
 SCALE: 1"=200'
 FILE NO.

ENGINEERS, PLANNERS, SURVEYORS
 CHARLESTON, WEST VIRGINIA

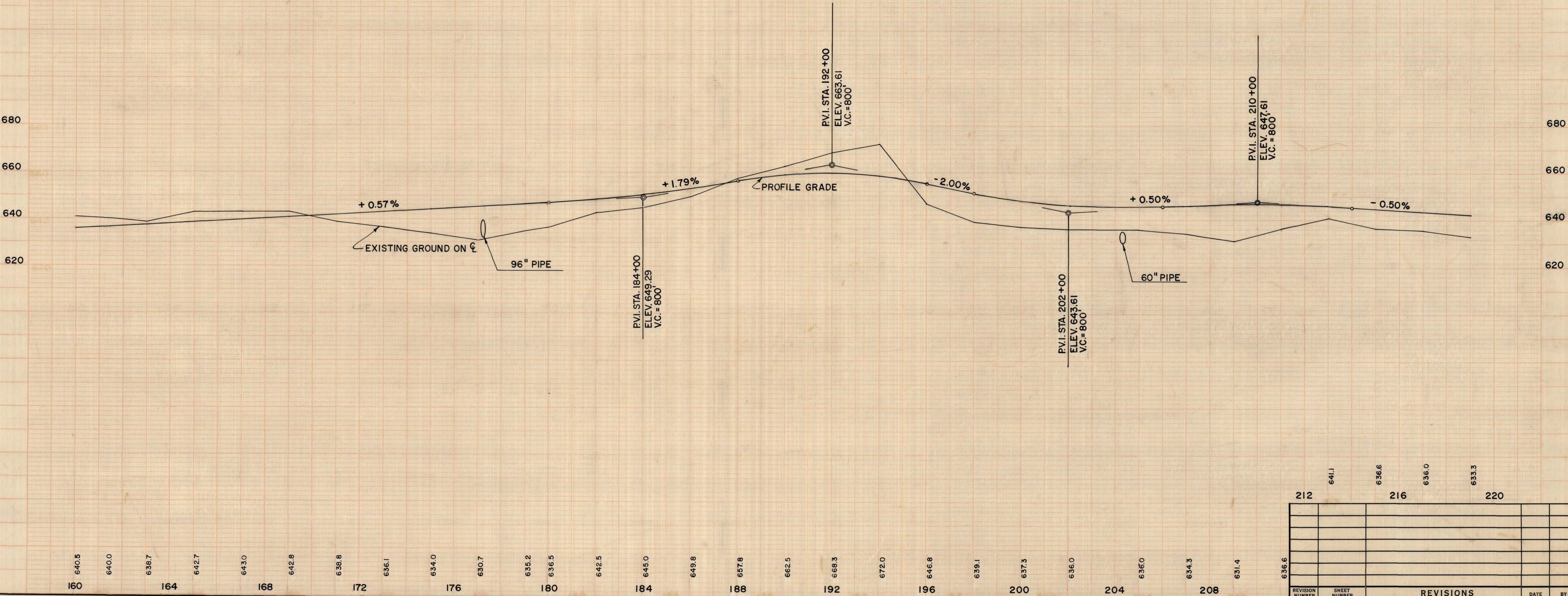
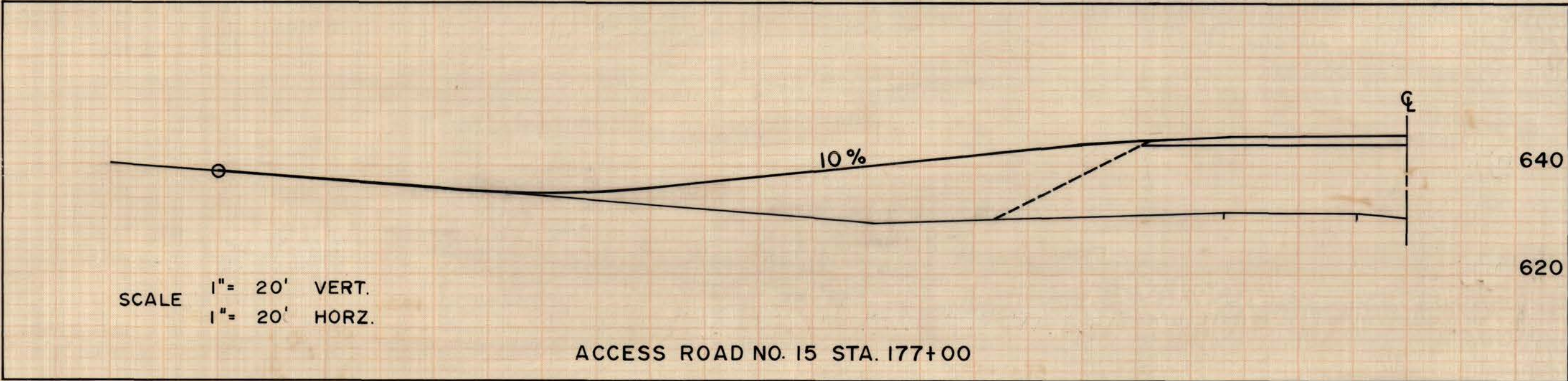
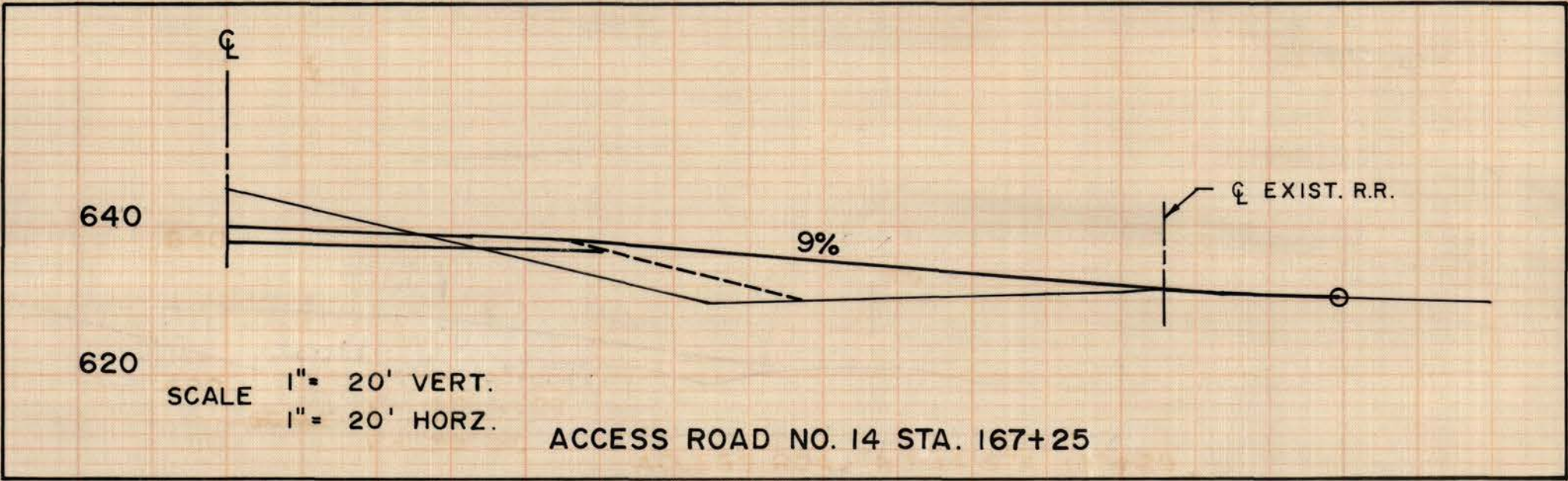
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	32	68



REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY
104	652.0			
	646.0			
	651.8			
108	655.1			

SCALE 1" = 20' VERT.
1" = 200' HORZ.

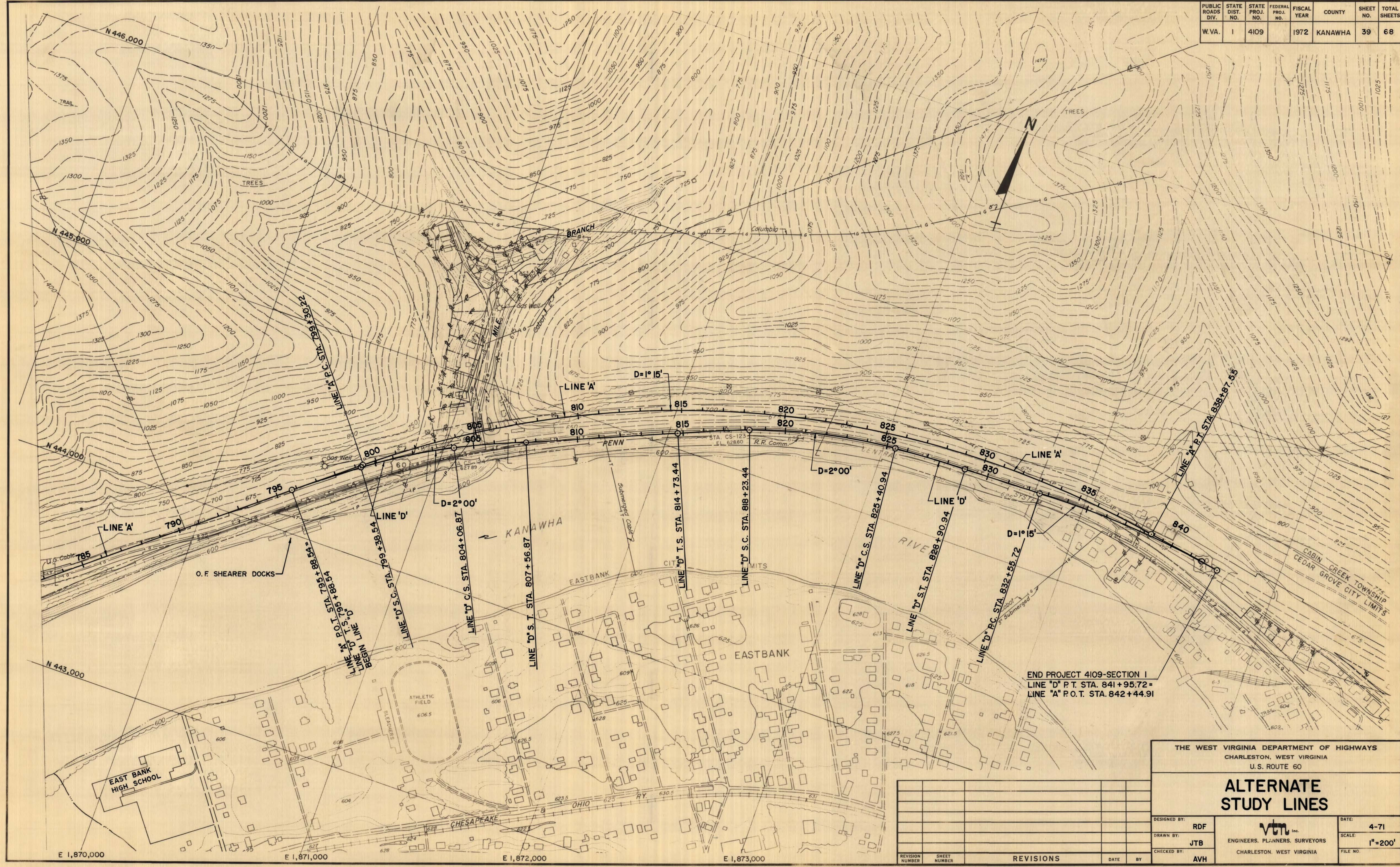


REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY
212	641.1			
216	636.6			
220	636.0			
	633.3			



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
ALTERNATE STUDY LINES	
DESIGNED BY: RDF	DATE: 4-71
DRAWN BY: JTB	SCALE: 1"=200'
CHECKED BY: AVH	FILE NO.:
ENGINEERS, PLANNERS SURVEYORS CHARLESTON, WEST VIRGINIA	

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

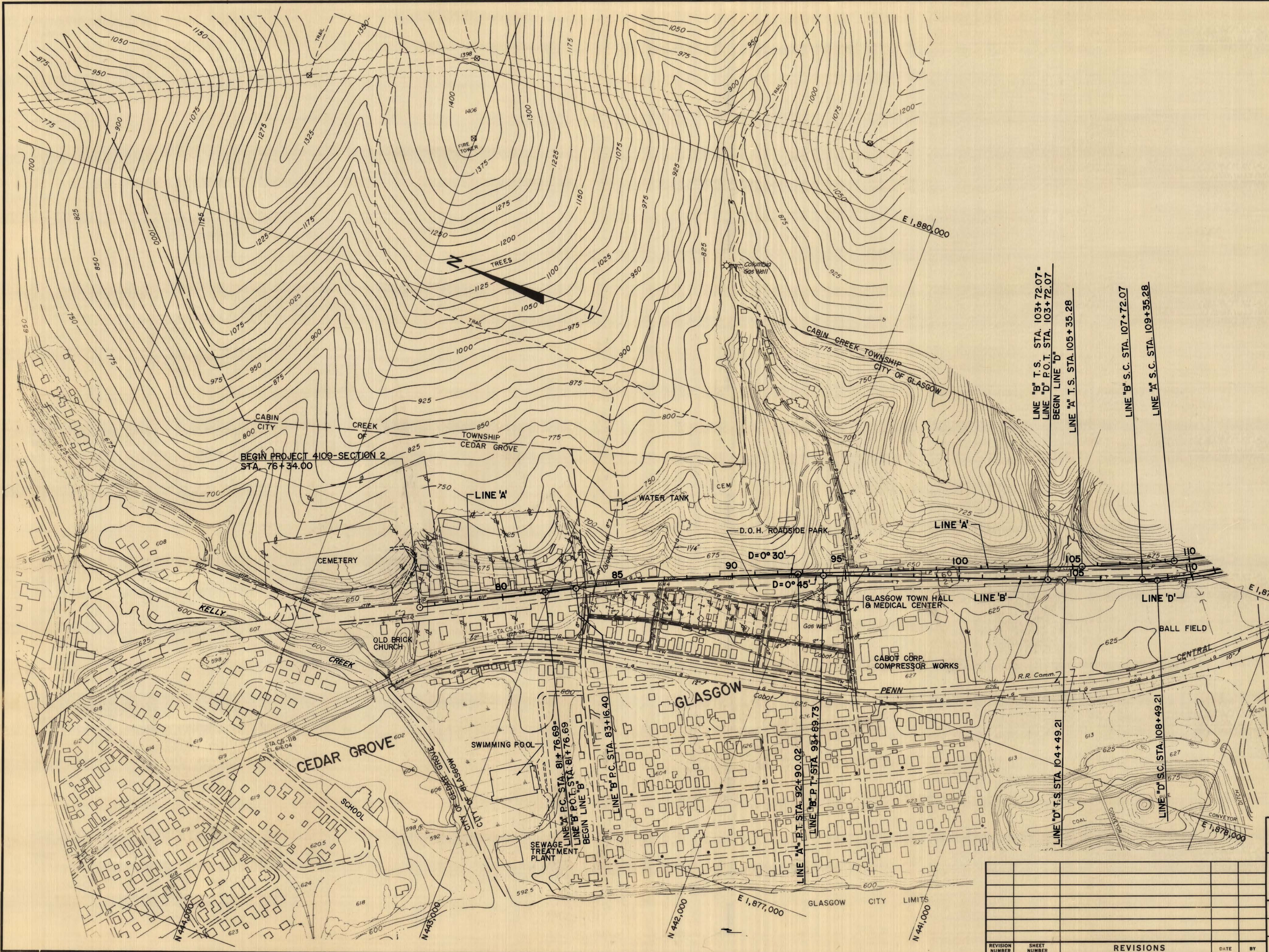


END PROJECT 4109-SECTION I
LINE "D" P.T. STA. 841+95.72=
LINE "A" P.O.T. STA. 842+44.91

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
ALTERNATE STUDY LINES	
DESIGNED BY: RDF	DATE: 4-71
DRAWN BY: JTB	SCALE: 1"=200'
CHECKED BY: AVH	FILE NO.:
ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	40	68



LINE "B" T.S. STA. 103+72.07 =
LINE "D" P.O.T. STA. 103+72.07
BEGIN LINE "D"
LINE "A" T.S. STA. 105+35.28
LINE "B" S.C. STA. 107+72.07
LINE "A" S.C. STA. 109+35.28

LINE "D" T.S. STA. 104+49.21
LINE "D" S.C. STA. 108+49.21

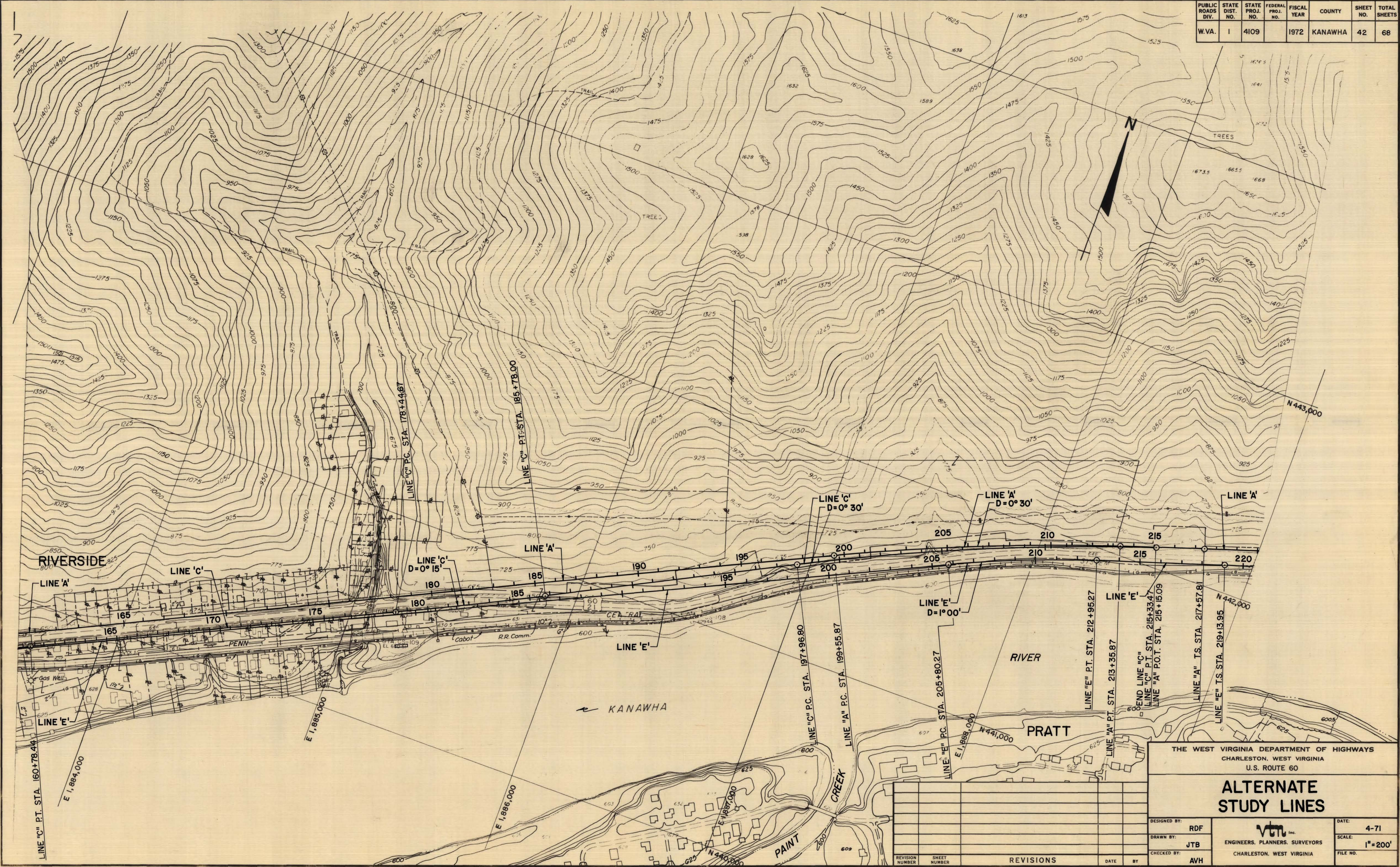
THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

**ALTERNATE
STUDY LINES**

DESIGNED BY:	RDF	DATE:	4-71
DRAWN BY:	JTB	SCALE:	1"=200'
CHECKED BY:	AVH	FILE NO.:	

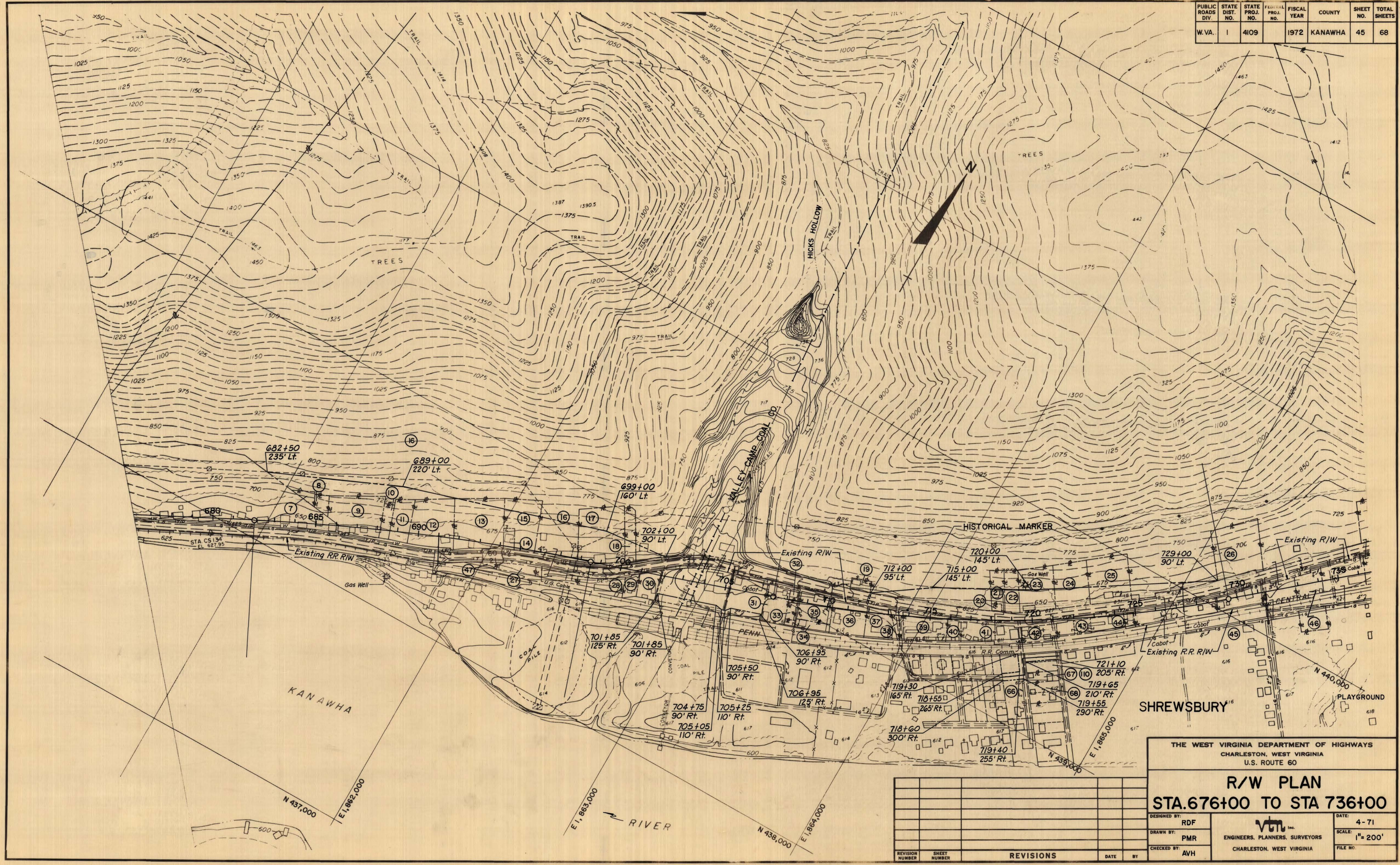
ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
ALTERNATE STUDY LINES	
DESIGNED BY: RDF	DATE: 4-71
DRAWN BY: JTB	SCALE: 1"=200'
CHECKED BY: AVH	FILE NO.

PUBLIC ROADS DIV	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	45	68



REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

R/W PLAN
STA. 676+00 TO STA 736+00

DESIGNED BY: RDF

DRAWN BY: PMR

CHECKED BY: AVH

DATE: 4-71

SCALE: 1"= 200'

FILE NO:


VTM Inc.

ENGINEERS, PLANNERS, SURVEYORS

CHARLESTON, WEST VIRGINIA


PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	48	68

[illegible]

						OWNERSHIP INDEX			
						DESIGNED BY:	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE:	3-71
						DRAWN BY:		SCALE:	NONE
						CHECKED BY:		FILE NO.	
REVISION	SHEET	REVISIONS			DATE	BY			


PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	RECORDED		A R E A								REMARKS	R/W DEED RECORD		
			DEED BOOK	PAGE NO.	CONTROLLED ACCESS	NON-CONTROLLED ACCESS	EASEMENT		REMAINING			TOTAL TAKEN		PARCEL TOTAL	DEED BOOK	PAGE NO.
							TYPE	AREA	LEFT	RIGHT	TOTAL					
31		EDWARD MASSEY, ETAL	356	135								0.41	0.41			
32		J. L. & JESSIE SCHERER	855	164								0.05	0.05			
33		SHREWSBERRY CHRISTIAN CHURCH	275	333								0.09	0.09			
34		JERRY L. & NANCY BARNETT	1517	23								0.19	0.19			
35		HOWARD SELBE	514	137								0.50	0.50			
36		HENRY CLATWORTHY EST, ETAL	30	179								0.57	0.57			
37		C.R. & VIRGIE SEABOLT	1032	36								0.48	0.48			
38		CONSOLIDATED REALTY CO.	1467	277								0.06	0.06			
39		H. & R.J. SHELDON	1307	535								0.64	0.64			
40		ARTHUR RAY & JEAN LIVELY	1077	89								0.17	0.17			
41		CARL & BERNICE SPEAREN	1442	343								0.59	0.59			
42		EDITH MARONEY	558	441								0.30	0.30			
43		E.F. GIBSON	554,664	487,87								0.56	0.56			
44		CARL E. & BERNICE SPEAREN	1476	241								0.08	0.08			
45		ORVA M. BASHAM	401	245								0.46	0.46			
46		C.R. & VIRGIE LEE SEABOLT	1549	5						0.64	0.64	0.36	1.00			
47		UNKNOWN										0.05	0.05			
48		CARLOS & VIRGIE LEE SEABOLT	1247	309					2.63		2.63	1.07	3.70			
49		O.D. & B.L. BASHAM	727	466					0.24		0.24		0.24			
50		SALLIE D. WATSON EST.	43	96					68.26		68.26		68.26			
51		W.H. & R.M. FERRELL	1218	358					1.73		1.73		1.73			
52		MITCHELL RASHID	678	15					177.75		177.75	8.25	186.00			
53		C.R. & VIRGIE LEE SEABOLT	713	282								1.50	1.50			
54		C.R. & VIRGIE LEE SEABOLT	725	439								1.19	1.19			
55		C.R. & VIRGIE LEE SEABOLT	823	391								0.40	0.40			
56		ROY C. BOYD	1532	571								3.48	3.48			
57		S.L. & ANNA M. JOHNSON	680,699	168,119						1.17	1.17		1.17			
58		C.R. & VIRGIE LEE SEABOLT	1119	238						2.26	2.26		2.26			
59		WILLIAM E. & BARBARA JOHNSON	1126	389								0.25	0.25			
60		LEROY & RICHARD RASHID	1538	272						8.65	8.65	11.35	20.00			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	49	68

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60			
OWNERSHIP INDEX			
DESIGNED BY: RDF	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 3-71	
DRAWN BY: RMM		SCALE: NONE	
CHECKED BY: AVH		FILE NO.	
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE BY


PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	50	68

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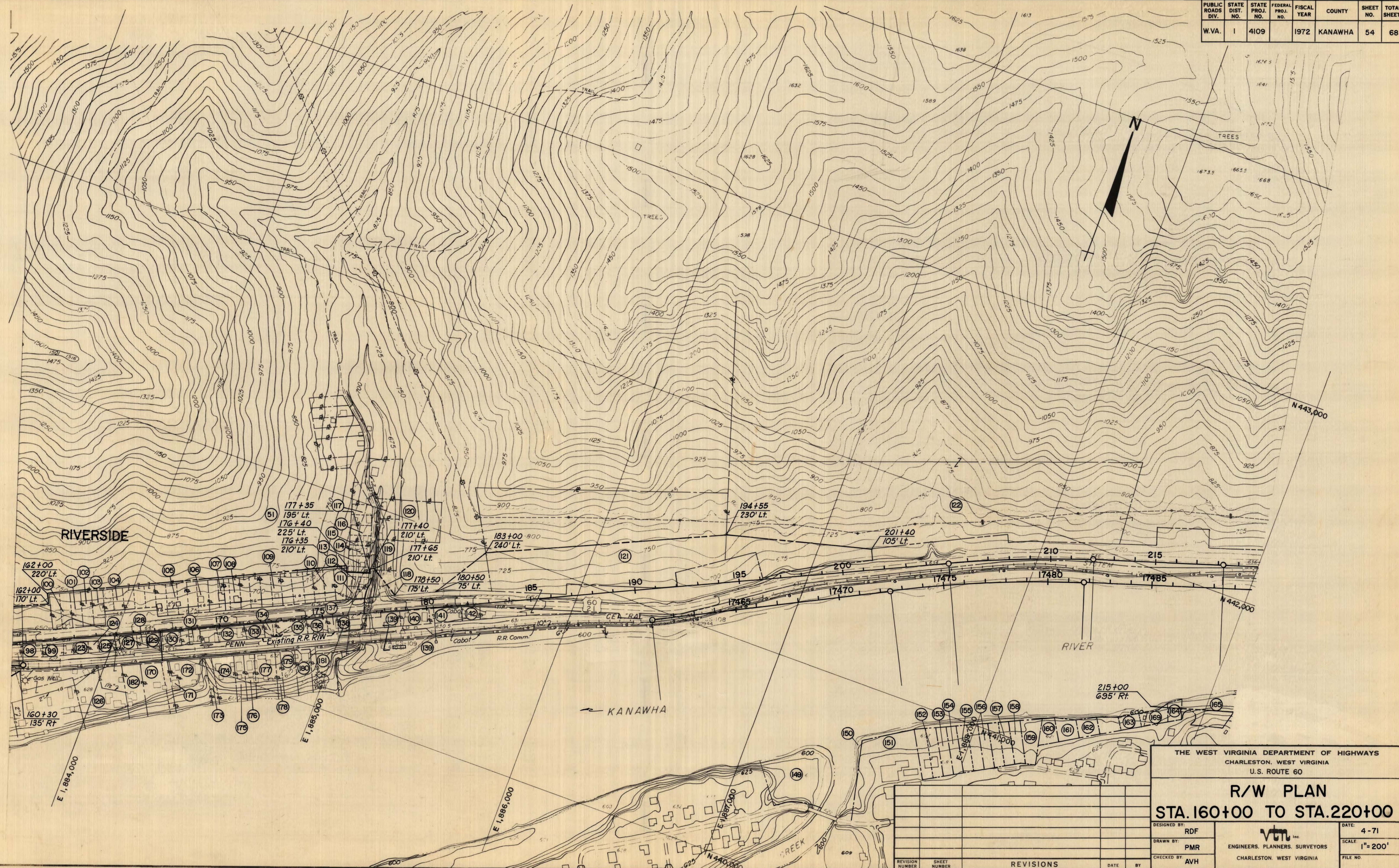
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				OWNERSHIP INDEX					
				DESIGNED BY: RDF		 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA		DATE: 3-71	
				DRAWN BY: RMM				SCALE: NONE	
				CHECKED BY: AVH					
REVISION NUMBER	SHEET NUMBER	REVISIONS		DATE	BY				

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	51	68

[illegible]


					OWNERSHIP INDEX			
					DESIGNED BY:	 Inc. ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE:	3-71
					DRAWN BY:		SCALE:	NONE
					CHECKED BY:		FILE NO.	
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY	AVH			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEET
W.VA.	1	4109		1972	KANAWHA	54	68



PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	RECORDED		A R E A								REMARKS	R/W DEED RECORD		
			DEED BOOK	PAGE NO.	CONTROLLED ACCESS	NON-CONTROLLED ACCESS	EASEMENT		REMAINING			TOTAL TAKEN		PARCEL TOTAL	DEED BOOK	PAGE NO.
							TYPE	AREA	LEFT	RIGHT	TOTAL					
39		JULIA B. HUDNALL	250	305						0.13	0.13		0.13			
40		JULIA B. HUDNALL	183	106						0.13	0.13		0.13			
41		A.O. & E.J. WILKINSON	1281	497						0.25	0.25		0.25			
42		O.F. & MINNIE B. ELLIOTT	1395	5						0.05	0.05		0.05			
43		ORVAN EDGAR & E.C.B. HAMMON	1431	541						0.07	0.07		0.07			
44		PAUL & BEATRICE ADKINS	1534	17						0.12	0.12		0.12			
45		CHARLES W. & GOLDIE THOMAS	1008	503						0.12	0.12		0.12			
46		KEITH THOMAS	1404	307						0.12	0.12		0.12			
47		TOWN OF GLASGOW	1206	166						0.16	0.16		0.16			
48		CABOT CORP.	248	68						4.56	4.56	0.01	4.57			
49		APPLACHIAN POWER CO.	947	261						84.29	84.29	1.71	86.00			
50		WILLIAM & IRIS BOSTIC	1566	506					1.00		1.00		1.00			
51		KNIGHT & COUCH COAL CO.	64	559					689.15		689.15	3.85	693.00			
52		WILLIAM B. HALL	1173	506								0.50	0.50			
53		EZRA CUSTER & PEARL ESKEW	1404	121								0.15	0.15			
54		VIRGIL & INEZ GARRETSON	1476	643								0.42	0.42			
55		H.C. & C.E. PHILLIPS EDELMAN	1159	319								0.17	0.17			
56		RICHARD L. SPAUDING	1287	312								0.68	0.68			
57		MARY C. FARMER	1136	100								0.33	0.33			
58		F. DUNCAN, ET. AL.	959	169								0.17	0.17			
59		CONNIE M. & SARAH A. TASKER	959	170								0.21	0.21			
60		JOE & NELLIE SELIG	1052	26								0.31	0.31			
61		EARL A. & RUBY WATERS	1293	39								0.71	0.71			
62		RUSSELL KOCH	1563	677								0.40	0.40			
63		ELVIN L. ELSWICK	1045	85								0.20	0.20			
64		FRANCIS B. & SANDRA J. BASS	1194	132								0.19	0.19			
65		GLEENA BASS	1530	239								0.19	0.19			
66		LONNIE & MARY BOWE	1073	197								0.41	0.41			
67		LONNIE & MARY BOWE	1143	392								0.21	0.21			
68		MALETIES & LILLIAN JONES	976	273								0.21	0.21			
69		LESTER C. & BEULAH M. PHILLIPS	1413	458								0.23	0.23			
70		L.C. & BEULAH PHILLIPS	976	274								0.32	0.32			
71		CITTIE B. PATTON	1044	179								0.27	0.27			
72		MILDRED F. PATTON	1044	180								0.18	0.18			
73		CONSOLIDATED REALTY CO.	1467	280								0.18	0.18			
74		THOMAS G. & FRANCES I. BOWE	1109	471								0.18	0.18			
75		PEARL J. & WIPT PENCE	1491	419								0.27	0.27			
76		DAMON & BESSIE STANLEY	1060	427								0.09	0.09			
77		DAMON & BESSIE STANLEY	1045	149								0.18	0.18			
78		JAMES & THELMA STANLEY	1093	263								0.18	0.18			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	57	68

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60			
OWNERSHIP INDEX			
DESIGNED BY: RDF	 ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 3-71	
DRAWN BY: RMM		SCALE: NONE	
CHECKED BY: AVH		FILE NO.	
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE BY

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	RECORDED		A R E A								REMARKS	R/W DEED RECORD		
			DEED BOOK	PAGE NO.	CONTROLLED ACCESS	NON-CONTROLLED ACCESS	EASEMENT		REMAINING			TOTAL TAKEN		PARCEL TOTAL	DEED BOOK	PAGE NO.
							TYPE	AREA	LEFT	RIGHT	TOTAL					
79		JAMES & THELMA STANLEY	1093	234								0.18	0.18			
80		THELMA STANLEY	1503	345								0.18	0.18			
81		F.R. & MARGARET BOWE	996	269								0.17	0.17			
82		LEONARD BOWE	1246	240								0.17	0.17			
83		EARL A. & RUBY WATERS	1293	39								0.56	0.56			
84		S.H. & GOLDIE KOCH	982	213								0.19	0.19			
85		RUSSEL & RUTH HUDNALL	987	11								0.19	0.19			
86		W.E. & BEATRICE HUDNALL	984	163								0.19	0.19			
87		RIVERSIDE CHURCH OF GOD	1201	377								0.22	0.22			
88		RIVERSIDE CHURCH OF GOD	1201	310								0.17	0.17			
89		F. & HAZEL GARRETSON	1014	78								0.17	0.17			
90		HAZEL GARRETSON	937	130								0.17	0.17			
91		TRUMAN & ELLENA HICKS	1341	65								0.33	0.33			
92		JOHN T. PIZER	1235	100								0.17	0.17			
93		D.E. & NAOMI McALLISTER	1429	498								0.06	0.06			
94		NAOMI McALLISTER	1507	317								0.09	0.09			
95		RAY & VIRGINIA DOLIN	1512	269								0.36	0.36			
96		RAYMOND & R. BOWE	1241	382								0.45	0.45			
97		MIDWEST STEEL CORP	1276	210						16.06	16.06	1.80	17.86			
98		MILBURN EDWARDS	1160	189								0.12	0.12			
99		MILBURN EDWARDS, SR.	879	301								0.19	0.19			
100		LAKE & GRACE SPRY	1349	395								0.39	0.39			
101		L.W. & G. SPRY	1307	695								0.20	0.20			
102		LAKE & GRACE SPRY	1349	413								0.20	0.20			
103		WILLIAM H. SMITH	1500	249								0.20	0.20			
104		VERNON E. SMITH, JR.	1360	483								0.23	0.23			
105		STELLA VEDOLOFF	1377	673								0.52	0.52			
106		J.R. GAYLOR	1347	470								0.34	0.34			
107		VESTA GAY	1283	307								0.26	0.26			
108		R.N. & JEAN McCLURE	988	122								0.26	0.26			
109		JOHN PERRY	1039	464								0.34	0.34			
110		ERNEST FERRELL	1525	691								0.34	0.34			
111		SAM & JULIA BELMONT	1272	448								0.12	0.12			
112		F.L. & A. LANHAM	1311	223								0.15	0.15			
113		W.H. & DOLLY F. STRAUGHAN	1085	92					0.17		0.17		0.17			
114		ROGER D. & FAYE FERRELL	1516	435					0.12		0.12		0.12			
115		W.F. FERRELL	906	406					0.05		0.05		0.05			
116		EARNEST L. & PHYLLIS FERRELL	1325	689					0.18		0.18		0.18			
117		JODIE & REBA HACKWORTH	1487	561					0.22		0.22		0.22			
118		SAM & JULIA BELMONT	1341	469					0.17		0.17	0.13	0.30			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	58	68

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60				
OWNERSHIP INDEX				
DESIGNED BY: RDF	vtn Inc. ENGINEERS, PLANNERS, SURVEYORS CHARLESTON, WEST VIRGINIA	DATE: 3-71		
DRAWN BY: RMM		SCALE: NONE		
CHECKED BY: AVH		FILE NO.		
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	RECORDED		A R E A								REMARKS	R/W DEED RECORD		
			DEED BOOK	PAGE NO.	CONTROLLED ACCESS	NON-CONTROLLED ACCESS	EASEMENT		REMAINING		TOTAL TAKEN	PARCEL TOTAL		DEED BOOK	PAGE NO.	
							TYPE	AREA	LEFT	RIGHT	TOTAL					
113		DENVER & ANN STARKS	1358	151					0.32		0.32		0.32			
121		JODIE & REBA HACKWORTH	1487	566					1.00		1.00		1.00			
121		I.L. HARK	1428	148					7.69		7.69	5.48	13.17			
122		DAVID WARD, EST	36	509					4592.13		4592.13	1.87	4594.00			
123		J.C. & NELLIE G. SIMMONS	515	473								0.09	0.09			
124		MELVIN GILLILAND	642	269								0.06	0.06			
125		J.E. RUTLEDGE % PT. WATSON	727	145								0.21	0.21			
126		J.R. & K. GILBERT	925	81						1.29	1.29		1.29			
127		JAMES & ZELLA SIZEMORE	1547	109								0.14	0.14			
128		AUGUSTA STEWART, ETAL	448	345								0.08	0.08			
129		ISADORE & REBECCA GONSETMAN	1537	253								0.10	0.10			
130		S. & Q.M. ALLEN	902	298								0.14	0.14			
131		SYLVIA ALLEN, ETAL	1121	167								0.14	0.14			
132		ANNA M. BRITT	1535	347								0.36	0.36			
133		NELL & RUSSELL L. YOUNG	1513	735								0.15	0.15			
134		EDITH W. RATLIFF	1019	305								0.11	0.11			
135		C.B. & OMA F. GILMORE	1369	242								0.25	0.25			
136		ELSIE KEENEY	895	54								0.16	0.16			
137		HARVEY & PHYLIS M. GOINS	1314	535								0.09	0.09			
138		ROBERT W. & ALTA GRAY	1384	159						0.02	0.02	0.39	0.41			
139		ALEX & MURIEL MANSOUR	967	389						2.64	2.64	0.26	2.90			
140		CARL & ULADINE BELCHER	1412	301								0.24	0.24			
141		KAYO OIL CO.	1296	529								0.25	0.25			
142		KAYO OIL CO.	1489	601								0.15	0.15			
143		E.L. JOHNSON	933	501					2.19		2.19	1.81	4.00			
144		JOBE HUDDLESTON	9	407					1.52		1.52	0.48	2.00			
145		MARY CLATWORTHY, EST.	942	281					11.59		11.59	0.79	12.38			
146		CRUCIBLE STEEL CO. OF AMERICA	1233	85					38.59		38.59		38.59			
147		WETZEL & JUANITA BOWE & MARSHALL WOLFE	1573	662								0.20	0.20			
148		LAWRENCE BROWN	763	229								0.68	0.68			
149		ROGER E. WILLIAMS	1233	225						1.75	1.75		1.75			
150		EASTER ASSCO. COAL CORP	1454	179						1.13	1.13		1.13			
151		BOARD OF EDUCATION	1094	153						3.13	3.13		3.13			
152		MARIO & AUDREY GRISAFI	1521	331						0.56	0.56		0.56			
153		H.H. & B.J. HARRIS	1220	423						0.27	0.27		0.27			
154		JAMES R. & DOMIGENE LOWE	1231	479						0.27	0.27		0.27			
155		E.F. & C.H. SCALES	1281	391						0.52	0.52		0.52			
156		J.A. & E.J. SLEBODA	1282	353						0.26	0.26		0.26			
157		CHARLES D. & NELLIE J. MATICS	986	423						0.50	0.50		0.50			

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	59	68

REVISION NUMBER	SHEET NUMBER	REVISIONS		DATE	BY

THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
OWNERSHIP INDEX	
DESIGNED BY: RDF	DATE: 3-71
DRAWN BY: RMM	SCALE: NONE
CHECKED BY: AVH	FILE NO.
ENGINEERS, PLANNERS, SURVEYORS VTH Inc. CHARLESTON, WEST VIRGINIA	

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	60	68

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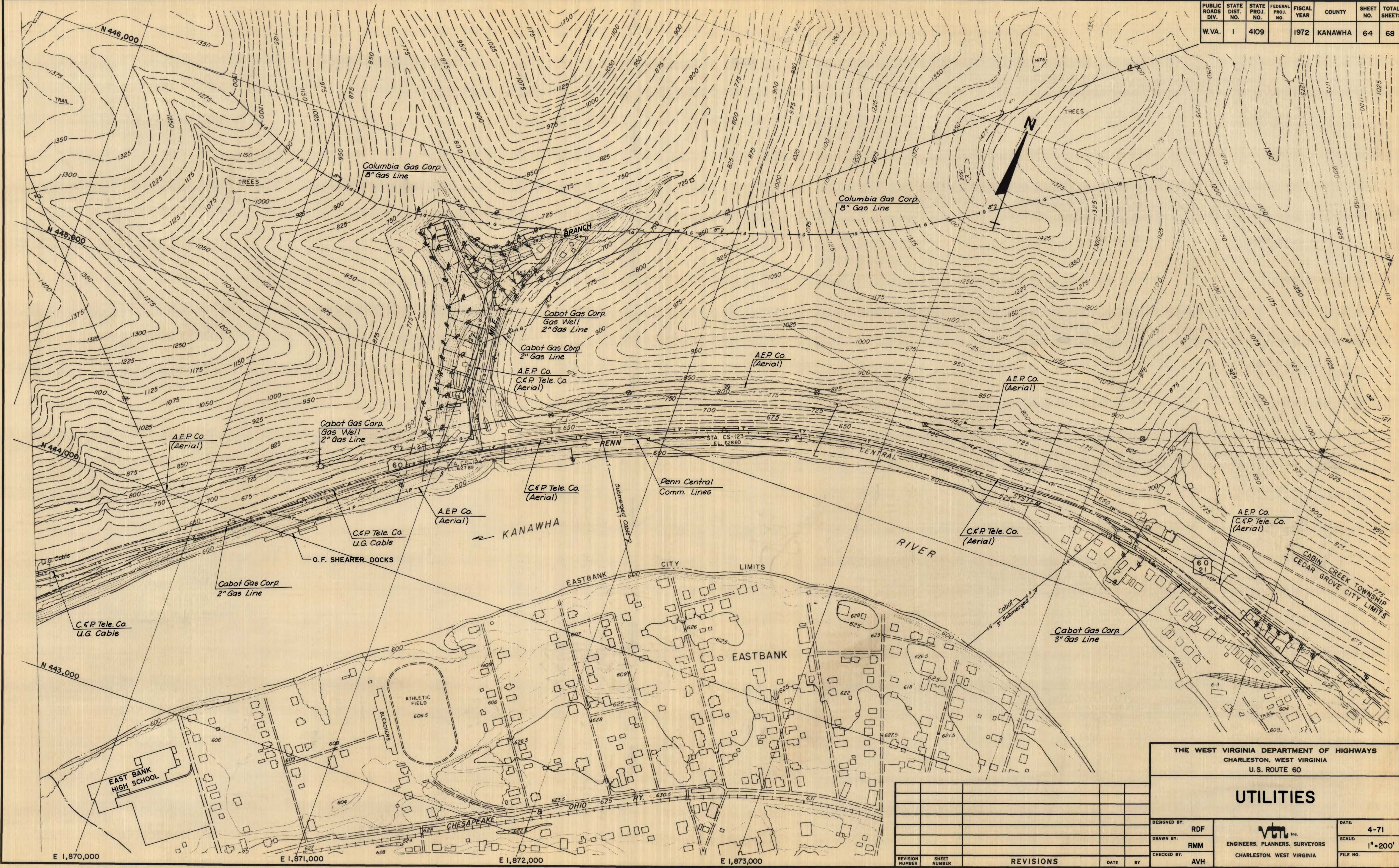
SECT 11

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W. VA.	I	4109		1972	KANAWHA	61	68



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60			
UTILITIES			
DESIGNED BY: RDF	ENGINEERS, PLANNERS, SURVEYORS VTH Inc. CHARLESTON, WEST VIRGINIA	DATE: 4-71	
DRAWN BY: RMM		SCALE: 1"=200'	
CHECKED BY: AVH		FILE NO.	

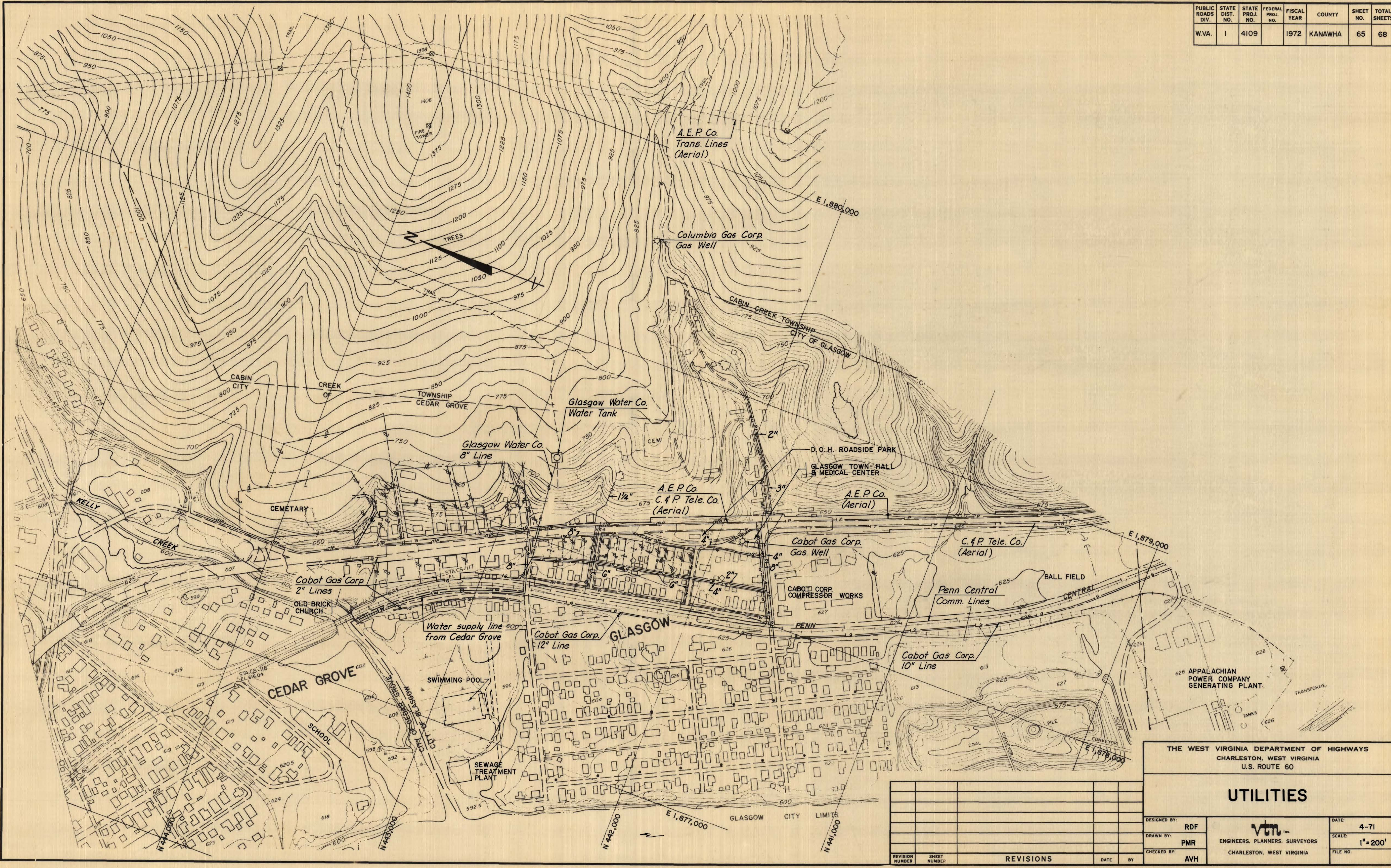
REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY
	61			



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS CHARLESTON, WEST VIRGINIA U.S. ROUTE 60	
UTILITIES	
DESIGNED BY: RDF	DATE: 4-71
DRAWN BY: RMM	SCALE: 1"=200'
CHECKED BY: AVH	FILE NO.

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.VA.	1	4109		1972	KANAWHA	65	68



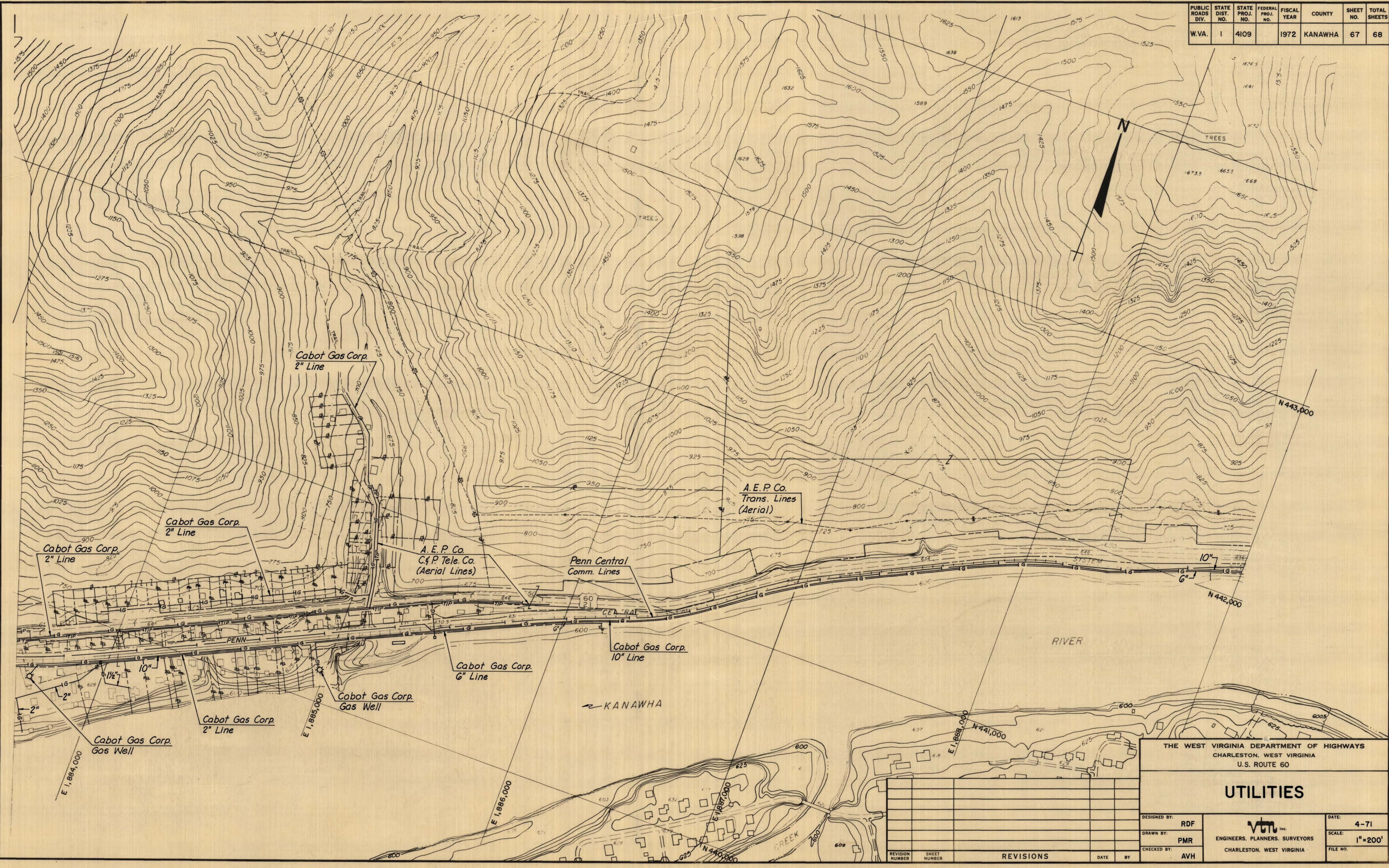
THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

UTILITIES

DESIGNED BY:	RDF	DATE:	4-71
DRAWN BY:	PMR	SCALE:	1" = 200'
CHECKED BY:	AVH	FILE NO.:	

ENGINEERS, PLANNERS, SURVEYORS
CHARLESTON, WEST VIRGINIA

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJ. NO.	FEDERAL PROJ. NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.A.	1	4109		1972	KANAWHA	67	68



THE WEST VIRGINIA DEPARTMENT OF HIGHWAYS
CHARLESTON, WEST VIRGINIA
U.S. ROUTE 60

UTILITIES

DESIGNED BY: **RDF**

DRAWN BY: **PMR**

CHECKED BY: **AVH**

DATE: **4-71**

SCALE: **1"=200'**

FILE NO.

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

