

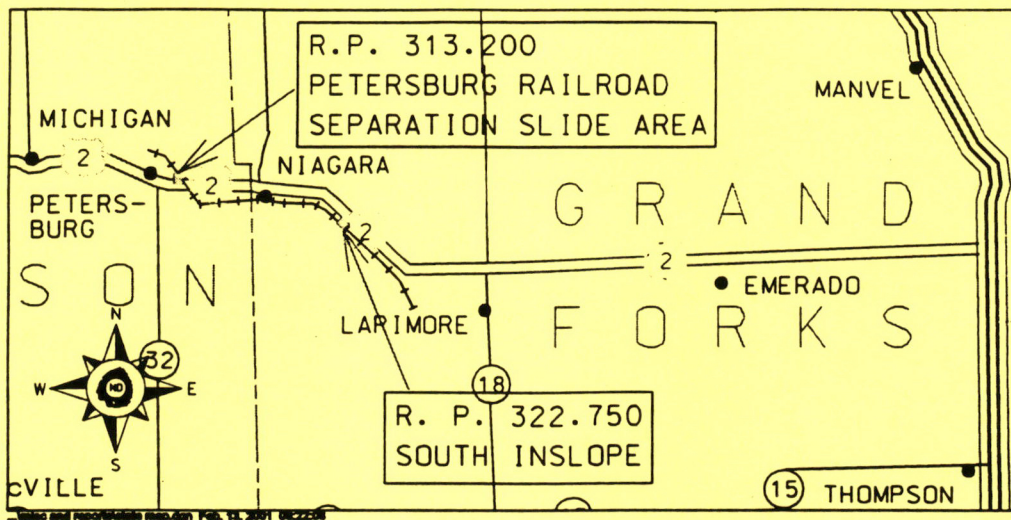
Landslide Repair

R.P. 313.200

SNH-6-002(060)322

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

NELSON COUNTY
SNH-6-002(058)313
PETERSBURG RAILROAD SEPARATION LANDSLIDE REPAIR
U.S. 2, WEST BOUND ROADWAY
R.P. 313.200
GRAND FORKS COUNTY
SNH-6-002(060)322
U.S. 2, EAST BOUND ROADWAY, SOUTH DITCH LANDSLIDE REPAIR
R.P. 322.750



DESIGNER <u>Richard J. Jorgensen</u>	APPROVED DATE _____	APPROVED DATE <u>2/23/01</u>	I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND APPROVED DATE <u>2/22/01</u> <div style="text-align: center;"> </div>
RECOMMEND APPROVAL _____ <u>Feb. 22</u> , 2001	DIVISION ADMINISTRATOR FEDERAL HIGHWAY ADMINISTRATION U.S. DEPARTMENT OF TRANSPORTATION	OFFICE OF INFRASTRUCTURE SUPPORT ND DEPARTMENT OF TRANSPORTATION	DISTRICT ENGINEER NORTH DAKOTA DEPARTMENT OF transportation <u>for</u>

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Standard Drawings are not included in the plans, but can be obtained at the District Offices or the Central Office of the North Dakota Department of Transportation.

SCOPE OF WORK-LANDSLIDE REPAIR

SNH-6-002(058)313: Inslopes on the Petersburg Separation were at a 1.5:1 slope ratio prior to failure. The proposed repair shall consist of benching behind the failure plane and installing layers of R1 Woven Geotextile Fabric. The slope shall also be extended to the right of way, flattening the slope to a 2:1inslope. Refer to detail drawings.

SNH-6-002(060)322: The existing inslope was 2:1prior to failure. The proposed repair shall consist of benching behind the failure plane and installing layers of R1 Woven Geotextile Fabric. The slope cannot be extended due to the toe of the inslope ending at the existing state right of way. Refer to detail drawing.

ESTIMATED QUANTITIES**SNH-6-002(058)313**

Item No.	Spec No.	Code No.	Description	Units	Estimated Quantity
1	0103	0100	Contract Bond	L Sum	1.00
2	0107	0100	Railway Protection Insurance	L Sum	1.00
3	0201	0295	Clearing & Grubbing	L.F.	219.00
4	0203	0101	Common Excavation-Type A	CY	2462.00
5	0203	0140	Borrow	CY	5201.00
6	0216	0100	Water	M Gal	117.00
7	0702	0100	Mobilization	L Sum	1.00
8	0704	0100	Flagging	MHr	60.00
9	0704	1000	Traffic Control Signs	Unit	902.00
10	0704	1052	Type III Barricade	Ea	1.00
11	0704	1060	Delineator Drums	Ea	12.00
12	0704	1067	Tubular Markers	Ea	22.00
13	0704	1087	Sequencing Arrow Panel-Type C	Ea	1.00
14	0708	2240	Seeding-Type B-CL II	Acre	3.38
15	0708	5751	Straw-Coconut Fiber Mat	SY	3411.00
16	0709	0701	Geotextile Fabric-Type R1	SY	8531.00
17	0764	0151	Remove W-Beam Guardrail & Posts	LF	75.00
18	0764	1010	Reset 3-Cable Guardrail	LF	534.00
19	0764	1050	Reset W-Beam Guardrail	LF	75.00
20	0764	1060	Reset W-Beam Guard Rail-Flared End Treat. & Transition	Ea	2.00
21	0764	2020	Remove 3-Cable Guardrail & Posts	LF	534.00
22	0764	2081	Remove End Treatment & Transition	Ea	2.00

SNH-6-002(060)322

Item No.	Spec No.	Code No.	Description	Units	Estimated Quantity
1	0203	0101	Common Excavation-Type A	CY	2670.00
2	0203	0140	Borrow	CY	666.00
3	0216	0100	Water	MGal	20.00
4	0704	0100	Flagging	MHr	30.00
5	0708	2240	Seeding-Type B-CL II	Acre	0.74
6	0708	5751	Straw-Coconut Fiber Mat	SY	1507.00
7	0709	0701	Geotextile Fabric-Type R1	SY	3754.00
8	0764	0151	Remove W-Beam Guardrail & Posts	LF	200.00
9	0764	1050	Reset W-Beam Guardrail	LF	200.00

PLAN NOTES

- 103-P01 Contract bond, mobilization, railroad insurance and traffic control items will be provided for on project SNH-6-002(058)313 to which project SNH-6-002(060)322 is tied.
- 105-P01 UNDERGROUND UTILITIES: The contractor will notify the local utility companies (1-800-795-0555) prior to the beginning of construction, so they may determine the location of all utilities in the project area. Separate plans, if any, showing relocation or adjustment work to be performed by utility companies to accommodate highway construction will be made available to the contractor, upon request to the engineer.
- 106-P01 Enbridge Petroleum Pipeline Co. shall be notified 48 hrs.(1-800-795-0555) prior to any work being performed on the northwest corner of the Petersburg Separation.
- 106-P02 CONTROL OF MATERIAL: Acceptance of material shall be in accordance with section 106 of the Standard Specifications. All materials will be approved by the Engineer before incorporation in the work.
- 108-P01 EASEMENT: The contractor shall be no closer that 25 feet to the nearest rail of the Burlington Northern Santa Fe Railroad Tracks. There shall be no parking of equipment, storage of materials or other work being performed in this area. This restriction could affect the standard equipment typically used in this type of project.
- 200-P01 COMPACTION AND DENSITY CONTROL: Compaction and density controls shall be in accordance with section 203.02 G of the Standard Specifications. The Engineer will determine the maximum dry density and optimum moisture content using AASHTO T-99 Modified. The moisture content of the soil at the time of compaction shall be not less than 4 percentage points below, nor more than 2 percentage points above the optimum moisture content. The embankment and cut areas designated to be excavated and recompacted shall be compacted to 95% of the maximum dry density as determined by AASHTO T-99.
- If the subgrade is unstable (as determined by the engineer) when compacted to the required density, the soil shall be dried to obtain adequate stability. This may require drying below optimum moisture. The cost of such drying will be incidental to the price bid for "Common Excavation-Type A" and "Borrow." The soil shall be worked so that the moisture content is uniform throughout.
- 200-P02 SHRINKAGE: 30 percent additional volume is allowed for shrinkage in earth embankment.
- 201-P01 CLEARING AND GRUBBING: Shall be performed as needed in North Dakota Dept. of Transportation right of way only.
- 203-P01 COMMON EXCAVATION: Common excavation shall be paid for by plan quantity.

- 203-P02 **TOPSOIL EXCAVATION:** Topsoil shall be removed from all excavation, embankment areas, and topsoil displaced at the bottom of the inslope landslide site; shall be stockpiled on the right of way at designated or acceptable locations as approved by the engineer. All topsoil shall be spread evenly over the new inslope. Costs associated with removal, stockpiling, and replacement shall be included in the bid price for Common Excavation-Type A.
- 203-P03 **TOPSOIL BORROW:** Topsoil shall be removed to its full depth, but not to exceed 6 inches. All costs associated with labor, materials and equipment for the removal, stockpiling, and replacement of the topsoil material shall be included in the price bid for "Borrow".
- 704-P03 **TRAFFIC CONTROL:** Traffic control for the slide repair shall consist of a lane closure and flagging as needed. The lane closure shall remain in place once guardrail has been removed and until guardrail is reset. Traffic Control Devices shall comply with the following.
Standards Drawings:
- 1) Standard D-704-33 For the lane closure.
 - 2) Standard D-704-22 layouts K and L: For trucks hauling material.
 - 3) Standard Drawings D-704-8,9,10,11 are applicable
- Quantities have been developed based on a single lane closure. The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid at the Contract Unit Price for each device. Additional devices required to accommodate the Contractor's operation shall be the Contractor's responsibility.
- 704-034 **TRAFFIC ROUTING DURING CONSTRUCTION:** The Contractor shall provide one lane of traffic at all times. A night watchman shall be assigned to the project and their name and telephone number given to the Engineer.
- 708-P01 **TEMPORARY EROSION AND SILTATION CONTROLS:** Project SNH-6-022(060)322, Sediment Control Fencing shall be placed along the outer diameter between the railroad and highway culverts. Hay or straw bales shall be placed along the exposed outer diameter of the US 2 culvert inlet.
- 708-P02 **SEEDING:** All seeding shall be in accordance with section 708.02 of the Standard Specifications, except the Contractor shall use a broadcaster to seed due to the steep grade of the new inslope. The seeding rate shall be at least 120% of the normal rate, and the seed shall be raked in to prevent erosion from wind and water. Areas which do not reveal adequate and uniform coverage, or areas which become damaged from wind or the Contractor's operation shall be reseeded at the Contractor's expense. Repairs shall be made before final acceptance. Seeding may take place upon completion of inslopes regardless of date.

708-P03 SOIL RETENTION BLANKET: The Straw-Coconut Fiber Mat shall be in accordance with section 708.03 of the Standard Specifications except that the blankets shall be unrolled vertically to the slope and netting shall be provided on both sides of the Straw-Coconut Fiber Mat.

709-010 GEOTEXTILE FABRIC: The geotextile fabric shall be delivered to the project for testing (approximately 15 working days) prior to being installed on the project. The fabric will be sampled by the NDDOT, according to the NDDOT field sampling and testing procedures. The sample will be submitted to an independent lab selected by the NDDOT. The Contractor will not be permitted to install the fabric until the test results are known.

Placement of Reinforcement Fabric (R1) shall be as follows: The fabric shall be placed so that the principal strength direction is perpendicular to the face of the Slope. Each length must extend from the back of the bench to the face of the proposed slope. Any splicing, or overlapping, of this fabric to meet the required Length will not be allowed. Adjacent strips of fabric shall be placed against each other. All fabric must be taut and pinned with a 6" (min) pin, or staple every 15 ft. along all edges and on all corners prior to placing fill on the fabric. No equipment is allowed on the fabric until a minimum of 12" of fill material covers the fabric. No sharp turns are allowed on the fabric area at any time. Small dozer equipment or front end loaders with low ground pressure shall place the initial 12" of fill material.

Fabric shall not be left uncovered for longer than 5 days. Fabric that is not covered within 5 days shall be removed and replaced at the Contractor's expense.

The reinforcement fabric shall be measured by the actual surface area covered to the nearest square yard. No allowance will be made for overlaps.

764-P01 GUARDRAIL: Guardrail shall be removed only within the limits of the lane closure and shall be reset prior to movement of the lane closure. The guardrail shall be stockpiled on site as directed by engineer.

BASIS OF ESTIMATEPetersburg Separation Slide Repair: **SNH-6-002(058)313**

Petersburg Separation Slide Repair: S/N 75-062(000)010			
Quadrant	Repair Area		Remarks
	Station to Station		
NE	0 + 28	1 + 50	Used Station from SE Inslope Survey- 122 ft repair length.
SE	0 + 30	1 + 50	120 ft repair length
NW	1 + 60	3 + 27	167 ft repair length
SW	1 + 60	3 + 50	190 ft repair length

U.S. 2, East Bound Roadway, South Ditch R.P. 322.750: **SNH-6-002(060)322**

Repair Area		Remarks
Station to Station		
2 + 00	4 + 00	200 ft Repair length

ESTIMATED QUANTITIES**SNH-6-002(058)313**

DESCRIPTION	LOCATION	UNIT	UNIT/LOCATION
W-BEAM GUARDRAIL			
Remove and Reset W Beam Guardrail	Petersburg Separation/Northeast Corner	LF	37.50
Reset W-Beam Guard Rail-Flared End Treat. & Transition	Petersburg Separation/Northeast Corner	Ea	1.00
Remove and Reset W Beam Guardrail	Petersburg Separation/Southeast Corner	LF	37.50
Reset W-Beam Guard Rail-Flared End Treat. & Transition	Petersburg Separation/Southeast Corner	Ea	1.00
3-CABLE GUARDRAIL			
Remove and Reset 3 Cable Guardrail	Petersburg Separation/Northeast Corner	LF	100.00

DESCRIPTION	LOCATION	UNIT	UNIT/LOCATION
Remove and Reset 3 Cable Guardrail	Petersburg Separation/Southeast Corner	LF	71.00
Remove and Reset 3 Cable Guardrail	Petersburg Separation/Northwest Corner	LF	175.00
Remove and Reset 3 Cable Guardrail	Petersburg Separation/Southwest Corner	LF	188.00
GEOTEXTILE FABRIC-TYPE R1			
Geotextile Fabric Type R1	Petersburg Separation/Northeast Corner	SY	1450.40
Geotextile Fabric Type R1	Petersburg Separation/Northwest Corner	SY	2050.40
Geotextile Fabric Type R1	Petersburg Separation/Southeast Corner	SY	2053.50
Geotextile Fabric Type R1	Petersburg Separation/Southwest Corner	SY	2976.70
COMMON EXCAVATION TYPE A			
Common Excavation-Type A	Petersburg Separation/Northeast Corner	CY	502.80
Common Excavation-Type A	Petersburg Separation/Northwest Corner	CY	567.00
Common Excavation-Type A	Petersburg Separation/Southeast Corner	CY	774.20
Common Excavation-Type A	Petersburg Separation/Southwest Corner	CY	618.00
BORROW			
Borrow	Petersburg Separation/Northeast Corner	CY	765.60
Borrow	Petersburg Separation/Northwest Corner	CY	1281.50
Borrow	Petersburg Separation/Southeast Corner	CY	1090.50
Borrow	Petersburg Separation/Southwest Corner	CY	2063.40

DESCRIPTION	LOCATION	UNIT	UNIT/LOCATION
STRAW-COCONUT FIBER MAT			
Straw-Coconut Fiber Mat	Petersburg Separation/Northeast Corner	SY	684.00
Straw-Coconut Fiber Mat	Petersburg Separation/Northwest Corner	SY	920.00
Straw-Coconut Fiber Mat	Petersburg Separation/Southeast Corner	SY	709.00
Straw-Coconut Fiber Mat	Petersburg Separation/Southwest Corner	SY	1098.00
SEEDING-TYPE B-CL II			
Seeding	Estimated Borrow Area Seeding	Acre	2.75
Seeding	Petersburg Separation/Northeast Corner	Acre	0.13
Seeding	Petersburg Separation/Northwest Corner	Acre	0.17
Seeding	Petersburg Separation/Southeast Corner	Acre	0.13
Seeding	Petersburg Separation/Southwest Corner	Acre	0.20

SNH-6-002(060)322

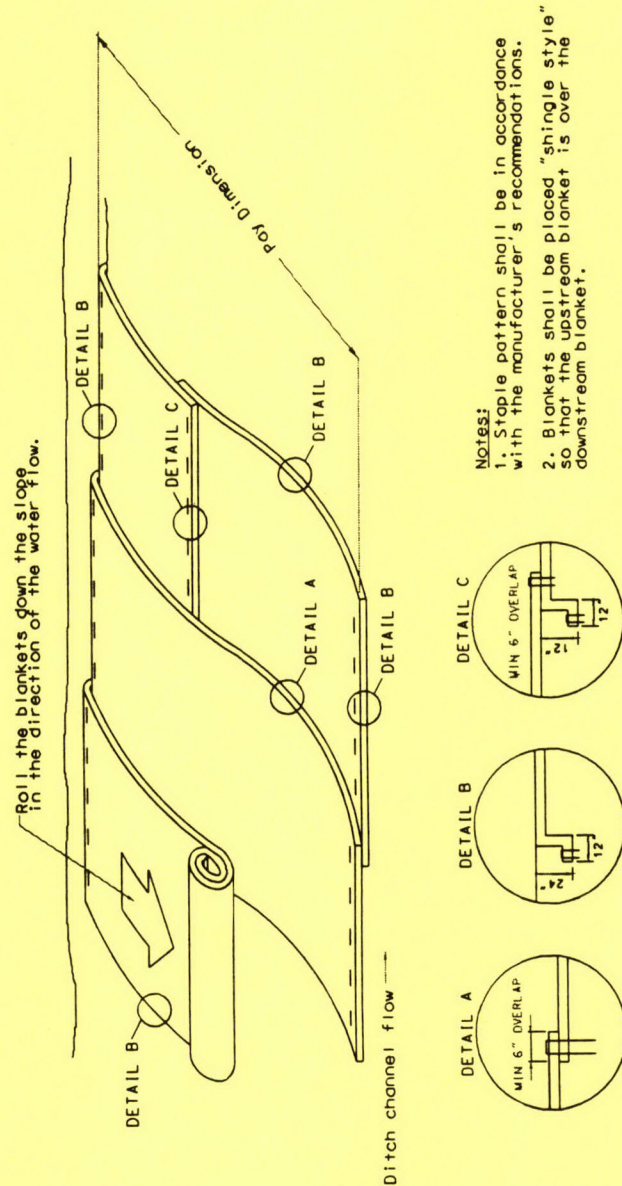
DESCRIPTION	UNIT	UNIT/LOCATION
W-BEAM GUARDRAIL		
Remove and Reset W Beam Guardrail	LF	175.00
Geotextile Fabric Type R1	SY	3753.30
Common Excavation-Type A	CY	2670.00
Straw-Coconut Fiber Mat	SY	1507.00
Borrow	CY	666.00
SEEDING-TYPE B-CL II-Landslide		
Estimated Borrow	Acre	0.44
Landslide repair	Acre	0.30

TRAFFIC CONTROL DEVICES LIST					
Sign Number	Sign Size	Description	Quantity Required	Units per Sign	Units Sub- total
G20-1a-60	60"x 36"	ROAD WORK NEXT MILES		34	0
G20-1b-60	60"x 24"	WORK IN PROGRESS / NO WORK IN PROGRESS		17	0
G20-2a-48	48"x 24"	END ROAD WORK	2	24	48
G20-4-36	36"x 18"	PILOT CAR FOLLOW ME		10	0
G20-8-48	48"x 36"	TEMPORARY SURFACE NEXT MILES		30	0
G20-50a-72	72"x 36"	ROAD WORK NEXT MILES RT & LT ARROWS		38	0
G20-52a-72	72"x 24"	ROAD WORK NEXT MILES RT or LT ARROW		30	0
G20-54-48	48"x 36"	OVERHEAD BRIDGE PAINTING		30	0
M1-4-24	24"x 24"	ROUTE MARKER (POST AND INSTALLATION ONLY)		8	0
M3-1-24	24"x 12"	NORTH (MOUNTED ON ROUTE MARKER POST)		6	0
M3-2-24	24"x 12"	EAST (MOUNTED ON ROUTE MARKER POST)		6	0
M3-3-24	24"x 12"	SOUTH (MOUNTED ON ROUTE MARKER POST)		6	0
M3-4-24	24"x 12"	WEST (MOUNTED ON ROUTE MARKER POST)		6	0
M4-8-24	24"x 12"	DETOUR (MOUNTED ON ROUTE MARKER POST)		6	0
M4-9-30	30"x 24"	DETOUR ARROW RIGHT or LEFT / AHD AND RT or LT		10	0
M4-10-48	48"x 18"	DETOUR ARROW RIGHT or LEFT		22	0
M5-1-21	21"x 15"	ARROW AHD AND RT or LT (MTD ON ROUTE MKR POST)		6	0
M6-1-21	21"x 15"	ARROW RT or LT (MOUNTED ON ROUTE MARKER POST)		6	0
R1-1-30	30"x 30"	STOP		17	0
R1-1-48	48"x 48"	STOP		34	0
R1-1a-18	18"x 18"	STOP and SLOW PADDLE Back to Back	1	8	8
R1-2-48	48"x 48"	YIELD		45	0
R2-1-48	48"x 60"	SPEED LIMIT	8	40	320
R2-1a-24	24"x 18"	MINIMUM FEE \$40 (MOUNTED ON SPEED LIMIT POST)	6	10	60
R2-5a-48	48"x 60"	REDUCED SPEED AHEAD	2	40	80
R4-1-48	48"x 60"	DO NOT PASS	2	40	80
R4-7-48	48"x 60"	KEEP RIGHT SYMBOL		40	0
R4-7a-48	48"x 60"	KEEP RIGHT		40	0
R4-8-48	48"x 60"	KEEP LEFT SYMBOL		40	0
R5-1-48	48"x 48"	DO NOT ENTER		34	0
R10-6-24	24"x 36"	STOP HERE ON RED		16	0
R11-2-48	48"x 30"	ROAD CLOSED		26	0
R11-2a-48	48"x 30"	STREET CLOSED		26	0
R11-3a-60	60"x 30"	ROAD CLOSED MILES AHEAD LOCAL TRAFFIC ONLY		30	0
R11-3c-60	60"x 30"	STREET CLOSED MILES AHEAD LOCAL TRAFFIC ONLY		30	0
R11-4a-60	60"x 30"	STREET CLOSED TO THRU TRAFFIC		30	0
W1-1-48	48"x 48"	RIGHT or LEFT SHARP CURVE ARROW		34	0
W1-2-48	48"x 48"	RIGHT or LEFT CURVE ARROW		34	0
W1-3-48	48"x 48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		34	0
W1-4-48	48"x 48"	RIGHT or LEFT REVERSE CURVE ARROW		34	0
W1-5-48	48"x 48"	RIGHT or LEFT WINDING ROAD		34	0
W1-6-48	48"x 24"	LARGE ARROW		26	0
W3-1a-48	48"x 48"	STOP AHEAD SYMBOL		34	0
W3-2a-48	48"x 48"	YIELD AHEAD SYMBOL		34	0
W3-3-48	48"x 48"	SIGNAL AHEAD SYMBOL		34	0
W4-2-48	48"x 48"	RIGHT or LEFT LANE TRANSITION SYMBOL	2	34	68
W5-1-48	48"x 48"	ROAD NARROWS		34	0
W5-2-30	30"x 30"	NARROW BRIDGE		17	0
W6-3-48	48"x 48"	TWO WAY TRAFFIC SYMBOL		34	0
W8-1-48	48"x 48"	BUMP		34	0
W8-3a-48	48"x 48"	PAVEMENT ENDS SYMBOL		34	0
W8-9a-48	48"x 48"	SHOULDER DROP OFF		34	0
W8-11-48	48"x 48"	UNEVEN LANES		34	0
W8-12-48	48"x 48"	NO CENTER STRIPE		34	0
W8-53-48	48"x 48"	TRUCKS ENTERING HIGHWAY		34	0

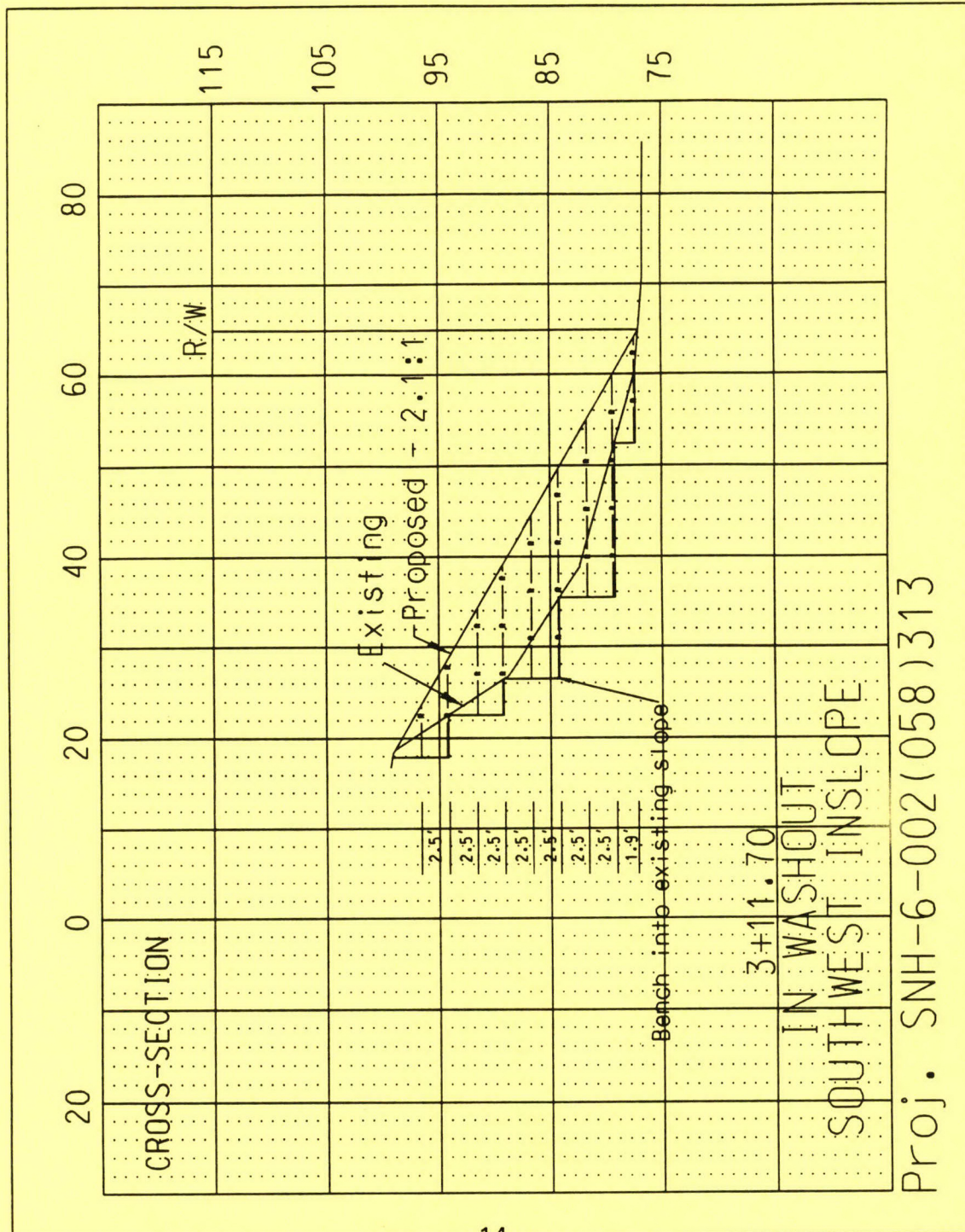
TRAFFIC CONTROL DEVICES LIST					
Sign Number	Sign Size	Description	Quantity Required	Units per Sign	Units Sub- total
W8-54-48	48"x 48"	TRUCKS ENTERING AHEAD or _ FT	2	34	68
W8-55-48	48"x 48"	TRUCKS CROSSING AHEAD or _ FT		34	0
W12-2-48	48"x 48"	LOW CLEARANCE SYMBOL		34	0
W13-1-24	24"x 24"	_ MPH ADVISORY SPEED PLATE		10	0
W13-3-48	48"x 60"	RAMP _ MPH ADVISORY SPEED PLATE		40	0
W13-4-48	48"x 60"	RAMP ARROW		40	0
W14-3-64	48"x 36"	NO PASSING ZONE		27	0
W20-2-48	48"x 48"	DETOUR AHEAD or _ FT		34	0
W20-3-48	48"x 48"	ROAD or STREET CLOSED AHEAD or _ FT		34	0
W20-4-48	48"x 48"	ONE LANE ROAD AHEAD or _ FT		34	0
W20-5-48	48"x 48"	RIGHT or LEFT LANE CLOSED AHEAD or _ FT	2	34	68
W20-7a-48	48"x 48"	FLAGGING SYMBOL	1	34	34
W20-7b-48	48"x 48"	BE PREPARED TO STOP		34	0
W20-7k-24	24"x 18"	_ FEET		8	0
W20-8-48	48"x 48"	STREET CLOSED		34	0
W20-51-48	48"x 48"	EQUIPMENT WORKING		34	0
W20-52-54	54"x 12"	NEXT _ MILES		10	0
W21-1a-48	48"x 48"	MEN WORKING SYMBOL		34	0
W21-2-48	48"x 48"	FRESH OIL		34	0
W21-3-48	48"x 48"	ROAD MACHINERY AHEAD or _ FT		34	0
W21-4-48	48"x 48"	ROAD WORK AHEAD or _ FT or ONE MILE	2	34	68
W21-5-48	48"x 48"	SHOULDER WORK		34	0
W21-6-48	48"x 48"	SURVEY CREW		34	0
W21-50-48	48"x 48"	BRIDGE PAINTING AHEAD or _ FT		34	0
W21-51-48	48"x 48"	MATERIAL ON ROADWAY		34	0
W22-8-48	48"x 48"	FRESH OIL LOOSE ROCK		34	0
	24"x 24"	TAKE TURNS (6" D letters)		14	0
		SPECIAL SIGN - NO.1			0
					0
Total Units:					902
Pay Item Description		Unit	Spec & Code	Quantity	
TRAFFIC CONTROL SIGNS		UNIT	704-1000		
ATTENUATION DEVICE - TYPE _		EACH	704-10		
TYPE I BARRICADES		EACH	704-1050		
TYPE II BARRICADES		EACH	704-1051		
TYPE III BARRICADES		EACH	704-1052	1	
DELINEATOR DRUMS		EACH	704-1060	12	
TRAFFIC CONES		EACH	704-1065		
TUBULAR MARKERS		EACH	704-1067	22	
DELINEATOR		EACH	704-1070		
FLEXIBLE DELINEATORS		EACH	704-1072		
VERTICAL PANELS - BACK TO BACK		EACH	704-1081		
SEQUENCING ARROW PANEL - TYPE C		EACH	704-108	1	
FLASHING BEACON		EACH	704-1090		
TYPE B FLASHERS		EACH	704-1095		
SHORT TERM 4IN LINE - TYPE R		LF	762-0420		
SHORT TERM 4IN LINE - TYPE NR		LF	762-0430		
OBLITERATION OF PAVEMENT MARKING		LF	704-0104		
RAISED PAVEMENT MARKERS		EACH	762-0200		

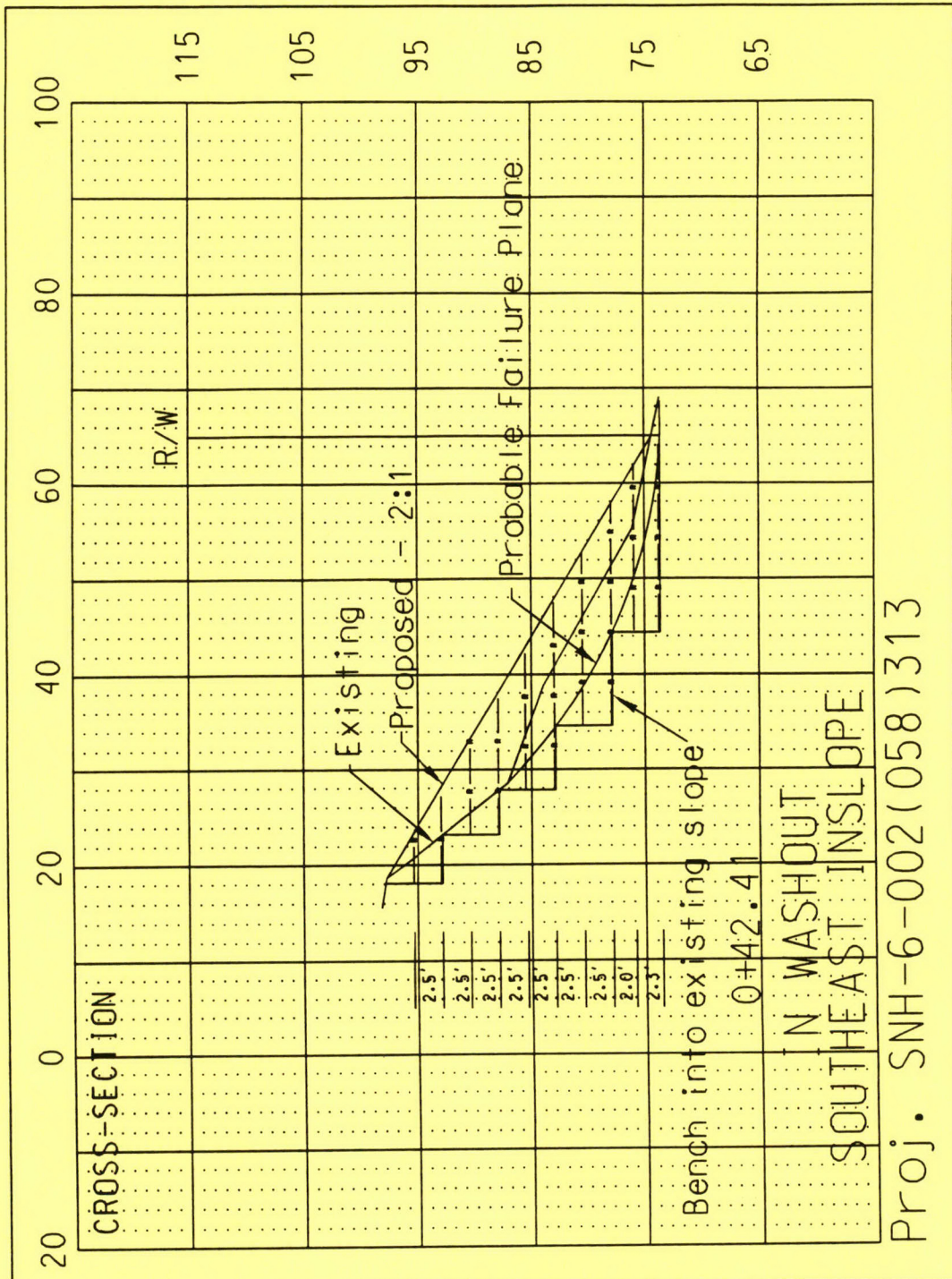
DETAIL DRAWING

STRAW-COCONUT FIBER MAT SNH-6-002(058)313 AND SNH-6-002(060)322

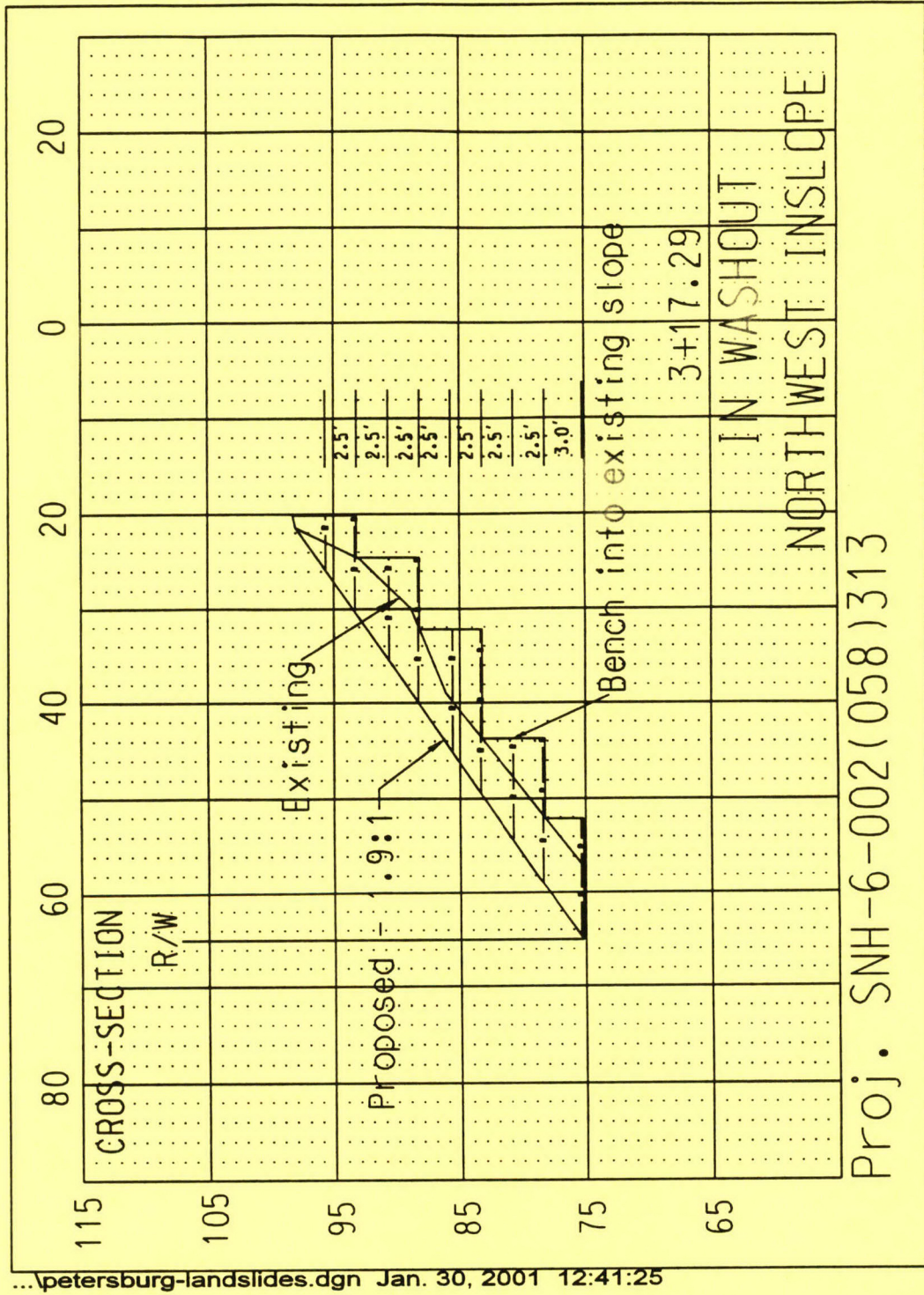


- Notes:
1. Staple pattern shall be in accordance with the manufacturer's recommendations.
 2. Blankets shall be placed "shingle style" so that the upstream blanket is over the downstream blanket.

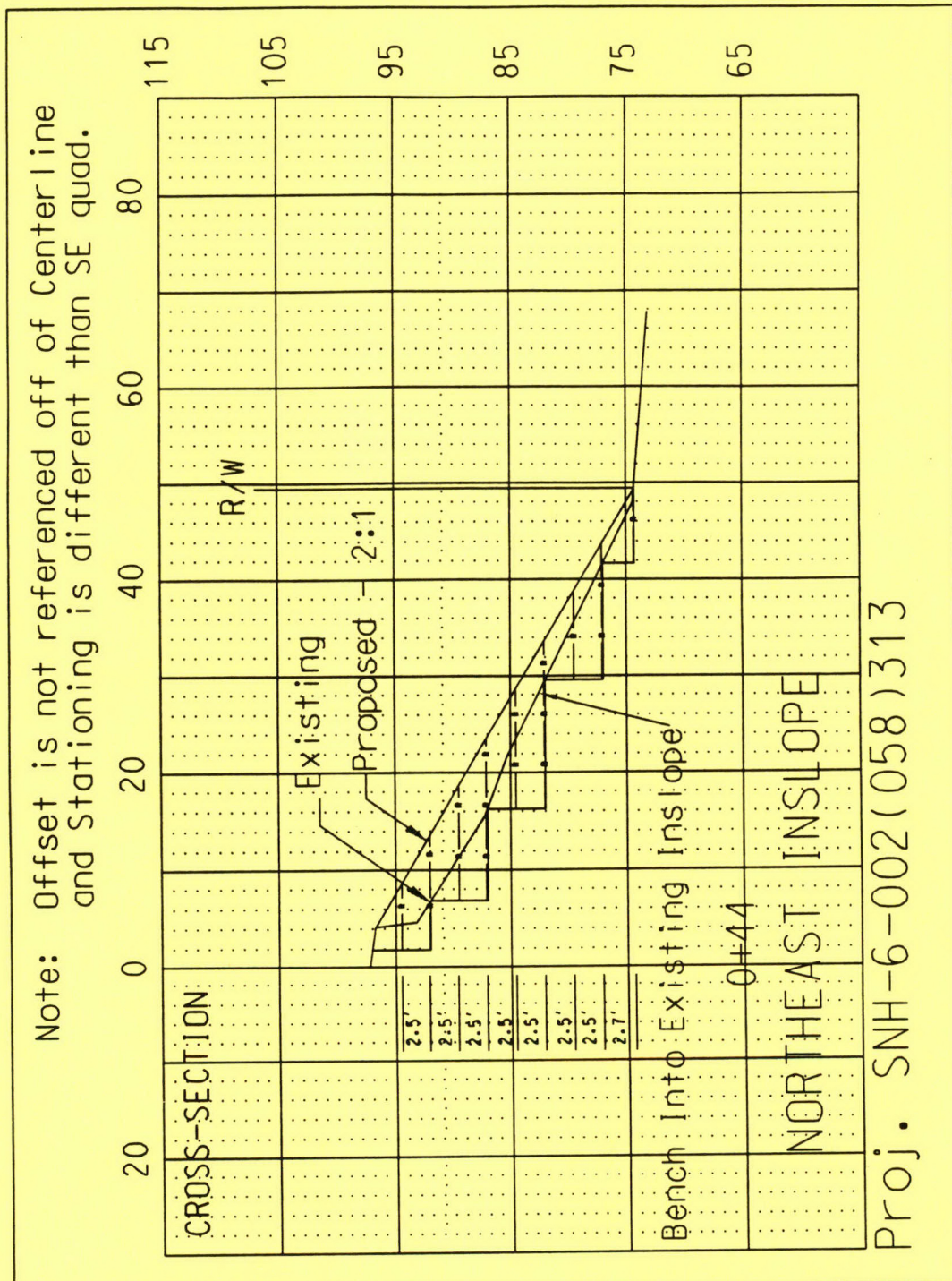


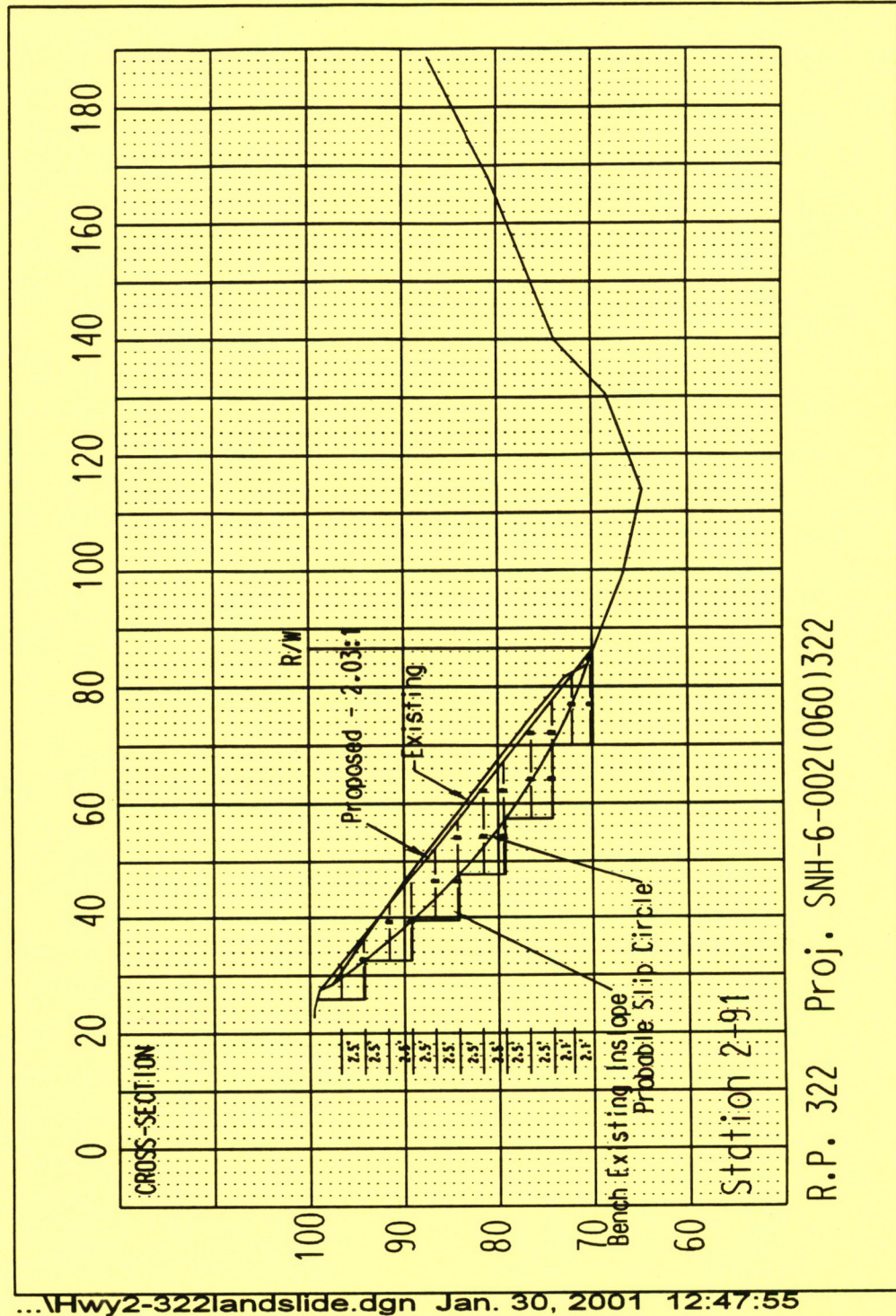


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