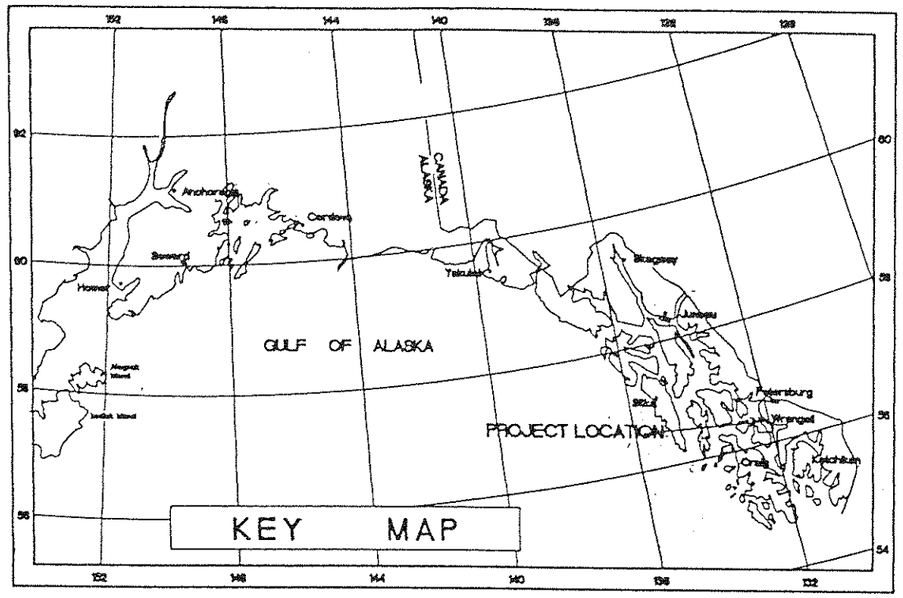


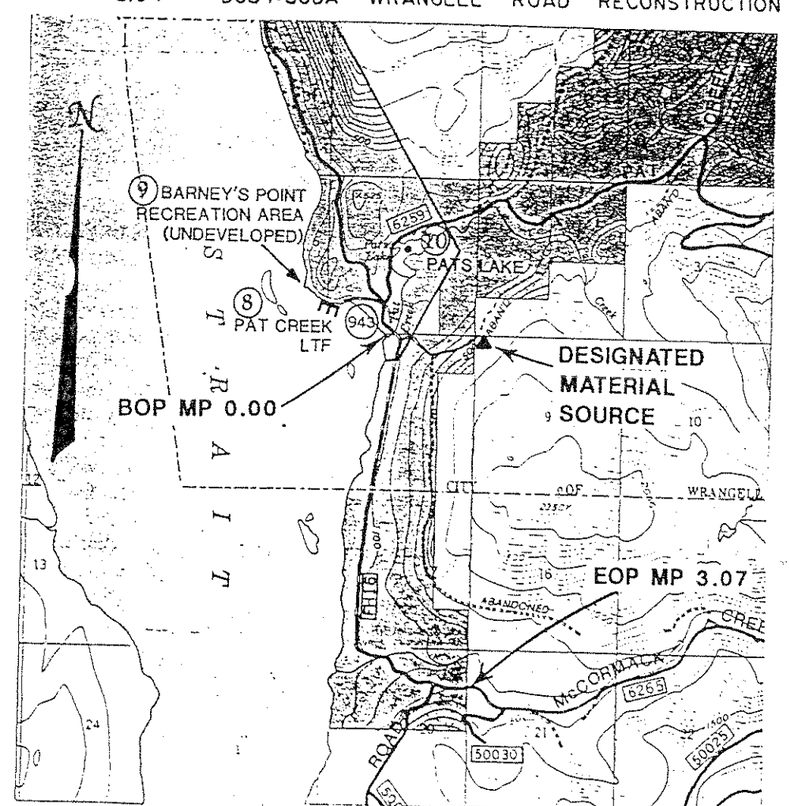
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE - REGION 10

TONGASS NATIONAL FOREST
STIKINE AREA
WRANGELL RANGER DISTRICT

PLANS FOR PROPOSED FOREST DEVELOPMENT PROJECT

FOREST HIGHWAY 16 PHASE III
ROAD RECONSTRUCTION

ROAD NUMBER	LENGTH	CLASSIFICATION	NAME	TYPE OF WORK
FH-16	3.04	DC34-300A	WRANGELL ROAD	RECONSTRUCTION



BASIS of SKETCH USGS QUADRANGLE PETERSBURG (B-2), ALASKA

VICINITY MAP

0 1 2 4 miles

N

LEGEND

- Paved Highway
- Gravel Surfaced Road
- Project Location
- Non Surfaced Road
- Other Proposed Projects
- ▲ Designated Material Source

SCALES

PLAN	PROFILE	
0 50 100 200	0 50 100 200	0 5 10 20
FEET	HORIZ. - FEET	VERT. - FEET

INDEX OF SHEETS

1a	TITLE SHEET
2a	SUMMARY OF EST. QUANTITIES
3a	SUMMARY OF DRAINAGE STRUCTURES
4a	TYPICAL ROAD CROSS SECTIONS
5a	TYPICAL EROSION BALE DETAILS
6a	TYPICAL CULVERT INSTALLATION
7a	CONSTRUCTION STAKING DETAILS
8a	QUARRY DEVELOPMENT & HAUL DIAG.
9a	PAT CREEK QUARRY CONTOUR MAP
10a	TRAFFIC CONTROL PLAN
11a	FH-16 PLAN & PROFILE
12a	FH-16 PLAN & PROFILE
13a	FH-16 SUBSURFACE TEST PIT DATA
14a	BUS TURNAROUND & SAND QUARRY RD.
15a	NEMO JCT. & SNOWPLOW TURNAROUND
16a	FH-16 TRAFFIC MARKINGS
17a	FH-16 TRAFFIC MARKINGS
18a	FH-16 AGGREGATE BASE COURSE, EATB, BST & SUPERELEVATION
19a	FH-16 AGGREGATE BASE COURSE, EATB, BST & SUPERELEVATION
20a	FH-16 SIGN DETAILS & PLACEMENT
21a	FH-16 SIGN DETAILS & PLACEMENT
22a	SIGN PLACEMENT SUMMARY
1b	BRIDGE GENERAL LAYOUT
2b	BRIDGE SITE PLAN
3b-5b	BRIDGE ABUTMENTS AND PIER DETAILS
6b	BRIDGE TYPICAL SECTION
7b-9b	BRIDGE GIRDERS AND DETAILS
10b	BRIDGE RAILING DETAILS
11b	BRIDGE APPROACH GUARDRAILS PLAN
12b-16b	STATE APPROACH GUARDRAILS TYPICAL DETAILS
17b-18b	FH-16 BRIDGE REMOVAL AND RELOCATION
19b-20b	USFS STANDARD APPROACH GUARDRAIL DETAILS

REVISION	DATE	APPROVED	DESCRIPTION
3			
2			
1			

DESIGNED BY: SCHAFER, GROMER, ELMORE
DRAWN BY: BARNETT, ELMORE
REVIEWED BY: [illegible]
Dwg. No.
Sheet 1a of 22a & 20b

RECOMMENDED
FOREST ENGINEER — DATE 1/28/97
RECOMMENDED
DISTRICT RANGER — DATE 1/27/97
APPROVED
FOREST SUPERVISOR — DATE 1/27/97
APPROVED
DIRECTOR OF ENGINEERING & AVIATION MGMT., R10 — DATE 3/27/97
APPROVED
REGIONAL DIRECTOR, S.E. REGION ALASKA DOT & PF — DATE 4/1/97
APPROVED
DIVISION ENGINEER, FHWA — DATE

SUMMARY OF ESTIMATED QUANTITIES

ITEM NUMBER	DESCRIPTION	METHOD OF MEASUREMENT	UNIT	FH16 PROJECT TOTALS
104(01)	TRAFFIC MAINTENANCE, TRAFFIC CONTROL DEVICES, SIGNING, MARKING, PILOT CARS, SWEEPERS AND WATERING	LSQ	LS	1
104(02)	FLAGGING	AQ	HR	832
121(01)	FIELD OFFICE & LABORATORY	LSQ	LS	1
170(02)	ESTABLISH CENTERLINE, PRECISION A	AQ	MI	3.04
170(03)	SLOPE STAKING, PRECISION A	AQ	MI	0.88
170(04)	FINISH STAKING, SUBGRADE, PRECISION A	AQ	MI	0.88
170(05)	FINISH STAKING, BASE COURSE, PRECISION A	AQ	MI	3.04
201(01)	CLEARING & GRUBBING, SLASH TREATMENT METHODS FOR TOPS AND LIMBS 1, LOGS 1, AND STUMPS 1, UTILIZATION OF TIMBER 2	DQ	ACRE	8.37
202(02)	REMOVAL OF CULVERTS	AQ	EA	12
202(05)	REMOVAL OF BRIDGE	LSQ	LS	1
203(01)	EXCAVATION, PLACEMENT METHOD 1	DQ	CY	13,358
203(10)	BORROW EXCAVATION, PLACEMENT METHOD 1	DQ	CY	57,368
204(05)	STRAW/HAY BALES	AQ	EA	290
204(07)	SILT FENCE	AQ	EA	24
204(21)	SOIL EROSION AND POLLUTION CONTROL	AQ	CONTINGENT SUM	AS REQUIRED
205A(02)	HAUL	DQ	CYM	173,825
205B(01)	END HAUL	DQ	CY	5,220
210(02)	OBLITERATION OF ABANDONED ROADWAYS	DQ	MI	0.4
304(10)	CRUSHED AGGREGATE, TYPE BASE, GRADING P, COMPACTION E	DQ	CY	8,270
304(21)	STOCKPILED AGGREGATE, TYPE ROAD SALVAGED, FH16 M.P. 2.3 – M.P. 3.1	AQ	CY	1,097
304(23)	ROADWAY AGGREGATE REMOVAL FROM FH-16, HAUL & PLACEMENT ON FDR # 6259 PAT LAKE ROAD, COMPACTION G	DQ	CY	2,737
306(01)	RECONDITIONING OF ROADBED, RD #6259	DQ	MI	1.6
405(01)	EMULSIFIED ASPHALT TREATED BASE	AQ	SY	48,905
405(03)	EMULSIFIED ASPHALT, GRADE CSS-1 See Amendment No. 3	AQ	GAL	78,248
405(04)	CHOKE AGGREGATE, GRADING A	DQ	CY	227
410(06)	POLYMER MODIFIED EMULSIFIED ASPHALT, RAPID SET, LOW TEMPERATURE	AQ	GAL	48,781
410(09) *	BITUMINOUS SURFACE TREATMENT, DOUBLE BST-2A	AQ	SY	48,781
551(25)	STEEL H-PILES, FURNISHED AND INSTALLED	DQ	LF	475
553(02)	PRESTRESSED CONCRETE STRUCTURE	LSQ	LS	1
556(05)	BRIDGE RAILING	LSQ	LS	1
556(06)	BRIDGE APPROACH RAILING, GALVANIZED 2 ELEMENT BEAM-TYPE, CLASS A, TYPE 2	AQ	LF	876
556(07)	END ANCHORAGE, TYPE 2	AQ	EA	4

ITEM NUMBER	DESCRIPTION	METHOD OF MEASUREMENT	UNIT	FH16 PROJECT TOTALS
556(08)	TERMINAL SECTION, TYPE 2	AQ	EA	4
601(01)	MOBILIZATION	LSQ	LS	1
603(01)18	18-INCH CORRUGATED METAL PIPE, 0.064-INCH THICKNESS FOR STEEL OR 0.060-INCH THICKNESS FOR ALUM., METHOD C, 2-2/3" X 1/2" CORRUGATIONS	AQ	LF	567
603(01)24	24-INCH CORRUGATED METAL PIPE, 0.064-INCH THICKNESS FOR STEEL OR 0.060-INCH THICKNESS FOR ALUM., METHOD C, 2-2/3" X 1/2" CORRUGATIONS	AQ	LF	472
603(01)36*	36-INCH CORRUGATED METAL PIPE, 0.064-INCH THICKNESS FOR STEEL OR 0.060-INCH THICKNESS FOR ALUM., METHOD C, 2-2/3" X 1/2" CORRUGATIONS	AQ	LF	136
625(03)	SEEDING, HYDRAULIC METHOD, WITH MULCH	DQ	ACRE	5.2
633(02)	STEEL POSTS	AQ	EA	46
633(11)	REGULATORY SIGNS	AQ	EA	18
633(12)	WARNING SIGNS & MARKERS	AQ	EA	24
633(13)	GENERAL INFORMATION SIGNS	AQ	EA	10
634(02)	TRAFFIC MARKINGS, SINGLE REFLECTORIZED, BROKEN, COLOR YELLOW, TYPE A	AQ	MI	0.74
634(04)a	TRAFFIC MARKINGS, SINGLE REFLECTORIZED, SOLID, COLOR WHITE, TYPE A	AQ	MI	6.14
634(04)b	TRAFFIC, MARKINGS, SINGLE REFLECTORIZED, SOLID, COLOR YELLOW, TYPE A	AQ	MI	0.71
634(06)	TRAFFIC MARKINGS, DOUBLE REFLECTORIZED, SOLID, COLOR YELLOW, TYPE A	AQ	MI	2.36

* THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR INFORMATIONAL AND BIDDING PURPOSES ONLY. THEY ARE INCIDENTAL TO THE INDICATED PAY ITEM, AND WILL NOT BE MEASURED SEPARATELY FOR PAYMENT:

GRADING 10 AGGREGATE REQUIRED IN TABLE 410-1 (INCIDENTAL TO 410(09))	1,074 TONS
GRADING 11 AGGREGATE REQUIRED IN TABLE 410-1 (INCIDENTAL TO 410(09))	586 TONS
CLASS VII RIPRAP (INCIDENTAL TO 603(01)36)	5 C.Y.

DESIGNED BY: JS, SG & KE DATE 2/96
DRAWN BY: BARNETT DATE 2/96
CHECKED BY: SCHAEFER DATE 2/96
REVIEWED BY: DUNHAM DATE 4/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
R-10 ALASKA REGION

FOREST TONGASS / STIKINE AREA
DISTRICT WRANGELL RANGER DISTRICT
SHEET TITLE: SUMMARY

DRAINAGE SUMMARY

DESIGN			INSTALLATION DETAILS			AS BUILT			
STATION	DIAMETER	LENGTH	SKEW	DITCH BLOCK	FISH STREAM	STATION	DIAMETER	LENGTH	REMARKS
132+12	24"	62'							
137+00	18"	100'							
139+12	24"	110'	41° LT. AH.						
143+26	36"	136'	54° LT. AH.						INSTALL 5 C.Y. CLASS VII RIPRAP AT OUTLET
145+32	24"	100'	40° RT. AH.						
147+49	18"	64'							
150+50	18"	60'							
153+15	18"	75'							
156+23	18"	74'	8° RT. AH.						
158+83	18"	48'	8° RT. AH.						
160+19	18"	52'	20° RT. BK.						
161+11	24"	50'	17° RT. AH.						
163+97	24"	56'	24° RT. AH.						
170+58	18"	54'							
172+30	18"	40'							
QUARRY RD.									
0+75	24"	94'							

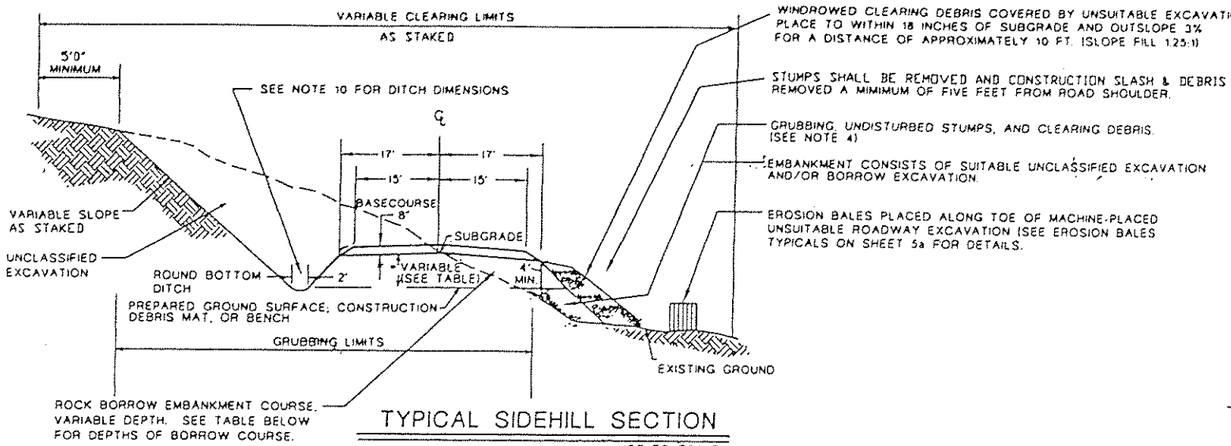
DESIGN			INSTALLATION DETAILS			AS BUILT			
STATION	DIAMETER	LENGTH	SKEW	DITCH BLOCK	FISH STREAM	STATION	DIAMETER	LENGTH	REMARKS

NOTE: SEE SCHEDULE OF ITEMS FOR CORRUGATED METAL PIPE THICKNESS AND CORRUGATIONS.

DESIGNED BY: JS, SG & KE DATE 2/96
DRAWN BY: BARNETT DATE 2/96
CHECKED BY: SCHAEFER DATE 2/96
REVIEWED BY: DUNHAM DATE 4/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
R-10 ALASKA REGION

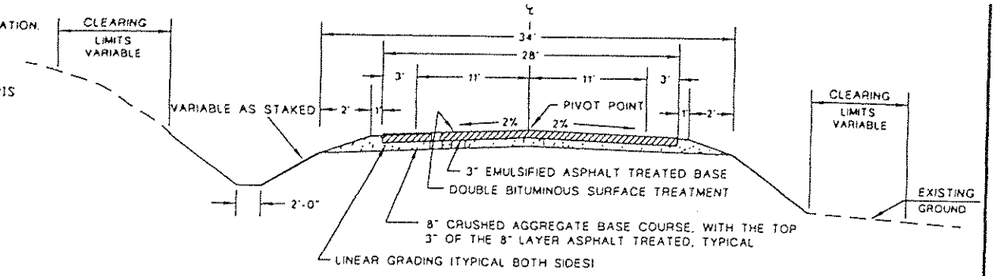
FOREST TONGASS / STIKINE AREA
DISTRICT WRANGELL RANGER DISTRICT
SHEET TITLE DRAINAGE SUMMARY SHEET 3a OF 22a



TYPICAL SIDEHILL SECTION

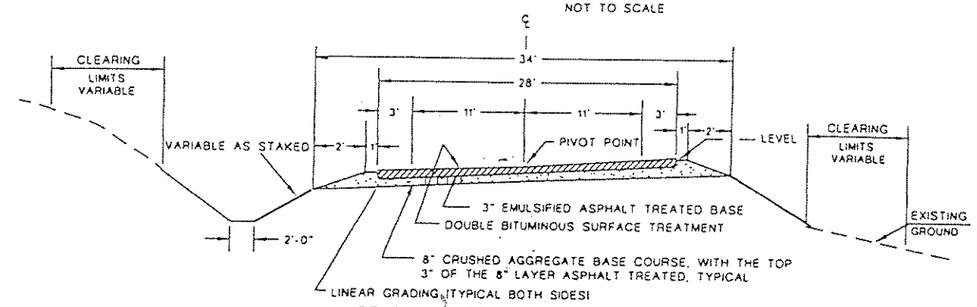
NOT TO SCALE

ROCK BORROW COURSE DEPTHS		
SECTION TYPE	UNDERLYING MATERIAL	MINIMUM DEPTH OF BORROW COURSE
EMBANKMENT (OVERLAY)	ALL MATERIALS	48 INCH
SIDEHILL AND THROUGH CUT	COMMON MATERIAL	48 INCH
	BEDROCK AND COMPETENT EXISTING ROADBED (AS STAKED ON GROUND)	24 INCH



TYPICAL EATB SECTION

NOT TO SCALE

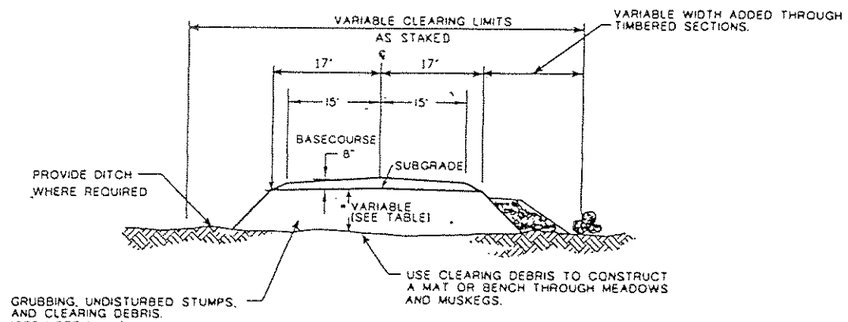


GENERAL NOTE

THE SUPERELEVATION SHALL BE ROTATED ABOUT THE CENTERLINE. THE RATE OF SUPERELEVATION AND SUPERELEVATION TRANSITION LENGTHS ARE SHOWN ON THE SUPERELEVATION DETAILS.

TYPICAL SUPERELEVATION SECTION

NOT TO SCALE



TYPICAL OVERLAY SECTION

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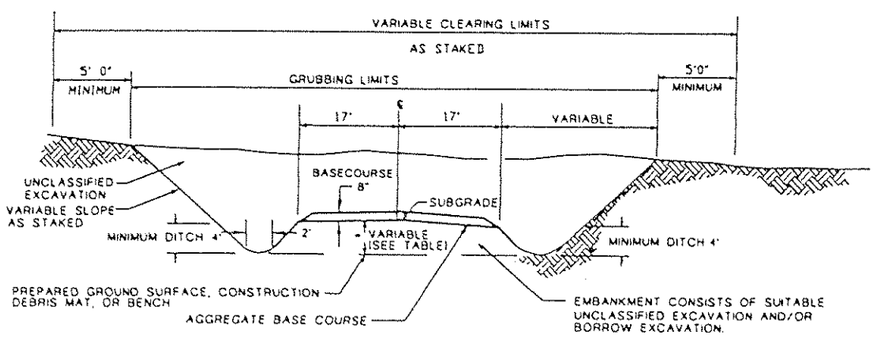


TYPICAL THROUGH - CUT SECTION

NOT TO SCALE

PAVEMENT COURSES LEGEND:

- DOUBLE BITUMINOUS SURFACE TREATMENT
- 3" EMULSIFIED ASPHALT TREATED BASE
- 8" CRUSHED AGGREGATE BASE COURSE, WITH THE TOP 3" OF THE 8" LAYER ASPHALT TREATED, TYPICAL

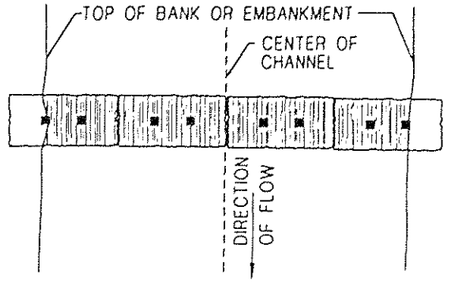
GENERAL NOTES:

1. ROAD GRADES AND ALIGNMENT, AS SHOWN ON THE PLANS, ARE SUBJECT TO REVISION.
2. PROFILE ELEVATIONS ARE SHOWN TO THE TOP OF THE SUBGRADE.
3. THE TRAVELED WAY SHALL BE CROWNED 2%, EXCEPT IN SUPERELEVATION SECTIONS.
4. UNDISTURBED STUMPS AND OTHER CLEARING DEBRIS IN EMBANKMENT AREAS MAY BE LEFT IN PLACE IF THEY DO NOT EXTEND CLOSER THAN 48 INCHES TO ANY SUBGRADE. (REFERENCE SPS 201)
5. UNLESS OTHERWISE INDICATED OR STAKED, ALL CUT SLOPES SHALL BE 1:1 AND ALL FILL SLOPES SHALL BE 1 1/4:1.
6. CLEARING LIMITS VARIABLE. (SEE STAKE NOTES)
7. ALL BORROW EXCAVATION SHALL BE REDUCED IN SIZE TO A MAXIMUM DIMENSION OF 24 INCHES.
8.

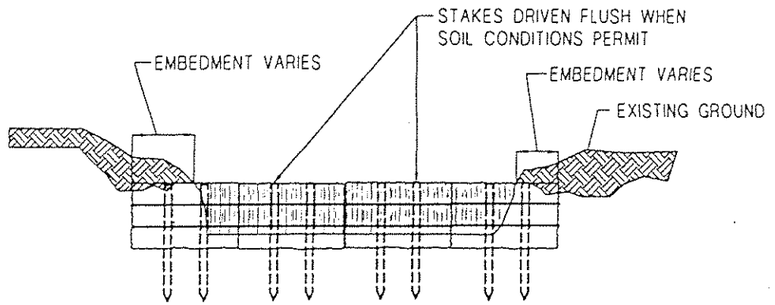
ROAD No.	FROM STA. TO STA.	LENGTH (MI)	DESIGN SPEED	TOLERANCE CLASS	SUBGRADE WIDTH
FH - 16	15+25 - 175+73	3.04	30 MPH	B	34 FEET
FDR 6267, MP 3.3	STA. 0+00 - STA. 7+75	0.15	10 MPH	D	20 FEET

9. SPECIFIED THICKNESS OF CRUSHED AGGREGATE BASE COURSE IS 8-INCHES (COMPACTED). THE TOP 3-INCHES OF THE CRUSHED AGGREGATE BASE COURSE SHALL BE ASPHALT TREATED AS SHOWN IN THE EATB TYPICAL SECTION DETAIL. AGGREGATE BASE COURSE WIDTH SHALL BE 30-FEET, WITH 3:1 FILL SLOPES.
10. DITCHES IN NON-BEDROCK CUT SECTIONS SHALL BE 4 FEET DEEP WITH A 2 FOOT ROUNDED BOTTOM. DITCHES IN SECTIONS WHERE BEDROCK IS ENCOUNTERED SHALL BE A MINIMUM 2 FEET DEEP WITH A 4 FOOT ROUNDED BOTTOM.
11. CLEARING DEBRIS TOO LARGE TO BE WINDROWED AND COVERED WITH SOIL SHALL BE REMOVED AND PLACED IN A DISPOSAL SITE DESIGNATED BY THE ENGINEER.
12. SEE SECTION 304 FOR AGGREGATE BASE COURSE CONSTRUCTION TOLERANCES.

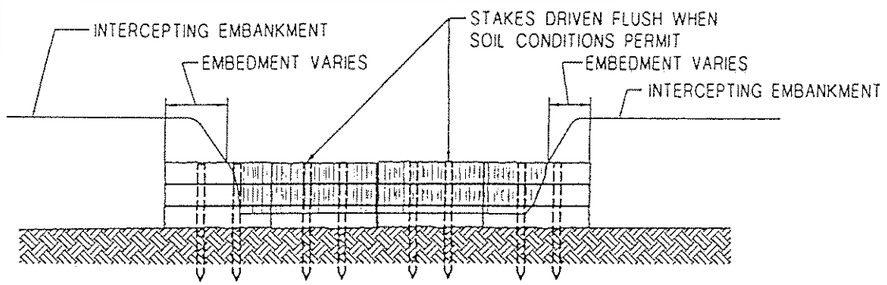
DESIGNED BY: SCHAEFER DATE: 2-12-96 DRAWN BY: BARNETT DATE: 2-12-96 REVIEWED BY: DUNHAM DATE: 4-12-96	U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE TONGASS N.F. STIKINE AREA	FOREST HIGHWAY 16 PHASE III TYPICAL ROAD CROSS SECTIONS Dwg. No. _____ Sht. 4a of 22a



PLAN VIEW

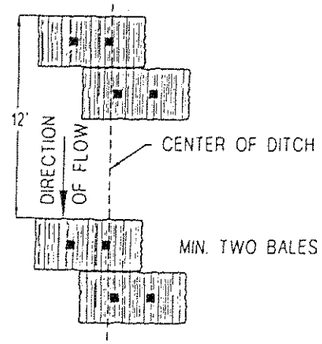


FRONT VIEW - EROSION CONTROL CHANNEL CHANGE

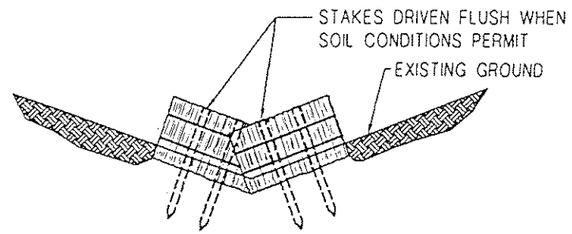


FRONT VIEW - EROSION CONTROL INTERCEPTING EMBANKMENT

EROSION CONTROL CHANNELS

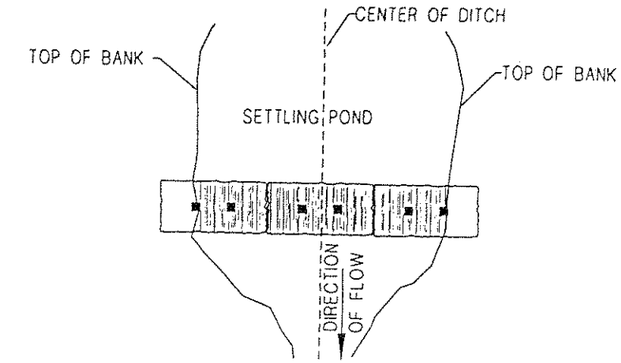


PLAN VIEW

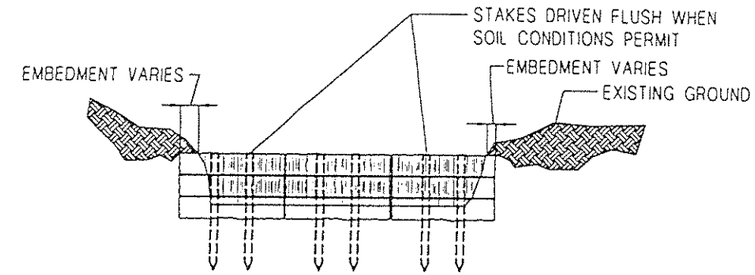


FRONT VIEW

DITCH CHECKS

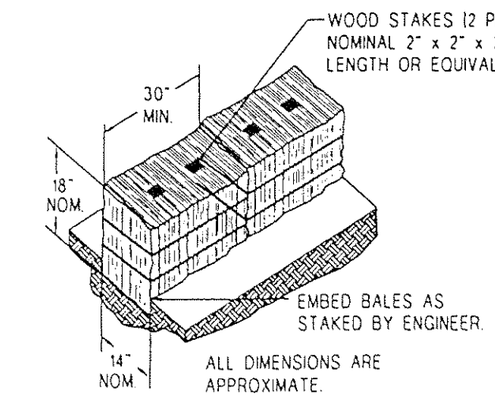


PLAN VIEW

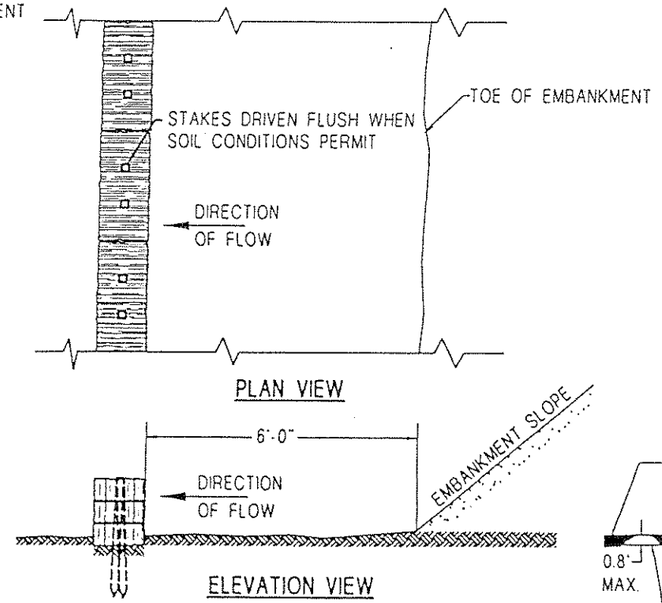


FRONT VIEW

SETTLING POND



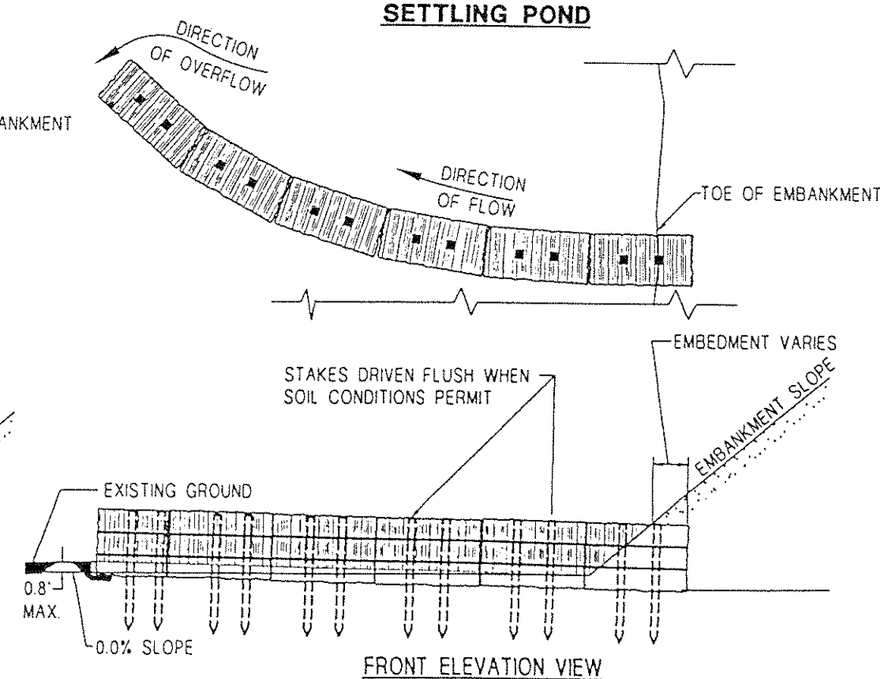
EROSION BALE INSTALLATION DETAIL



PLAN VIEW

ELEVATION VIEW

BALES AT TOE OF SLOPE



FRONT ELEVATION VIEW

EROSION BALES CHANNEL AT TOE OF SLOPE

NOTES:

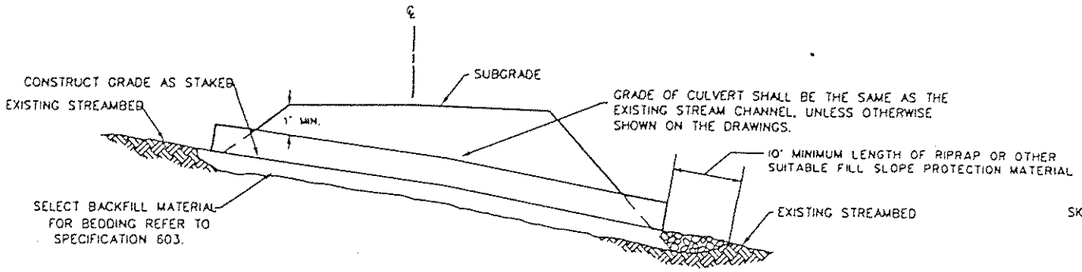
BALES SHALL BE PLACED END TO END OR OVERLAPPING AT RIGHT ANGLES TO THE DIRECTION OF FLOW AND FAR ENOUGH UP THE SIDES OF THE DITCH TO PREVENT ERODING AROUND THE ENDS.

BALES SHALL BE PLACED WITH THE TWINE OR TIE WIRES PARALLEL TO THE GROUND.

STAKES TO BE BATTERED IN OPPOSITE DIRECTIONS.

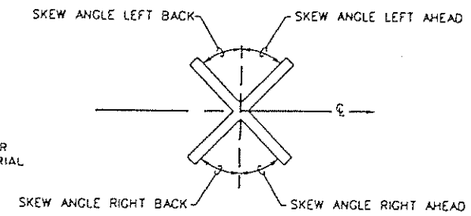
DESIGNED BY: K. ELMORE DATE: 3/25/96 DRAWN BY: K. ELMORE DATE: 3/25/96 REVIEWED BY: L. DUNHAM DATE: 4/12/96	U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE TONGASS N.F. STIKINE AREA	EROSION CONTROL & SETTLING POND TYPICAL DETAILS Dwg. No. EROSION Sht. 5a of 22a

TYPICAL CULVERT INSTALLATION



TYPICAL CULVERT INSTALLATION IN LIVE STREAMS

NO SCALE



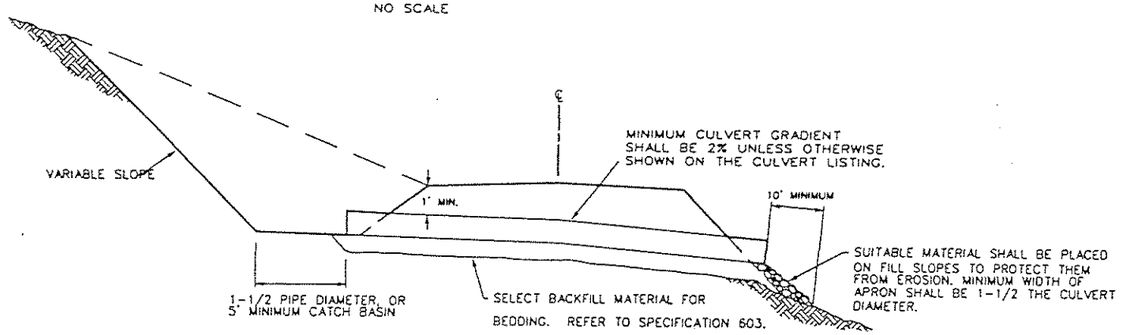
THE SKEW ANGLE BETWEEN A PERPENDICULAR TO℄ AND CULVERT INLET.

CULVERT SKEW DIAGRAM

NO SCALE

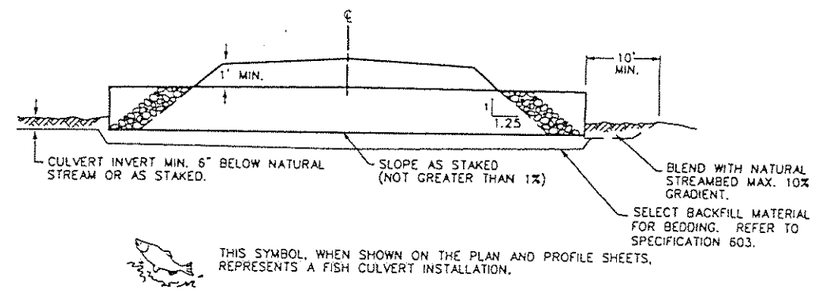
GENERAL NOTES

1. CULVERT LENGTHS, DIAMETERS, AND LOCATIONS, AS SHOWN ON THE PLANS, ARE APPROXIMATE AND ARE SUBJECT TO REVISION BY THE ENGINEER.
2. ONE FOOT OF CULVERT SHALL EXTEND BEYOND THE CATCH POINT ON BOTH INLET AND OUTLET END OF CMP.
3. CAMBER WILL DEPEND ON SITE CONDITIONS. MINIMUM CAMBER IS 1% OF CULVERT LENGTH BUT NOT LESS THAN 0.3 FT. AT CENTER.
4. CULVERTS AND PIPE ARCHES SHALL HAVE RIPRAP PLACED AT THE INLET AND OUTLET AS CALLED FOR ON THE SITE PLAN.
5. A "LIVE STREAM" IS DEFINED AS ANY STREAM REQUIRING A CULVERT WITH A DIAMETER OF 36" OR GREATER.



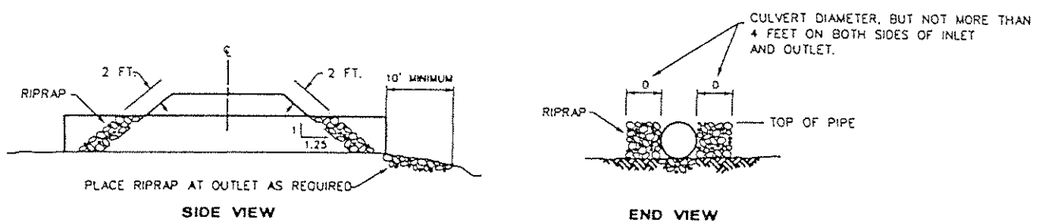
TYPICAL CULVERT INSTALLATION FOR DITCH RELIEF

NO SCALE



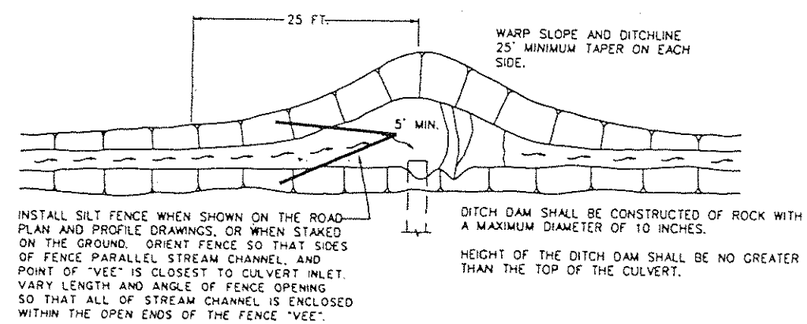
TYPICAL FISH CULVERT PLACEMENT

NO SCALE



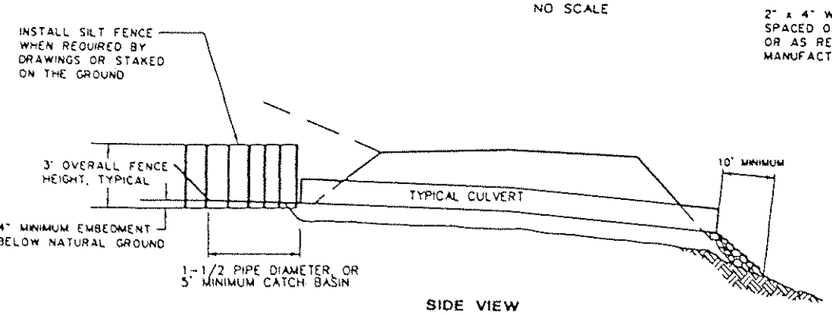
TYPICAL RIPRAP PLACEMENT

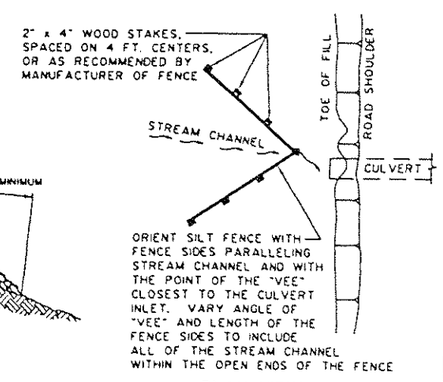
NO SCALE



TYPICAL CATCH BASIN WITH DITCH DAM

NO SCALE





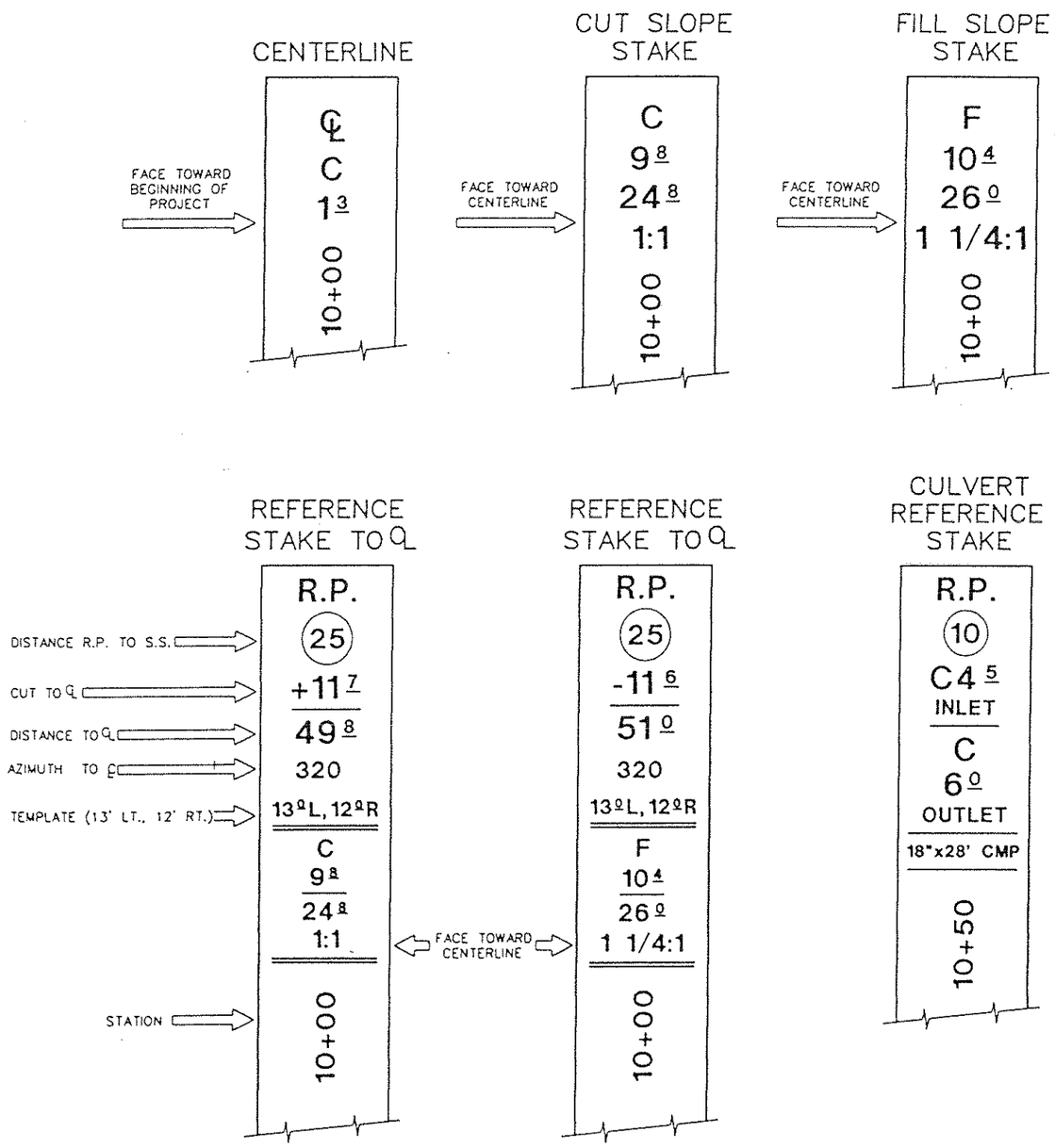
TYPICAL SILT FENCE PLACEMENT

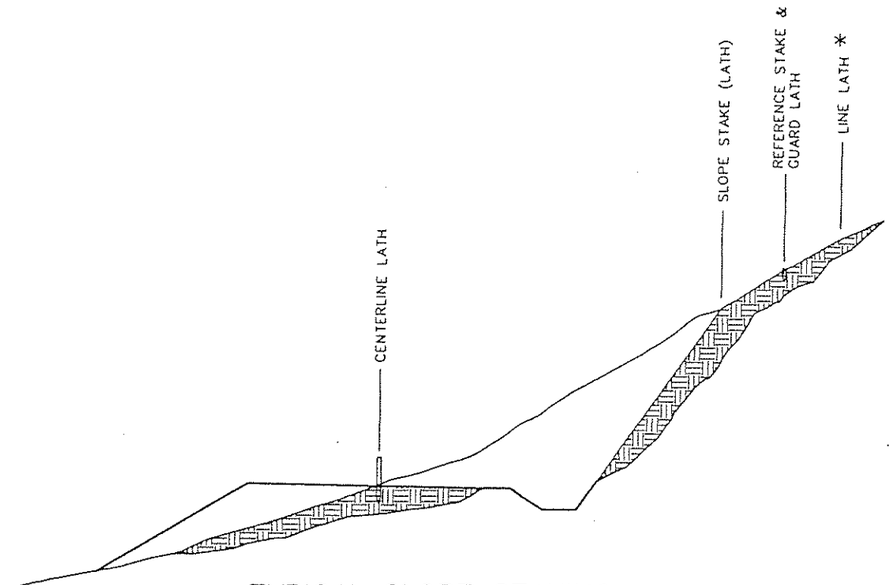
NO SCALE

FOREST HIGHWAY 16 PHASE III

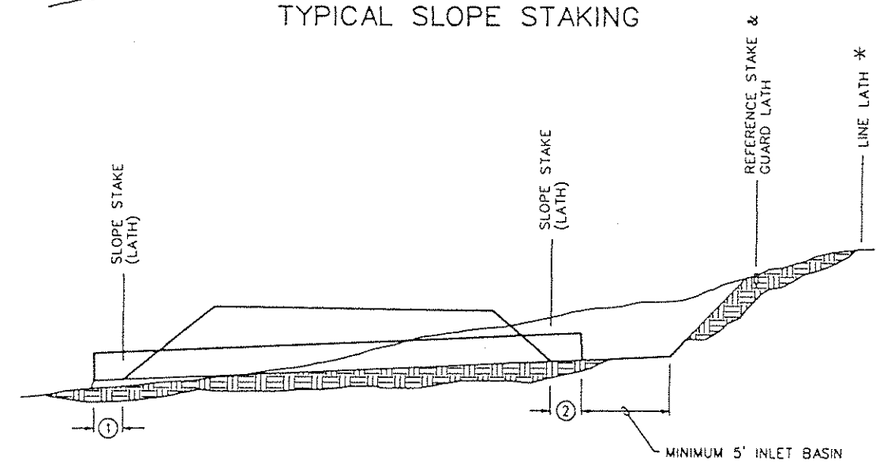
DESIGNED BY: JS, SG & KE DATE 2/96 DRAWN BY: BARNETT/ELMORE DATE 4/96 CHECKED BY: SCHAEFER DATE 2/96 REVIEWED BY: DUNHAM DATE 4/96	U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE R-10 ALASKA REGION	FOREST TONGASS / STIKTINE AREA DISTRICT WRANGELL RANGER DISTRICT SHEET TITLE CULVERT TYPICALS SHEET 6a OF 22a

TYPICAL CONSTRUCTION STAKING DETAIL





TYPICAL SLOPE STAKING



TYPICAL CULVERT STAKING

① CULVERT INVERT TO EXTEND ___' BEYOND CATCHPOINT

② CULVERT INVERT TO EXTEND ___' BEYOND CATCHPOINT

* LINE LATH IS AN UNMARKED LATH IN ALIGNMENT WITH CENTERLINE, S.S. AND R.P. STAKES

NOTE:
CLEARING LIMITS SHALL BE MARKED WITH FLORESCENT ORANGE FLAGGING. REFERENCE STAKES, SLOPE STAKES, STRUCTURE STAKES, AND MISCELLANEOUS STAKES SHALL BE MARKED WITH FLORESCENT ORANGE PAINT.

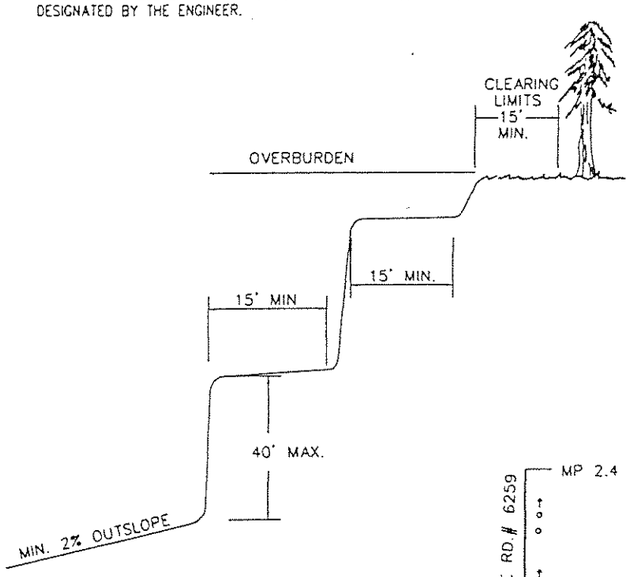
DESIGNED BY: JS, SG & KE DATE 2/96 DRAWN BY: BARNETT DATE 2/96 CHECKED BY: SCHAEFER DATE 2/96 REVIEWED BY: DUNHAM DATE 4/96	U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE R-10 ALASKA REGION	FOREST TONGASS / STIKINE AREA DISTRICT WRANGELL RANGER DISTRICT SHEET TITLE STAKING DETAILS SHEET 7a OF 22a

PIT AND QUARRY DEVELOPMENT DETAILS

DESIGNATED MATERIAL SOURCE

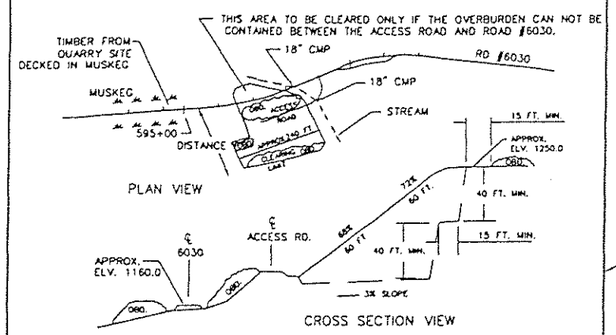
TYPE OF MATERIAL	LOCATION	CONSTRUCTION AREA
BORROW EXCAVATION	PAT QUARRY	FH16 MP. 2.24-MP. 3.07
AGGREGATE, GRADING P	PAT QUARRY	FH16 MP. 0.04-MP. 3.07
COVER AGGREGATE, GRADING 10	CONTRACTOR FURNISHED SOURCE	FH16 MP. 0.04-MP. 3.00
COVER AGGREGATE, GRADING 11	CONTRACTOR FURNISHED SOURCE	FH16 MP. 0.04-MP. 3.00
CHOKE AGGREGATE, GRADING A	PAT QUARRY	FH16 MP. 0.04-MP. 3.00
RIPRAP	PAT QUARRY	FH16 MP. 2.3
WOODFILL	SPUR ROAD AT MP 4.8, RD. #6267	RD #6267, MP. 5.4

DESIGNATED DISPOSAL SITE FOR UNSUITABLE ROADWAY EXCAVATION LOCATED AT MP 0.5, RD #6267. PLACE UNSUITABLE EXCAVATION ON EXISTING ROAD FILL SLOPES AS STAKED ON THE GROUND OR DESIGNATED BY THE ENGINEER.



TYPICAL SECTION

--QUARRY DEVELOPMENT PLAN--
QUARRY IS LOCATED RIGHT OF STA. 597+50 ON ROAD NO 6030
ESTIMATE OF VOLUME = 25,000 CU. YD.



DEVELOPMENT PLAN:
1. ALL MERCHANTABLE TIMBER WILL BE REMOVED FROM THE QUARRY SITE AND DECKED IN THE MUSKEG LEFT OF 595+00.
2. OVERBURDEN WILL NOT BE PLACED IN THE SMALL STREAM BORDERING THE QUARRY.
3. DEVELOPMENT WILL COMPLY WITH THE GENERAL NOTES SHOWN ON THE PIT AND QUARRY DEVELOPMENT TYPICAL SHEET.
4. A TEST SHOT OF APPROXIMATELY 2,000 CU. YD. IS PLANNED.

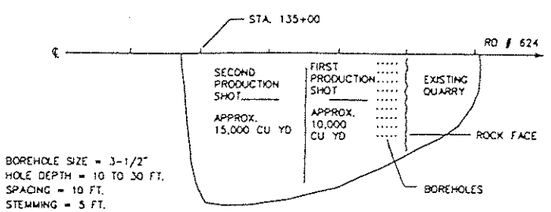
REHABILITATION PLAN:
1. THE ACCESS ROAD SHALL BE OBLITERATED BY CUTTING A DITCH AT THE JUNCTION OF THE ACCESS ROAD WITH ROAD 6030, AND BY ROUGHING UP THE ACCESS ROAD SURFACE.
2. ALL OVERSIZE ROCK SHALL BE PLACED AGAINST THE SIDES OF THE QUARRY NEXT TO THE BACKWALL BENCH.
3. A MINIMUM OF 6 INCHES OF OVERBURDEN SHALL BE EVENLY SPREAD OVER THE QUARRY FLOOR.
4. ALL DISTURBED AREAS, SUCH AS OVERBURDEN PILES, BENCH SURFACES AND ACCESS ROAD SURFACES SHALL BE SEEDED AND FERTILIZED IN ACCORDANCE WITH SECTION 625.
5. PROVISIONS FOR FUTURE QUARRY ACCESS SHALL BE PROVIDED, UNLESS THIS REQUIREMENT IS WAIVED BY THE ENGINEER.

CONTRACTOR DATE C.O.R. OR E.R. DATE DISTRICT RANGER DATE

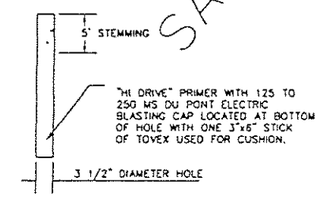
8-1/2" x 11" SHEET

--QUARRY BLASTING PLAN--

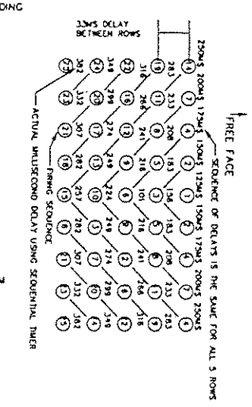
THIS PLAN IS FOR THE FIRST TEST SHOT IN THE QUARRY EAST OF STA. 136+50 ON ROAD NO. 6214



BOREHOLE SIZE = 3-1/2"
HOLE DEPTH = 10 TO 30 FT.
SPACING = 10 FT.
STEMMING = 5 FT.
TYPE OF EXPLOSIVES = TOVEX 800 3" X 16", DENSITY = 1.25
TYPE OF PRIMER & LOCATION IN HOLE = 2" DIAMETER STICK OF "HI DRIVE" LOCATED IN BOTTOM OF HOLE
TOTAL NUMBER OF HOLES IN SHOT = 45
TOTAL NUMBER OF POUNDS OF POWDER IN SHOT, INCLUDING PRIMERS = 3,382 POUNDS
NUMBER OF CUBIC YARDS IN SHOT = 2,667
POWDER FACTOR = 1.27 POUNDS PER CU.YD.
PLANNED SHOT DATE = JUNE 15, 1994
NAME OF BLASTER IN CHARGE = JOE SMITH
MAX. POUNDS OF POWDER PER 8 MILLISECOND DELAY = 255



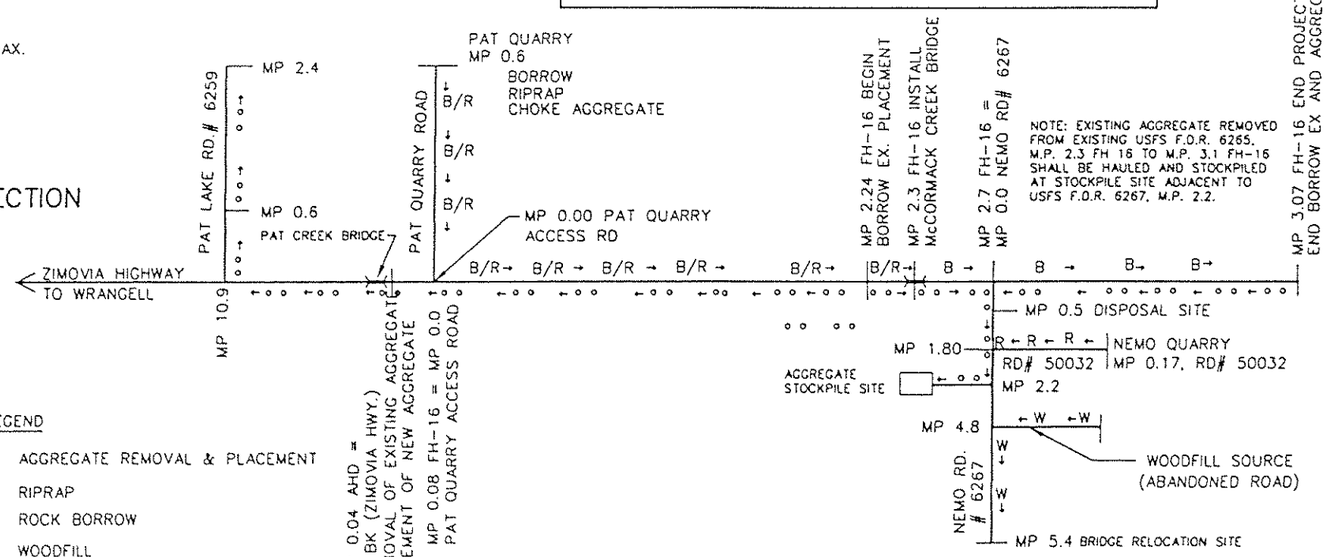
TYPICAL LOADED HOLE



SAMPLE

GENERAL NOTES:

1. ALL PITS AND QUARRIES SHALL BE APPROVED IN WRITING BY THE FOREST SERVICE PRIOR TO EXPLORATION, CLEARING OR DEVELOPMENT.
2. ALL OVERBURDEN SHALL BE REMOVED TO SOLID ROCK FOR MINIMUM DISTANCE OF 15 FT. FROM THE WORKING FACE.
3. THE CUTBANK OF THE OVERBURDEN SHALL BE SLOPED TO THE NATURAL ANGLE OF REPOSE, BUT SHALL, IN NO CASE, BE STEEPER THAN 1:1.
4. WITHIN CLEARING LIMITS:
   (a) MAXIMUM HEIGHT OF STUMPS SHALL BE IN ACCORDANCE WITH SPECIFICATION NO. 201.
   (b) STABLE TREES UP TO 6 INCHES dbh NEED NOT BE CUT IF THEY WILL NOT INTERFERE WITH BACK SLOPE STABILITY.
5. ALL OVERBURDEN, CLEARING, MERCHANTABLE TIMBER, AND GRUBBING DEBRIS SHALL BE DISPOSED OF OR STOCKPILED FOR LATER USE AS SHOWN ON QUARRY DEVELOPMENT PLANS.
6. ALL DEAD TREES AND SNAGS WHICH ARE SUFFICIENTLY TALL TO REACH THE WORK AREA SHALL BE FELLED.
7. THE PIT OR QUARRY SHALL BE LEFT IN A NEAT, ORDERLY AND WELL-DRAINED CONDITION. ALL OVERHANGS AND LOOSE ROCK SHALL BE REMOVED. ROCK, LOOSENED BY BLASTING OPERATIONS, SHALL BE SCALED FROM FACES PRIOR TO LEAVING THE SITE.
8. AFTER EXCAVATION IS COMPLETE, THE AREA SHALL BE CLEANED UP AND LEFT AS SHOWN ON QUARRY DEVELOPMENT PLAN. ANY ACCESS ROAD WILL BE TREATED AS SHOWN ON THE DRAWINGS OR QUARRY DEVELOPMENT PLAN.
9. NO MORE THAN 5% BY VOLUME OF OVERSIZE MATERIAL SHALL REMAIN IN THE QUARRY. ALL OTHER MATERIAL SHALL BE BROKEN DOWN AND USED AS SPECIFIED IN SPECIFICATIONS 203, 304, AND 611. IN SPECIFICATIONS 203, 304, AND 611.
10. TEST SHOTS OF FROM 1,500 TO 3,500 CUBIC YARDS MAY BE REQUIRED AT ALL QUARRY SITES AS SPECIFIED IN SPECIFICATION 611.
11. INSTALL AND MAINTAIN A "FOREST SERVICE" TYPE RAIN GAUGE.



LEGEND

← ∘∘ ←∘∘ AGGREGATE REMOVAL & PLACEMENT
← R RIPRAP
← B ROCK BORROW
← W WOODFILL

HAUL DIAGRAM

DESIGNED BY: SCHAEFER	DATE 2/96	U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE R-10 ALASKA REGION	FOREST TONGASS / STIKINE AREA
DRAWN BY: BARNETT	DATE 2/96		DISTRICT WRANGELL
CHECKED BY: SCHAEFER	DATE 2/96		SHEET TITLE QUARRY DETAILS SHEET 8a OF 22a
REVIEWED BY: DUNHAM	DATE 4/96		

NOTE: EMBANKMENT FILL MATERIAL IN ABANDONED ROADWAY STA. 131+00 TO STA. 152+50 SHALL BE EXCAVATED TO ADJACENT NATURAL GROUND CONTOURS AND ENDHAULED FOR DISPOSAL. SUITABLE EXCAVATED MATERIAL SHALL BE INCORPORATED INTO NEW CONSTRUCTION AND UNSUITABLE EXCAVATED MATERIAL SHALL BE PLACED AT THE DESIGNATED DISPOSAL SITE, M.P. 0.5, RD. #6267.

BEGIN APPROACH GUARDRAIL WIDENING STA. 133+25

SEE SHEETS 1b TO 16b FOR McCORMACK CREEK BRIDGE DETAILS.

BEGIN DOUBLE LANE CONSTRUCTION STA. 131+51

BEGIN BRIDGE STA. 134+84

END BRIDGE STA. 136+28

SAND PIT ACCESS ROAD

Δ :	17°39'12" LT
T :	23.29
R :	150.00
L :	46.22

STATE SAND PIT ACCESS ROAD

CURVE #5

Δ :	58°20'08" LT
T :	237.21
R :	425.00
L :	432.71

CURVE #2

Δ :	88°04'51" LT
T :	846.17
R :	875.00
L :	1345.14

CL EXISTING ROAD

CURVE #3

Δ :	39°26'57" RT
T :	98.60
R :	275.00
L :	189.34

CURVE #4

Δ :	19°05'19" RT
T :	75.66
R :	450.00
L :	149.92

CURVE #1

Δ :	7°38'24"
T :	66.77
R :	1000.00
L :	133.35

NOTE: CURVE NOT DEPICTED ON THIS DRAWING; CURVE IS LOCATED BETWEEN STATIONS 74+36 AND 75+69

SALVAGE, REMOVE, AND TRANSPORT EXISTING TREATED TIMBER BRIDGE, AND REINSTALL BRIDGE AT M.P. 5.4, F.D.R. 6267. SEE DETAILS ON SHEETS 17b – 20b.

END APPROACH GUARDRAIL WIDENING STA. 139+50

THE FOLLOWING STREAM RESTRICTIONS APPLY TO McCORMACK CREEK, A DESIGNATED CLASS I FISH STREAM:
NO INSTREAM CONSTRUCTION WORK DURING BRIDGE CONSTRUCTION WILL BE ALLOWED UNLESS APPROVED IN WRITING BY THE ENGINEER. WHEN APPROVED, IN STREAM ACTIVITIES CAN TAKE PLACE FROM JUNE 18 TO AUG 1.

REMOVE CRUSHED AGGREGATE SURFACING FROM TRAVELED WAY OF EXISTING ROAD TO A DEPTH OF 0.5 FT. FROM STATIONS 136+50 TO 175+00. HAUL REMOVED AGGREGATE TO STOCKPILE SITE AT M.P. 2.2, F.D.R. 6267, AND PLACE IN STOCKPILE.

INSTALL SILT FENCE 3' HIGH X 10' LONG INSTALLED PER MANUFACTURER'S RECOMENDATION. SILT FENCES SHALL BE MAINTAINED DURING THE LIFE OF THE CONTRACT AND SHALL BE REMOVED WHEN DESIGNATED BY THE ENGINEER. SEE SHEET 6A FOR DETAILS.

LEGEND

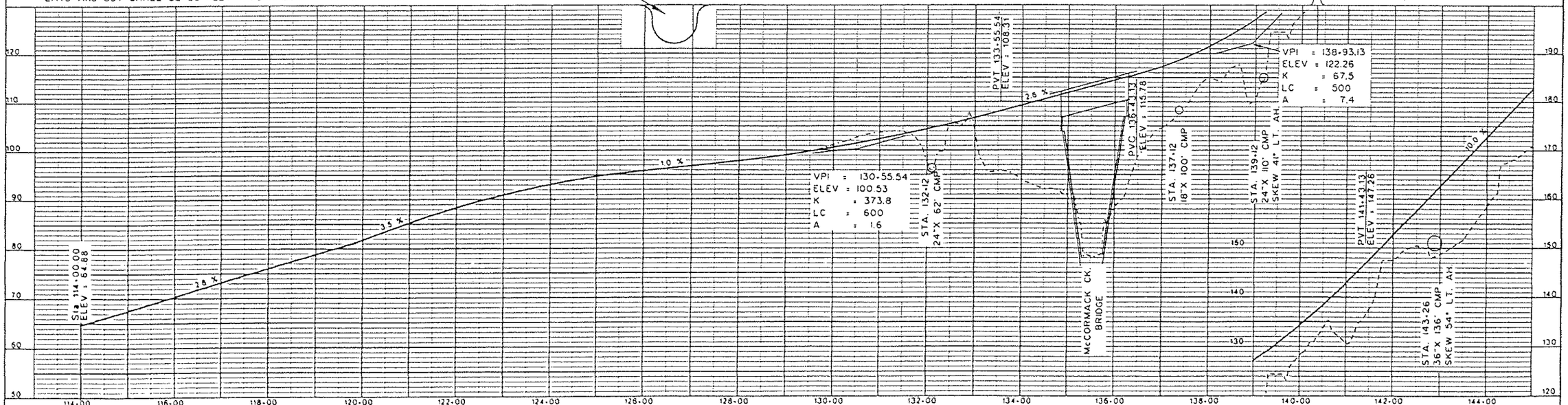
SILT FENCE

CONSTRUCT SCHOOL BUS TURNAROUND SEE SHEET 14a FOR DETAILS.

See Amendment No. 3

CONSTRUCT INTERSECTION FOR STATE SAND QUARRY ACCESS ROAD. SEE SHEET 14a FOR DETAILS.

NOTE: CONSTRUCT EMULSIFIED ASPHALT TREATED BASE (EATB) AND DOUBLE BITUMINOUS SURFACE TREATMENT (BST) STA. 15+25 TO STA. 131+51 OF EXISTING HIGHWAY AND FROM STA. 131+51 TO STA. 172+00 OF RECONSTRUCTION.
STA. 15+25 FH-16 = MP 0.04 FH-16 AHD = MP 11.04 ZIMOVIA HWY. BK
EATB AND BST SHALL BE 28 FEET WIDE UNLESS OTHERWISE NOTED.



STATION 15+25 – STATION 175+73

CLEARING & GRUBBING	6.8 ACRE	ENDHAUL	1,700 CY
EXCAVATION	9,710 CY	CRUSHED AGGREGATE	7,646 CY
BORROW EXCAVATION	54,650 CY	SEEDING	5.2 ACRE
HAUL	165,802 CYM		

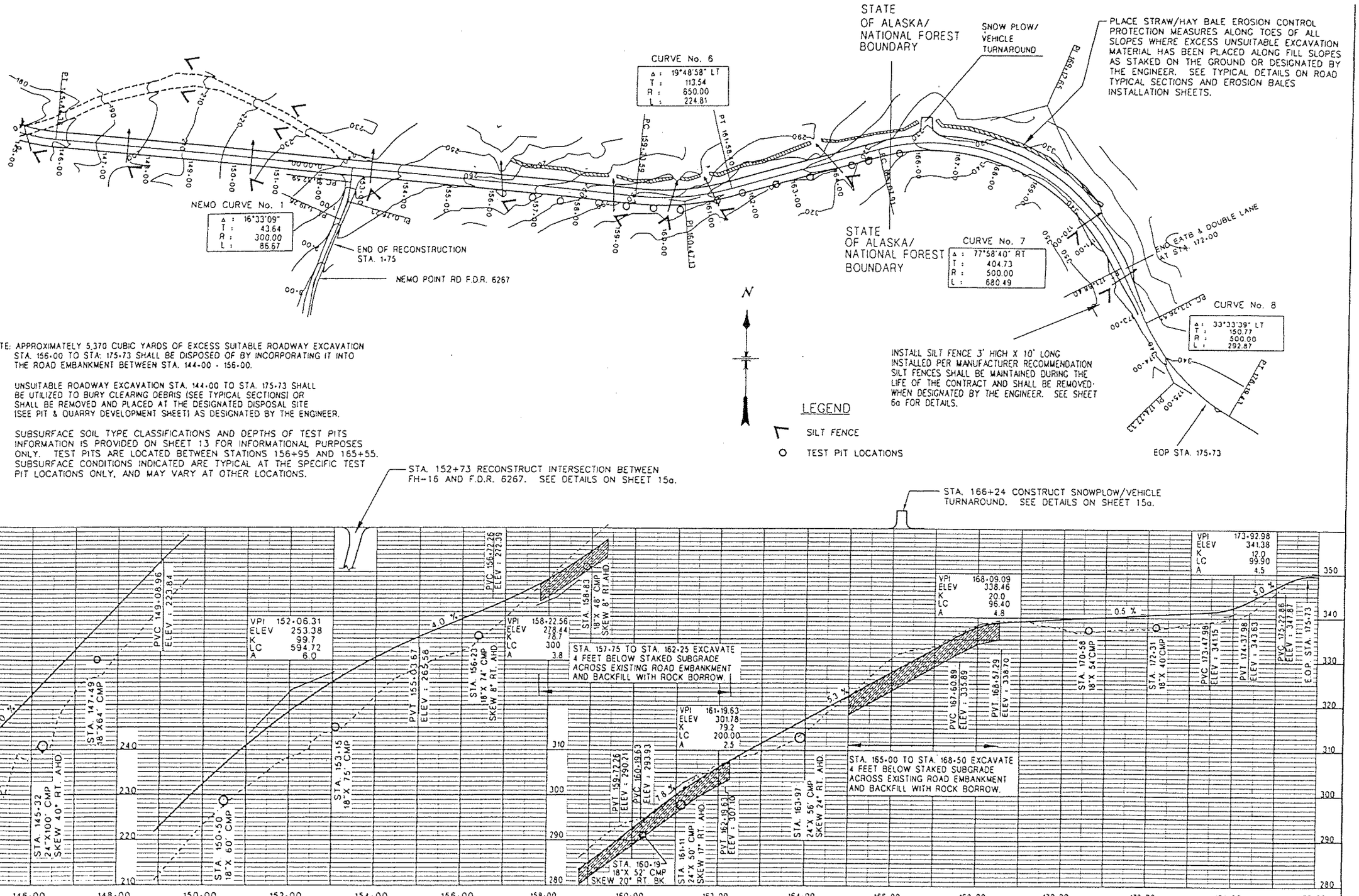
DESIGNED BY: JS, SG & KE	DATE 3/96	
DRAWN BY: BARNETT	DATE 3/96	
CHECKED BY: SCHAEFER	DATE 3/96	
REVIEWED BY: DUNHAM	DATE 4/96	

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

100 0 100 200
SCALE IN FEET

SCALE VERTICAL 1"=10' HORIZONTAL 1"= 100'

REGION	FOREST	PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
R-10	TONGASS	FH16 III	11a	22a



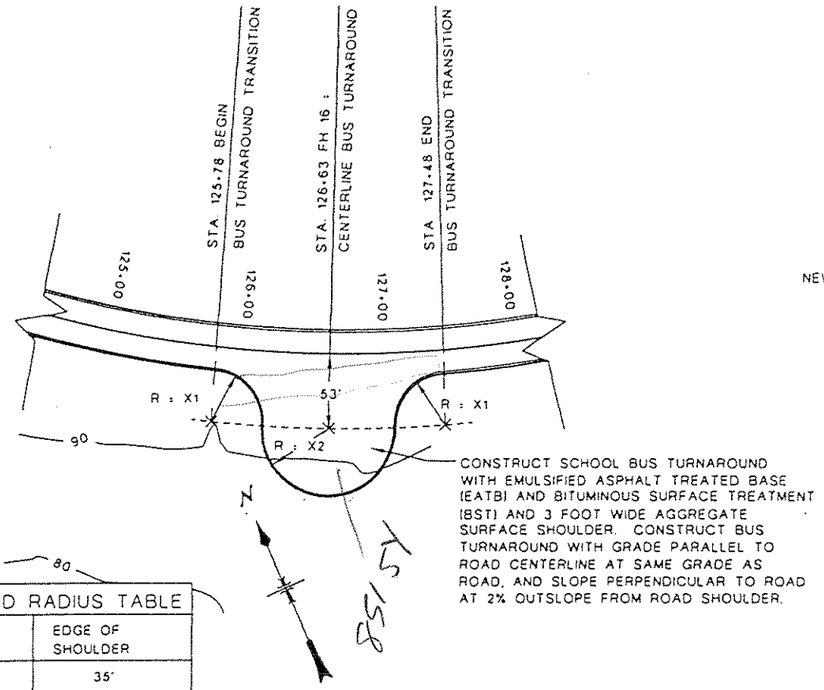
NOTE: APPROXIMATELY 5,370 CUBIC YARDS OF EXCESS SUITABLE ROADWAY EXCAVATION STA. 156+00 TO STA. 175+73 SHALL BE DISPOSED OF BY INCORPORATING IT INTO THE ROAD EMBANKMENT BETWEEN STA. 144+00 - 156+00.

UNSUITABLE ROADWAY EXCAVATION STA. 144+00 TO STA. 175+73 SHALL BE UTILIZED TO BURY CLEARING DEBRIS (SEE TYPICAL SECTIONS) OR SHALL BE REMOVED AND PLACED AT THE DESIGNATED DISPOSAL SITE (SEE PIT & QUARRY DEVELOPMENT SHEET) AS DESIGNATED BY THE ENGINEER.

SUBSURFACE SOIL TYPE CLASSIFICATIONS AND DEPTHS OF TEST PITS INFORMATION IS PROVIDED ON SHEET 13 FOR INFORMATIONAL PURPOSES ONLY. TEST PITS ARE LOCATED BETWEEN STATIONS 156+95 AND 165+55. SUBSURFACE CONDITIONS INDICATED ARE TYPICAL AT THE SPECIFIC TEST PIT LOCATIONS ONLY, AND MAY VARY AT OTHER LOCATIONS.

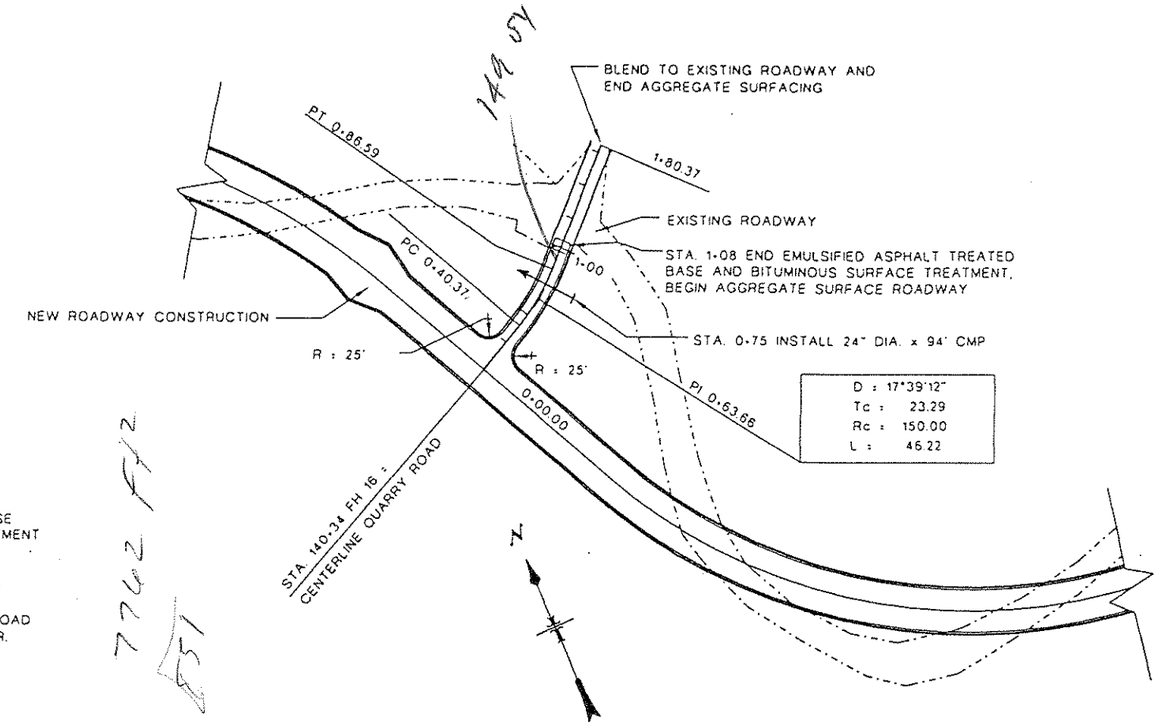
DESIGNED BY: JS, SG & KE	DATE 3/96	U.S. DEPARTMENT OF AGRICULTURE	100 0 100 200
DRAWN BY: BARNETT	DATE 3/96	FOREST SERVICE	SCALE IN FEET
CHECKED BY: SCHAEFER	DATE 3/96		
REVIEWED BY: DUNHAM	DATE 4/96		

SCALE		REGION	FOREST	PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
VERTICAL	1" = 10	R-10	TONGASS	FH16 III	12a	22a
HORIZONTAL	1" = 100					

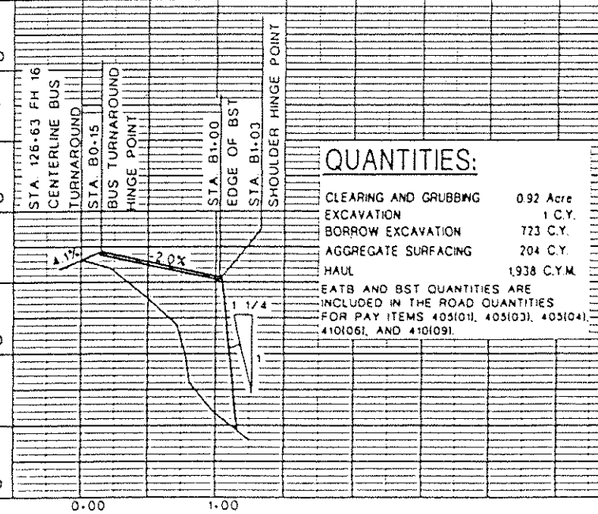


BUS TURNAROUND RADIUS TABLE		
RADIUS	EDGE OF BST	EDGE OF SHOULDER
R : X1	38'	35'
R : X2	47'	50'

SCHOOL BUS TURNAROUND DETAIL



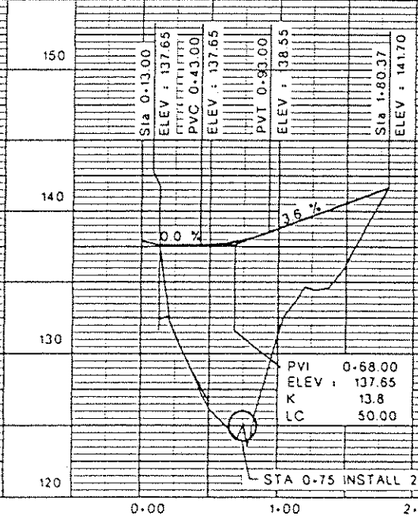
STATE SAND QUARRY ACCESS ROAD DETAIL



QUANTITIES:

CLEARING AND GRUBBING	0.92 Acre
EXCAVATION	1 C.Y.
BORROW EXCAVATION	723 C.Y.
AGGREGATE SURFACING	204 C.Y.
HAUL	1,938 C.Y.M.

EATB AND BST QUANTITIES ARE INCLUDED IN THE ROAD QUANTITIES FOR PAY ITEMS 405(01), 405(03), 405(04), 410(06), AND 410(09).



QUANTITIES:

CLEARING AND GRUBBING	0.21 Acre
EXCAVATION	2 C.Y.
BORROW EXCAVATION	1,127 C.Y.
AGGREGATE SURFACING	86 C.Y.
HAUL	3,325 C.Y.M.

EATB AND BST QUANTITIES ARE INCLUDED IN THE ROAD QUANTITIES FOR PAY ITEMS 405(01), 405(03), 405(04), 410(06), AND 410(09).

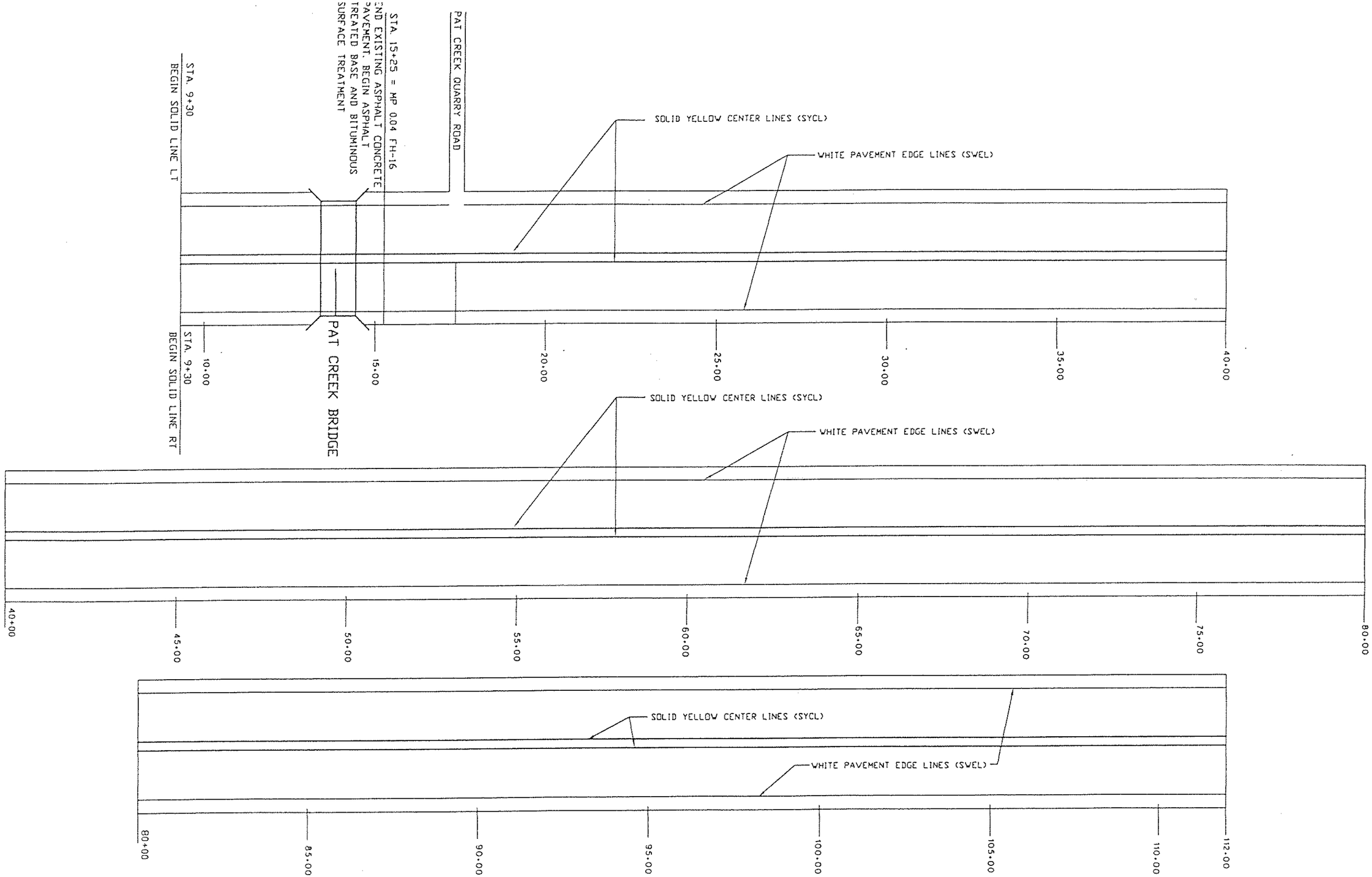
Designed By: K. ELMORE Date 3/12/96
Drawn By: K. ELMORE Date 3/12/96
Checked by: L. DUNHAM Date 4/12/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

0 50 100 150
HOR. SCALE IN FEET

0 5 10 15
VERT. SCALE IN FEET

REGION	FOREST	PROJECT	SHEET NUMBER	TOTAL SHEETS
10	TONGASS STIKINE	FH 16	14a	22a



LEGEND

SOLID YELLOW CENTER LINE (SYCL) ———
BROKEN YELLOW CENTER LINE (BYCL) - - - - - -
SOLID WHITE EDGE LINE (SWEL) ———

ALL BROKEN LINE SEGMENTS SHALL BE 10 FOOT LONG WITH 30 FOOT BLANK SEGMENTS, PER MUTCD SUBSECTION 3A-6, No. 4.

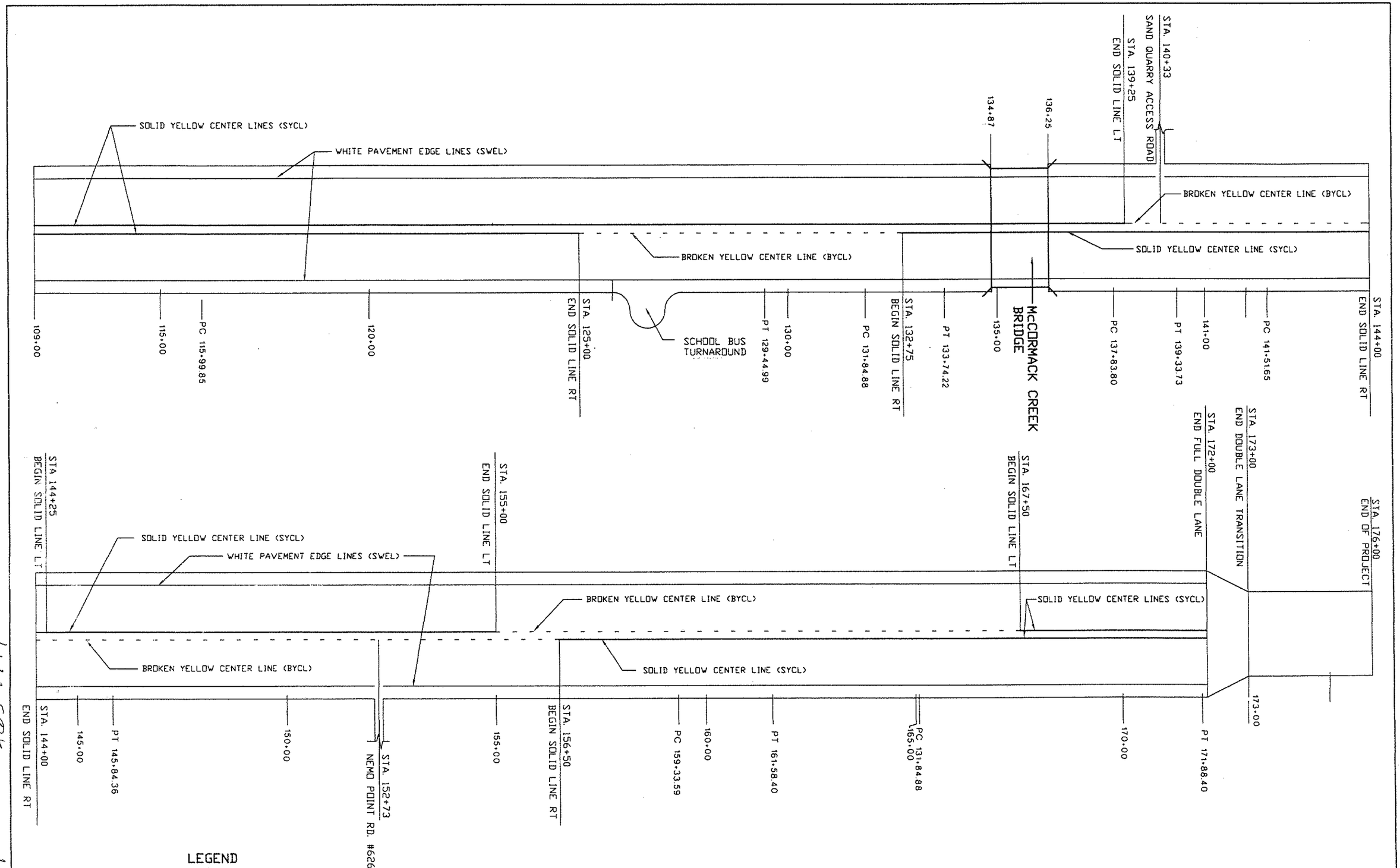
REVISION	DATE	DESCRIPTION	BY

Designed By: K. ELMORE Date 2/12/96
Drawn By: K. ELMORE Date 2/12/96
Checked by: L. DUNHAM Date 4/12/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FOREST HIGHWAY 16
PHASE III
TRAFFIC MARKINGS

Drawing No. _____ Page 16a of 22a



ALL BROKEN LINE SEGMENTS SHALL BE 10 FT LONG WITH 30 FT BLANK SEGMENTS, PER MUTCD SUBSECTION 3A-6, No. 4.

REVISION	DATE	DESCRIPTION	BY

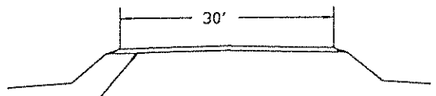
Designed By: K. ELMORE Date 2/12/96
Drawn By: K. ELMORE Date 2/12/96
Checked by: L. DUNHAM Date 4/12/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FOREST HIGHWAY 16
PHASE III
TRAFFIC MARKINGS

Drawing No. _____ Page 17a of 22a

Rick Perusi to contact
Mike Lutkzen
DOT-Traffic 465-1779

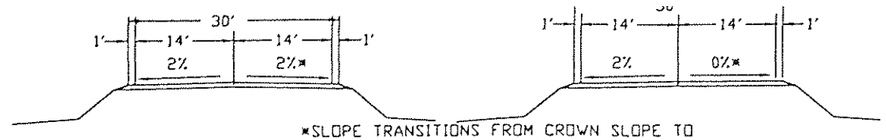


REMOVE 0.30 FT. OF EXISTING AGGREGATE BASE COURSE AND REPLACE WITH NEW AGGREGATE TO STAKED FINISH ELEVATION, UNLESS OTHERWISE NOTED.

See Amendment No. 3

TYPICAL AGGREGATE BASE COURSE SECTION

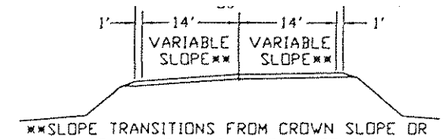
NO SCALE



*SLOPE TRANSITIONS FROM CROWN SLOPE TO 0.0% SLOPE VALUE: DISTANCE IS BASED ON THE PERCENT OF SUPERELEVATION AND LENGTH OF SUPERELEVATION TRANSITION

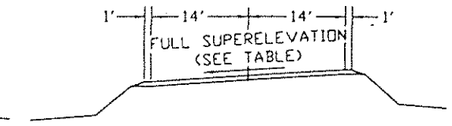
TYPICAL CROWN SECTION (BEGIN TANGENT RUNOUT)

END TANGENT RUNOUT SECTION



**SLOPE TRANSITIONS FROM CROWN SLOPE OR 0% SLOPE VALUE AT END OF TANGENT RUNOUT TO THE FULL SUPERELEVATION SLOPE

TYPICAL RUNOFF SECTION

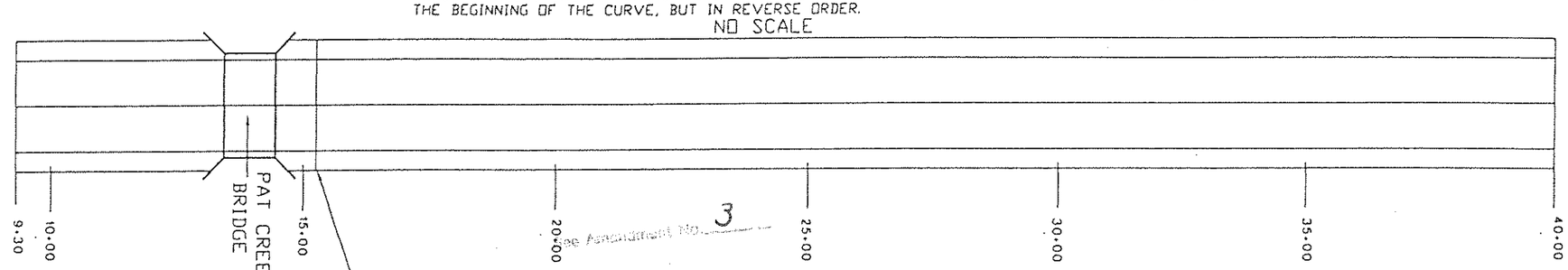


FULL SUPERELEVATION SECTION

TYPICAL ROADWAY SUPERELEVATION SECTIONS

CROSS SECTION SHOWN ARE FOR A LEFT-HAND CURVE LOOKING FROM BEGINNING OF CURVE TOWARD END OF CURVE; CROSS SECTIONS FOR RIGHT-HAND CURVE ARE MIRROR IMAGE ABOUT ROAD CENTERLINE OF THE CROSS SECTIONS SHOWN. TRANSITIONS AT THE END OF EACH CURVE USE THE SAME CROSS SECTIONS AS THE BEGINNING OF THE CURVE, BUT IN REVERSE ORDER.

NO SCALE



See Amendment No. 3

STA. 15+25 BEGIN REMOVAL OF TOP 0.30 FOOT OF EXISTING AGGREGATE BASE FROM ENTIRE ROAD SURFACE FOR PLACEMENT ON RD. F.D.R. 6259. PLACE REMOVED AGGREGATE IN ACCORDANCE WITH SECTION 304 ON PAT LAKE RD. F.D.R. 6259 FROM M.P. 0.6 TO M.P. 2.4 AT A COMPACTED DEPTH OF 0.5 FT.

PLACE A 0.30 FOOT THICK LIFT OF NEW AGGREGATE FROM STA. 15+25 TO 131+51, F.H. 16, FOLLOWING REMOVAL OF EXISTING AGGREGATE, FOR CONSTRUCTION OF EMULSIFIED ASPHALT TREATED BASE (EATB). CONSTRUCT EMULSIFIED ASPHALT TREATED BASE (EATB) 3 INCHES THICK FROM STA. 15+25 TO STA. 172.00, F.H. 16, AND PLACE DOUBLE BITUMINOUS SURFACE TREATMENT (BST). CONSTRUCT A 6 INCH THICK EATB FOR 20 FEET AHEAD OF EACH BRIDGE APPROACH AT McCORMACK CREEK. EATB AND BST SHALL NOT BE PLACED ON THE McCORMACK CREEK BRIDGE DECK.

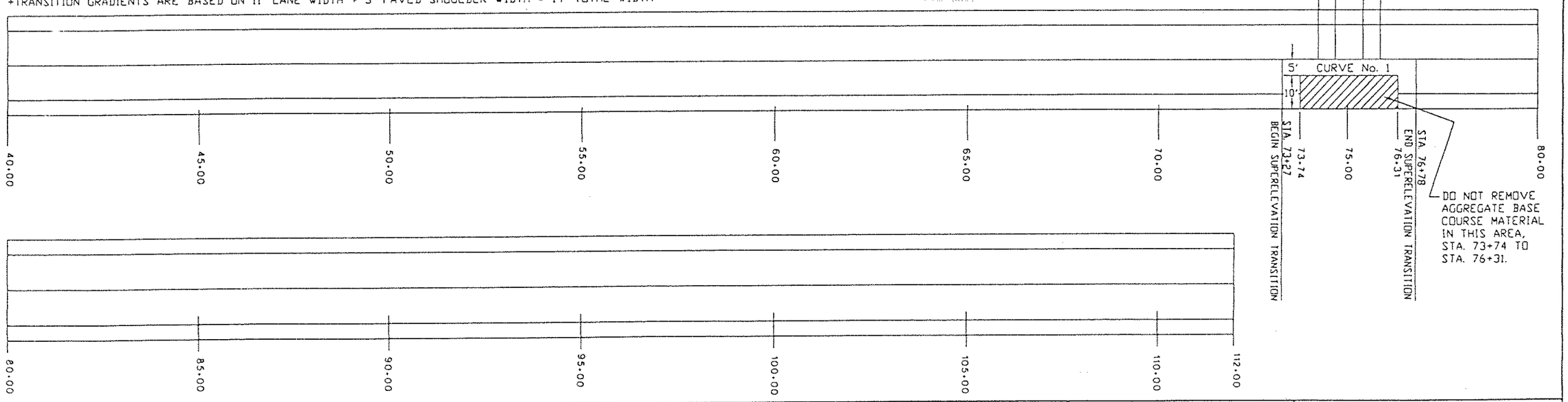
COMPACTED AGGREGATE BASE COURSE AND EMULSIFIED ASPHALT TREATED BASE (EATB) SHALL MEET 95% OF MAXIMUM DENSITY ACHIEVED THROUGH CONTROL STRIP COMPACTION IN ACCORDANCE WITH SUBSECTION 212.03.

See Amendment No. 3

SUPERELEVATION DATA

CURVE No.	% FULL SUPER.	RUNOFF LENGTHS		TANGENT RUNOUT LENGTHS		TRANSITION GRADIENT+
		LEFT LANE	RIGHT LANE	LEFT LANE	RIGHT LANE	
1	3.9% (0.039)	45'	92'	0	47'	0.005935
2	4.1% (0.041)	47'	92'	0	45'	0.006239
3	6.0% (0.060)	105'	70'	35'	0	0.008000
4	5.6% (0.056)	98'	63'	35'	0	0.008000
5	5.6% (0.056)	63'	98'	0	35'	0.008000
6	4.7% (0.047)	53'	92'	0	39'	0.007152
7	5.3% (0.053)	95'	59'	36'	0	0.007811

+TRANSITION GRADIENTS ARE BASED ON 11' LANE WIDTH + 3' PAVED SHOULDER WIDTH = 14' TOTAL WIDTH



DO NOT REMOVE AGGREGATE BASE COURSE MATERIAL IN THIS AREA, STA. 73+74 TO STA. 76+31.

NOTE: SUPERELEVATED AND OTHER DESIGNATED SECTIONS WILL REQUIRE ADDITIONAL THICKNESS OF AGGREGATE AS STAKED.

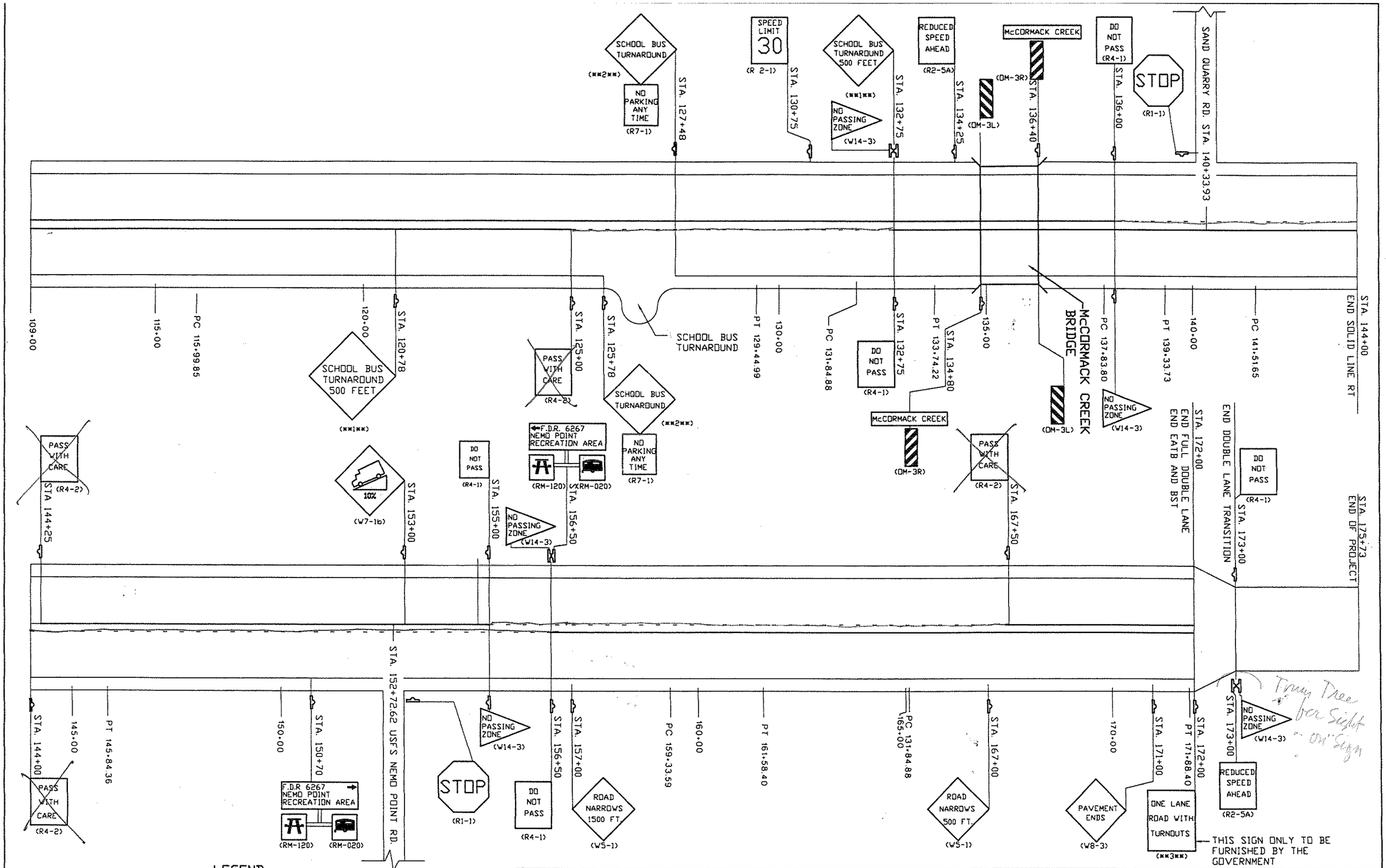
REVISION	DATE	DESCRIPTION	BY

Designed By: K. ELMORE Date 2/12/96
Drawn By: K. ELMORE Date 2/12/96
Checked by: L. DUNHAM Date 4/12/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FOREST HIGHWAY 16
PHASE III
AGGREGATE BASE, EATB, BST, & SUPERELEVATIONS

Drawing No. _____ Page 18a of 22a



LEGEND

SOLID YELLOW CENTER LINE
BROKEN YELLOW CENTER LINE
SOLID WHITE EDGE LINE

SIGN LOCATION, WITH SIGN LEGIBLE FROM VIEWING SIDE
MUTCD CODE FOR STANDARD SIGNS (R1-1)
CODE FOR NON-STANDARD SIGNS (**1**)

REVISION	DATE	DESCRIPTION	BY

Designed By: K. ELMORE Date 2/12/96
Drawn By: K. ELMORE Date 2/12/96
Checked by: L. DUNHAM Date 4/12/96

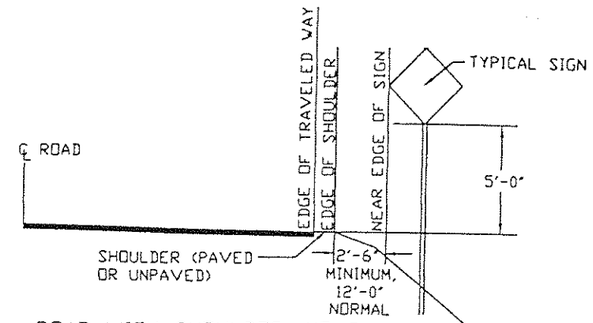
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FOREST HIGHWAY 16
PHASE III
SIGNS PLACEMENT

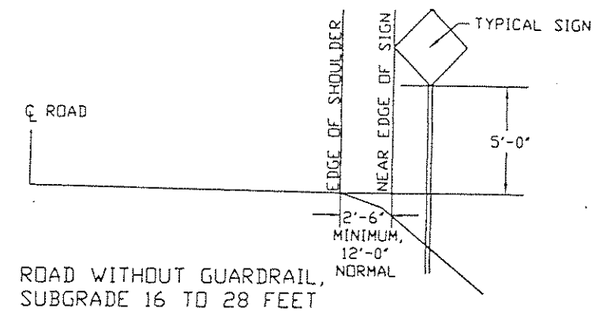
Drawing No. _____

SIGNING SUMMARY (INCHES)

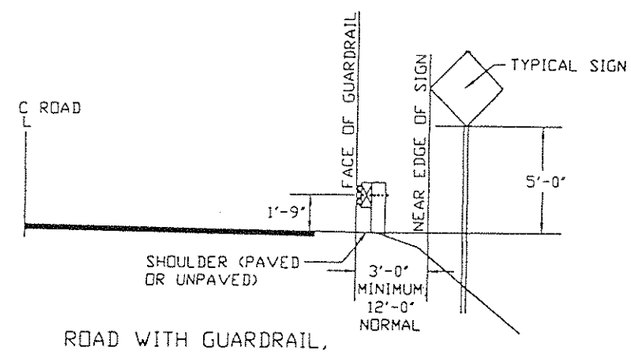
SIGN No.	STATION	REF. C.L.	TYPE	LEGEND	POST SIZE	WIDTH (INCHES)	HEIGHT (INCHES)	SIGN COLOR	REMARKS
1	9+30	RT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
2	9+30	LT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	
3	12+40	RT.	W5-2A	NARROW BRIDGE SYMBOL	2.5	30	30	BLACK ON YELLOW	
4	13+40	RT.		DIRECTIONAL GUIDE SIGN - PAT CREEK	2.0	36 +/-	12 +/-	WHITE ON BROWN	MOUNT ABOVE SIGN #5
5	13+40	RT.	OM-3R			12	36	BLACK ON YELLOW	
6	13+40	LT.	OM-3L		2.0	12	36	BLACK ON YELLOW	
7	14+43	RT.	OM-3L		2.0	12	36	BLACK ON YELLOW	
8	14+43	LT.	OM-3R			12	36	BLACK ON YELLOW	
9	14+43	LT.		DIRECTIONAL GUIDE SIGN - PAT CREEK	2.0	36 +/-	12 +/-	WHITE ON BROWN	MOUNT ABOVE SIGN #8
10	15+43	LT.	W5-2A	NARROW BRIDGE SYMBOL	2.5	30	30	BLACK ON YELLOW	
11	15+50	RT.	R2-1	SPEED LIMIT 30	2.5	24	30	BLACK ON WHITE	
12	120+78	RT.	××1××	NON-STANDARD SIGN - SCHOOL BUS TURNAROUND 500 FEET	2.5	30	30	BLACK ON YELLOW	
13	125+00	RT.	R4-2	PASS WITH CARE	2.5	24	30	BLACK ON WHITE	
14	125+78	RT.	××2××	NON-STANDARD SIGN - SCHOOL BUS TURNAROUND	2.5	30	30	BLACK ON YELLOW	
15	125+78	RT.	R7-1	NO PARKING ANY TIME		12	18	RED ON WHITE	MOUNT BELOW SIGN #14
16	127+48	LT.	××2××	NON-STANDARD SIGN - SCHOOL BUS TURNAROUND	2.5	30	30	BLACK ON YELLOW	
17	127+48	LT.	R7-1	NO PARKING ANY TIME		12	18	RED ON WHITE	MOUNT BELOW SIGN #16
18	130+75	LT.	R2-1	SPEED LIMIT 30	2.5	24	30	BLACK ON WHITE	
19	132+75	LT.	××1××	NON-STANDARD SIGN - SCHOOL BUS TURNAROUND 500 FEET	2.5	30	30	BLACK ON YELLOW	
20	132+75	RT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
21	132+75	LT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	MOUNT BACK TO BACK WITH SIGN #19
22	134+25	LT.	R2-5A	REDUCED SPEED AHEAD	2.5	24	30	BLACK ON WHITE	
23	134+80	RT.		DIRECTIONAL GUIDE SIGN - McCORMACK CREEK	2.0	36 +/-	12 +/-	WHITE ON BROWN	MOUNT ABOVE SIGN #24
24	134+80	RT.	OM-3R		2.0	12	36	BLACK ON YELLOW	
25	134+80	LT.	OM-3L		2.0	12	36	BLACK ON YELLOW	
26	136+40	RT.	OM-3L		2.0	12	36	BLACK ON YELLOW	
27	136+40	LT.	OM-3R		2.0	12	36	BLACK ON YELLOW	
28	136+40	LT.		DIRECTIONAL GUIDE SIGN - McCORMACK CREEK	2.0	36 +/-	12 +/-	WHITE ON BROWN	MOUNT ABOVE SIGN #27
29	139+25	LT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
30	139+25	RT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	
31	144+00	RT.	R4-2	PASS WITH CARE	2.5	24	30	BLACK ON WHITE	
32	144+25	LT.	R4-2	PASS WITH CARE	2.5	24	30	BLACK ON WHITE	
33	150+70	RT.		F.D.R. 6267 WITH DIRECTION ARROW RT.	2.5	48 +/-	24 +/-	WHITE ON BROWN	
				NEMO POINT RECREATION AREA (SEE DETAIL ON SHEET 22a)					
34	150+70	RT.	RM-120	PICNIC TABLE SYMBOL		18	18	WHITE ON BROWN	MOUNT BELOW SIGN #33
35	150+70	RT.	RM-020	CAMPING TRAILER SYMBOL		18	18	WHITE ON BROWN	MOUNT BELOW SIGN #33
36	153+00	LT.	W7-1B	STEEP GRADE AHEAD SYMBOL WITH 10% ADDED	2.5	30	30	BLACK ON YELLOW	
37	155+00	RT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	
38	155+00	LT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
39	156+50	LT.		F.D.R. 6267 WITH DIRECTION ARROW LT.	2.5	48 +/-	24 +/-	WHITE ON BROWN	
				NEMO POINT RECREATION AREA (SEE DETAIL ON SHEET 22a)					
40	156+50	LT.	RM-120	PICNIC TABLE SYMBOL		18	18	WHITE ON BROWN	MOUNT BELOW SIGN #39
41	156+50	LT.	RM-020	CAMPING TRAILER SYMBOL		18	18	WHITE ON BROWN	MOUNT BELOW SIGN #39
42	156+50	RT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
43	156+50	LT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	MOUNT BACK TO BACK WITH SIGN #39
44	157+00	RT.	W5-1×	ROAD NARROWS 1500 FT.	2.5	36	36	BLACK ON YELLOW	
45	167+00	RT.	W5-1×	ROAD NARROWS 500 FT.	2.5	36	36	BLACK ON YELLOW	
46	167+50	LT.	R4-2	PASS WITH CARE	2.5	24	30	BLACK ON WHITE	
47	171+00	RT.	W8-3	PAVEMENT ENDS	2.5	30	30	BLACK ON YELLOW	
48	172+00	RT.		ONE LANE ROAD WITH TURNOUTS	2 @ 2.5	GOVERNMENT FURNISHED SIGN - SUPPLY 2 POSTS ONLY FOR THIS SIGN			
49	173+00	RT.	R2-5A	REDUCED SPEED AHEAD	2.5	24	30	BLACK ON WHITE	
50	173+00	RT.	W14-3	NO PASSING ZONE	2.5	48	36	BLACK ON YELLOW	MOUNT BACK TO BACK WITH SIGN #49
51	173+00	LT.	R4-1	DO NOT PASS	2.5	24	30	BLACK ON WHITE	
				STA. 140+34 FH 16: SAND QUARRY RD. INTERSECTION					
52	0+25	LT.	R1-1	STOP	2.5	30	30	WHITE ON RED	
				STA. 152+73 FH 16: NEMO POINT RD. INTERSECTION					
53	0+25	LT.	R1-1	STOP	2.5	30	30	WHITE ON RED	



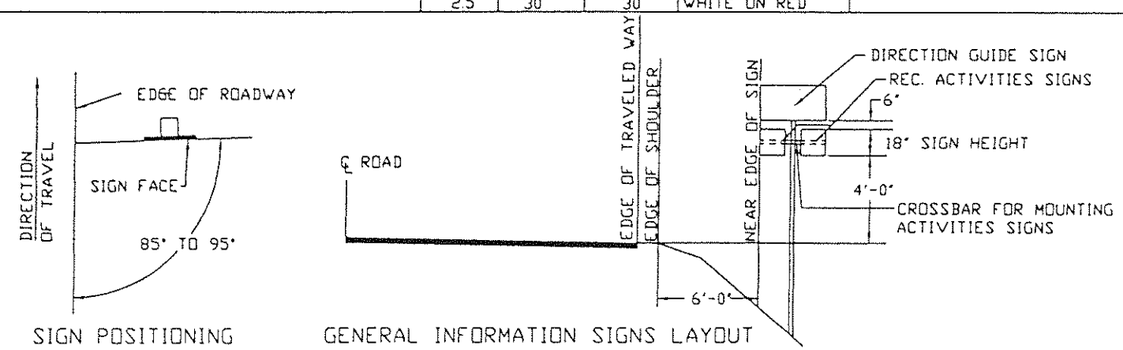
ROAD WITH SHOULDER, NO GUARDRAIL, SUBGRADE OVER 28 FEET



ROAD WITHOUT GUARDRAIL, SUBGRADE 16 TO 28 FEET

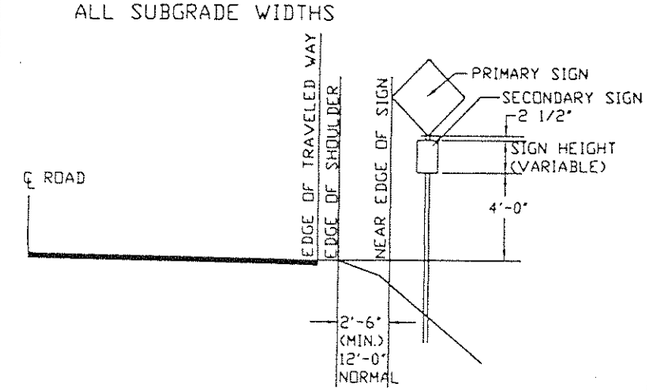


ROAD WITH GUARDRAIL, ALL SUBGRADE WIDTHS



SIGN POSITIONING

GENERAL INFORMATION SIGNS LAYOUT



SIGNS WITH SECONDARY PANELS

SIGNS GENERAL NOTES

1. ALL SIGNS SHALL BE INSTALLED USING DIMENSIONS SHOWN ON THE DRAWINGS.
2. ALL SIGN POSTS SHALL BE TELESCOPING PERFORATED GALVANIZED STEEL POSTS.
3. STANDARD SIGN OFFSET IS 12 FT., UNLESS OTHERWISE SHOWN ON THE DRAWINGS. MINIMUM SIGN OFFSET IS 2 1/2 FT.

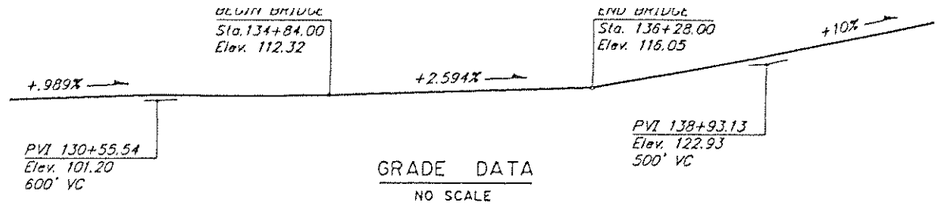
REVISION	DATE	DESCRIPTION	BY

Designed By: K. ELMORE Date 2/29/96
Drawn By: K. ELMORE Date 2/29/96
Checked by: L. DUNHAM Date 4/12/96

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

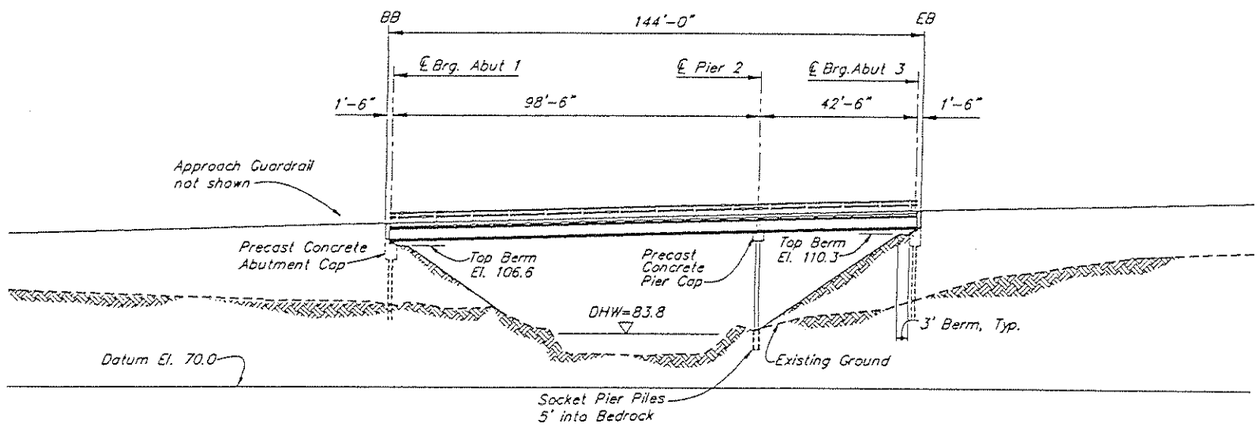
FOREST HIGHWAY 16
PHASE III
SIGN PLACEMENT SUMMARY

Drawing No. _____ Page 22a of 22a



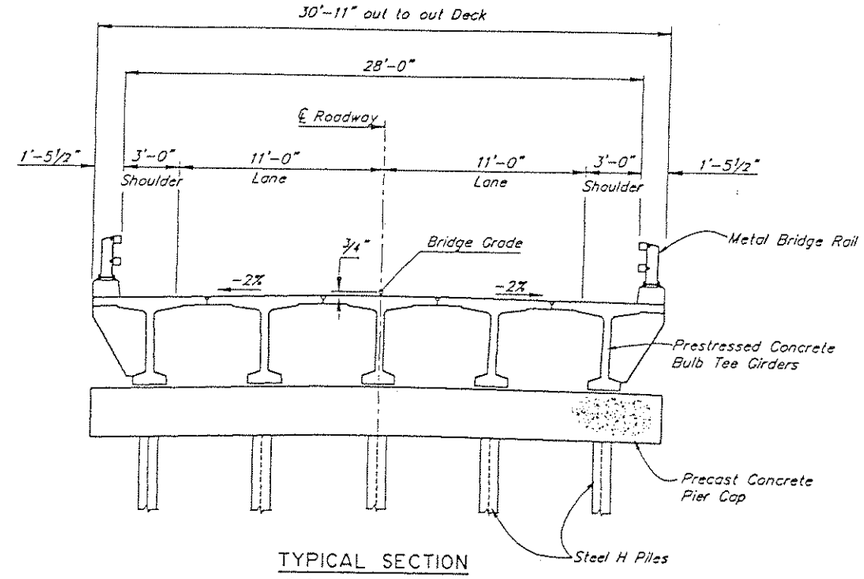
GRADE DATA

NO SCALE



ELEVATION

10 0 20 40
Feet

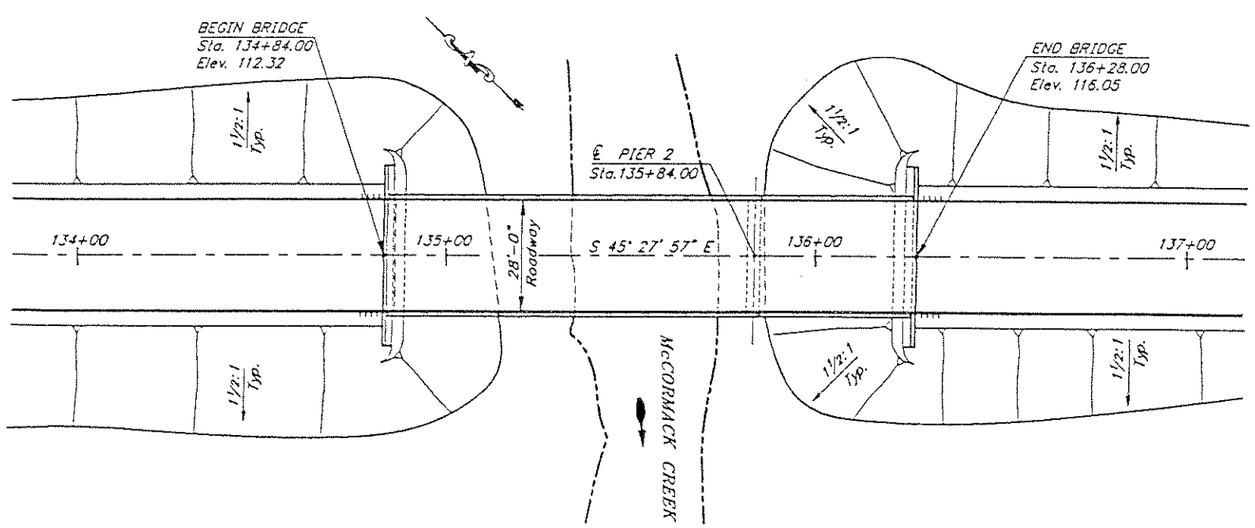


TYPICAL SECTION

12 0 4 8
In. Feet

PILE TIP ELEVATIONS		
LOCATION	DESIRABLE	ESTIMATED
ABUT. 1	79	76
PIER 2	75	75
ABUT. 3	79	76

DRAWING INDEX	
TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2
ABUTMENTS	3
ABUTMENT AND PIER DETAILS	4
PIER	5
TYPICAL SECTION	6
GIRDERS A-E	7
GIRDERS F-J	8
GIRDER DETAILS	9
BRIDGE RAILING	10



PLAN

10 0 20 40
Feet

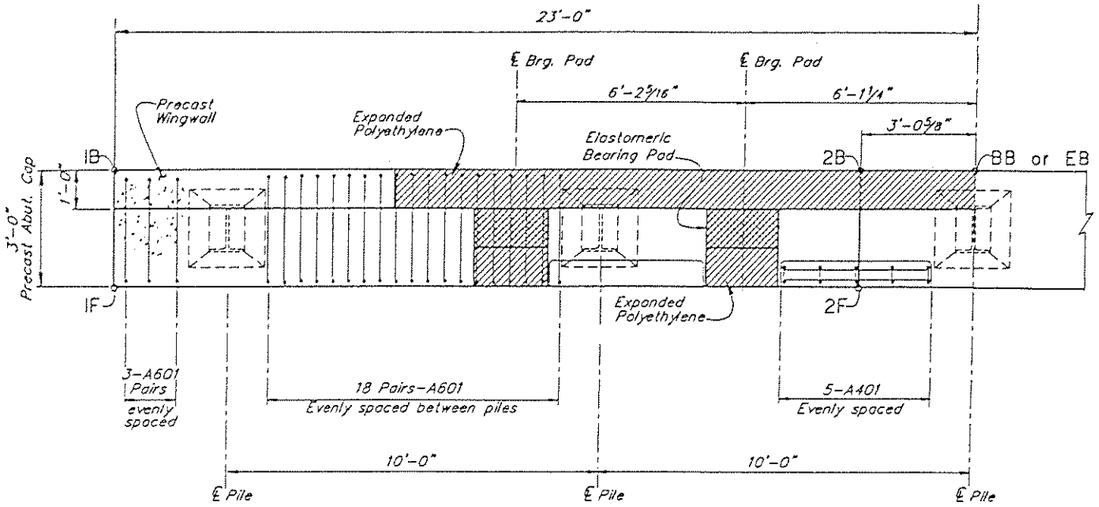
Design Live Load U80 Offroad Vehicle
Dead Load Includes 25 psf allowance
for Future Paving.

STATE OF ALASKA
49TH
R. Robert V. Miller
CE-7435
REGISTERED PROFESSIONAL ENGINEER

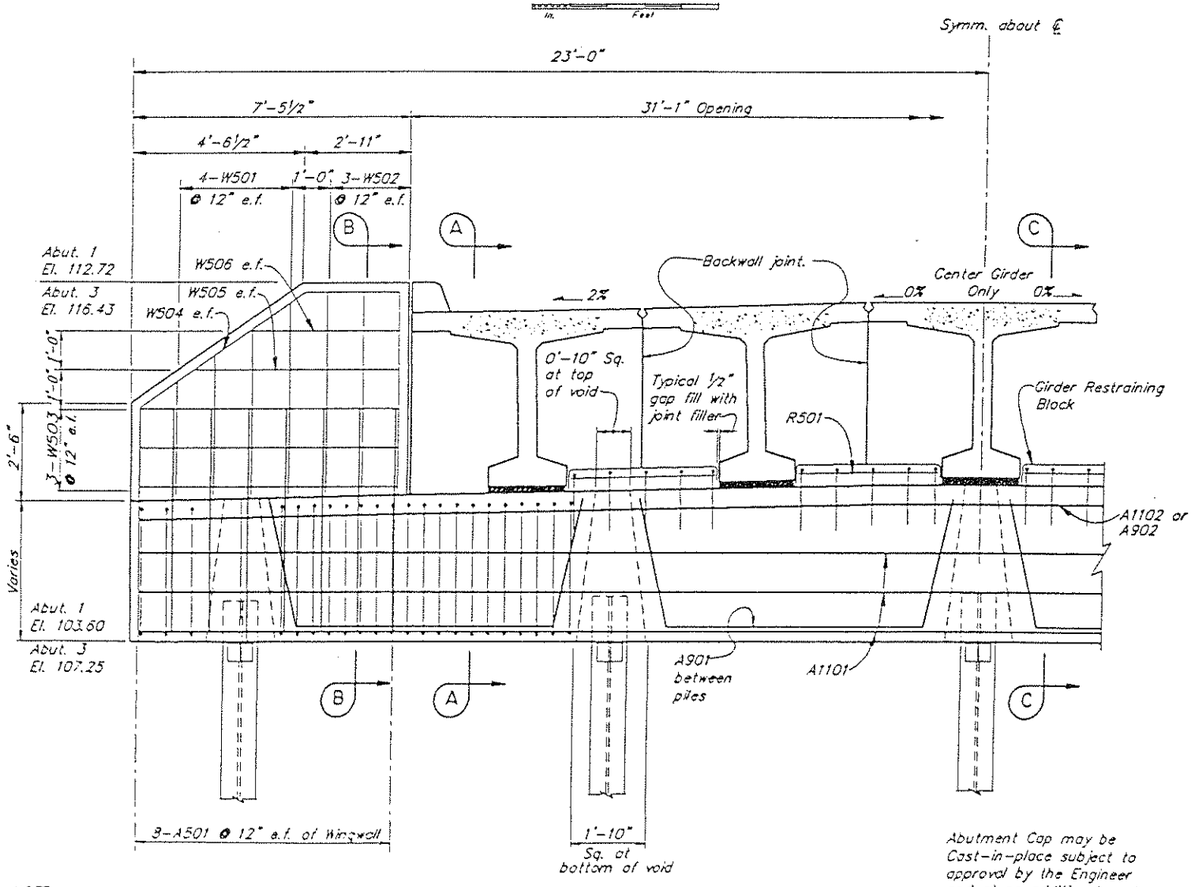
FOREST HIGHWAY 16
PHASE III
McCORMACK CREEK BRIDGE
GENERAL LAYOUT

STATE of ALASKA
DEPARTMENT of TRANSPORTATION
and PUBLIC FACILITIES
JUNEAU, ALASKA

BRIDGE NO. 1089
DWG. NO. 1b



ABUTMENT PLAN



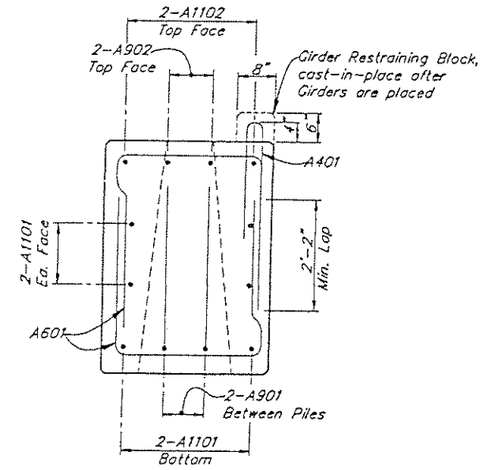
NOTE

Center 3' wide filter cloth over vertical joint on earth side of backwall full depth. (6 places each abutment).

ABUTMENT ELEVATION

Abutment Cap may be Cast-in-place subject to approval by the Engineer and at no additional cost to the owner.

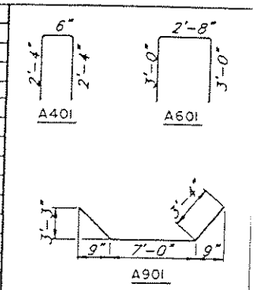
TOP OF CAP ELEVATIONS		
PT	ABUT. 1	ABUT. 3
1B	107.19	110.92
1F	107.27	110.84
2B	107.59	111.32
2F	107.67	111.24



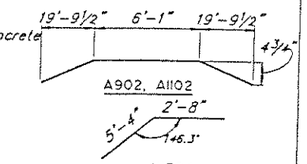
ABUTMENT SECTION C-C

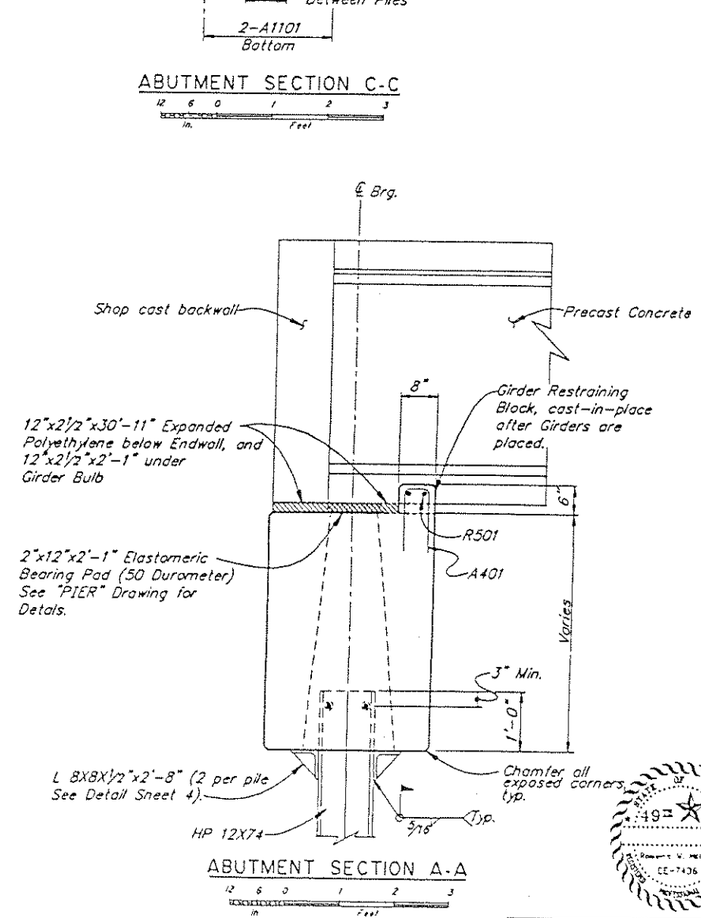
REINFORCING STEEL-ONE ABUTMENT

MARK	SIZE	NO.	LENGTH	TYPE
A401	4	20	5'-2"	Bent
A501	5	32	5'-10"	—
A601	6	156	8'-8"	Bent
A901	9	8	13'-8"	Bent
A902	9	2	45'-8"	Bent
A1101	11	6	45'-8"	—
A1102	11	2	45'-8"	Bent
R501	5	8	3'-8"	—
W501	5	16	Varies	—
W502	5	12	5'-2"	—
W503	5	12	7'-2"	—
W504	5	4	8'-0"	Bent
W505	5	4	5'-6"	—
W506	5	4	4'-0"	—

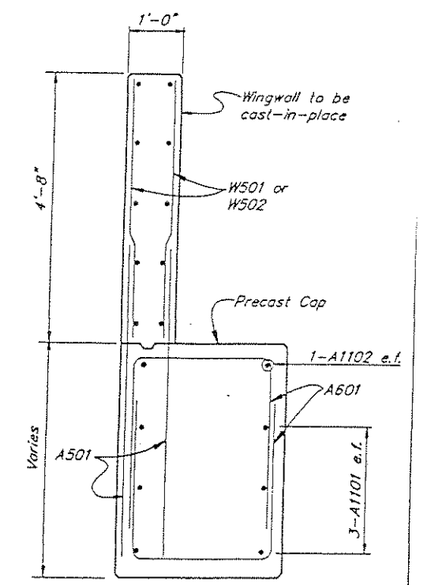


A Bars are in precast cap
R&W Bars are in C.I.P. concrete





ABUTMENT SECTION A-A

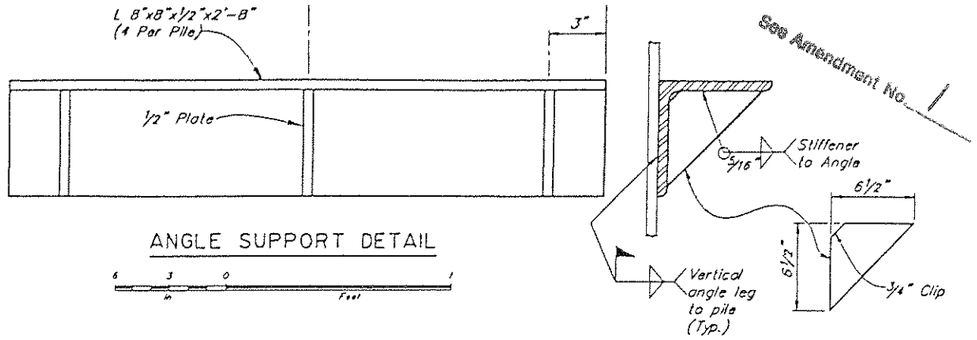


ABUTMENT SECTION B-B

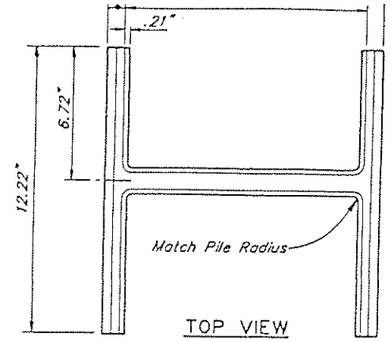
FOREST HIGHWAY 16
PHASE III
McCORMACK CREEK BRIDGE
ABUTMENTS

STATE of ALASKA
DEPARTMENT of TRANSPORTATION and PUBLIC FACILITIES
JUNEAU, ALASKA

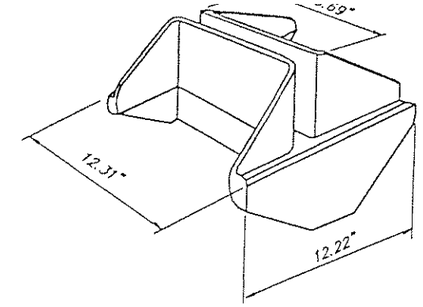
BRIDGE NO. 1089
DWG. NO. 3b



ANGLE SUPPORT DETAIL



TOP VIEW

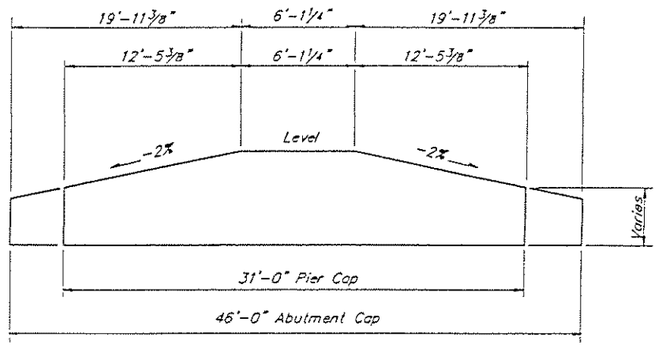


ISOMETRIC

No Scale

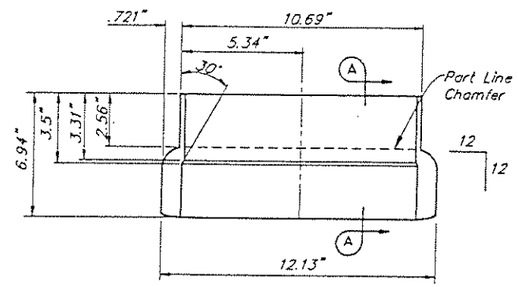
TABLE OF ELEVATIONS			
GIRDERS	∓ ELEVATIONS-TOP OF CAP		
	ABUT. 1	PIER 2	ABUT. 3
A	107.45	109.98	
B	107.57	110.11	
C	107.63	110.17	
D	407.57	110.11	
E	407.45	109.98	
F		110.01	111.10
G		110.14	111.22
H		110.20	111.28
I		110.14	111.22
J		110.01	111.10

∓ At ℄ Bearings

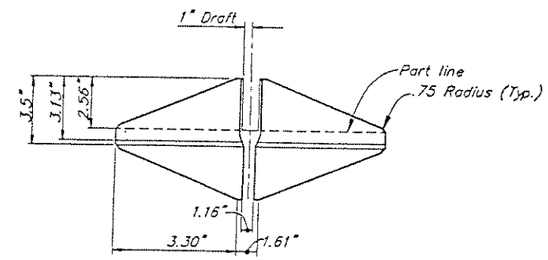


CAP PROFILE ELEVATION

No Scale

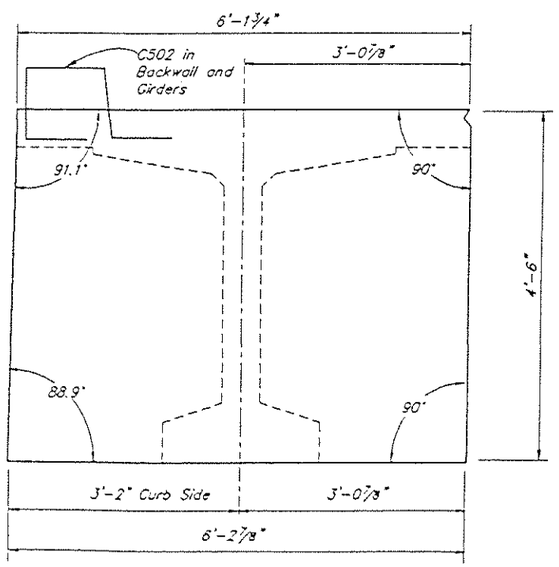


CROSS SECTION



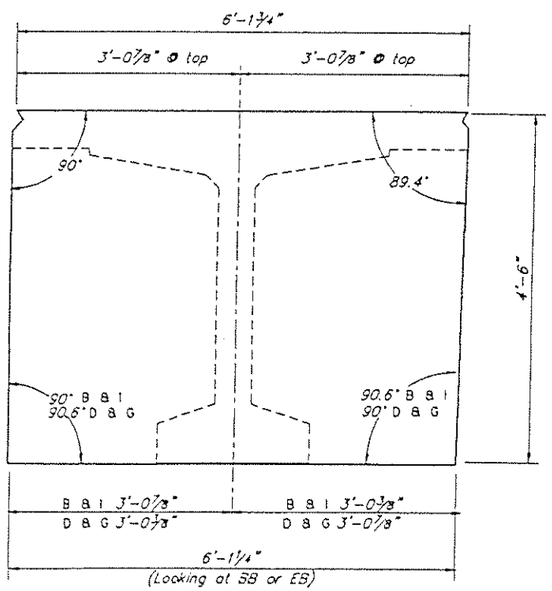
SECTION A-A

STEEL PILE SHOE DETAIL



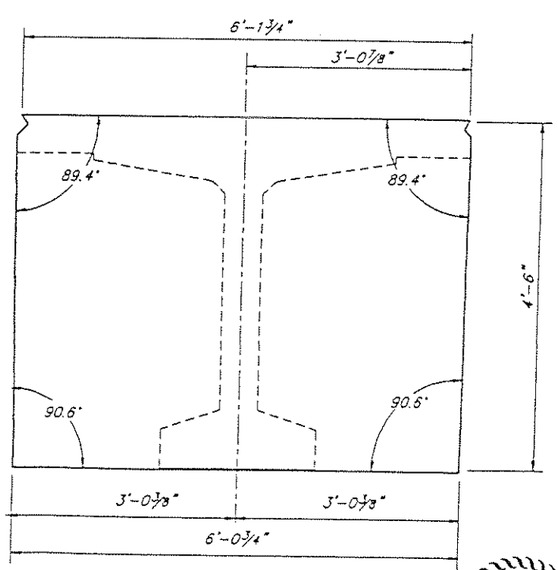
BACKWALL ELEVATION

GIRDERS A, E, F, & J



BACKWALL ELEVATION

GIRDERS B, D, G, & I



BACKWALL ELEVATION

GIRDERS C & H

FOREST HIGHWAY 16

PHASE III

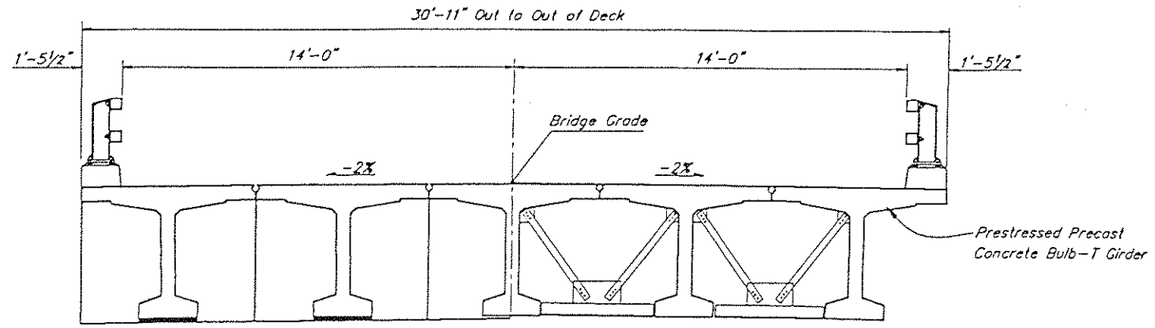
McCORMACK CREEK BRIDGE

ABUTMENT AND PIER DETAILS

STATE of ALASKA
DEPARTMENT of TRANSPORTATION
and PUBLIC FACILITIES
JUNEAU, ALASKA

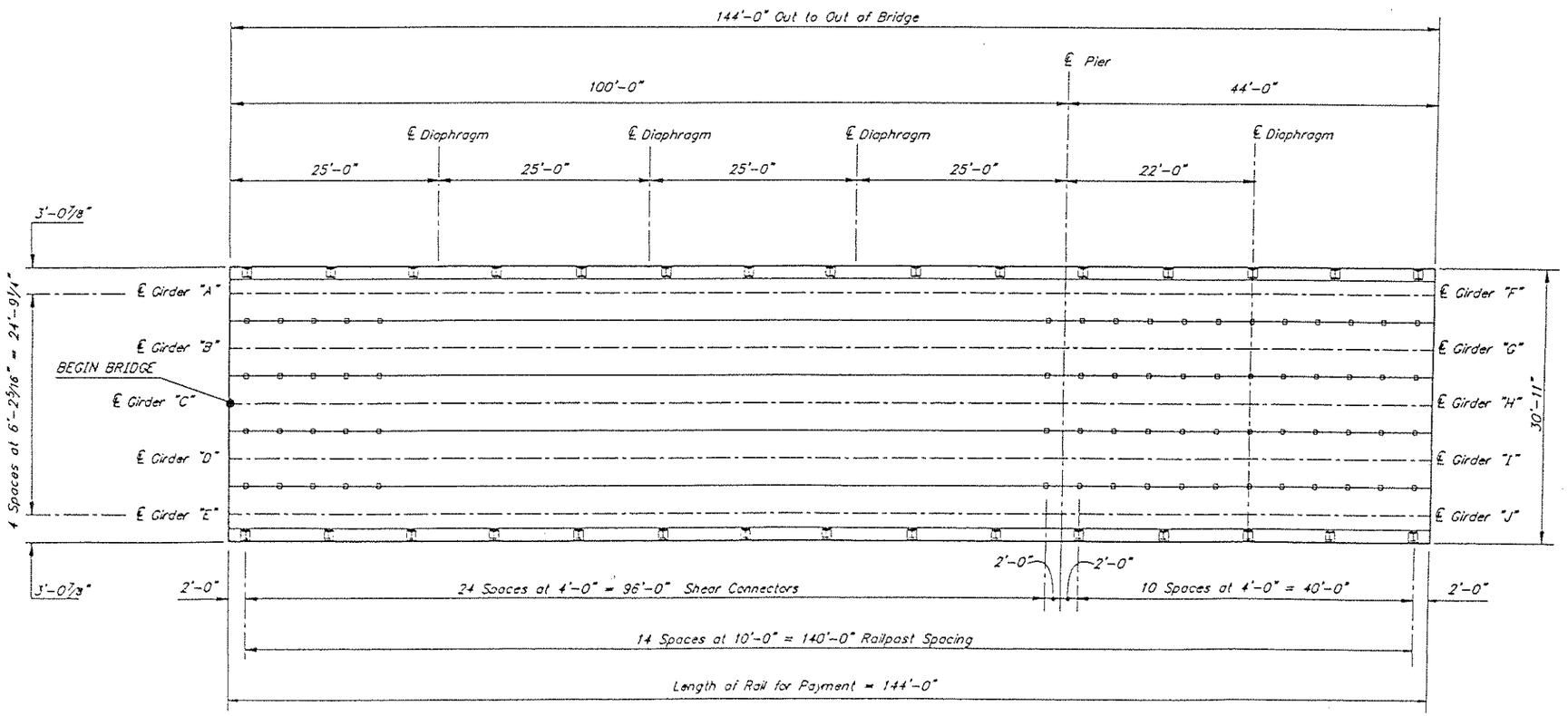
BRIDGE NO. 1089

DWG. NO. 4b

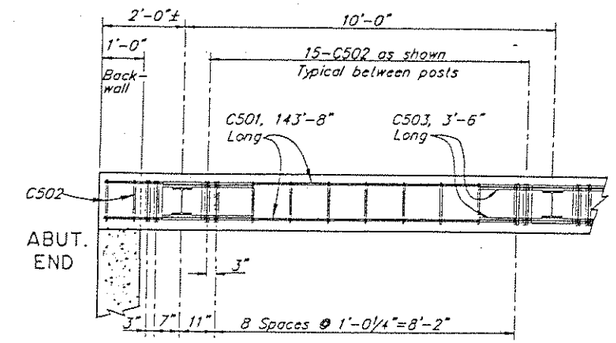


AT ABUTMENT NEAR MIDSPAN

TYPICAL SECTION

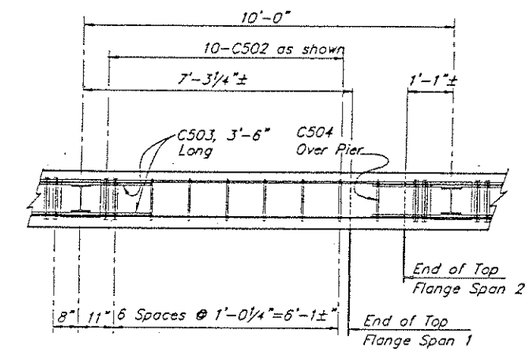


FRAMING PLAN



BRIDGE CURB REINFORCING

No Scale

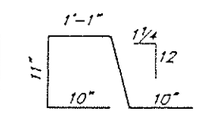


BRIDGE CURB REINFORCING OVER PIER

No Scale

CURB REINFORCING
(BOTH SIDES)

MARK	SIZE	NO.	LENGTH	TYPE
C501	5	4	143'-8"	——
C503	5	60	3'-6"	——
C504	5	2	4'-7"	Bent



C504

All curb bars are epoxy coated and are incidental to Metal Bridge Railing.

Minimum lap length is 2'-0" for C501 bars.

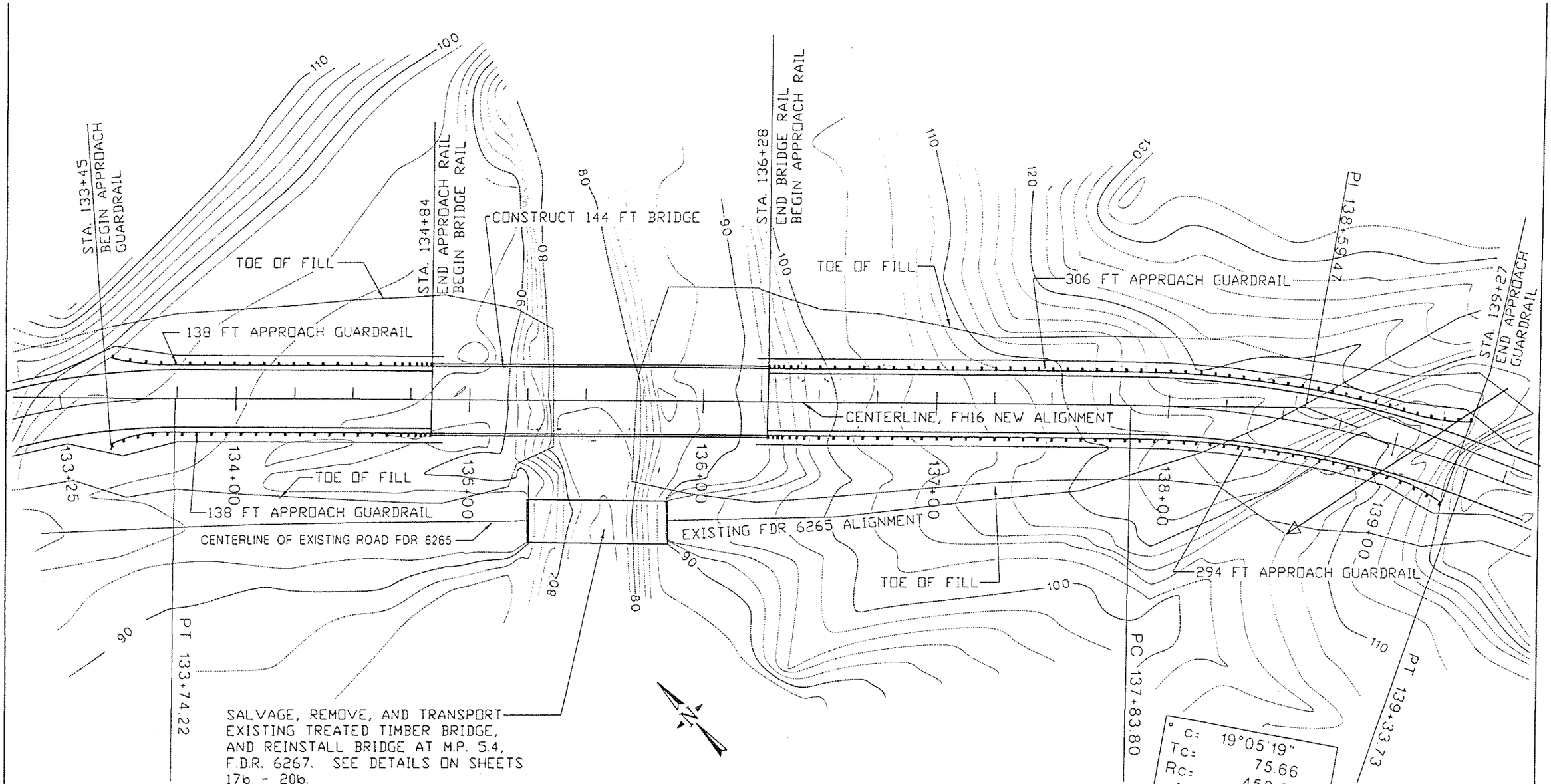
C502 bars are cast in Girders and Backwall. See "GIRDERS" drawings for Reinforcing Steel Schedule for C502 bars.

FOREST HIGHWAY 16
PHASE III
McCORMACK CREEK BRIDGE

TYPICAL SECTION

STATE of ALASKA
DEPARTMENT of TRANSPORTATION
and PUBLIC FACILITIES
JUNEAU, ALASKA

BRIDGE NO. 1089
DWG. NO. 6b



REVISION	DATE	DESCRIPTION	BY

Designed By: K. ELMORE Date 11/16/95
Drawn By: K. ELMORE Date 11/16/95
Checked by: B. BRUNETTE Date 12/05/95

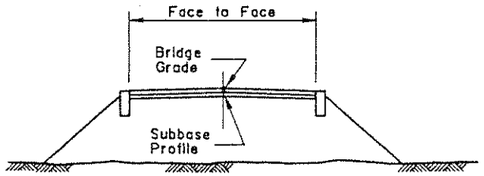
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FOREST HIGHWAY 16 PHASE III APPROACH GUARDRAILS

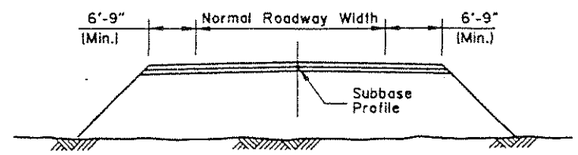
Drawing No. _____ Page 11b of 20b

G-29.02S

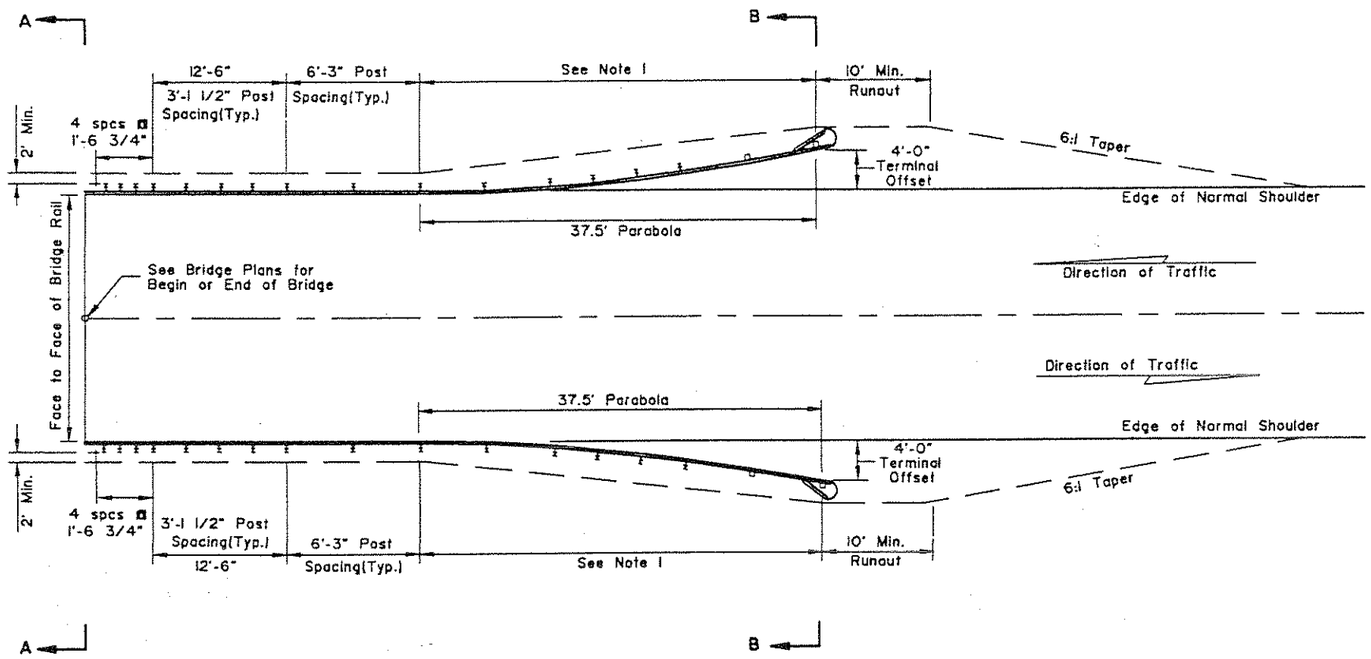
SHEET 1 of 1



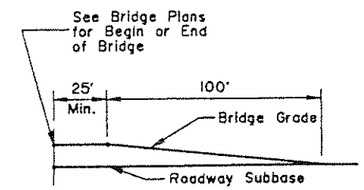
SECTION A-A
See Bridge Typical for Bridge Cross Slope



SECTION B-B

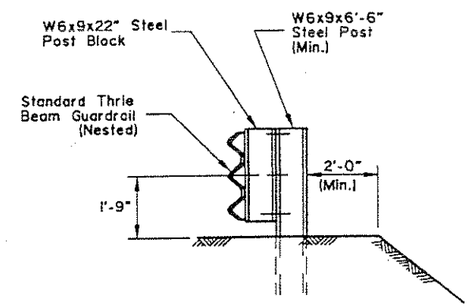


PLAN VIEW

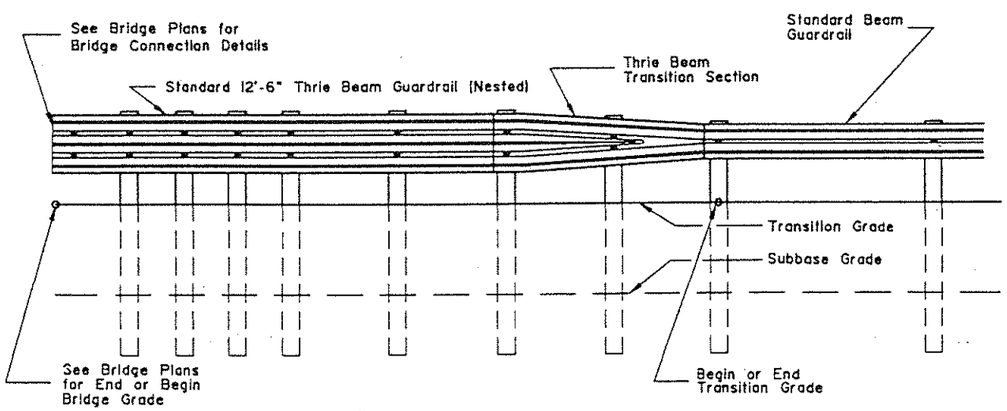


PROFILE - ROADWAY TO BRIDGE TRANSITION*

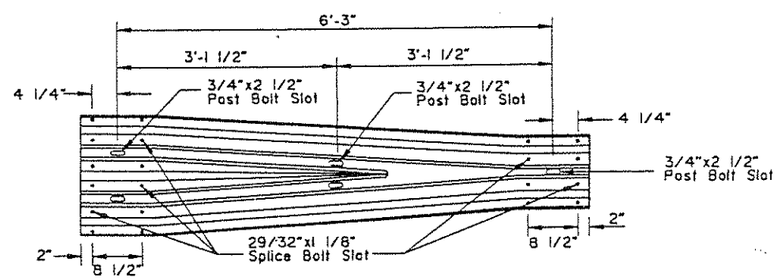
* To be used when surfacing is not part of roadway contract.



STEEL BLOCKING DETAIL



W-BEAM TO THRIE BEAM TRANSITION DETAIL



THRIE-BEAM TO W-BEAM TRANSITION SECTION

GENERAL NOTES:

1. See Standard Drawing 'G4S Breakaway Cable Terminal' for terminal details.
2. See Standard Drawing 'G4S Beam Guardrail' for W-beam and post installation details.
3. See Standard Drawing 'G9S Beam Guardrail' for Thrie Beam and post installation details.
4. All posts shall be W6x9 steel.

REVISIONS

Date	Description	By
5/15/89	Post length--6'-6"	Gdo
1/1/96	Bridge Connect Note	Gdo

State of Alaska
Department of Transportation & Public Facilities

G9S THRIE BEAM GUARDRAIL TERMINAL TRANSITION AT BRIDGES

APPROVED 12/1/87

Date

G-29.02S

Drawing 12b

P STA.	OFFSET	Δ ELEV.	L STA.
P 2255	0.81	-0.81	0+00
P 2250	-2.58	-3.57	0+23.97
P 2240	-5.57	-7.41	0+63.48
P 2230	-11.89	-5.49	1+03.43
P 2225	-17.42	-0.81	1+31.79
P 2220	-24.45	14.07	1+48.65
P 2205	-33.11	14.42	1+77.90
P 2195	-42.33	10.80	2+07.12
P 2190	-39.94	0.00	2+20.71
P 2185	-41.92	-8.07	2+62.87
P 2180	-44.62	-11.38	2+88.78

SURVEY DATA:

STA. 0+00 : "P" SEC. 2255
STA. 2+88.78 : "P" SEC. 2180
ELEV. 100.0 : ELEV. 651.52
POINT 2 : P 2225

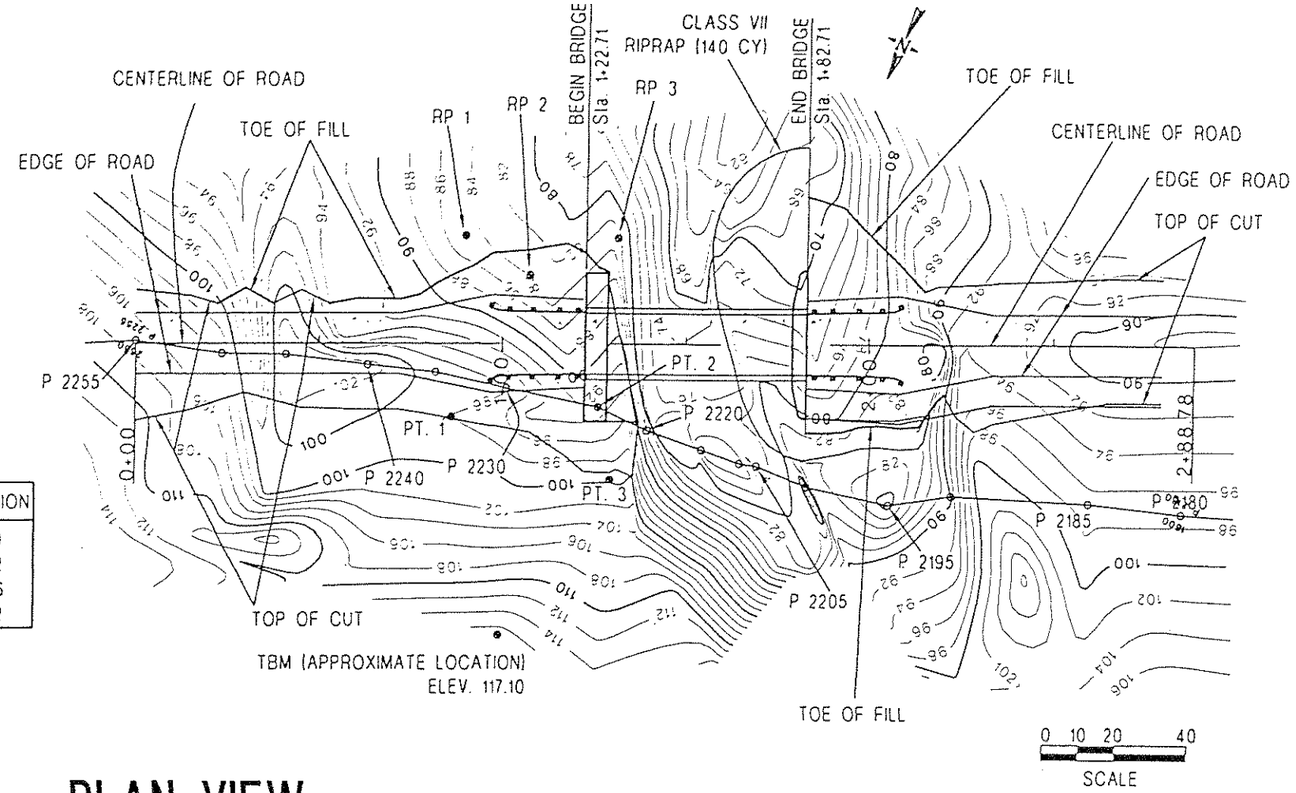
FROM	TO	AZIMUTH	H. DIST.
TBM	PT. 1	218	59.50
RP 1	PT. 1	21	47.74
RP 2	PT. 3	48	58.20
RP 3	PT. 3	24	63.46

POINT	ELEVATION
TBM	117.10
RP 1	84.22
RP 2	83.96
RP 3	82.92

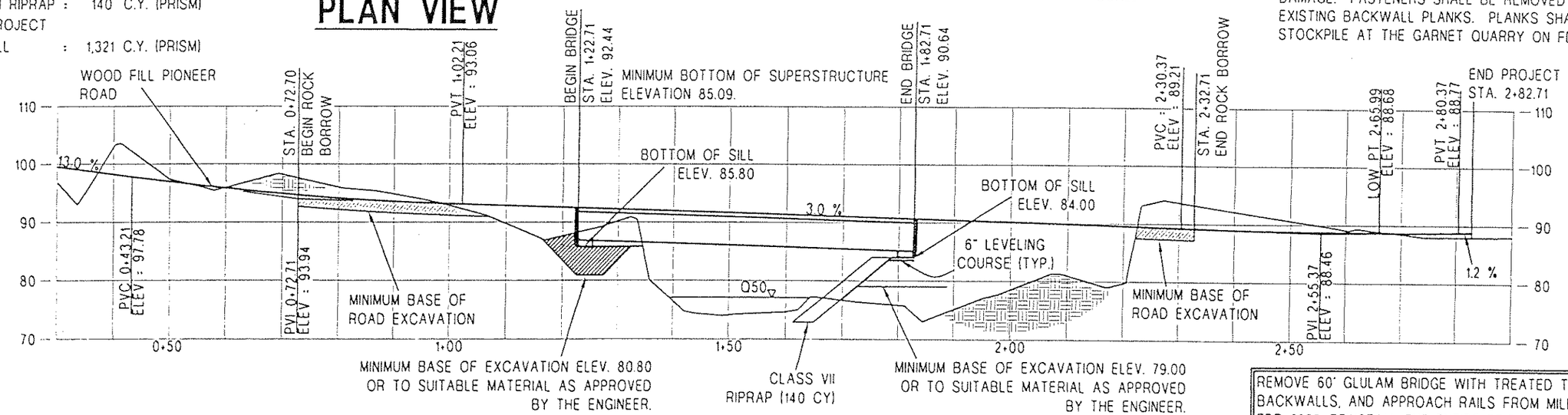
ESTIMATED QUANTITIES:

STA. 0+56 TO STA. 2+16

STRUCTURAL EX.	:	220 C.Y. (SOLID)
EXCAVATION	:	262 C.Y. (PRISM)
BORROW	:	847 C.Y. (PRISM)
CLASS VII RIPRAP	:	140 C.Y. (PRISM)
TOTAL PROJECT		
WOOD FILL	:	1,321 C.Y. (PRISM)



PLAN VIEW



PROFILE ALONG CENTERLINE OF ROAD

0 5 10 20
HORIZONTAL AND VERTICAL SCALE

NOTES:

EXCESS AND/OR UNSUITABLE MATERIAL EXCAVATED DURING BRIDGE CONSTRUCTION SHALL NOT BE PLACED ON THE SLOPES ADJACENT TO THE STREAM OR IN THE STREAM CHANNEL.

EXCAVATION SHALL BE APPROVED BY THE ENGINEER BEFORE BACKFILLING IN ACCORDANCE WITH SECTION 203, METHOD 4.

FURNISH AND INSTALL NEW APPROACH RAIL ENDS. NEW ENDS SHALL BE CLASS A TYPE 2, METHOD A END ANCHOR. METHOD 1 TERMINAL SECTION. BRIDGE AND APPROACH RAIL CONSTRUCTION IS INCIDENTAL TO BRIDGE CONSTRUCTION.

INSTALL TYPE THREE OBJECT MARKERS (TYPICAL ALL FOUR CORNERS.)

ALL ESTIMATED QUANTITIES SHOWN ON THIS DRAWING ARE INCLUDED IN THE WORK FOR PAY ITEM 202(05) AND WILL NOT BE MEASURED SEPERATELY FOR PAYMENT.

ACTUAL RIPRAP PLACEMENT WILL BE AS FIELD DETERMINED BY THE ENGINEER DURING CONSTRUCTION.

REPLACE NATIVE MATERIAL OVER BASE OF RIPRAP AFTER PLACEMENT OF RIPRAP.

BEDROCK MAY BE ENCOUNTERED AND BLASTING MAY REQUIRED.

EXISTING BACKWALL SHALL BE REMOVED WITH MINIMAL DAMAGE. FASTENERS SHALL BE REMOVED FROM THE EXISTING BACKWALL PLANKS. PLANKS SHALL BE PLACED IN STOCKPILE AT THE GARNET QUARRY ON FDR 6265 AT MP 5.6.

REMOVE 60' GLULAM BRIDGE WITH TREATED TIMBER SILLS, BACKWALLS, AND APPROACH RAILS FROM MILEPOST 2.32 ON FDR 6265. REINSTALL THE ENTIRE BRIDGE STRUCTURE BETWEEN STA. 0+06.07 AND 1+66.07 ON FDR 6267. FURNISH AND INSTALL NEW BACKWALLS. BACKWALLS SHALL BE FABRICATED IN ACCORDANCE WITH FOREST SERVICE SPECIFICATIONS 557. FURNISH AND INSTALL NEW APPROACH RAIL ENDS.

BEGIN PIONEER ROAD CONSTRUCTION FROM THE END OF THE EXISTING AGGREGATE SURFACE ROAD AT MP 5.28 TO END OF PROJECT MP 5.42

Q50 : 308 CFS
V50 : 11.8 FPS
So : 10.9 %
N : 0.055

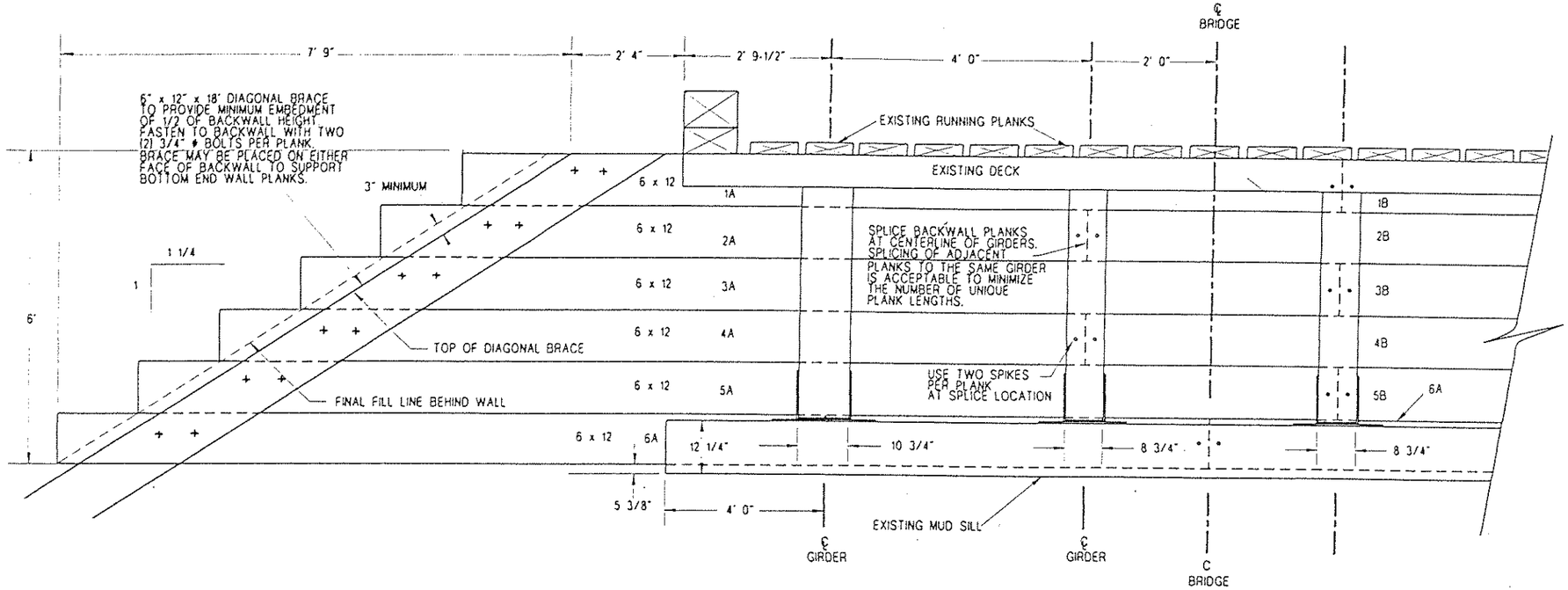
REVISION	DATE	DESCRIPTION	BY

Designed By: T. Laurent Date 1/21/97
Drawn By: T. Laurent Date 1/22/97
Checked by: L. Dunham Date 1/23/97

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FDR 6267 GNEISS CREEK
HYDRO SITE PLAN & PROFILE
MP 5.4 STA. 1+06

Drawing No. GNEISS



ABUTMENT ELEVATION

NOT TO SCALE

MATERIALS LIST FOR ONE BACKWALL

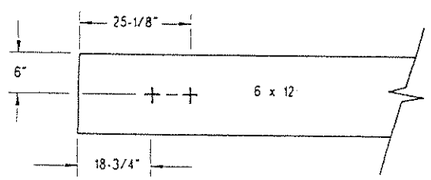
TIMBER

PLANK	SIZE	LENGTH
1A	6 x 12	14' 9-1/4"
1B	6 x 12	10' 9-1/4"
2A	6 x 12	12'
2B	6 x 12	16'
3A	6 x 12	17' 3-1/4"
3B	6 x 12	13' 3-1/4"
4A	6 x 12	14' 6-1/4"
4B	6 x 12	18' 6-1/4"
5A	6 x 12	19' 9-1/4"
5B	6 x 12	15' 9-1/4"
6A	6 x 12	19' 1/4" (2 REQ'D)
DIAGONAL BRACE	6 x 12	16' 0" (2 REQ'D)

HARDWARE

24 3/4" ϕ x 14" BOLTS
24 3/4" ϕ NUTS
48 3/4" ϕ MALLEABLE IRON WASHERS
MISCELLANEOUS 3/8" x 10" SPIKES

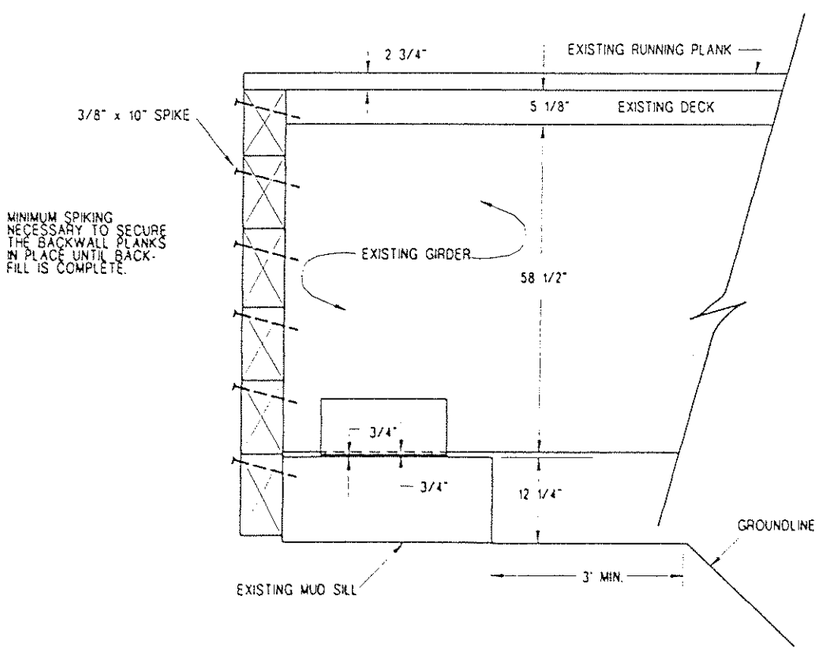
ALL HARDWARE IS GALVANIZED.



NOTE: DIAGONAL BRACE END ONLY

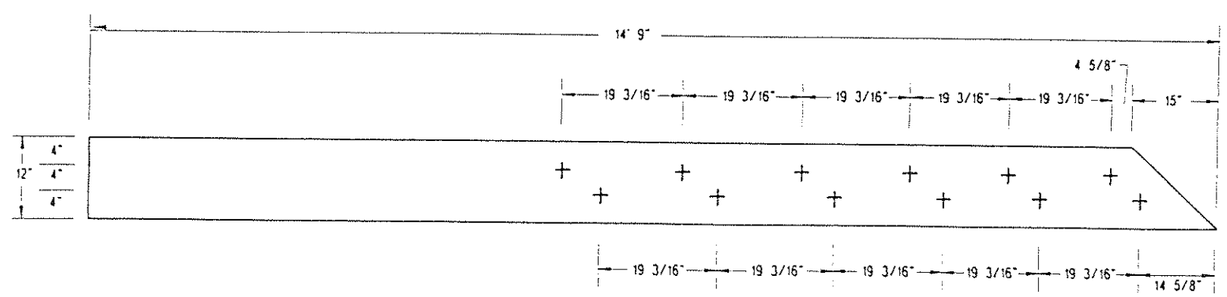
6 x 12 END DETAIL

NOT TO SCALE



PLANK PLACEMENT AT BASE OF BACKWALL

NOT TO SCALE



DIAGONAL BRACE

NOT TO SCALE

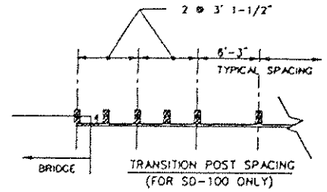
REVISION	DATE	DESCRIPTION	BY

Designed By: T. Laurent Date 1/23/96
Drawn By: T. Laurent Date 1/23/96
Checked By: L. Dunham Date 1/23/96

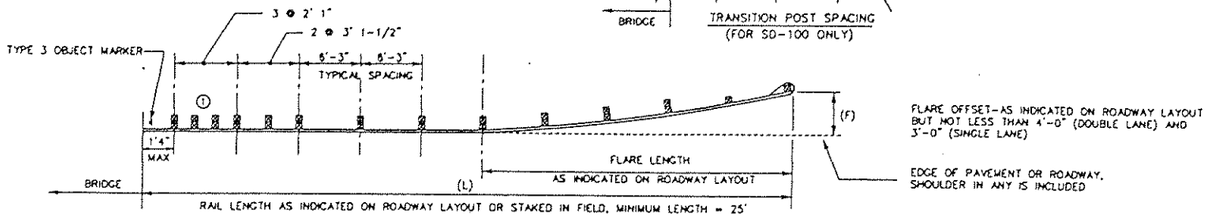
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 10 STIKINE AREA

FDR 6267 GNEISS CREEK
BACKWALL LAYOUT
MP 5.4 STA. 1+06

Drawing No. GNEISSBW

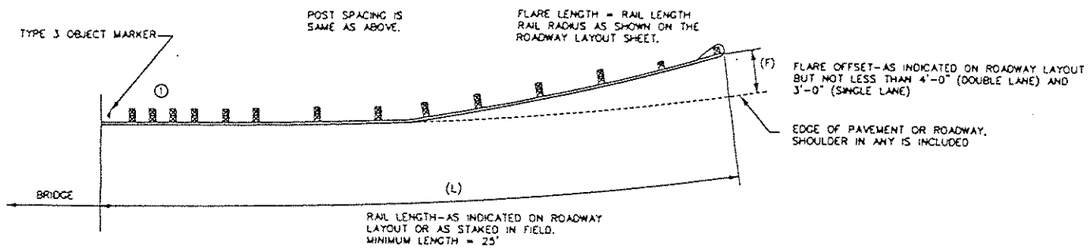


TRANSITION POST SPACING
(FOR SD-100 ONLY)



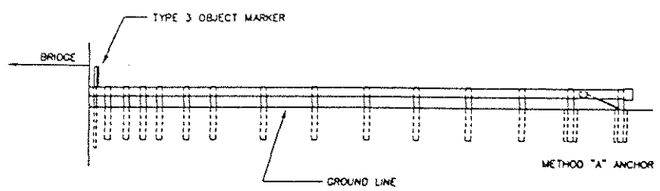
RAIL RADIUS, APPROXIMATELY = $(X)^2/2F$.
IF R. IS LESS THAN 150', SHOP BENDING IS REQUIRED.

STRAIGHT ALIGNMENT

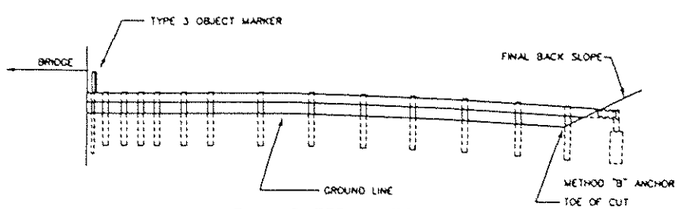


CURVED ALIGNMENT

APPROACH RAILING PLAN

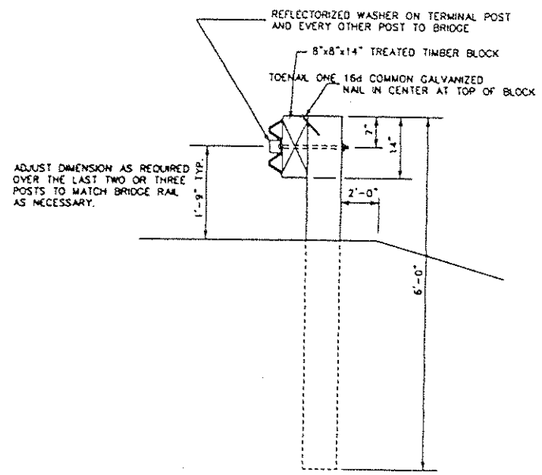


RAILING ON GRADE OR FILL



RAILING TERMINATES IN CUT

APPROACH RAILING ELEVATION

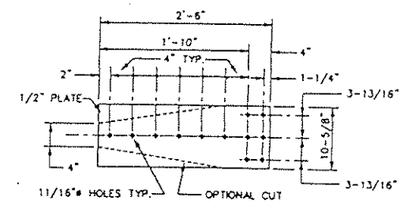


TYPICAL GUARD RAIL CROSS SECTION

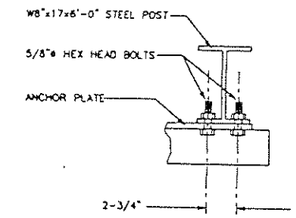
MATERIALS: STEEL SHAPES, PLATES, AND BARS SHALL BE STRUCTURAL STEEL CONFORMING TO AASHTO M183 (ASTM A36). RAIL ELEMENTS SHALL CONFORM TO AASHTO M180 AND SHALL BE OF THE CLASS AND TYPE SPECIFIED ON THE LAYOUT SHEET. ALL STEEL SHAPES, PLATES, AND BARS SHALL BE GALVANIZEDIN ACCORDANCE WITH AASHTO M111, UNLESS OTHERWISE SPECIFIED ON THE BRIDGE LAYOUT SHEET. NUTS, BOLTS, AND WASHERS SHALL SHALL MEET THE REQUIREMENTS OF ASTM A-307 AND SHALL BE GALVANIZED UNLESS SPECIFIED OTHERWISE ON THE BRIDGE LAYOUT SHEET. ANCHOR CABLE SHALL BE 3/4"ø GALVANIZED WIRE ROPE CONFORMING TO AASHTO M30, TYPE II. REFLECTORS SHALL BE SILVER, HIGH INTENSITY, 3M SCOTCHLITE #3870, OR APPROVED EQUAL. POSTS SHALL BE No. 1 STRUCTURAL GRADE DOUGLAS FIR OR WESTERN LARCH CONFORMING TO AASHTO M168 AND SHALL BE TREATED IN ACCORDANCE WITH AWPA C14.

FABRICATION: STRUCTURAL STEEL SHALL BE SHOP FABRICATED. WELDING SHALL CONFORM TO THE AWS STRUCTURAL WELDING CODE, D1.1, AND SHALL BE BY A CERTIFIED WELDER. ALL STEEL SHALL BE FABRICATED BEFORE BEING GALVANIZED, EXCEPT THAT MINOR SHOP CUTTING, DRILLING, AND WELDING IS PERMITTED ON GALVANIZED METAL, PROVIDED THAT THESE AREAS ARE CLEANED AND REPAIRED WITH 2 COATS OF ZINC DUST-ZINC OXIDE PAINT MEETING FEDERAL SPECIFICATION TT-P-641 OR MILITARY SPECIFICATION MIL-P-21035. THE CABLE ASSEMBLY SHALL DEVELOP A MINIMUM TENSILE STRENGTH OF 40,000 LBS.

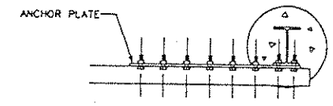
ERECTION: RAIL ELEMENTS MAY BE EITHER 25'-0" OR 12'-6" IN LENGTH. IF RAIL CURVATURE IS LESS THAN A 150 FT. RADIUS, IT SHALL BE CURVED TO THE SPECIFIED RADIUS. NO FIELD CUTTING OR WELDING IS PERMITTED ON GALVANIZED METAL UNLESS APPROVED BY THE ENGINEER. ALL RAIL POSTS SHALL BE SET VERTICALLY AND THE RAILING ERECTED PARALLEL TO GRADE. POST SPACING SHALL BE 6'-3" EXCEPT AS NOTED. THE COMPLETED INSTALLATION SHALL NOT REFLECT ANY UNEVENNESS IN THE STRUCTURE. AFTER ERECTION IS COMPLETE, BURR THREADS OF ALL BOLTS AND RODS TO PREVENT BACKING OFF OF NUTS. ALL DAMAGED SURFACES SHALL BE REPAIRED WITH 2 COATS OF ZINC PAINT AS SPECIFIED IN THE FABRICATION NOT ABOVE.



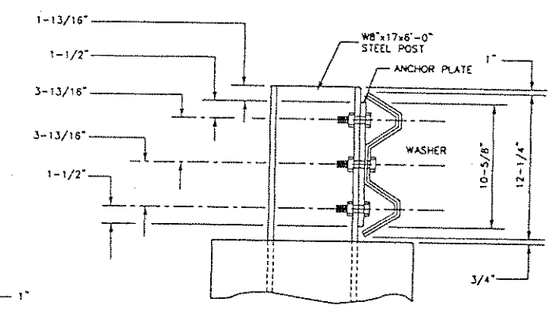
ANCHOR PLATE



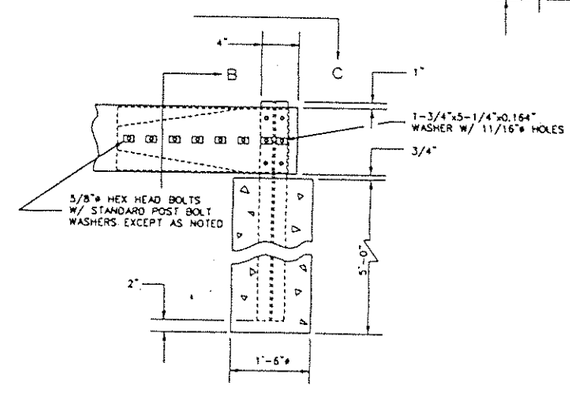
SECTION C



PLAN



SECTION B



ELEVATION

METHOD "B" ANCHOR

REVISION	DATE	DESCRIPTION	BY
1	12/90	ADD TRANSITION POST.	RJM

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION TEN

STANDARD BRIDGE
APPROACH GUARD RAIL

SERVICE LOAD-HS-20, U80 INFREQUENT LOAD U102, L90

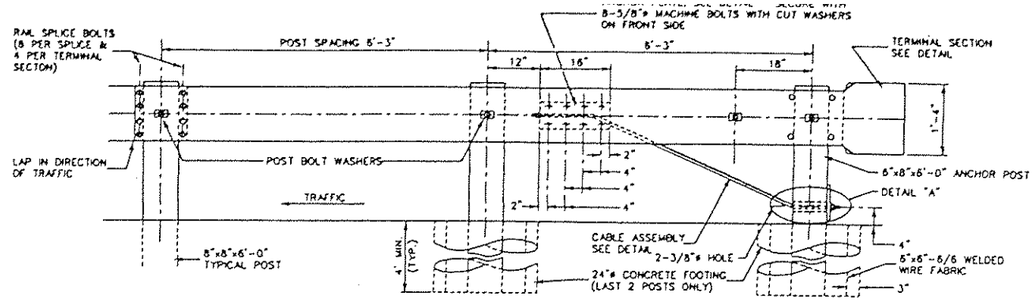
DESIGNED _____ CHECKED _____

REVIEW & CHECK _____ Regional Structural Engineer _____ Date

APPROVED _____ Director of Engineering _____ Date

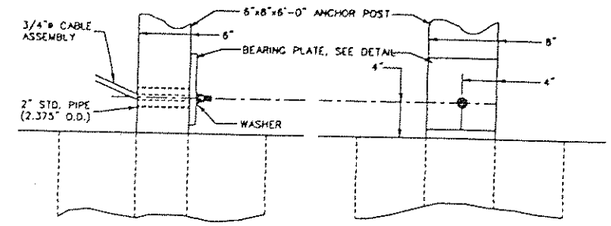
DRAWING No. SD 161-1 SHEET 19b OF 20b

SOUTHEAST GRAPHIC MEDIA - JUNEAU, ALASKA

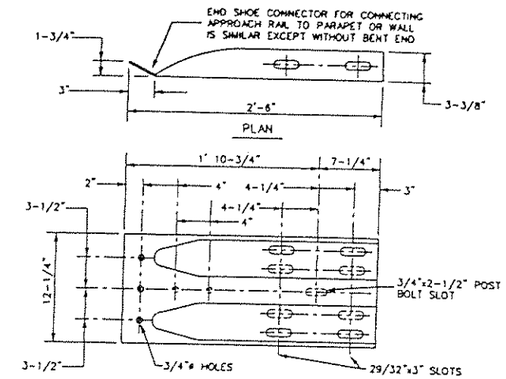


ELEVATION

METHOD "A" ANCHOR

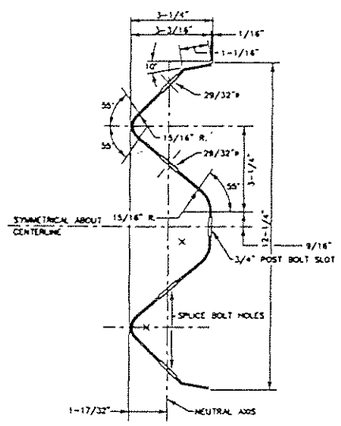


DETAIL "A"

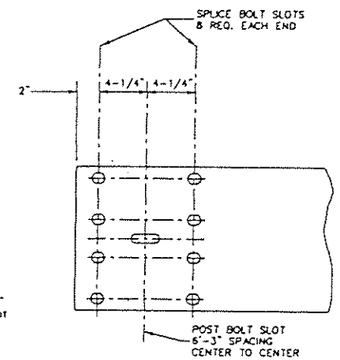


ELEVATION

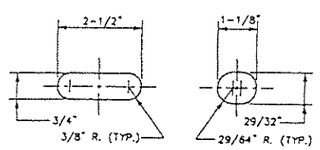
TERMINAL CONNECTOR



CROSS SECTION



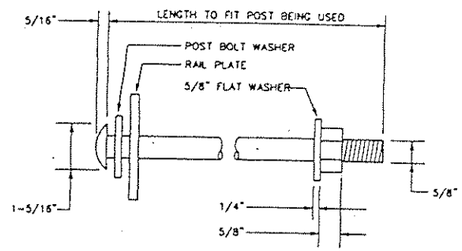
ELEVATION



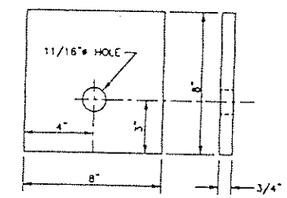
POST BOLT SLOT

SPLICE BOLT SLOT

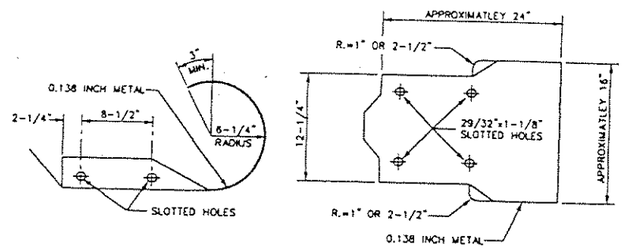
RAIL ELEMENT



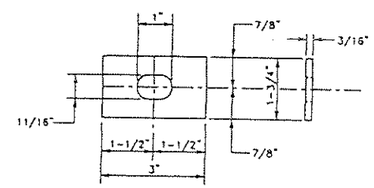
POST BOLT



BEARING PLATE

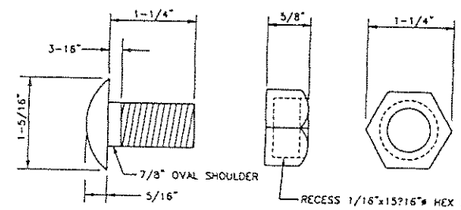


METHOD 2



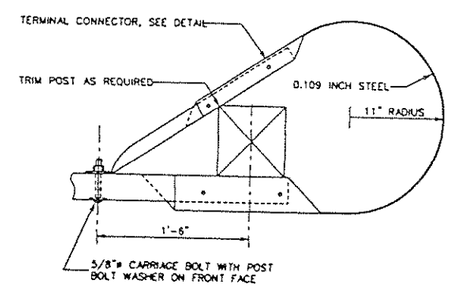
POST BOLT WASHER (END POST ONLY)

POST BOLT ASSEMBLY



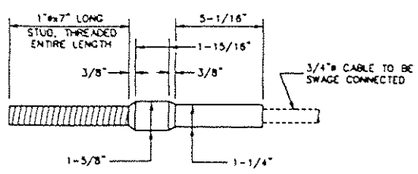
A SCREW HEAD RAIL SPLICE BOLT WITHOUT SHOULDER, BUT WITH THE SAME GENERAL DIMENSIONS MAY BE USED IN LIEU OF THE RAIL BOLT AS SHOWN.

RAIL SPLICE BOLT



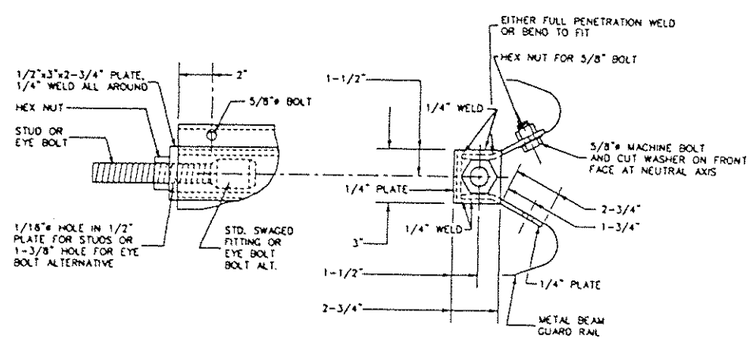
METHOD 1

TERMINAL SECTION

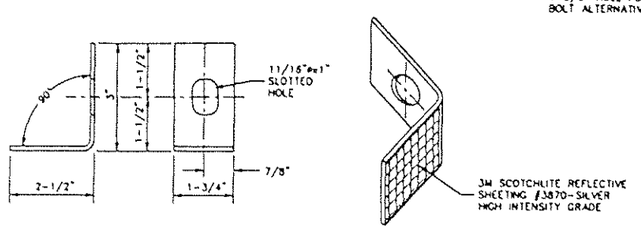


STANDARD SWAGED FITTING AND STUD

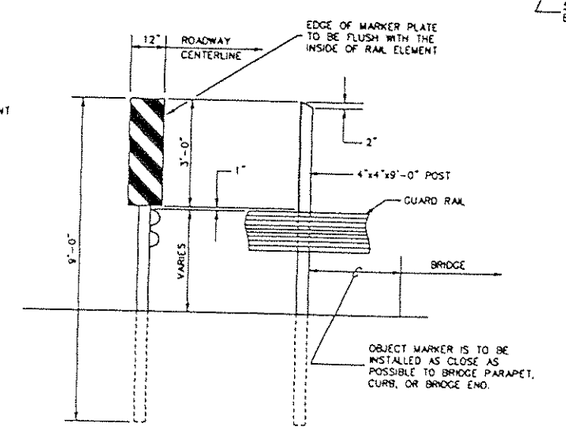
CABLE ASSEMBLY



ANCHOR PLATE DETAILS



REFLECTORIZED WASHER DETAIL



OBJECT MARKER

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES- TYPE J (M.U.T.C.D. TYPE 3)

REVISION	DATE	DESCRIPTION	BY

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION TEN

STANDARD BRIDGE APPROACH GUARD RAIL

SERVICE LOAD-HS-20, U80 INFREQUENT LOAD U102, L90

DESIGNED _____ CHECKED _____

REVIEW & CHECK _____ Regional Structural Engineer _____ Date

APPROVED _____ Director of Engineering _____ Date

DRAWING No. SD 161-2 SHEET 20b OF 20b

SOUTHEAST GRAPHIC MEDIA - JUNEAU, ALASKA