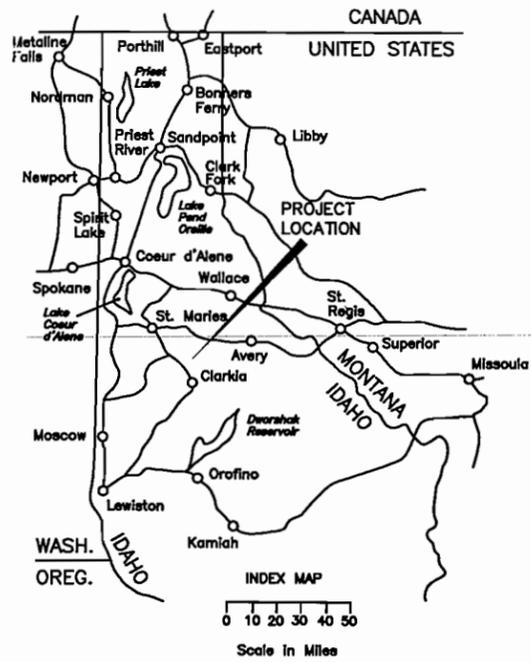


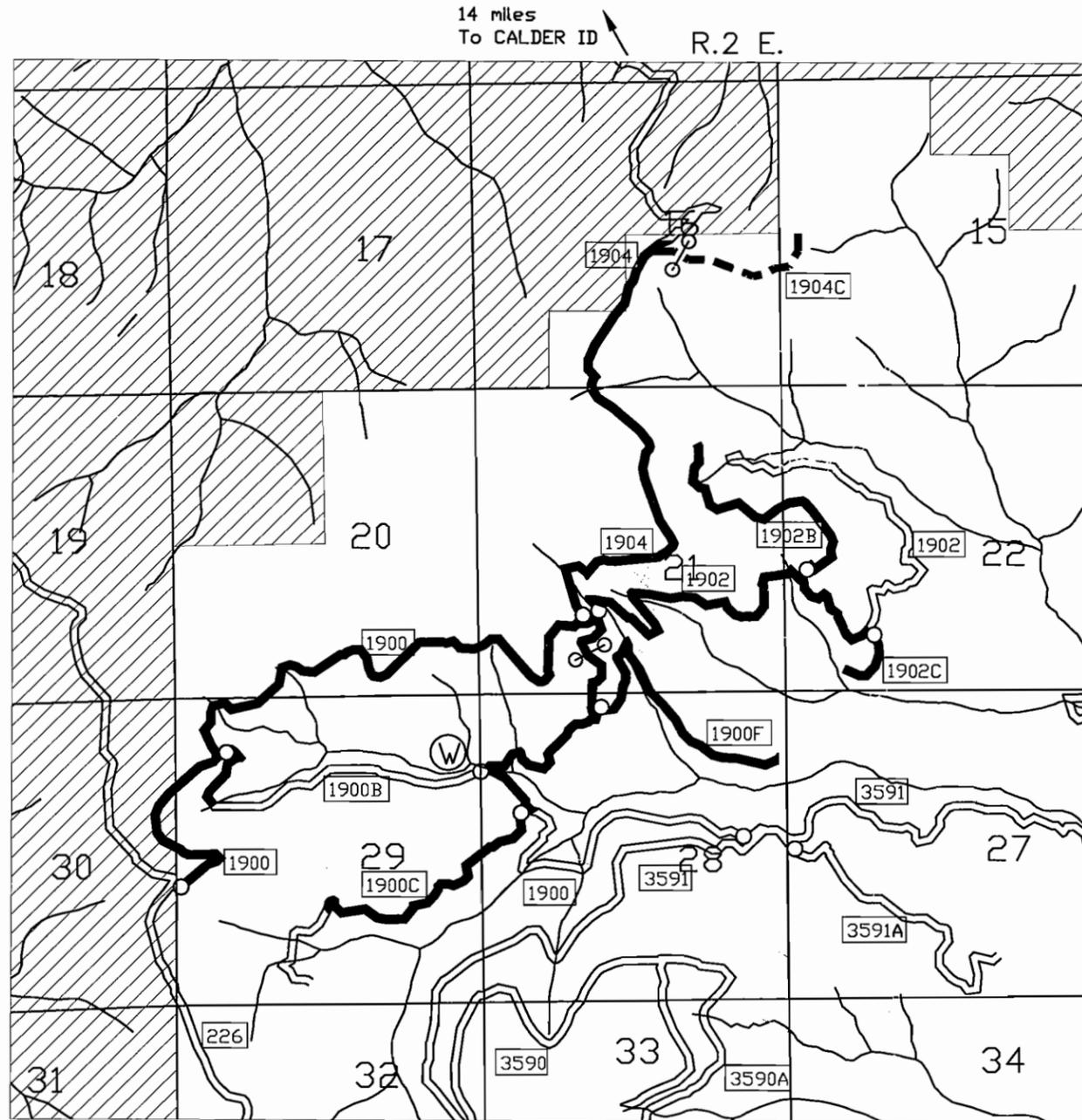
U.S. DEPARTMENT OF AGRICULTURE  
 FOREST SERVICE - REGION ONE  
 DRAWINGS FOR PROPOSED FOREST DEVELOPMENT

# TOLE BOOTH T.S.

TIMBER SALE ROADS  
 IDAHO PANHANDLE NATIONAL FORESTS  
 St. JOE RANGER DISTRICT  
 SHOSHONE COUNTY, IDAHO



T.44 N.



**LEGEND**

	National Forest System Lands
	Other Than NFS Lands
	Existing Road
	Reconstruction
	New Construction
	Water Source
	Existing Gate
	New Gate
	Beginning Termini of Road Segment

SHEET #	DESCRIPTION
1	COVERSHEET
2	SUMMARY OF ESTIMATED QUANTITIES AND GENERAL NOTES
3	TYPICAL SECTIONS
4	WORKLISTS Rds. 1900, 1900B, 1900C, 1900F, 1902, 1902B, 1902C, 1904
5	DRAINAGE STRUCTURE SUMMARY
6	PLAN AND PROFILE RD 1900
7-8	PLAN AND PROFILE RD 1900F
9-10	PLAN AND PROFILE RD 1902B
11-13	PLAN AND PROFILE RD 1904C
14	SIGN PLAN
15	PILING CONSTRUCTION SLASH TYPICAL
16	STRAW BALE SEDIMENT BASIN
17	GATE DETAIL
18	CULVERT DETAILS
19-21	COUPLING SHEET DETAILS
22	GATE BYPASS DETAIL



Recommended to be technically correct and that this project is in conformance with Environmental Assessment requirements

*Pat Ruff* 7/1/08  
 Operations Team Leader

Approved to be in conformance with sound Engineering practice for safety, structural integrity, and operational requirements.

*[Signature]*  
 Forest Engineer

Approved: *Charles Mack* 7/1/08  
 District Ranger Date

**SUMMARY OF ESTIMATED QUANTITIES**

ROAD NUMBER				1900	1900B	1900C	1900F	1902	1902B	1902C	1904	1904C	Project Totals
TYPE OF CONSTRUCTION: (C = CONSTRUCTION, R = RECONSTRUCTION)				R	R	R	R	R	R	R	R	C	
LENGTH OF CONSTRUCTION (MILES)												0.70	0.70
LENGTH OF RECONSTRUCTION (MILES)				3.89	0.31	0.84	0.90	1.65	1.00	0.20	1.80		10.59
ITEM NO.	DESCRIPTION	MM*	UNIT										
173(01)A	Establishing Slope Stakes, Cut Side(s) & Through Fills, Clearing Limit & Slope Stake Combined	DQ	MI	0.12			0.12		0.11			0.70	1.05
201(01)	Clearing & Grubbing, Slash Treatment Methods for Tops & Limbs 11.1, Logs 8.1, & Stumps 11.1, Utilization of Timber 1.	DQ	AC	0.48			0.43		0.41			3.00	4.32
201(03)	Clearing & Grubbing, Slash Treatment Methods for Tops & Limbs 4, 6.1, 11.3, Logs 8.1, & Stumps 4, 11.3, Utilization of Timber 1.	DQ	MI				0.78			0.20			0.98
201A(01)	Roadway Brushing	DQ	MI	3.77	0.31	0.84		1.65	0.89		1.80		9.26
202(02)CM	Removal of Metal Pipe	AQ	EA	1.00							1.00		2
203(01)H	Excavation, P.M. 1, Includes Sta. Y.d. Haul	DQ	CY	224			252		148			2536	3160
203(07)	Excavation, Placement Method 1	DQ	STA	1					3		1		5.0
204(01)	Temporary Seeding and Fertilizing	DQ	AC	0.36			0.35		0.3			2.22	3.23
204(09)	Sediment Basin	AQ	EA	1			1				1		3
206A(02)	Pipe Culvert Excavation	DQ	CY	235									235
304(10)	Crushed Aggregate, Type Surfacing, , Grading D, Compaction A,(commercial source)	DQ	CY	30							40		70.00
306(01)	Reconditioning of Roadbed, Compaction A	DQ	MI	3.77	0.31	0.84	0.78	1.65	0.89	0.20	1.80		10.24
601(01)	Mobilization	LSQ	LS	1	1	1	1	1	1	1	1	1	Job
603(01)18C	18" CMP (incl. Culv. Exc.) Thickness: Steel 0.064, Thickness: Aluminum 0.060, Method C	AQ	LF				34						34
603(01)36C	36" CMP (incl. Culv. Exc.) Thickness: Steel 0.064, Thickness: Aluminum 0.060, Method C	AQ	LF				46				46		92
603(01)60C	60" CMP (incl. Culv. Exc.) Thickness: Steel .109, Thickness: Aluminum .164, Method C	AQ	LF	46									46
625(07)	Seeding, Dry Method (with Mulch)	DQ	AC	0.36			0.35		0.30			2.22	3.23
640(01)	Furnish and Install Road Closure Device, Type gate, Size 14'4" - 16'6"	AQ	EA	1.00								1.00	2.00
640(05)	Install Gate Bypass	AQ	EA	1.00									1.00

MM\* = Method of Measurement

**General Notes**

**Section 201:**

- Log Decks Shall Be Located Beyond Toe Of Fill So As To Not Interefere With Road Construction.
- Embanked Material Shall Not Be Placed On Or Against Log Decks.

**Section 203:**

- All Excess Or Unsuitable Excavation Not Utilized Shall Be Sidecast Wasted Along The Roadway Unless Otherwise Designated On The Plans Or Directed By The Engineer.
- No Material Shall Be Sidecast Into Live Streams.
- Scarification Will Not Be Required.
- No Material Shall Be Sidecast Wasted On Slopes Within 20 Ft. Of Cross-Drain Culverts.
- All Road Construction Shall Conform To Tolerance Class I. All Reconstruction Shall Conform to Tolerance Class D.
- All Excavation under Item 203(07) that is not included in the worklist but is included in the schedule of items will be designated on the ground.

**Section 204:**

- All Areas Of Disturbed Earth Outside Roadbed Shall Be Temporary Seeded And Fertilized.

**Section 206A:**

- All Excess or Unsuitable Material Shall Be Sidecast Wasted Along the Roadway Unless Otherwise Designated on The Plans or Directed By The Engineer.
- No Material Shall Be Sidecast Into, Or Along Slopes Adjacent To Live Streams.

**Section 207:**

- Water Source Is Located Along Rd. 1900 M.P. 3.78

**Section 306:**

- All Excess, Oversized or Unsuitable Material Removed Under Section 306 Shall Be Sidecast Wasted Along The Roadway Unless Otherwise Designated On The Plans.
- No Material Shall Be Sidecast onto slopes within 100 ft. slope distance of live streams, or within 200 ft. of stream channel crossings.
- No Material Shall Be Sidecast Wasted On Slopes Within 20 Ft. Of Cross-Drain Culverts.
- Scarification Will Not Be Required.
- All Road Intersections Marked On The Ground Shall Be Treated Under Section 306 For A Distance Of 50 Ft.

**Section 625:**

- All Areas Of Disturbed Earth Outside Of Roadbed Shall Be Seeded.

**Noxious Weed Control:**

In Order To Prevent The Spread Of Noxious Weeds Into The Tole Booth Timber Sale, The Contractor Shall Be Required To Provide Certification That Any Seed Or Straw/Hay On The Project Is Noxious Weed Free. The contractor shall be required to furnish the Forest Service with proof of weed free equipment as provided in the contract.

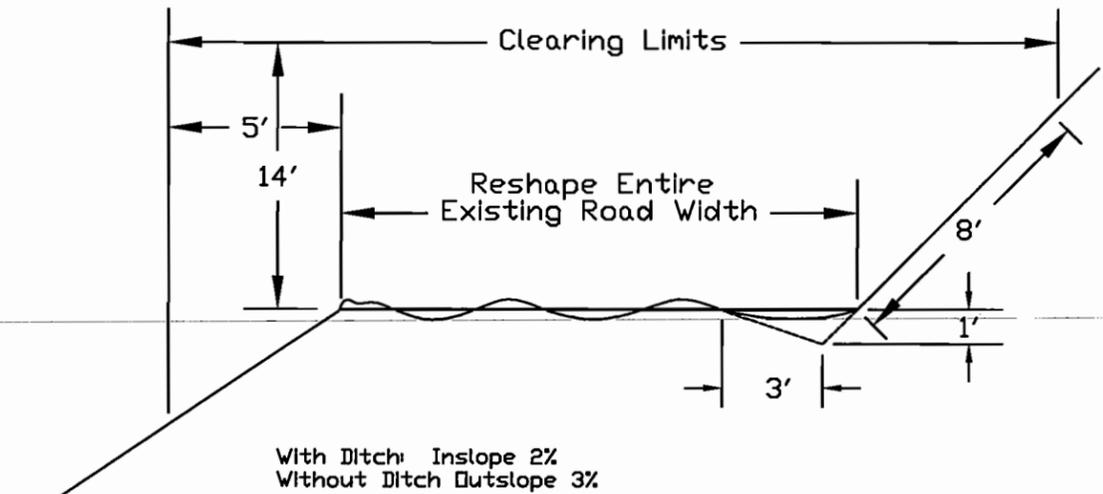
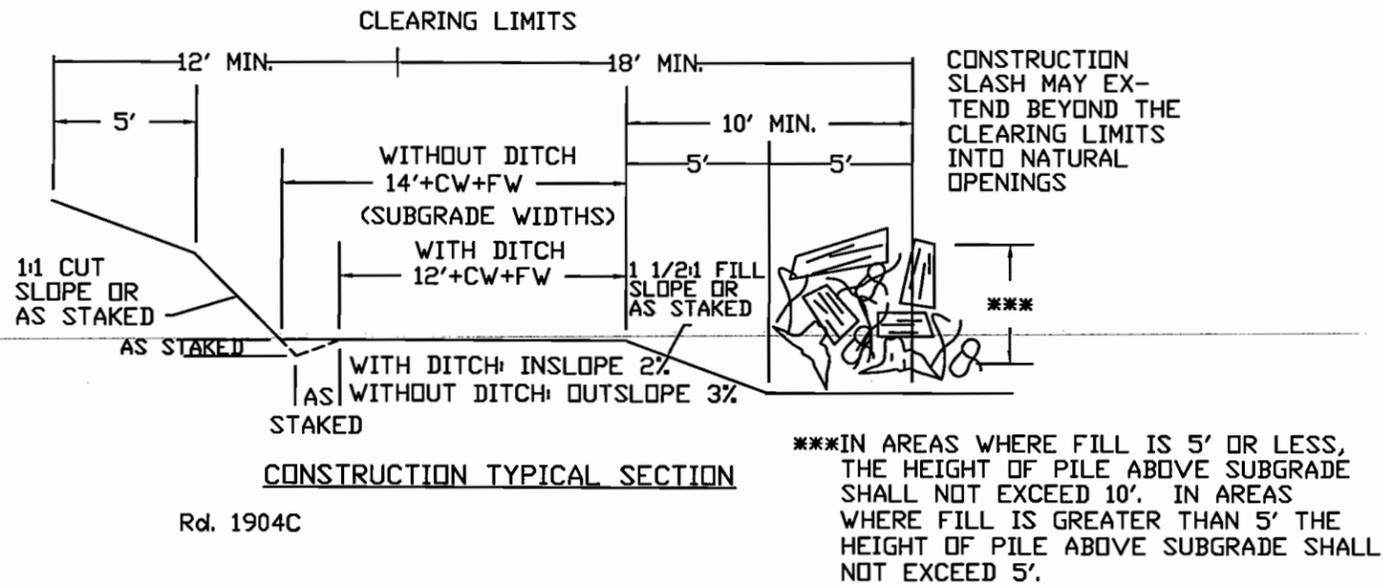
**Construction Signing:**

All Construction Signs And Installations Shall Conform To The Current M.U.T.C.D. Standards.

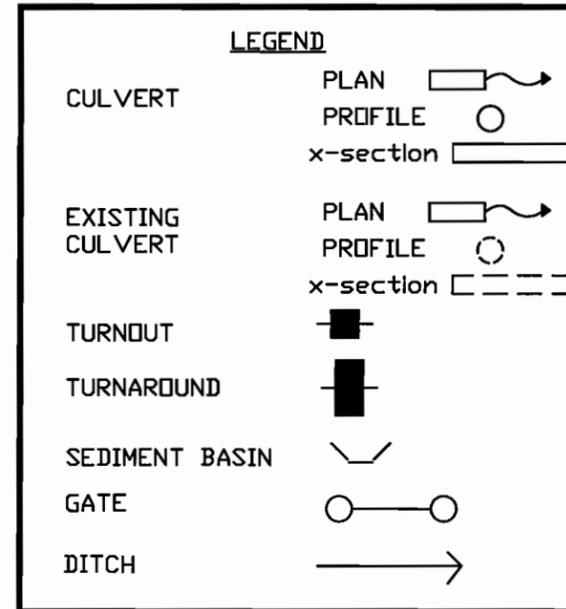
**CALL BEFORE YOU DIG**

Project access Road 1491 is known to have a buried powerline in the vicinity. No other buried utilities are known.

Purchaser is responsible for damage to existing utilities.



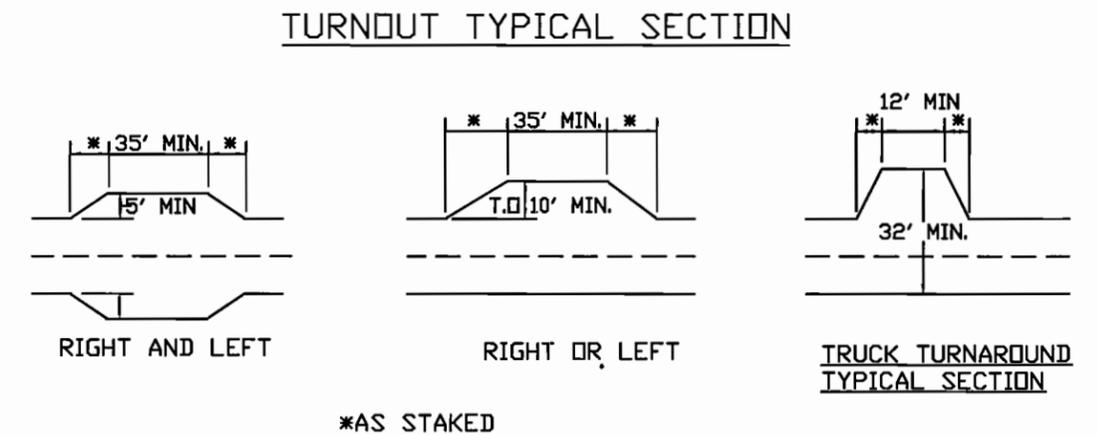
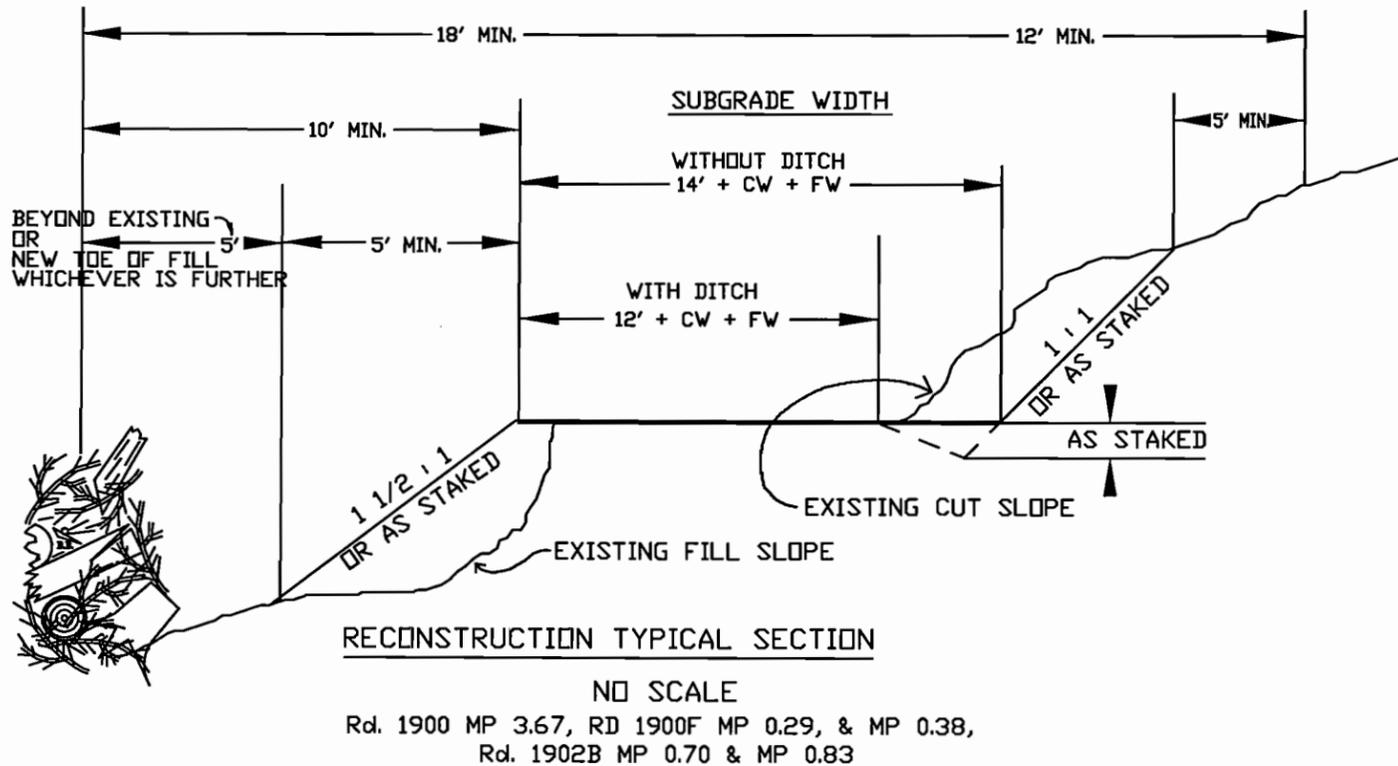
Aggregate Depths, Item 304(10)	
Road #, M.P.	Depth (Inches)
1900, M.P. 2.82 (Item 640(05))	6
1900, M.P. 3.79	6
1904, M.P. 0.20	6



All roads  
Design Speed = 10 MPH  
Traffic Service Level D

Road 1900 (MP 0.00 - 2.80) and Road 1904  
Curve Widening = lowboy

All other roads  
Curve Widening = logtruck



WORK LIST: ROAD 1900	
M.P.	DESCRIPTION
0.00	Jct. Rd 226 Begin reconditioning Item 201A(01) Brushing, Item 306(01) Reconditioning.
0.83	Jct with Road 1900B
2.80	Jct of 1904 and 1902
2.82	Furnish and Install Item 640(01) Gate, and Item 640(05) Gate Bypass
3.19	Jct. with RD 1900F
3.67	End reconditioning items, begin reconstruct item 173(01)A Staking, item 201(01) Clearing, item 203(01)H Excavation, item 204(01) Temp Seeding, item 625(07) Seeding and Mulch, (see sheet 6 of 22)
3.78	Item 202(02)cm Remove Metal Pipe, Item 204(09) Sediment Basin, Item 304(10) Aggregate, Item 603(01)60C Install 60" x 46' cmp
3.79	Jct. with RD 1900B End reconstruct items, begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
3.81	Remove Earthen Barrier item 203(07) Excavation Placement method 1
3.89	Jct. with RD 1900C End reconditioning items

WORK LIST: ROAD 1900F	
M.P.	DESCRIPTION
0.00	Jct. Rd 1900 Begin reconditioning Item 201(03) Clearing, item 306(01) Reconditioning.
0.29	End reconditioning items, begin reconstruct item 173(01)A Staking, item 201(01) Clearing, item 203(01)H Excavation, item 204(01) temp Seeding, item 603(01)18C 18"CMP, item 625(07) Seeding and Mulch; (See Sheet 7 of 22)
0.35	End reconstruct items, begin reconditioning Item 201(03) Clearing, item 306(01) Reconditioning.
0.38	End reconditioning items, begin reconstruct item 173(01)A Staking, item 201(01) Clearing, item 203(01)H Excavation, item 204(01) temp Seeding, Item 204(09) Sediment Basin, item 603(01)36C 36"CMP, item 625(07) Seeding and Mulch, (see sheet 8 of 22)
0.44	End reconstruct items, begin reconditioning Item 201(03) Clearing, item 306(01) Reconditioning.
0.90	Unit Boundary End reconditioning items

WORK LIST: ROAD 1902B	
M.P.	DESCRIPTION
0.00	Jct Rd 1902 Begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
0.50	End Item 306(01). Begin Item 203(07) Excavation.
0.56	End Item 203(07) Begin Item 306(01)
0.70	End reconditioning items, begin reconstruct item 173(01)A Staking, item 201(01) Clearing, item 203(01)H Excavation, item 204(01) Temp Seeding, item 625(07) Seeding and Mulch, (see sheet 9 of 22)
0.75	End reconstruct items, begin reconditioning Item 201A(01) Brushing, item 306(01) reconditioning
0.83	End reconditioning items, begin reconstruct item 173(01)A Staking, item 201(01) Clearing, item 203(01)H Excavation, item 204(01) Temp Seeding, item 625(07) Seeding and Mulch, (see sheet 10 of 22)
0.89	End reconstruct items, begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
1.00	End reconditioning items,

WORK LIST: ROAD 1900B	
M.P.	DESCRIPTION
0.00	Jct Rd 1900 Begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
0.31	End reconditioning items

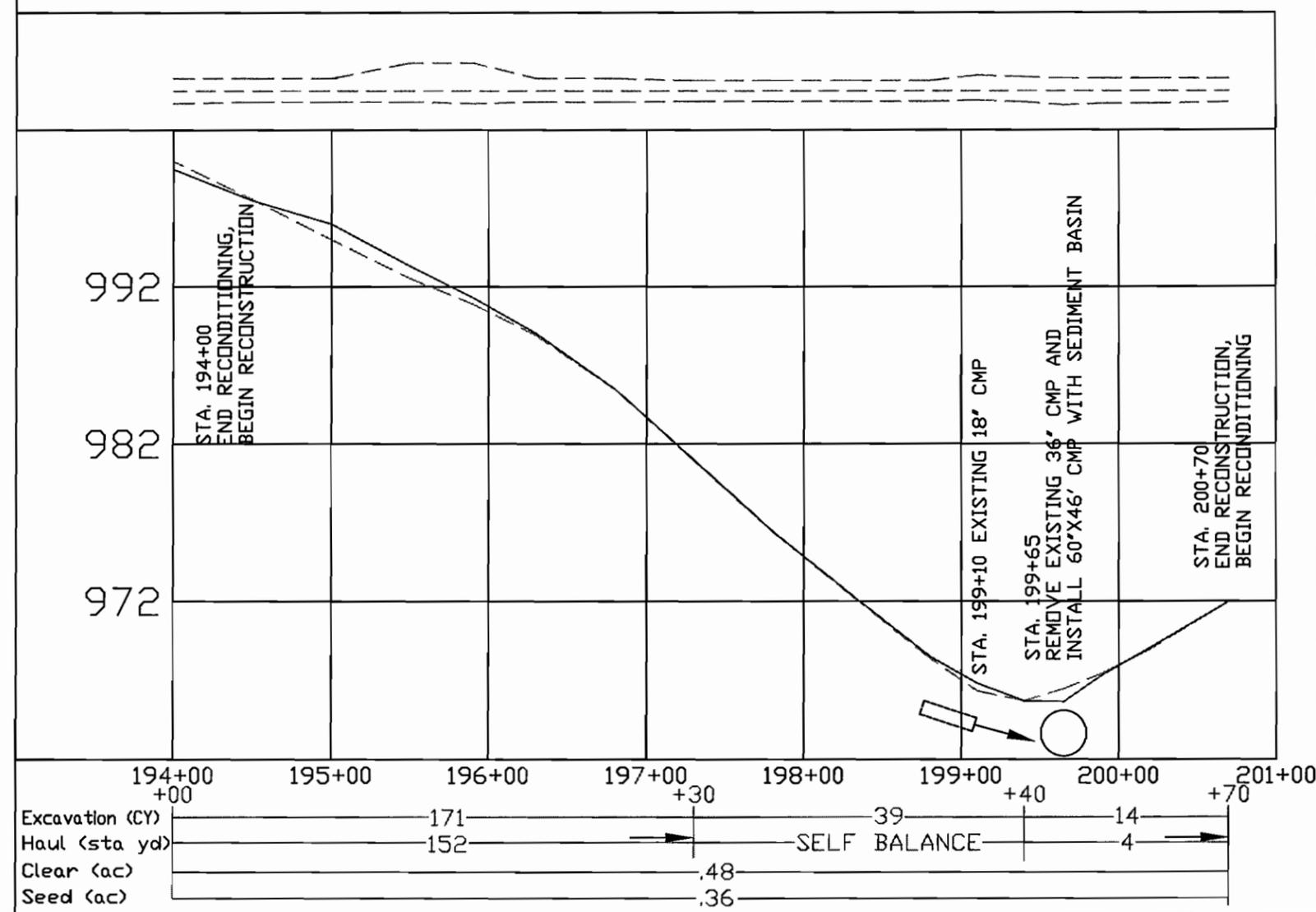
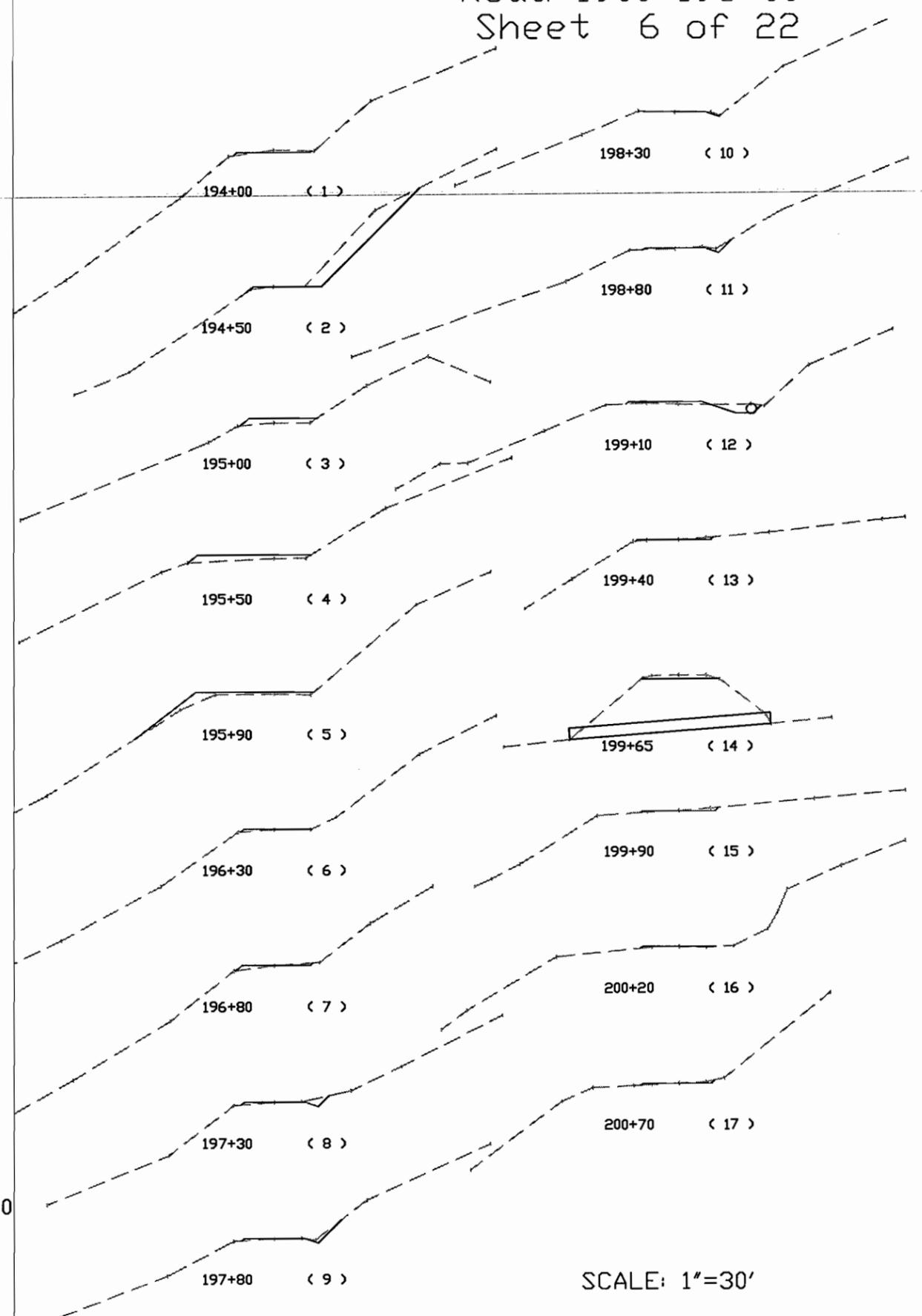
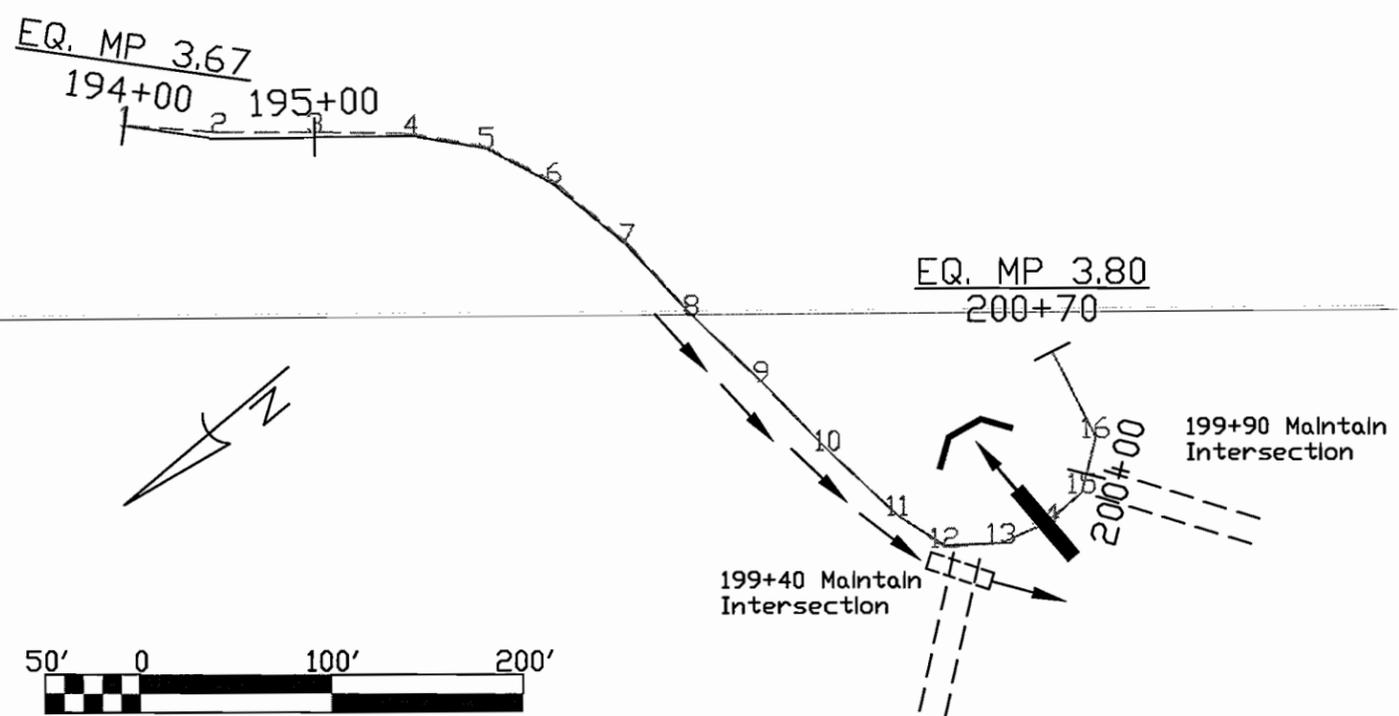
WORK LIST: ROAD 1902	
M.P.	DESCRIPTION
0.00	Jct. Rd 1900 Begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
0.10	Existing CMP Clean inlet and outlet
0.55	Existing CMP Clean inlet and outlet
1.33	Jct. with 1902B
1.65	Jct. with 1902C End Reconditioning Items.

WORK LIST: ROAD 1902C	
M.P.	DESCRIPTION
0.00	Jct Rd 1902 Begin reconditioning Item 201(03) Clearing, item 306(01) Reconditioning.
0.20	End reconditioning

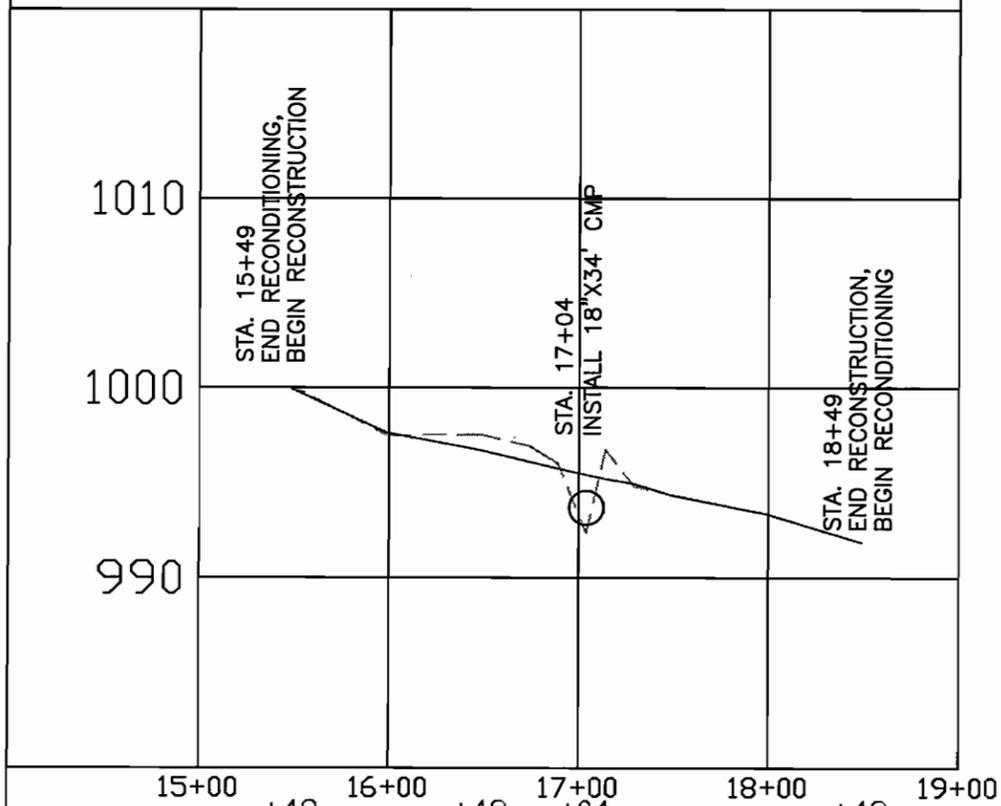
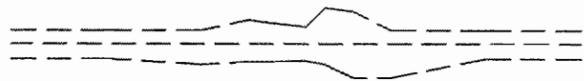
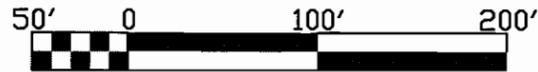
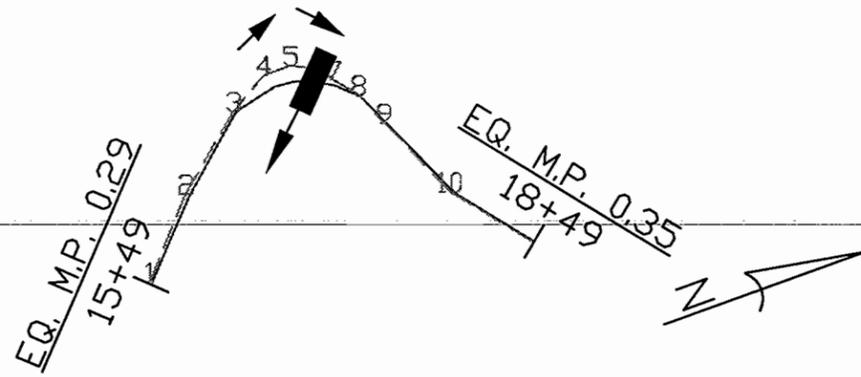
WORK LIST: ROAD 1900C	
M.P.	DESCRIPTION
0.00	Jct Rd 1900 Begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
0.84	End reconditioning items

WORK LIST: ROAD 1904	
M.P.	DESCRIPTION
0.00	Jct. Rd 1900 Begin reconditioning Item 201A(01) Brushing, item 306(01) Reconditioning.
0.20	Item 202(02)cm Remove 18" Metal Pipe, Item 204(09) Sediment Basin, Item 304(10) Aggregate, Item 603(01)36C Install 36" x 46' cmp
1.10	Repair fill settlement, item 203(07) Excavation Placement method 1, Item 304(10) Aggregate,
1.80	End reconditioning,

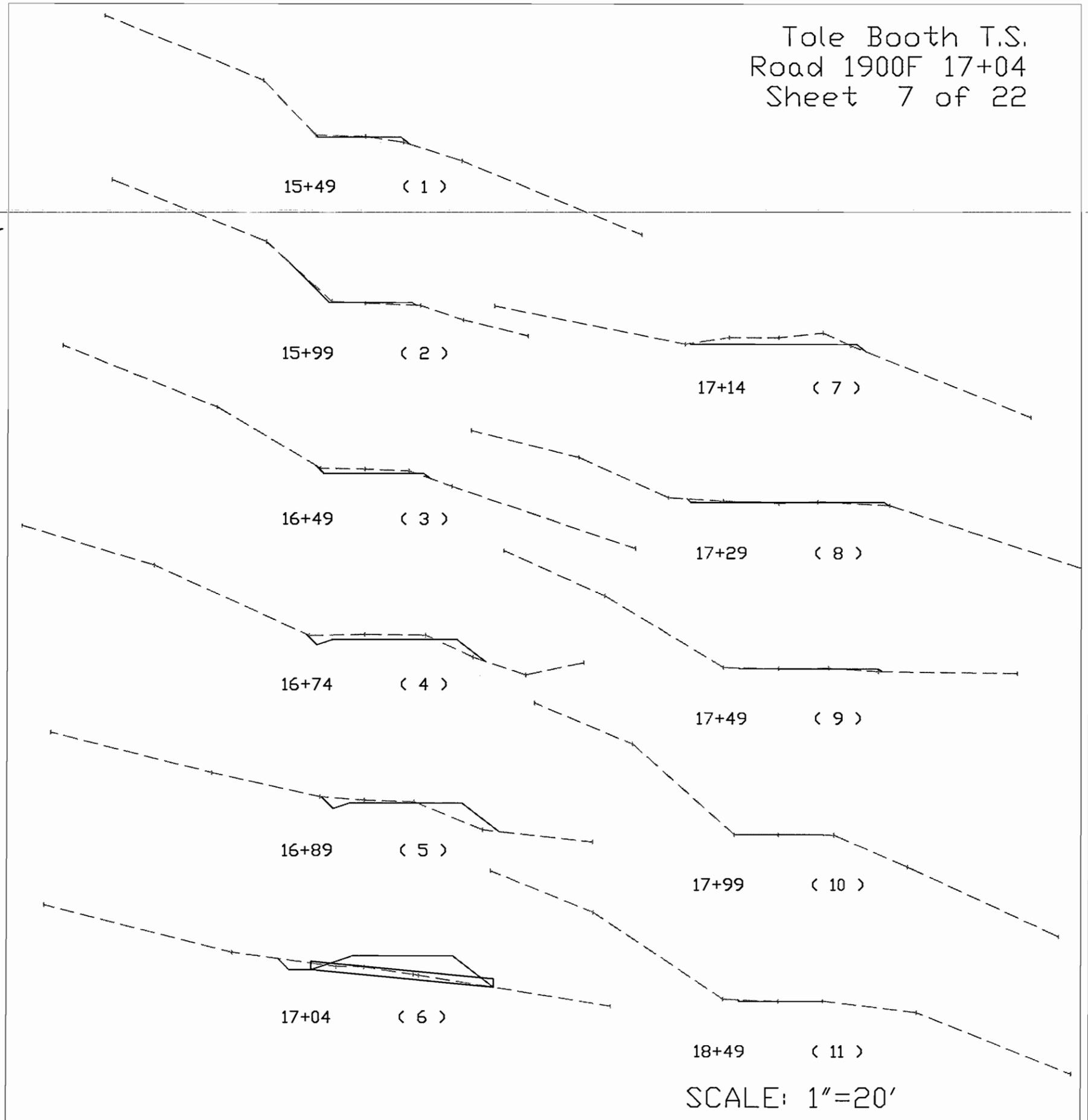




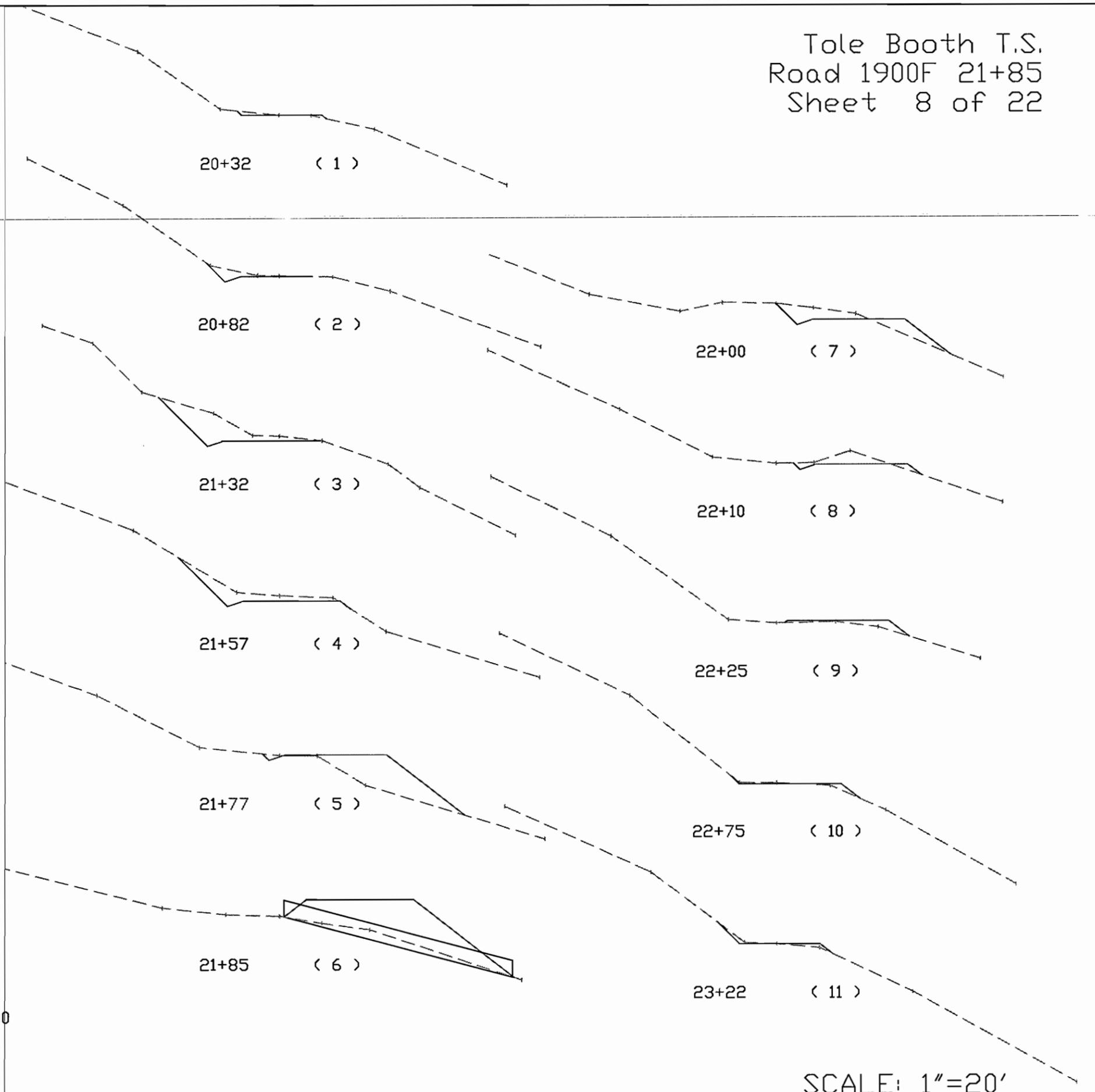
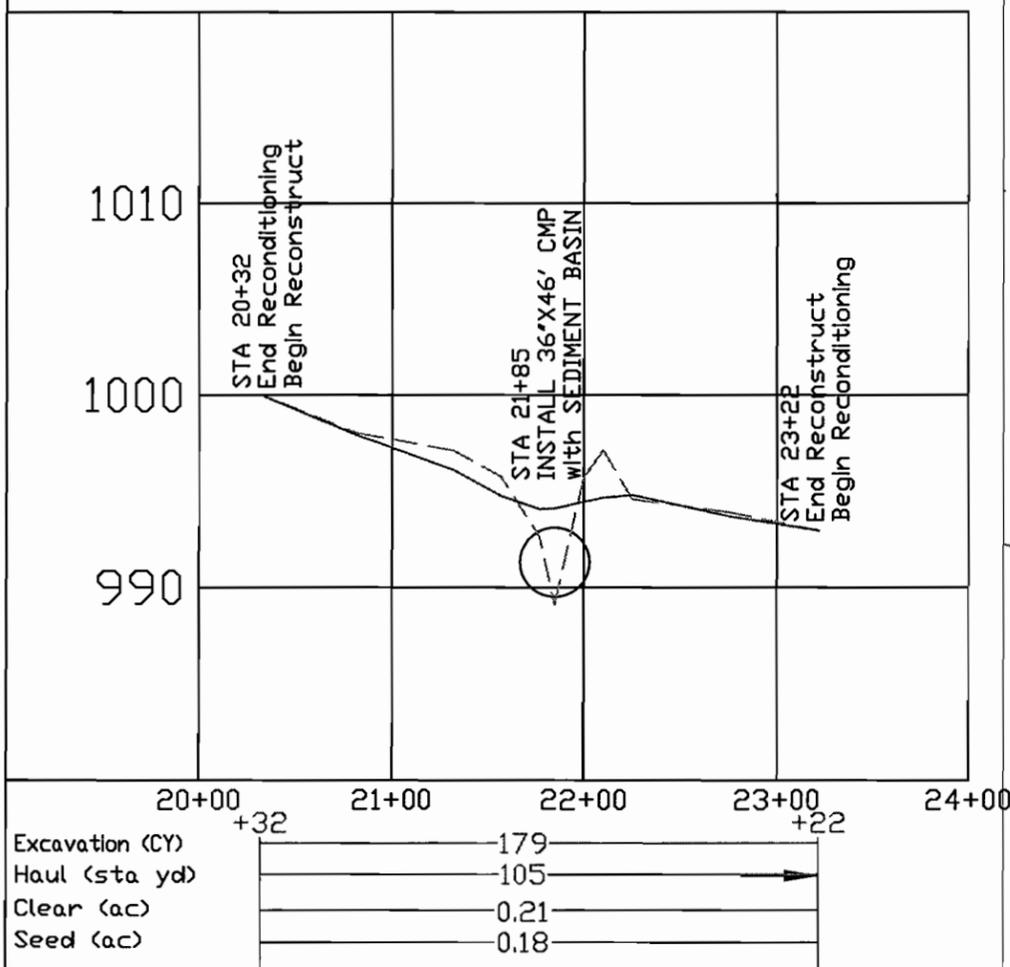
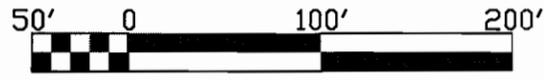
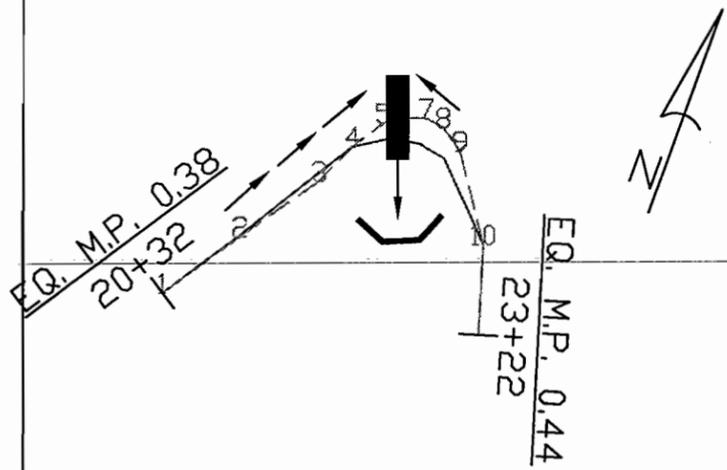
SCALE: 1"=30'



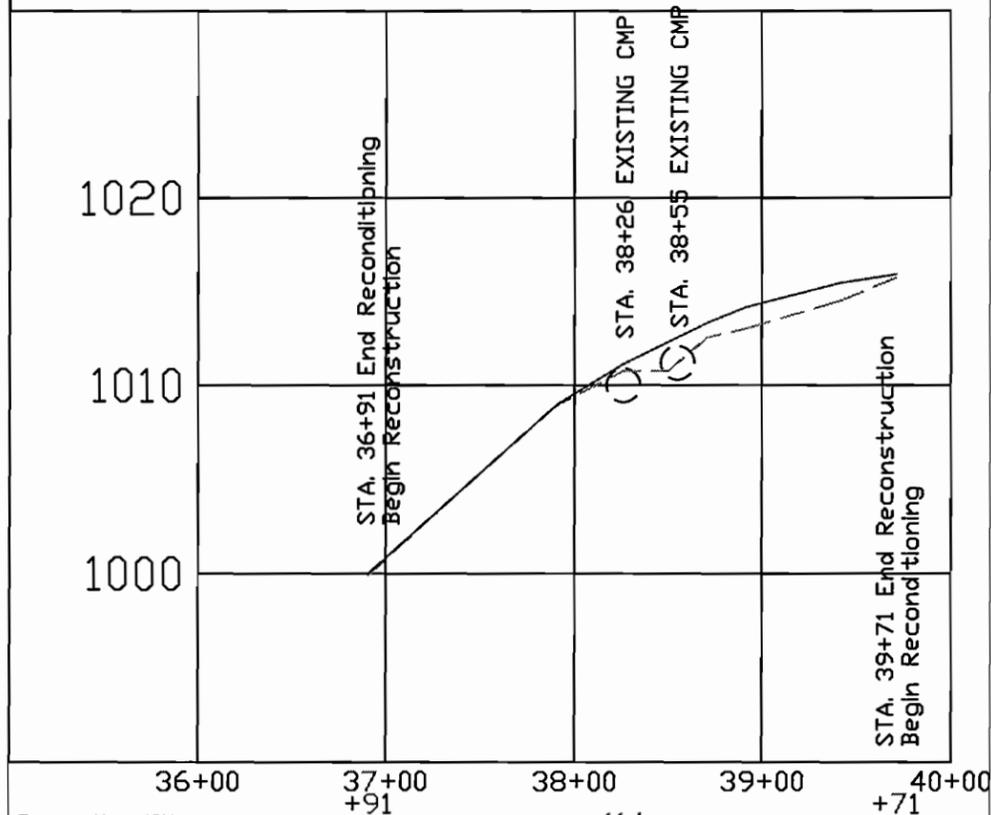
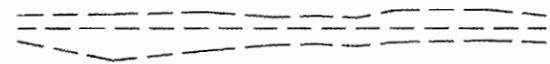
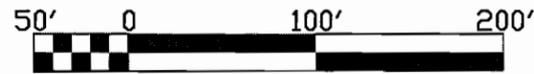
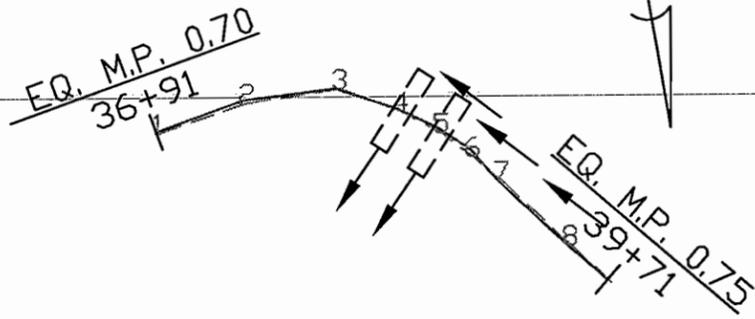
Excavation (CY)	7	41	25
Haul (sta yd)	0	9	3
Clear (ac)		0.22	
Seed (ac)		0.17	



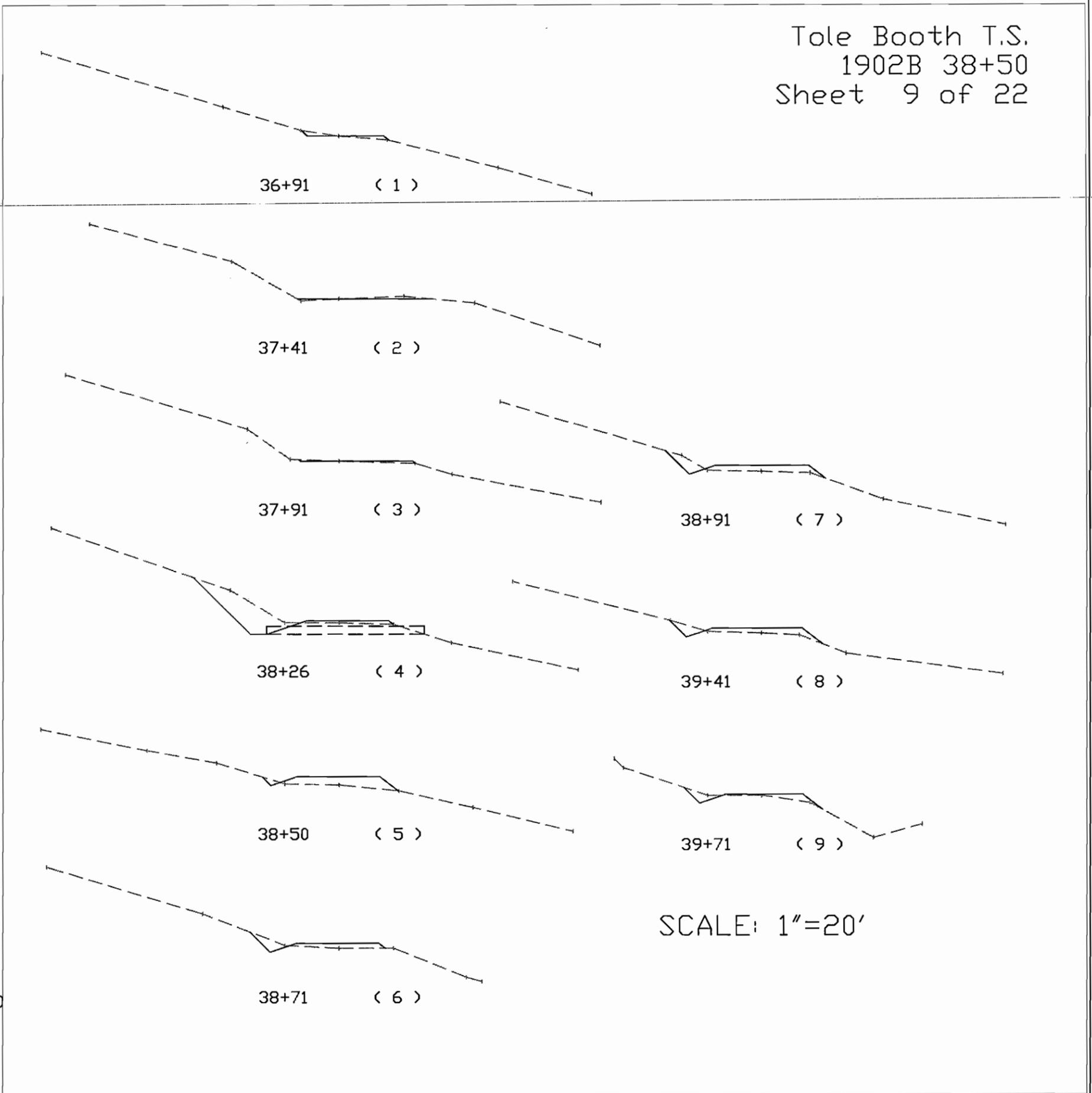
SCALE: 1"=20'



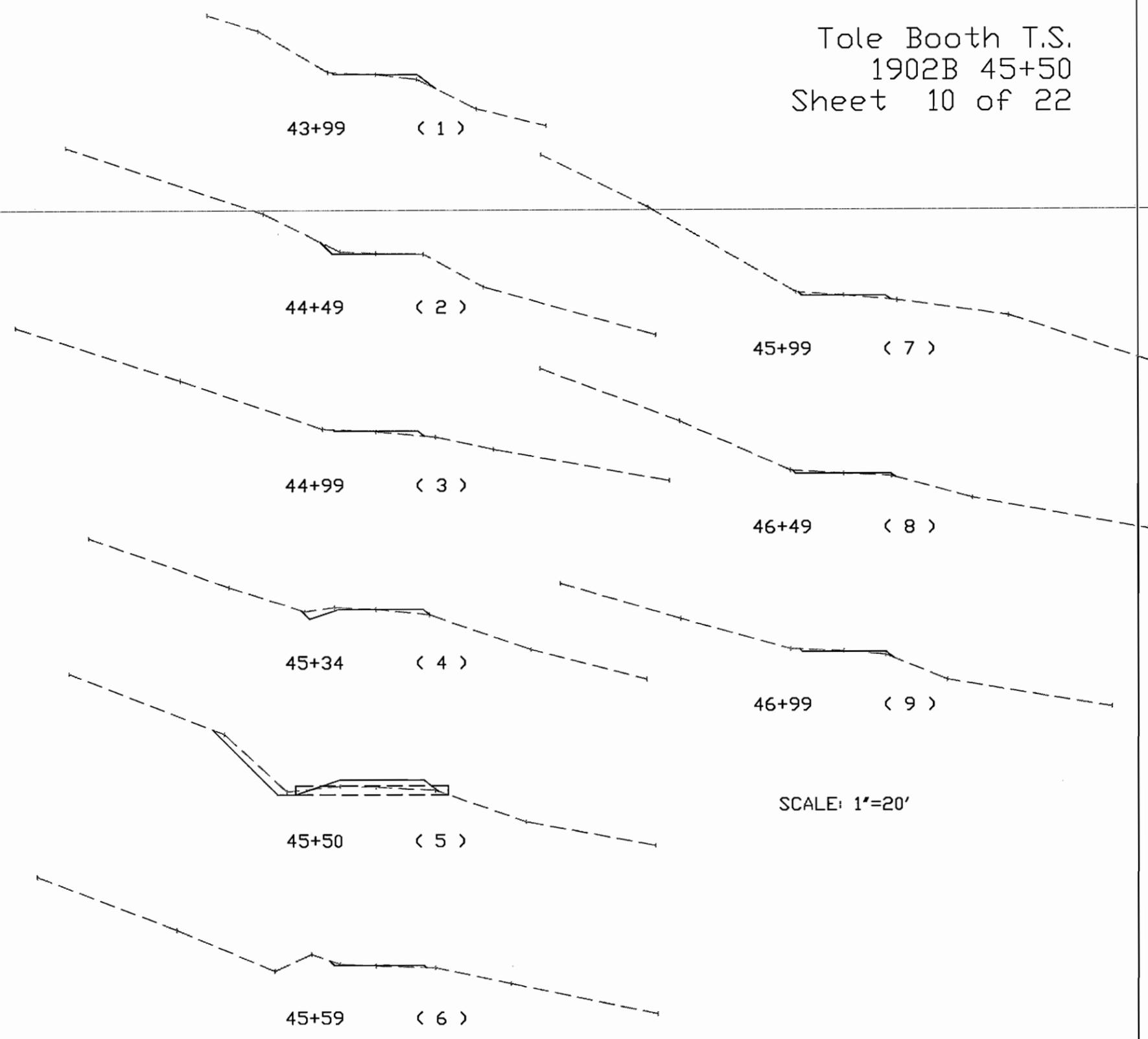
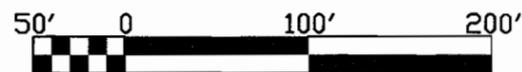
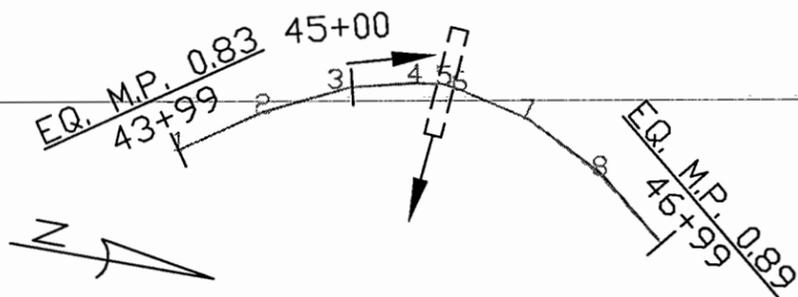
SCALE: 1"=20'



Excavation (CY)	114
Haul (sta yd)	44
Clear (ac)	.21
Seed (ac)	.17



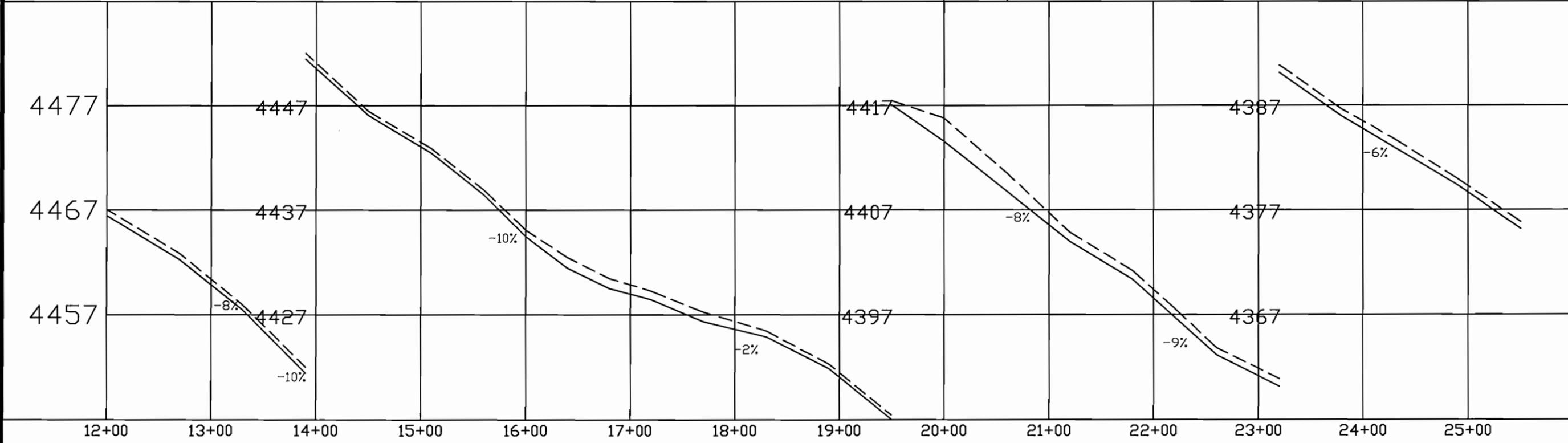
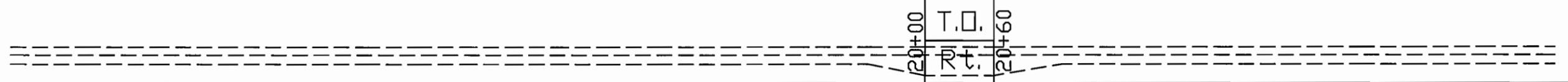
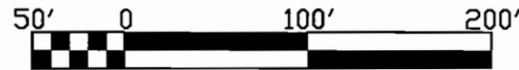
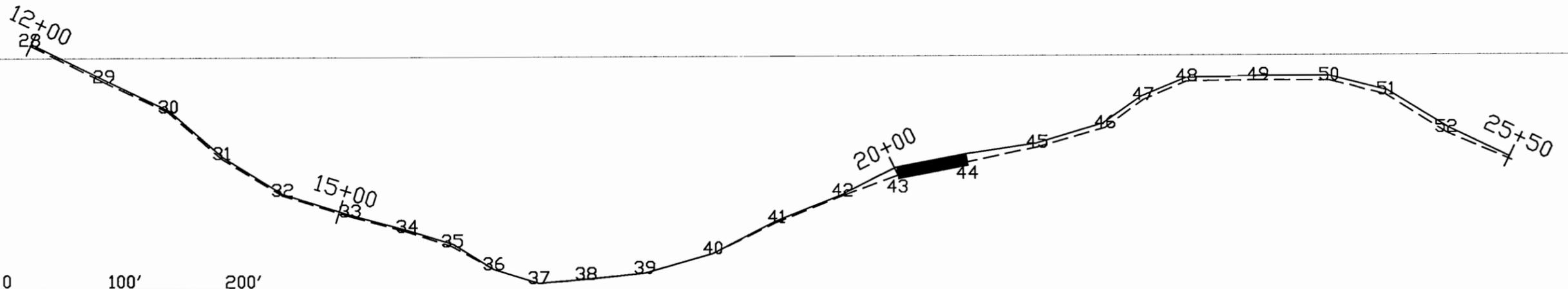
SCALE: 1"=20'



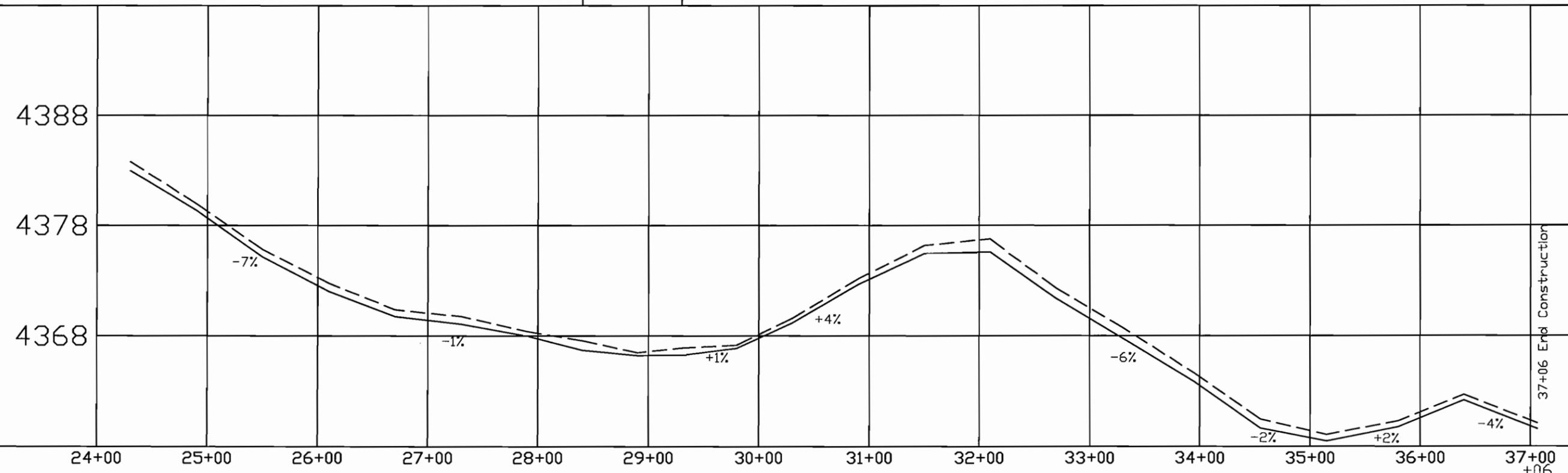
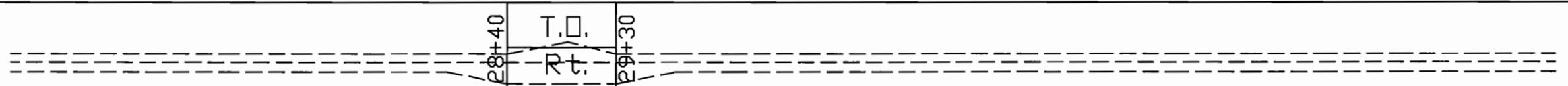
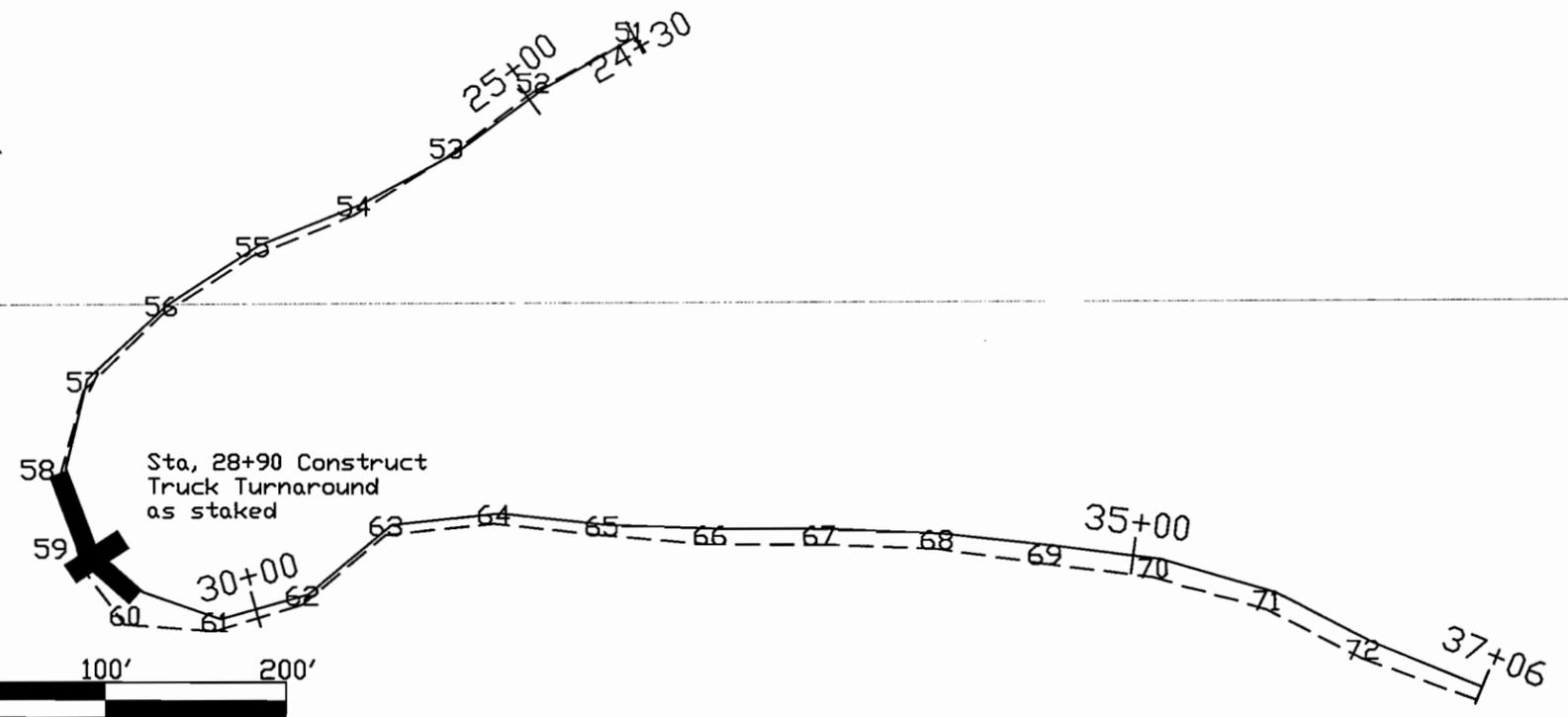
SCALE: 1"=20'

1020					
1010	STA. 43+99 End Reconditioning. Begin Reconstruction.		STA. 45+50 EXISTING CMP	STA. 45+59 Remove Berm and fill ditch left	STA. 46+99 End Reconstruction. Begin Reconditioning.
1000					
	43+00	44+00 +99	45+00	46+00	47+00 +99
Excavation (CY)			34		
Haul (sta yd)			— SELF BALANCE —		
Clear (ac)			0.20		
Seed (ac)			0.13		

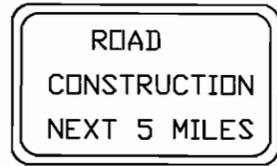




Excavation (CY)	2382
Haul (sta yd)	Self Balance
Clear (ac)	0.98
Seed (ac)	0.73



Excavation (CY)		Self Balance	
Haul (sta yd)			
Clear (ac)	+90		0.97
Seed (ac)			0.68



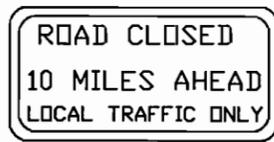
FG20-1 60"x36"



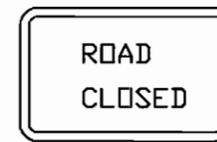
G20-2 60"x24"



W20-1 48"x48"



R11-3a 60"x30"



R11-2 48"x30"



FR13-1C 60"x30"



W22-1 48"x48"



W22-2 42"x36"



W22-3 42"x36"



FW11-9a 30"x30"



W21-2 30"x30"



W21-1 30"x30"



W21-6 30"x30"



W21-4 36"x36"



W21-3 36"x36"



W21-5 30"x30"

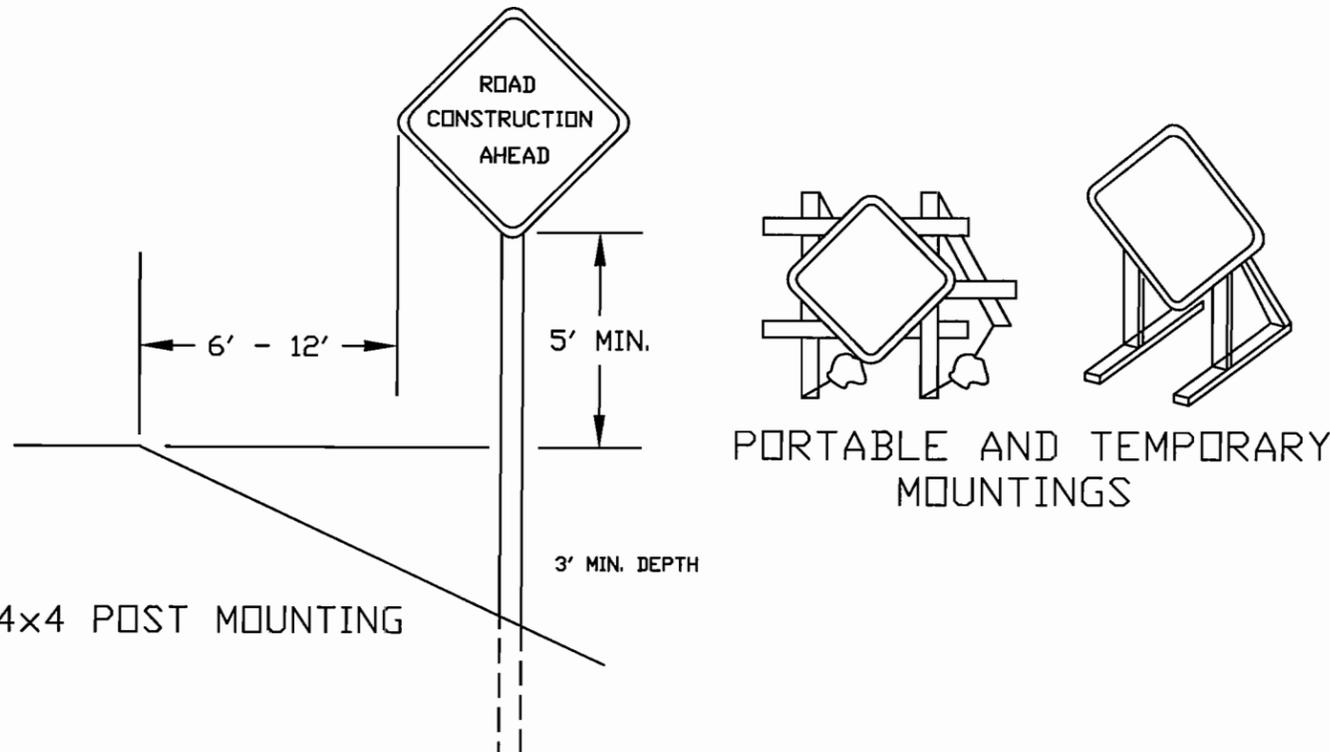
### TYPICAL CONSTRUCTION WARNING SIGNS (AS PER M.U.T.C.D)

### GENERAL NOTES

1. The Purchaser/Contractor shall have the responsibility for furnishing, installing, maintaining, and removing construction warning signs in conformance with the latest revision of the Manual of Uniform Traffic Control Devices (M.U.T.C.D).
2. Warning signs shall be installed at the location shown below prior to beginning of construction or reconstruction. FW11-9a signs shall be installed prior to hauling activities.
3. During periods of non-work (weekends, holidays, end of work day, etc.) all FW11-9a signs shall be covered or removed.
4. Additional warning signs shall be temporarily installed by the Purchaser/Contractor as mutually agreed by the Purchaser/Contractor and engineering representative.
5. All warning signs shall be removed from the project by the Purchaser/Contractor upon completion and acceptance of the project.
6. Payment to the Purchaser/Contractor for furnishing, installing, maintaining, and removing construction warning signs is considered incidental to Pay Item 601 - Mobilization; no separate payment will be made.
7. Construction "Warning Signs" color shall be a black symbol or message on an orange background as per M.U.T.C.D.
8. Regulatory sign color shall be a black legend and border on white background as per M.U.T.C.D.
9. All signs signs shall be either reflectorized with a material that has a smooth, sealed outer surface, or illuminated to show approximately the same shape and color day and night.

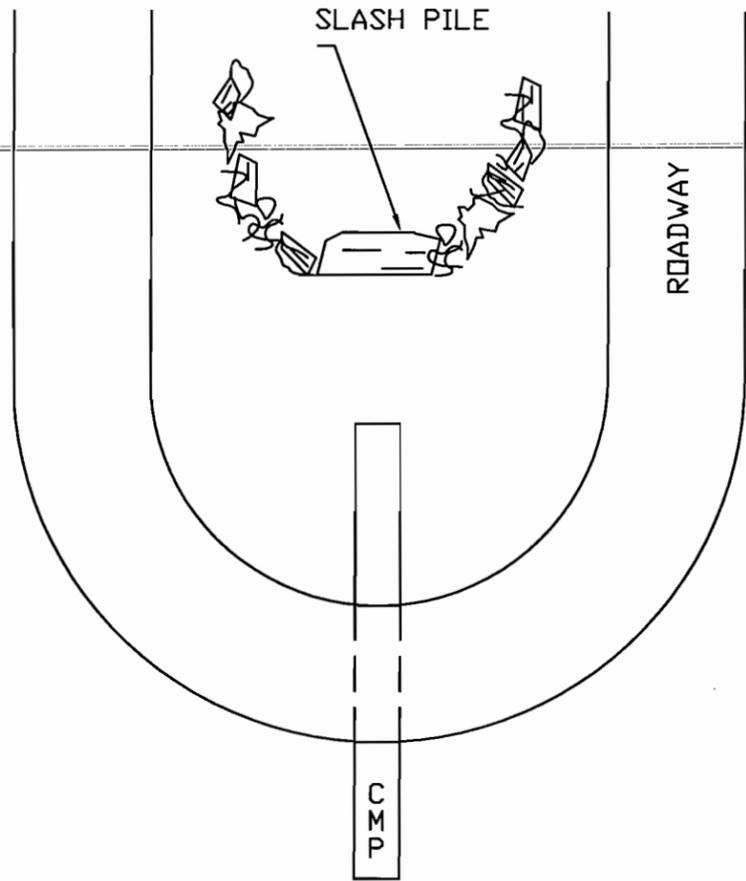
### MINIMUM SIGNS REQUIRED FOR THIS PROJECT Install additional signs as directed by the CD

ROAD	LOCATION	WARNING SIGN	PERIOD OF USE
226	Jct 1491	HEAVY TRUCK TRAFFIC FW11-9A	LOG, WATER, OR AGGREGATE HAUL
1451	Jct SH-3	HEAVY TRUCK TRAFFIC FW11-9A	LOG, WATER, OR AGGREGATE HAUL
1491	Jct 1451	HEAVY TRUCK TRAFFIC FW11-9A	LOG, WATER, OR AGGREGATE HAUL
1900	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1900B	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1900C	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1900F	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1902	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1902B	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1902C	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A ROAD CONSTRUCTION AHEAD W20-1	LOG, WATER, OR AGGREGATE HAUL RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1904	MP 0.01	HEAVY TRUCK TRAFFIC FW11-9A	LOG, WATER, OR AGGREGATE HAUL
	Jct 1904C	ROAD CONSTRUCTION AHEAD W20-1	RECONSTRUCTION OR CONSTRUCTION ACTIVITIES
1904C	MP 0.01	ROAD CONSTRUCTION AHEAD W20-1	RECONSTRUCTION OR CONSTRUCTION ACTIVITIES



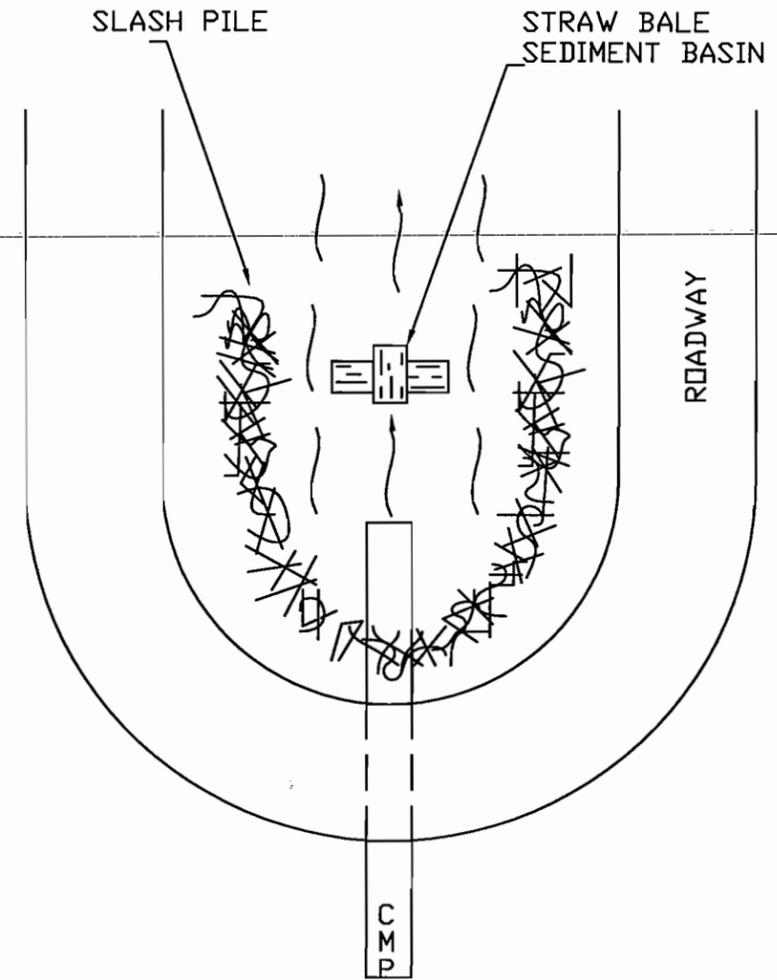
### TYPICAL SIGN INSTALLATION (AS PER M.U.T.C.D)

PLAN - DRY DRAW

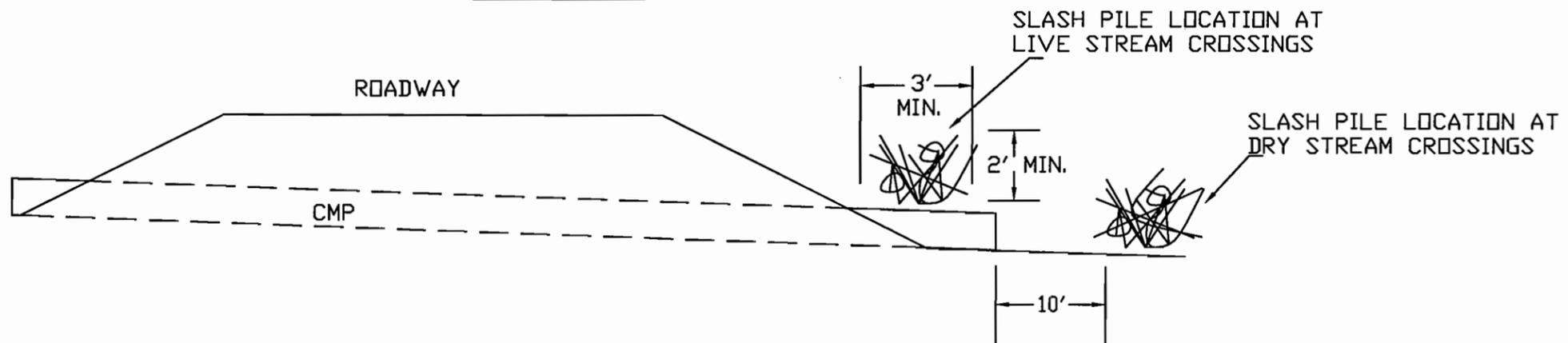


PILING CONSTRUCTION  
SLASH TYPICAL SECTION

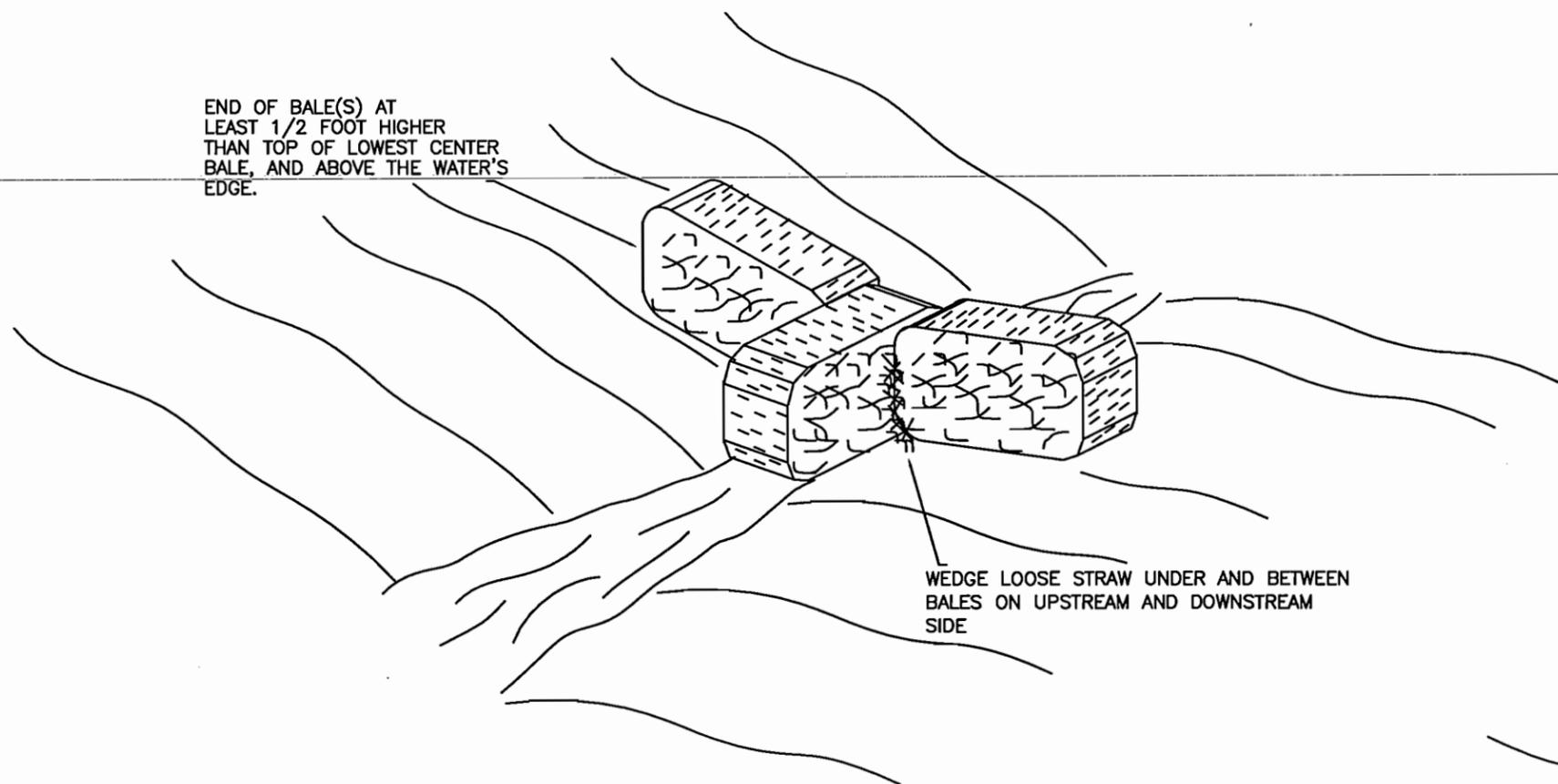
PLAN - WET DRAW



PROFILE



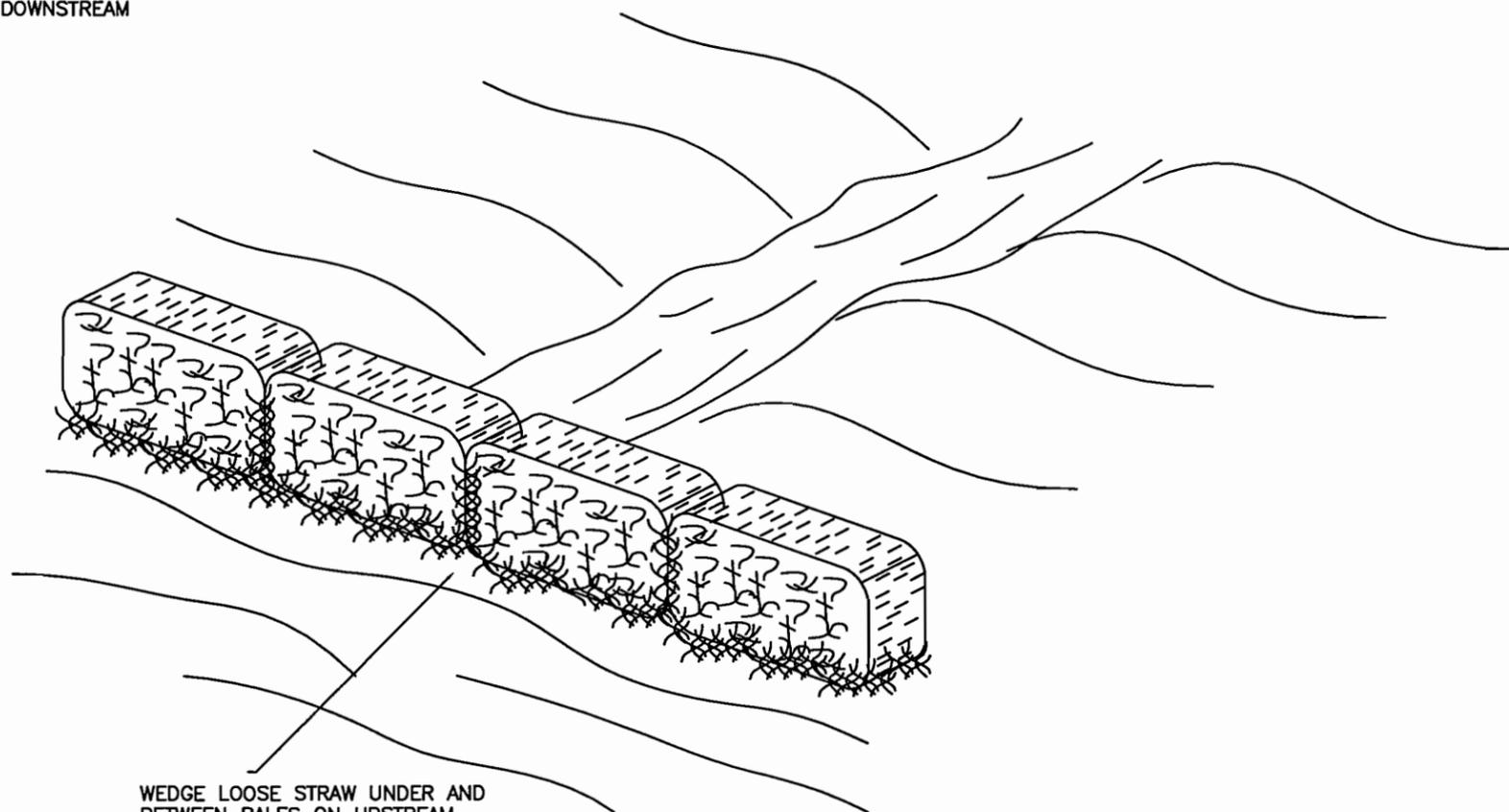
TYPE A  
(FOR NARROW V BOTTOM DRAWS)



END OF BALE(S) AT  
LEAST 1/2 FOOT HIGHER  
THAN TOP OF LOWEST CENTER  
BALE, AND ABOVE THE WATER'S  
EDGE.

WEDGE LOOSE STRAW UNDER AND BETWEEN  
BALES ON UPSTREAM AND DOWNSTREAM  
SIDE

TYPE B  
(FOR WIDE FLAT BOTTOM DRAWS)



WEDGE LOOSE STRAW UNDER AND  
BETWEEN BALES ON UPSTREAM  
AND DOWNSTREAM SIDE

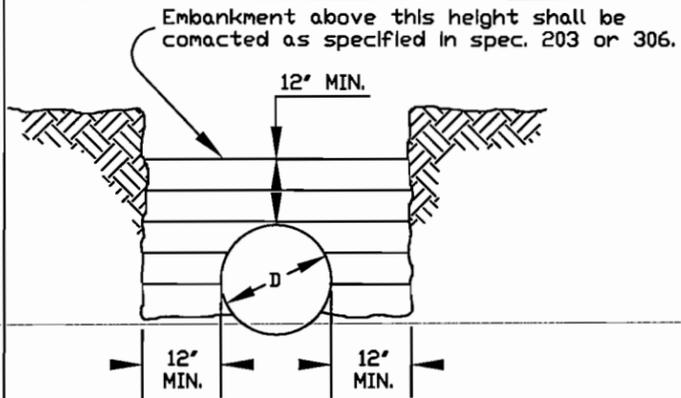
NOTE: THE NUMBER OF BALES SHOWN ABOVE ARE  
FOR TYPICAL INSTALLATIONS. THE ACTUAL  
NUMBER OF BALES REQUIRED MAY VARY.

STRAW BALE SEDIMENT BASINS  
ITEM 204(09)

NOTES:

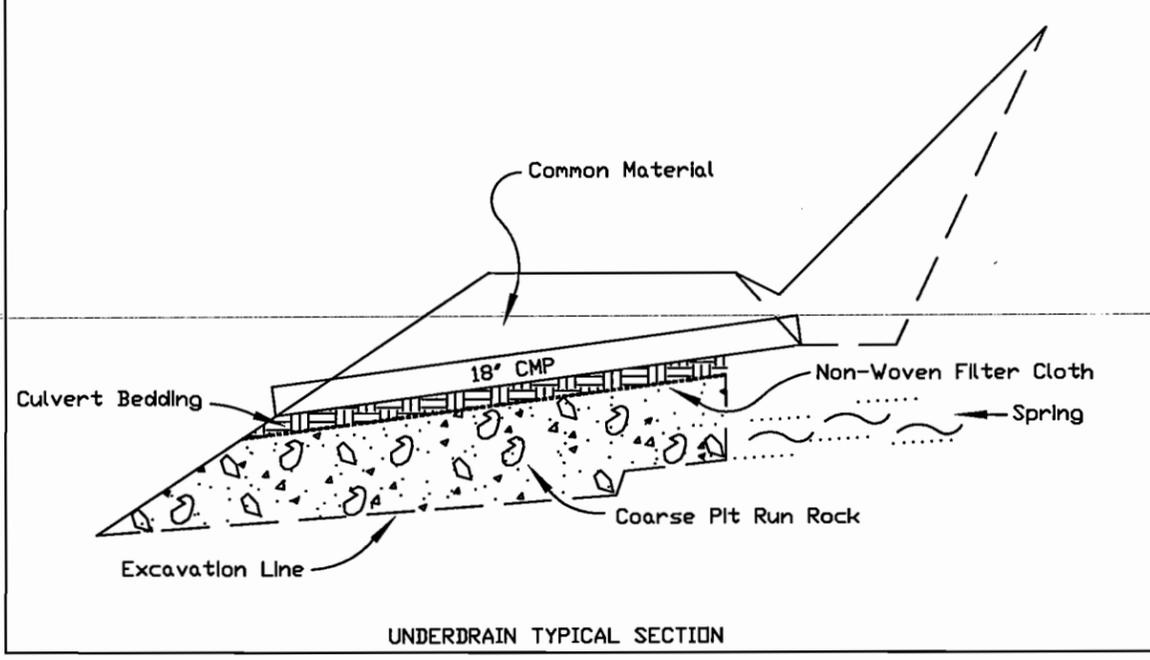
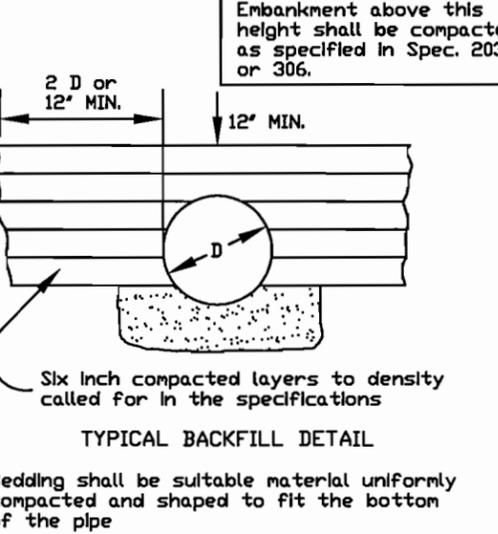
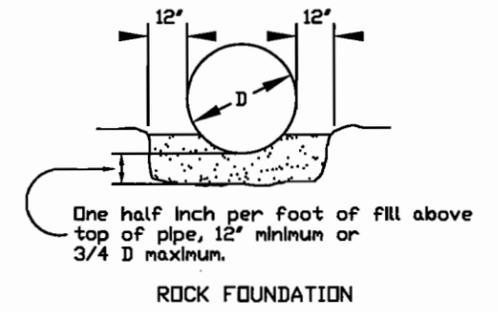
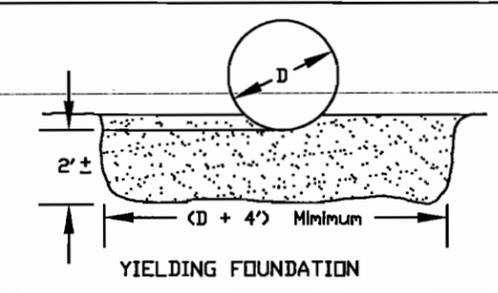
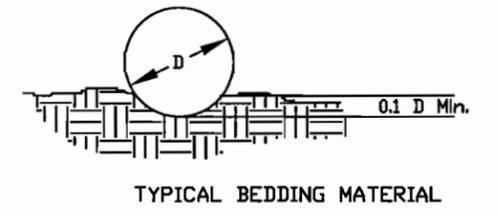
1. GRASS HAY OR STRAW SHALL BE OF APPROVED HERBACEOUS MOWINGS, CERTIFIED FREE OF NOXIOUS WEEDS OR OTHER OBJECTIONABLE MATERIAL.
2. STRAW BALE SEDIMENT BASINS SHALL BE CONSTRUCTED IN THE AREAS SHOWN ON THE DRAWINGS PRIOR TO PIONEER ROAD CONSTRUCTION ACTIVITY IN THE AREA.
3. THE BARRIER LENGTH SHALL EXTEND ACROSS THE STREAM SO THAT THE BOTTOM OF EACH END BALE IS AT LEAST ONE HALF FOOT HIGHER THAN THE TOP OF THE LOWEST CENTER BALE AND ABOVE THE WATER'S EDGE.
4. BALES SHALL BE STAKED OR WEIGHTED IN PLACE USING NATIVE MATERIALS. LOOSE STRAW OR HAY SHALL BE WEDGED UNDER AND BETWEEN THE BALES.
5. STRAW BALE SEDIMENT BASINS SHALL BE REGULARLY MAINTAINED DURING CONSTRUCTION OF ADJACENT ROAD SEGMENTS AND REPAIRED AS NECESSARY. DAMAGED OR WASHED OUT BALES WILL BE REPLACED.





Maximum 6-inch compacted layers to density called for in the specifications. Bedding shall be suitable material uniformly compacted and shaped to fit the bottom of the pipe.

METAL THICKNESS AND GAGE TABLES			
Steel			Approx. Gage
Zinc Coated	Un-Coated	Aluminum	
Metal Thickness in Inches			
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8
0.188	0.1838		7
0.218	0.2145		5
0.249	0.2451		3
0.280	0.2758		1



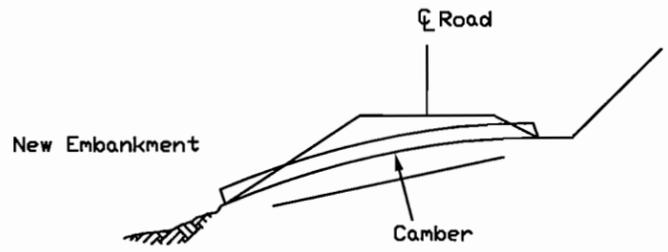
**GENERAL NOTES:**

**TREATMENT OF DAMAGED SPELTER:** The damaged or corroded ends of metal pipe to be extended shall be removed. If the damaged end is flame cut, the burned spelter on the galvanized pipe shall be wire brushed to clean metal and the area shall be painted with two coats of paint, high in zinc content, for repair of the galvanized surfaces.

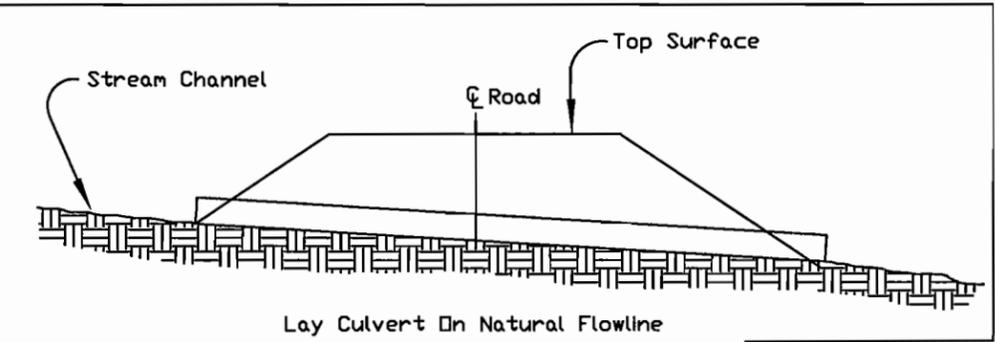
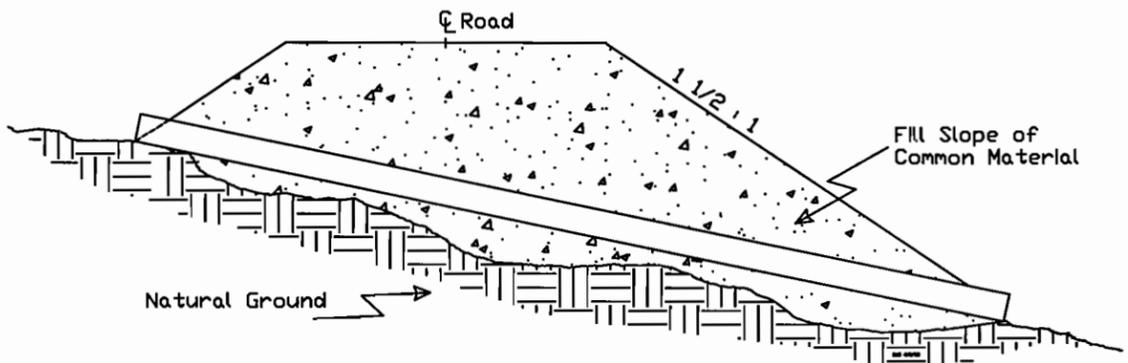
**SETTLEMENT AND CAMBER:** Pipes shall be cambered as necessary to compensate for any anticipated settlement in the foundation or bed. Camber shall be on a parabolic curve with no point along the invert being higher than the invert at the inlet.

**EMBANKMENT AND FOUNDATION SOIL CONDITION**  
Existing Fills, Regardless of Foundation Soils

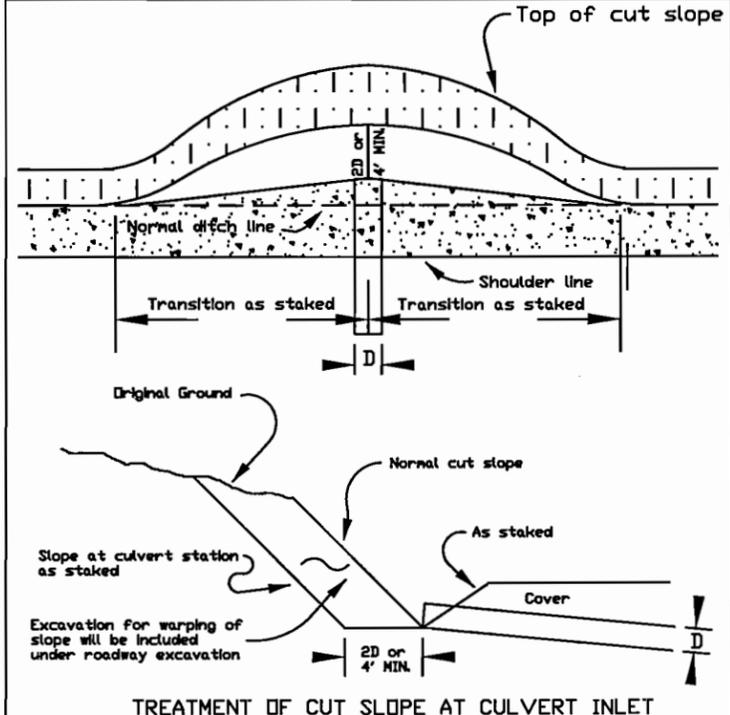
**CAMBER**  
1% of pipe length, not to exceed 3/4 of pipe span.



TYPICAL INSTALLATION IN EMBANKMENT

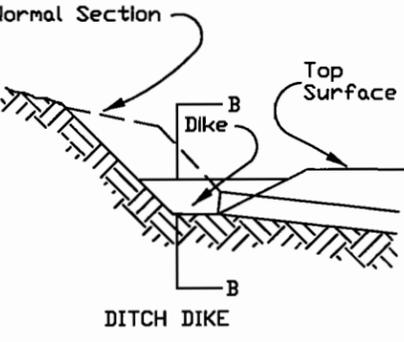
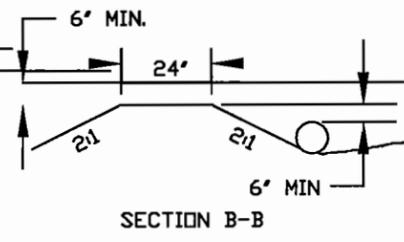


TYPICAL INSTALLATION IN STREAM CHANNEL



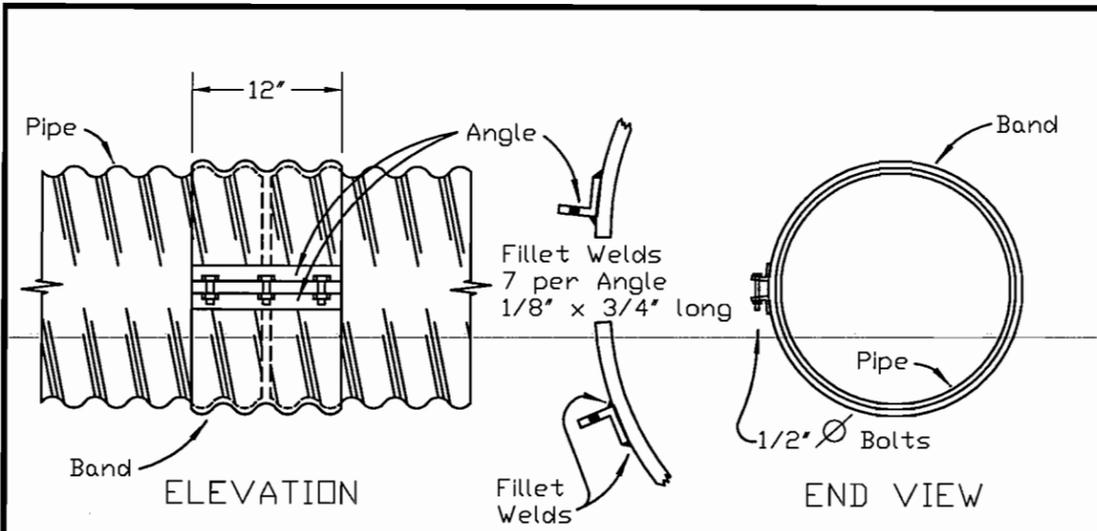
TREATMENT OF CUT SLOPE AT CULVERT INLET

Construct Ditch Dikes at Locations designated by the Engineer

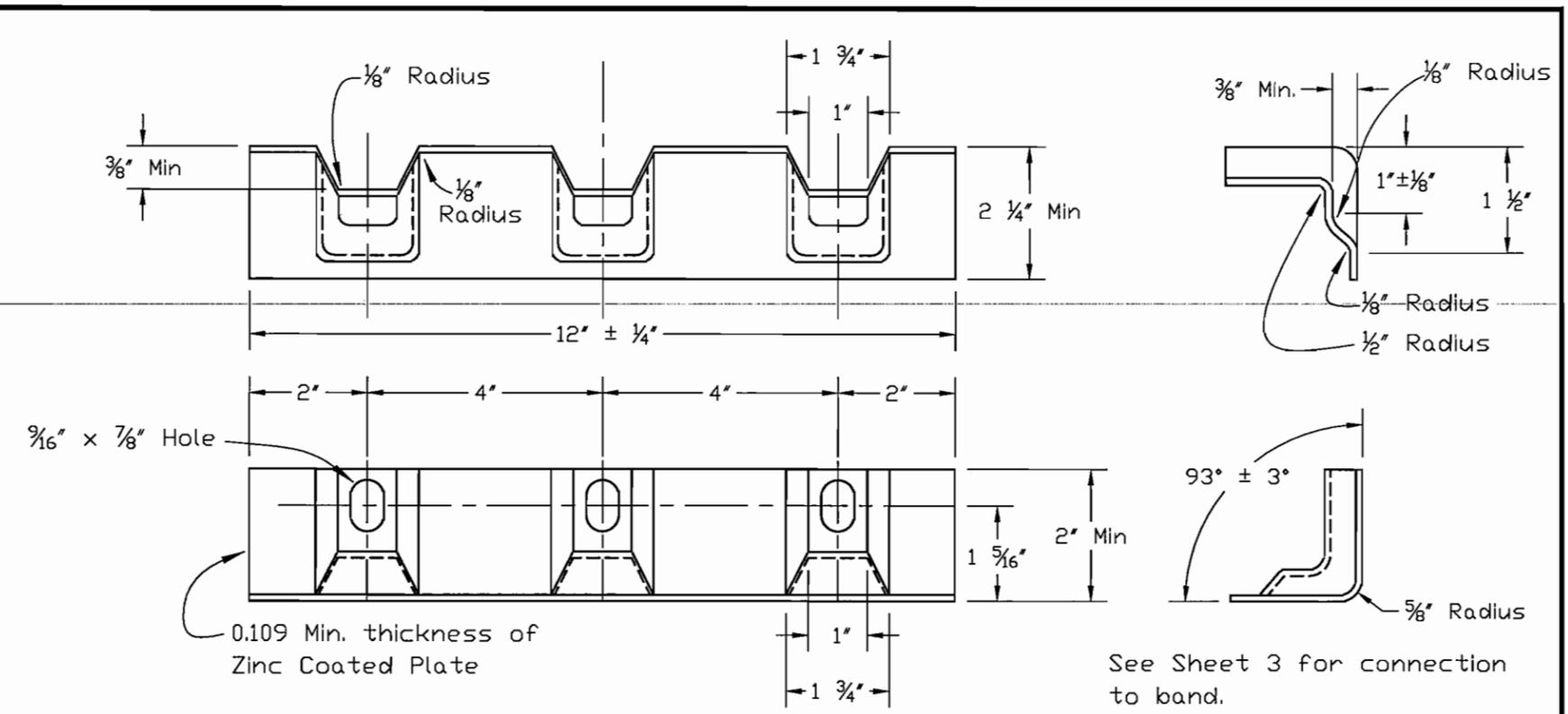


DITCH DIKE

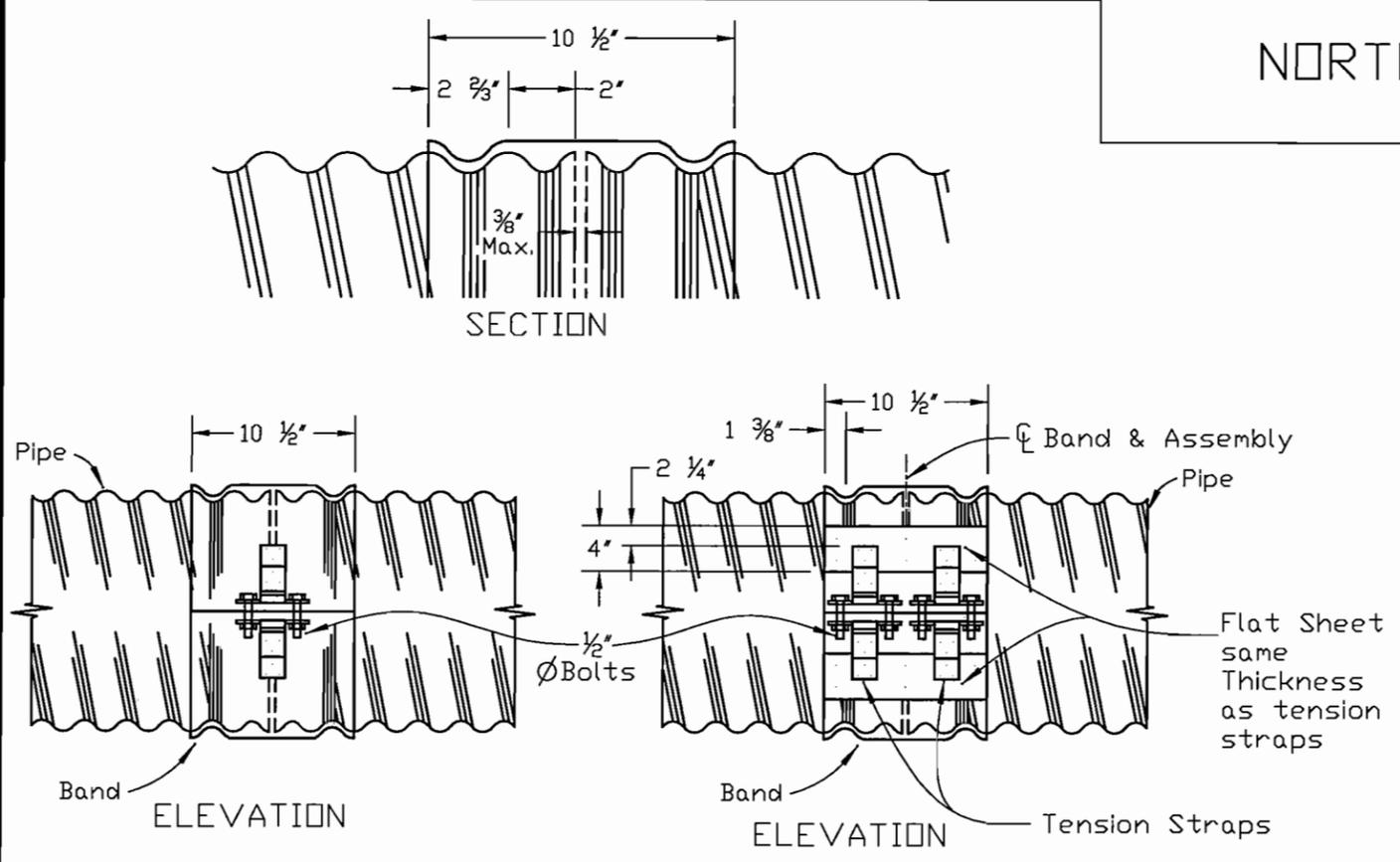
NO SCALE  
**CULVERT DETAILS**



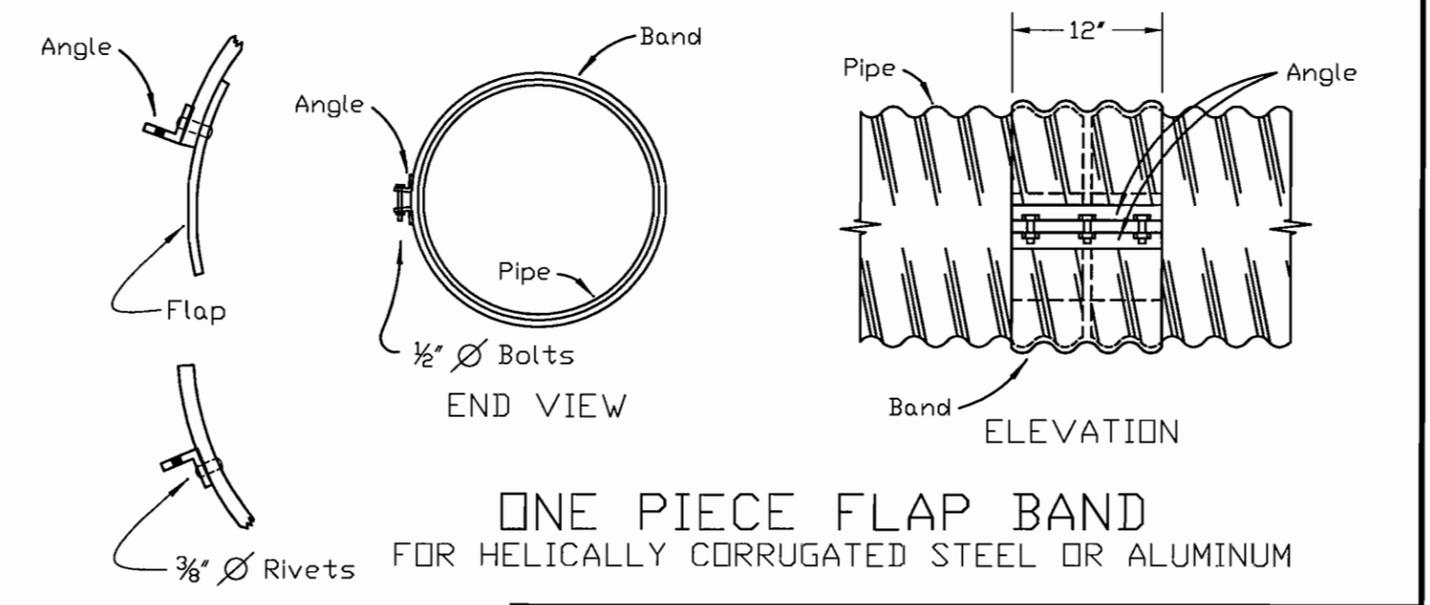
AMERICAN CULVERT BAND  
FOR HELICALLY CORRUGATED STEEL PIPE



NORTHWEST CULVERT ANGLE ALTERNATIVE  
FOR STEEL PIPE

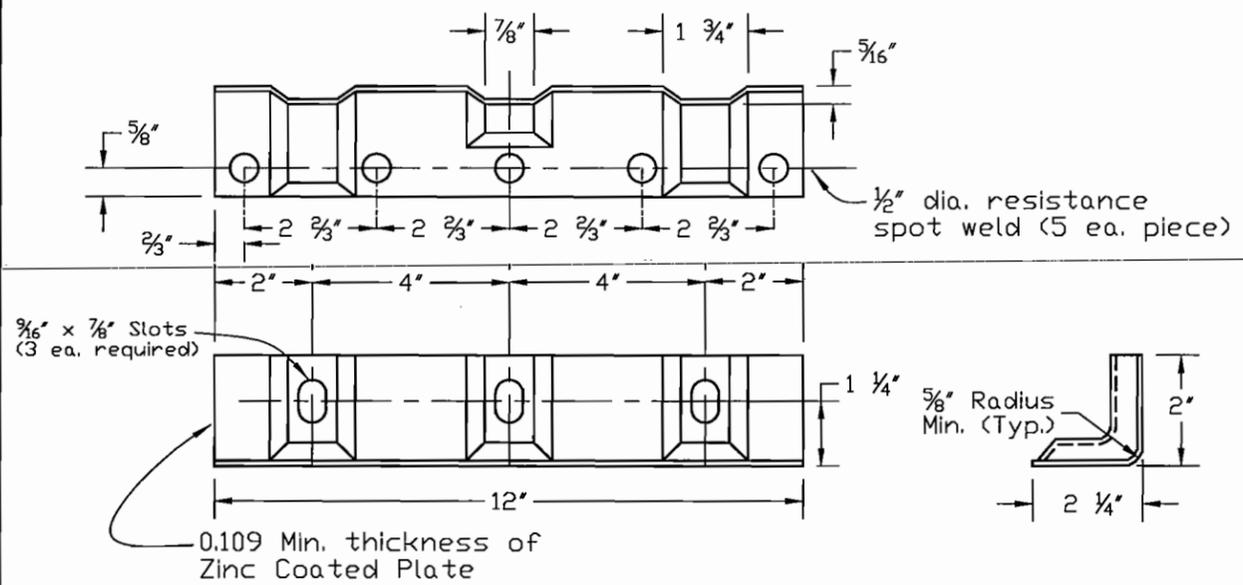


HUGGER COUPLING BAND  
FOR REFORMED END HELICALLY CORRUGATED  
WELDED SEAM STEEL PIPE

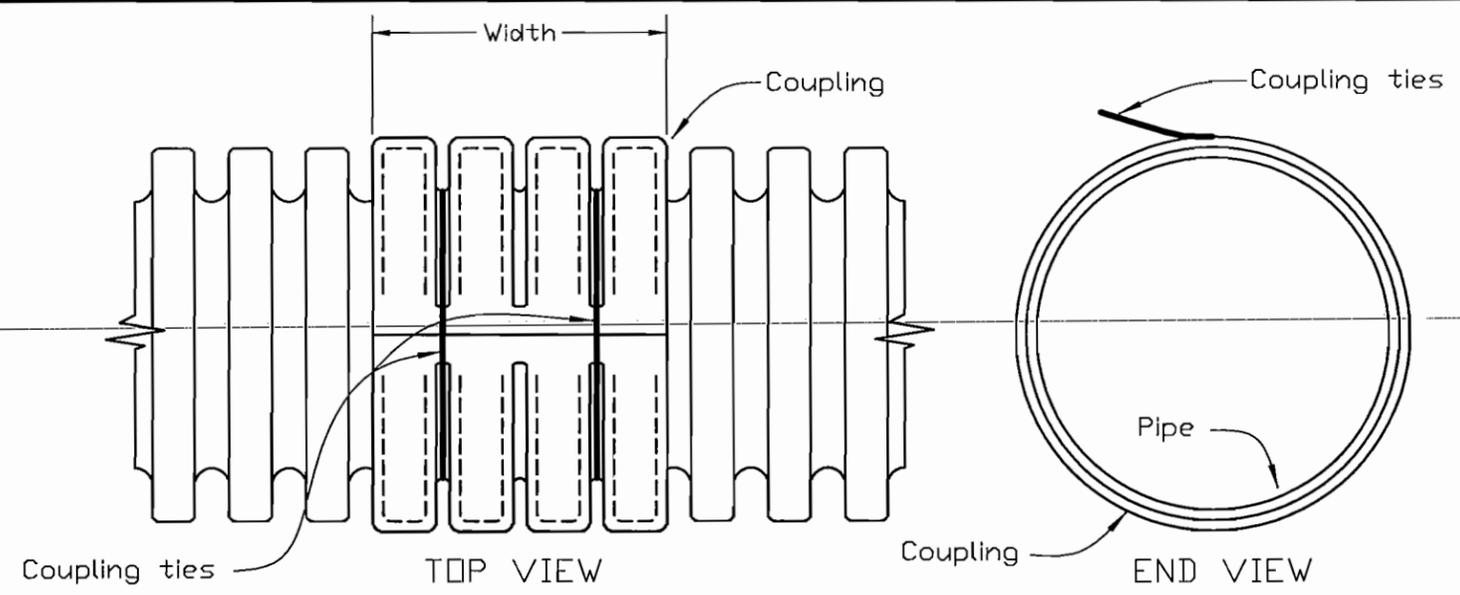


ONE PIECE FLAP BAND  
FOR HELICALLY CORRUGATED STEEL OR ALUMINUM

COUPLING BAND DETAILS FOR  
CORRUGATED PIPE AND PIPE ARCH  
Submitted CARL CAIN Date 6/7/89  
Approved BILL HARPER Date 6/13/89  
Acad Brent Briggs Date 2/00  
DRAWING NO. R1690 Sheet 1 of 3  
Tol Booth T.S. Sheet 19 of 22

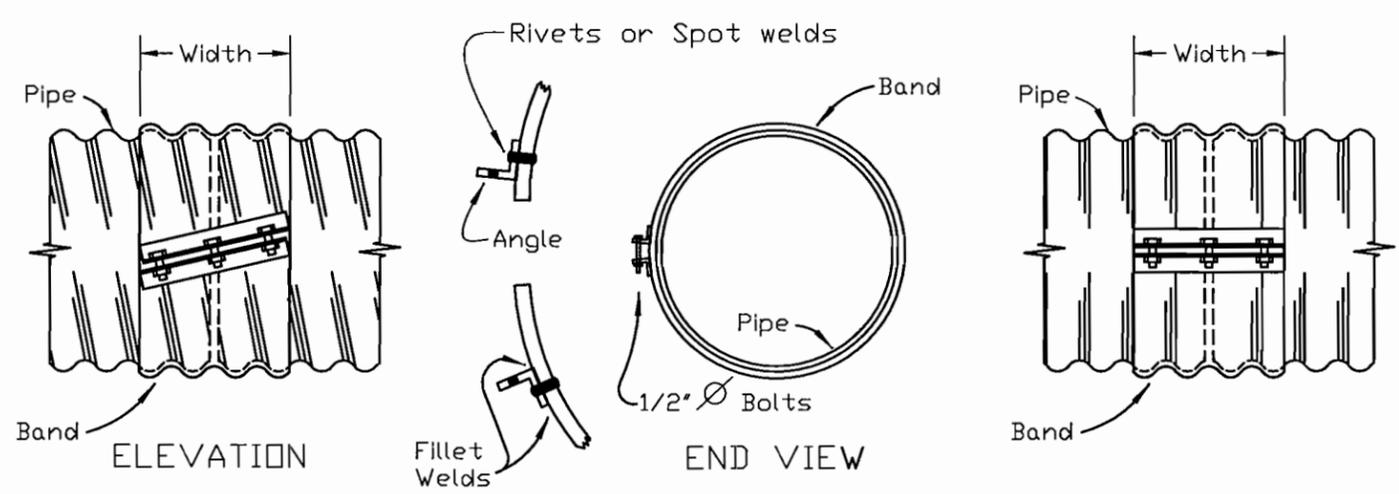


ALTERNATE FOR 2X2X3/16 ANGLE FOR STEEL PIPE



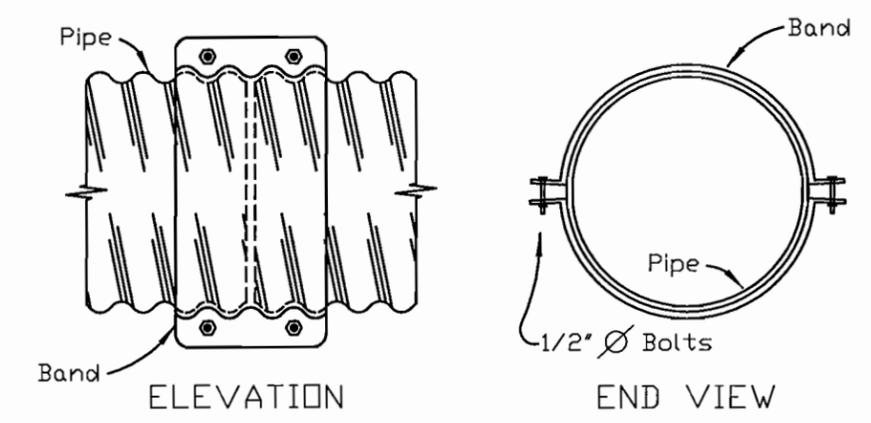
SPLIT COLLAR COUPLING FOR ANNULAR CORRUGATED POLYETHYLENE PIPE

- Notes:
1. Minimum width 4 corrugations, 2 on each culvert segment.
  2. The opening of the coupling shall be within 15° of the top of the culvert.



HELICAL COUPLING BAND FOR HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE

ANNULAR COUPLING BAND FOR ANNULAR OR REFORMED END HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE



TWO PIECE INTEGRAL FLANGE FOR HELICALLY CORRUGATED STEEL OR ALUMINUM PIPE

- Notes:
1. Use 2x12x0.150 thickness 5052-H141 aluminum plate washer under bolt head & nut on aluminum pipe flange.
  2. Use 2x12x0.125 thickness galvanized steel plate washer under bolt head & nut on steel pipe flange.

COUPLING BAND DETAILS FOR CORRUGATED PIPE AND PIPE ARCH

Submitted CARL CAIN Date 6/7/89

Approved BILL HARPER Date 6/13/89

Acad Brent Briggs Date 3/00

DRAWING NO. R1690 Sheet 2 of 3

Tole Booth T.S. Sheet 20 of 22

GENERAL NOTES

COUPLING TYPE	CORRUGATION Inches	PIPE DIAMETER Inches	WIDTH Inches	SPECIFIED THICKNESS See Note 1-C		DIMENSION	BOLTS NO / DIAMETER	ANGLE TO BAND	
				Pipe Wall	Band			RIVETS	SPOT WELDS
				ANGLE - See Note 1-H					
<i>Metal Pipe</i>  Annular and Helical	2-2/3x1/2  (Steel or Aluminum)	Thru 36	12	0.064-0.138	0.064-0.079	2x2x3/16	3-1/2	3-3/8	5-1/2
		42-60	12	0.064-0.079	0.064	2x2x3/16	3-1/2	3-3/8	5-1/2
	3x1 and 5x1 (Steel Only)	42-60	12	0.064-0.168	0.064-0.109	2x2x5/16	3-1/2	5-3/8	
		66-84	24	0.109-0.168	0.064-0.109	2x2x5/16	5-1/2	7-3/8	
		36-60	14	0.064-0.079	0.064	2x2x3/16	3-1/2	3-3/8	5-1/2
		42-60	14	0.109	0.064	2x2x5/16	3-1/2	5-3/8	
66-120	25	0.064-0.109	0.064	2x2x5/16	5-1/2	9-3/8			
One Piece Flap Band & Two Piece Integral Flange	2-2/3x1/2 (Steel or Aluminum) see Note 1-I	18-24	12	0.064-0.079	0.064		3-1/2	4-3/8*	* Flap Band Only
American Culvert Band	2-2/3x1/2 (Steel Only)	Thru 24	12	0.064-0.109	0.064-0.079	2x2x0.183	3-1/2	7-1/8x3/4 Long Fillet	
		30-36	12	0.064-0.109	0.064	2x2x0.183	3-1/2		
		42-48	12	0.064-0.079	0.064	2x2x0.183	3-1/2		
Northwest Culvert Alternative	2-2/3x1/2 (Steel Only)	Thru 84	12	0.064-0.079	0.064-0.109			5-3/16x3/4 Long Fillet	
		Thru 54	12	0.109	0.064-0.109				
		Thru 42	12	0.138	0.064-0.109				
		Thru 84	12	0.064-0.168	0.064-0.109			5-1/2 Spot	
						BAR AND STRAP			
						NUMBER/THICKNESS	BOLT DIAMETER	BAR DIAMETER	BAR YIELD STRENGTH P.S.I.
Hugger	2-2/3x1/2 (Steel Only)	Thru 48	10-1/2	0.064-0.109	0.064-0.109	One 0.079	1/2	7/8	32,000
		36-48	10-1/2	0.138-0.168	0.079-0.109	One 0.109	1/2	7/8	45,000
		54-60	10-1/2	0.079-0.168	0.064-0.109	Two 0.079	1/2	7/8	32,000
	3x1 (Steel Only)	66-84	10-1/2	0.109-0.168	0.109	Two 0.109	1/2	7/8	45,000
		36-66	10-1/2	0.064-0.109	0.064	Two 0.079	1/2	7/8	32,000
		72-84	10-1/2	0.109	0.079	Two 0.079	1/2	7/8	32,000
61-120	10-1/2	0.109	0.109	Two 0.109	1/2	7/8	45,000		
<i>PE Pipe</i>  Split Collar		Thru 24	See Drawing	per AASHTO M-294	per AASHTO M-294				

1. Metal Coupling Bands
  - A. These coupling bands meet the strength requirements for special Joint Types under Non-erodible Soil Conditions, Table 2.23.3 of AASHTO's 'Standard Specifications for Highway Bridges'.
  - B. For pipe walls and bands, the Specified Thickness for steel is given. For aluminum, the Specified Thickness is that for steel less the allowance for the zinc coating which is 0.003 to 0.004 of an inch per AASHTO M-36, M-196 and M-197.
  - C. The minimum specified Thickness for bands is two Specified Thicknesses less than that for the pipe, but in no case thinner than 0.064 inches, (0.060 for aluminum).
  - D. For pipe arches, use the same width band as for round pipe of equal periphery.
  - E. A two-piece band is required for pipe greater than 42 inches in diameter.
  - F. Tension straps may be connected to bands of plates with either spot or fillet welds that develop minimum required strength of strap.
  - G. For helically corrugated coupling bands, the connection angles may be oriented parallel to the pipe axis, provided connecting holes are slotted lengthwise sufficiently to allow adjustment for the helix angle.
  - H. Use 1 1/4 inch center to center gauge line dimension on attached angle leg for rivets and spot welds.
  - I. The Two Piece Integral Flange coupling band shall not be used on pipe arches.
  - J. Culvert bands shall be made of the same metal as the culverts being joined.
2. Polyethylene (PE) Couplings
 

Testing standards for Corrugated Polyethylene (PE) Pipe couplings have not been established nor have couplings been tested for shear or bending moment. Therefore, until further information is available, PE couplings shall be used only where bending moment and shear requirements are minimal. Typical situations are:

  - A. Where the slope of the culvert will not be more than 5%.
  - B. Where the fill below the culvert is less than 2 feet.
  - C. In areas of firm soils. This excludes marshes unless the bedding is specially designed and approved by the engineer.
3. Other
 

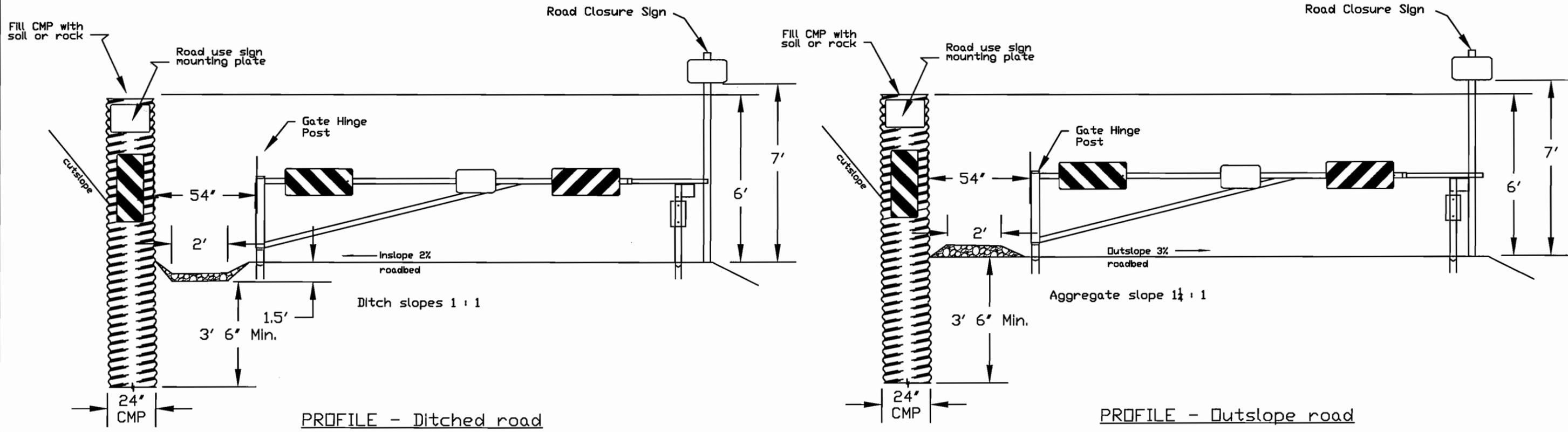
Couplings other than those shown on this drawing may be used upon submission of testing data (see 1-A above) and approval by the Engineer.

**U.S. FOREST SERVICE**  
**COUPLING BAND DETAILS FOR**  
**CORRUGATED PIPE AND PIPE ARCH**  
Submitted CARL CAIN Date 6/7/89  
Approved BILL HARPER Date 6/13/89  
Acad Brent Briggs Date 3/00  
**DRAWING NO. R1690 Sheet 3 of 3**  
 Tole Booth T.S. Sheet 21 of 22

# Gate Installation Typical Gate Bypass, Item 640(05)

## GENERAL NOTES:

- Surface bypass 20' each side of barrier with 6" crushed aggregate grading D, (incidental to Item 640(05).
- Remove any burrs or sharp edges on top end of culvert.
- Place type 3 object markers on both sides of culvert facing traffic.
- Fill culvert and overfill for future settlement with material from excavation or adjacent cutbank.
- Install Road use mounting plate facing closure



No Scale