

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	2
OLD RED TRAIL		

TABLE OF CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>	<u>SHEET NO.</u>	<u>DESCRIPTION</u>
	<u>GENERAL</u>		<u>CONSTRUCTION SIGNING & MARKING</u>
1	TITLE SHEET	82-125	CONSTRUCTION SIGNING LAYOUTS
2	TABLE OF CONTENTS	126-128	CONSTRUCTION SIGNING QUANTITIES AND DETAILS
3	LEGEND		
4-8	GENERAL NOTES		<u>SIGNING, MARKING, AND LIGHTING</u>
9-12	QUANTITIES		PERMANENT SIGNING AND MARKING
13	BASIS OF ESTIMATE	129-156	LIGHTING LAYOUT
14	LIST OF STANDARDS AND LIST OF BENCH MARKS	157-187	
	<u>PLAN AND PROFILE</u>		<u>SOILS</u>
15-22	UNDERGROUND UTILITY LAYOUT		SOILS PROFILE
23-55	CURB AND GUTTER LAYOUT	188-198	
	<u>MISCELLANEOUS DETAILS</u>		<u>CROSS SECTIONS</u>
56-60	TYPICAL ROADWAY SECTIONS		CROSS SECTION SHEETS
61	PIPE BEDDING & BACKFILL DETAILS	199-254	
62	WATERMAIN LOWERING DETAILS		<u>STANDARD DRAWINGS</u>
63	RESHAPING LOT 5 & 6 SUNVIEW HEIGHTS(NYGREN DR)		(FOUND AT BACK OF PLANS)
64	S - DRIVEWAY/REGRADE LOT 20 SUNSET ACRES(2110 ORT)		
65	DRIVEWAY/REGRADE LOT 17 PATTI'S ACRES FIRST(4300 ORT)		
66	STANDARD FLOATING MANHOLE CASTING	255-304	
67	MAILBOX LOCATION DETAIL		
68-71	EROSION CONTROL PLAN		
	<u>PCC PAVEMENT</u>		
72-80	JOINT LAYOUTS		
81	TYPICAL INTERSECTION PAVEMENT DETAIL		

LEGEND

SYMBOLS

	250 WATT H.P. SODIUM VAPOR LUMINARE		GROUND MOUNTED SIGN (NEW)
	BORINGS		HEDGES
	CABLE TV		HYDRANT
	CENTERLINE OF CONSTRUCTION		MAILBOX
	CONCRETE CURB AND GUTTER		MANHOLE (EXISTING)
	CONCRETE PULL BOX		MANHOLE (NEW)
	CONDUCTOR		OLD RIGHT-OF-WAY LINE
	CONDUIT		NEW RIGHT-OF-WAY LINE
	CONIFEROUS TREE		POWER LINES
	CONSTRUCTION SIGN		PROPERTY CORNER
	CURB INLET (EXISTING)		SECTION LINE
	CURB INLET (NEW)		STREET LIGHTS
	CURBSTOP		TELEPHONE LINES
	DECIDUOUS TREE		TEMPORARY CONSTRUCTION EASEMENT LINE
	DEFLECTION ANGLE (DELTA)		TUBULAR MARKERS
	DELINEATOR DRUMS		TYPE III BARRICADE
	FEED POINT		VALVE (EXISTING)
	FENCE		VALVE (NEW)
	GAS		
	GRADE LINE (EXISTING)		
	GRADE LINE (NEW)		

ABBREVIATIONS

AGG. = AGGREGATE	M.A. = MAST ARM
AHD. = AHEAD	MAX. = MAXIMUM
ALUM. = ALUMINUM	MGAL. = THOUSAND GALLONS
APT. = APARTMENT	MDU = MONTANA DAKOTA UTILITIES
BEG. = BEGIN	MED. = MEDIAN
BIT. = BITUMINOUS	MIN. = MINIMUM
BK. = BACK	MTL. = METAL
BLK. = BLOCK	NB = NORTH BOUND
BRK. = BRICK	N.T.S. = NOT TO SCALE
B.S.W. = BACK OF SIDEWALK	O.C. = O/C = ON CENTER
BVC = BEGIN VERTICAL CURVE	O.D. = OUTSIDE DIAMETER
B.M. = BENCH MARK	PARPT. = PARAPET
BTM. = BOTTOM	PCC = PORTLAND CEMENT CONCRETE
CIP = CAST IRON PIPE	PERIM. = PERIMETER
CL = CENTERLINE	PERMANENT MTCE. ESMT. = PERMANENT MAINTENANCE EASEMENT
CL = CLASS	PI = POINT OF INTERSECTION
CONC. = CONCRETE	PROP. COR. = PROPERTY CORNER
CR = CURB RETURN	PSI = POUNDS PER SQUARE INCH
CRS. = COURSE	PT = POINT OF TANGENCY
CS = CURB STOP	PVC = POLYVINYL CHLORIDE PIPE
C.Y. = CUBIC YARD	PVMT = PAVEMENT
DEF. BARS = DEFORMED BARS	RAD. = RADIUS
DGBC = DENSE GRADED BASE COURSE	RCP = REINFORCED CONCRETE PIPE
EA. = EACH	R/W = RIGHT OF WAY
EB = EAST BOUND	SAN. = SANITARY
EL. = ELEV. = ELEVATION	SB = SOUTH BOUND
EVC = END VERTICAL CURVE	S.F. = SQUARE FEET
EX. = EXIST. = EXISTING	SIG./LT. COMB. = TRAFFIC SIGNAL/STREET LIGHT COMBINATION
FIN. = FINISH	SRT = SOURIS RIVER TELEPHONE
FL = FLOW LINE	STA. = STATION
FLR. = FLOOR	STD. = STANDARD
FND. = FOUNDATION	SURF. = SURFACE
FTG. = FOOTING	SVC. = SERVICE
GAL. = GALLON	S.Y. = SQUARE YARD
GALV. = GALVANIZED	TA = TOP OF ASPHALT
G.C. = GENERAL CONTRACTOR	TC = TOP OF CURB
GV = GATE VALVE	TEMP. = TEMPERED
GYP. BD. = GYPSUM BOARD	TEMP. CONST. ESMT. = TEMPORARY CONSTRUCTION EASEMENT
HBP = HOT BITUMINOUS PAVEMENT	TW = TOP OF WALL
H.M. = HEAVY METAL	VC = VERTICAL CURVE
HORIZ. = HORIZONTAL	VCP = VITRIFIED CLAY PIPE
IN. = INCH	VERT. = VERTICAL
INT. = INTERIOR	VPC = VERTICAL POINT OF CURVATURE
INSUL. = INSULATION	VPI = VERTICAL POINT OF INTERSECTION
INV. = INVERT	VPT = VERTICAL POINT OF TANGENCY
JST. = JOIST	W/ = WITH
JST. BRG. = JOIST BEARING	WB = WEST BOUND
KI = KIPS PER INCH	WD = WIDE
LBS. = POUNDS	
L.F. = LINEAR FOOT	
L.S. = LUMP SUM	

GENERAL NOTES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	4
OLD RED TRAIL GENERAL NOTES		

100 011 GENERAL: THE ENGINEER WILL ATTEND TO THE REMOVAL OF EXISTING FENCES TO THE HIGHWAY RIGHT OF WAY LINE AND TO THE RELOCATION OR ADJUSTMENT OF UTILITY FACILITIES AS SHOWN ON THE PLANS. EQUIPMENT SHALL WORK AROUND UTILITY POLES, WITHIN THE AREA, THAT ARE NOT TO BE DISTURBED.

100 021 WEEKLY PLANNING/REPORTING MEETING:

A. PURPOSE OF WEEKLY MEETING.

1. THE CONTRACTOR SHALL ORGANIZE THE WEEKLY MEETING TO COORDINATE THE EFFORTS BETWEEN SUBCONTRACTORS, UTILITIES, LOCAL AUTHORITIES, AND OTHERS.

B. CONTRACTOR'S PROJECT MANAGER/SUPERINTENDENT: PLANNING AND REPORTING.

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR SENDING A KNOWLEDGEABLE REPRESENTATIVE TO CONDUCT A WEEKLY REPORTING/PLANNING MEETING. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PREPARE MINUTES FOR EACH MEETING AND TO MAKE THE APPROPRIATE DISTRIBUTION OF THE MINUTES.
2. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE A WRITTEN SCHEDULE OF THE NEXT WEEK'S WORK AND A TENTATIVE SCHEDULE OF THE FOLLOWING WEEK.
3. REPORTING/PLANNING MEETING WILL INCLUDE DISCUSSION OF PROBLEMS ENCOUNTERED DURING THE CURRENT WEEK; INFORMATION OF INTEREST TO LOCAL AUTHORITIES, SUBCONTRACTORS, UTILITIES, AND NEXT WEEK'S PROSPECTIVE SCHEDULE.
4. THE CONTRACTOR SHALL ORGANIZE THE WEEKLY MEETING CONTACTING INTERESTED AGENCIES. THESE AGENCIES INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
 - a. NORTH DAKOTA DEPARTMENT OF TRANSPORTATION.
 - b. CITY ENGINEER'S REPRESENTATIVE.
 - c. POLICE DEPARTMENT.
 - d. FIRE DEPARTMENT.
 - e. AMBULANCE SERVICE.
 - f. TELEPHONE CO.
 - g. POWER CO.
 - h. CABLE T.V.
 - i. GAS CO.
 - k. SUBCONTRACTORS.
 - l. CHAMBER OF COMMERCE.

100 060 DETOURS: THE CONTRACTOR SHALL MAINTAIN THE STREETS USED AS DETOURS (STREETS TO BE DESIGNATED BY THE ENGINEER) AND REPAIR AREAS DAMAGED BY THE DETOURED TRAFFIC. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL RESTORE THE STREETS TO A CONDITION AT LEAST EQUAL TO THAT WHICH EXISTED AT THE TIME TRAFFIC WAS ROUTED OVER THEM. WORK SHALL BE AS DEEMED NECESSARY BY THE ENGINEER. THE REPAIR AND MAINTENANCE OF THE DETOURS WILL BE PAID FOR IN ACCORDANCE WITH SECTION 107.05 B OF THE STANDARD SPECIFICATIONS - HAUL ROADS.

100 P01 PUBLIC RELATIONS COORDINATOR: THE CONTRACTOR SHALL PROVIDE A PUBLIC RELATIONS AND INFORMATION COORDINATOR. THE COORDINATOR WILL NOT BE THE PROJECT SUPERINTENDENT OR CONSTRUCTION FOREMAN. THE COORDINATOR SHOULD BE KNOWLEDGEABLE IN CONSTRUCTION OPERATIONS, BE ABLE TO DEVELOP EFFECTIVE MEDIA RELEASES, POSSESS WRITTEN AND VERBAL COMMUNICATION SKILLS, AND BE ABLE TO ORGANIZE PRODUCTIVE MEETINGS.

THE PUBLIC RELATIONS COORDINATOR WILL BE RESPONSIBLE FOR THE FOLLOWING:

1. ORGANIZE, SCHEDULE, AND CONDUCT THE WEEKLY PLANNING AND REPORTING MEETINGS (PLAN NOTE 100-021).

100 P01 (CONT)

2. NOTIFY NDDOT BISMARCK DISTRICT, THE CITY OF MANDAN, THE CITY POLICE, EMERGENCY SERVICES, SCHOOLS, AND OTHER PERTINENT CITY AGENCIES OF FORTHCOMING CONSTRUCTION ACTIVITIES IN REGARD TO STREET CLOSURES AND TRAFFIC DETOUR ROUTES.

3. PROVIDE NEWS RELEASES AND NECESSARY DRAWINGS TO THE LOCAL MEDIA, INCLUDING TV, RADIO, NEWSPRINT PRIOR TO AND DURING CONSTRUCTION, TO INFORM THE PUBLIC ON CONSTRUCTION ACTIVITIES AND SCHEDULES, STREET CLOSURES, WIDTH OR HEIGHT RESTRICTIONS ON TRAFFIC DETOUR ROUTES. NEWS RELEASES ON CONSTRUCTION ACTIVITIES SHALL BE UPDATED REGULARLY. (MINIMUM TWO-WEEK UPDATE.)

4. NEWS MEDIA INTERVIEWS.

5. THE PUBLIC RELATIONS COORDINATOR'S NAME, WORK ADDRESS, AND WORK TELEPHONE NUMBER WILL BE MADE AVAILABLE TO ALL INTERESTED AGENCIES AND PARTIES SO THAT THE COORDINATOR MAY ADDRESS PUBLIC QUESTIONS.

6. WORK DIRECTLY WITH PROPERTY OWNERS AND BUSINESSES AFFECTED BY CONSTRUCTION ACTIVITIES. THE COORDINATOR MUST HAVE SUFFICIENT KNOWLEDGE AND AUTHORITY TO RESOLVE PROPERTY OWNER AND BUSINESS CONCERNS REGARDING SCHEDULING, MAINTAINING ACCESS, AND CONSTRUCTION OPERATIONS.

ALL COSTS FOR PROVIDING THE PUBLIC RELATIONS COORDINATOR TO BE INCLUDED IN THE OTHER ITEMS.

100 P02

CONTRACTOR LOCATED AGGREGATE: THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING IF THE POTENTIAL FOR CULTURAL RESOURCES IN THE AREA OF THE AGGREGATE SOURCE EXISTS. IF AN ARCHAEOLOGIST PERMITTED BY SHPO, DETERMINES THAT A MODERATE OR HIGHER POTENTIAL DOES EXIST, THE CONTRACTOR MUST OBTAIN SHPO CLEARANCE BEFORE ANY PIT OPERATIONS CAN BE INITIATED.

100 P03

THE CONTRACTOR'S OPERATION IS LIMITED TO THE R/W OR EASEMENTS AS SHOWN ON THE PLANS. ANY WORK OR DISTURBANCE OF PROPERTY BEYOND THOSE LIMITS SHALL BE RESTORED TO EXISTING CONDITIONS AND ANY COMPENSATION DUE THE PROPERTY OWNER SHALL BE NEGOTIATED BETWEEN THE OWNER AND THE CONTRACTOR AND PAID BY THE CONTRACTOR. THE CONTRACTOR SHALL PROTECT TREES AND SHRUBS UNLESS INDICATED FOR CLEARING AND GRUBBING. ANY DAMAGE OR REMOVAL PERFORMED BY THE CONTRACTOR WITHOUT PRIOR APPROVAL OF THE ENGINEER IN THE FIELD SHALL BE RESTORED OR COMPENSATION DUE SHALL BE NEGOTIATED WITH THE OWNER OF THE ADJACENT PROPERTY. THE CONTRACTOR SHALL OBTAIN A WRITTEN RELEASE FROM THE PROPERTY OWNER AND FURNISH THE ENGINEER WITH A COPY.

100 P04

DURING THE 1999 CONSTRUCTION SEASON, WATERMANS AND SEWERMANS WERE INSTALLED IN THE PROJECT AREA. AS PART OF THIS CONSTRUCTION, A ROADWAY WAS CONSTRUCTED ALONG THE WEST (RIGHT) RIGHT OF WAY LINE FROM STA. 125+00 TO STA. 145+00. THE ROADWAY WAS SURFACED WITH A 3-1/2" BITUMINOUS PAVEMENT AND A CLASS 5 AGGREGATE BASE (MINIMUM THICKNESS 6"). THE CONTRACTOR SHALL REMOVE AND SALVAGE THE 3-1/2" BITUMINOUS PAVEMENT AND 6" OF CLASS 5 AGGREGATE BASE USING A METHOD APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE INCORPORATED INTO THE BLENDED BASE COURSE AS PART OF THE CLASS 5 PORTION (SEE PLAN NOTE 302-P02) AND PAID FOR AS "SALVAGED BASE COURSE." THE CONTRACT PLAN QUANTITY (2600 TON) OF SALVAGED BASE COURSE SHALL BE PAID FOR COMPLETING THESE REQUIREMENTS IN THEIR ENTIRETY. THE REMAINDER OF THE CLASS 5 AGGREGATE SHALL BECOME PART OF THE EMBANKMENTS AND SUBCUT BACKFILL.

MANHOLES INSTALLED DURING THE PROJECT HAVE NEW CASTINGS, COVERS, AND ADJUSTING RINGS ATOP THEM. THE RINGS WERE NOT GROUTED TO ALLOW EASIER ADJUSTMENT DURING THIS PROJECT. 6 MANHOLES WERE INSTALLED BETWEEN STA. 127+45 AND STA. 144+75 USING A STANDARD CASTING AND COVER. THESE MANHOLES WILL NEED FLOATING CASTINGS INSTALLED IN PLACE OF THE STANDARD CASTINGS AND COVERS. EXISTING CASTINGS SHALL BE DELIVERED TO THE CITY. THE 6 FLOATING MANHOLE CASTINGS SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "MANHOLE CASTING"

GENERAL NOTES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	5
OLD RED TRAIL GENERAL NOTES		

HYDRANTS WERE SET TO FINAL GRADE WHERE POSSIBLE AND WHERE CONFLICTS EXISTED FOR HYDRANT INSTALLATION THE HYDRANT LEADS WERE INSTALLED AND PLUGGED. THE CONTRACTOR WAS REQUIRED TO ACHIEVE 90% OF MODIFIED PROCTOR FOR UTILITY LINES INSTALLED UNDER THE PAVEMENT.

UNDERGROUND UTILITIES WERE ALSO RELOCATED TO PREPARE FOR THE CONSTRUCTION OF THIS PROJECT. THE UTILITIES SHOWN WITHIN THESE PLANS ARE FOR THE MOST PART NO LONGER IN SERVICE. AT THE TIME OF PRINTING PLANS, AS-BUILT DRAWINGS OF THE NEW UTILITIES HAD NOT BEEN PROVIDED.

105 UNDERGROUND UTILITIES: THE CONTRACTOR SHALL NOTIFY THE LOCAL UTILITY
030 COMPANIES PRIOR TO THE BEGINNING OF CONSTRUCTION, SO THEY MAY DETERMINE THE LOCATION OF ALL UTILITIES IN THE PROJECT AREA. SUBCUTTING OR SCARIFYING OVER UTILITY LINES MAY BE ELIMINATED IF, IN THE OPINION OF THE UTILITY, A HAZARDOUS SITUATION EXISTS. SEPARATE PLANS, IF ANY, SHOWING RELOCATION OR ADJUSTMENT WORK TO BE PERFORMED BY UTILITY COMPANIES TO ACCOMMODATE HIGHWAY CONSTRUCTION WILL BE MADE AVAILABLE TO THE CONTRACTOR, UPON REQUEST TO THE ENGINEER.

105 PAVEMENT SWEEPING: THE CONTRACTOR SHALL SWEEP NEW PAVEMENTS BEFORE
110 OPENING TO TRAFFIC AND FOR FINAL ACCEPTANCE. FOR THIS SWEEPING, THE CONTRACTOR SHALL FURNISH AND UTILIZE A VACUUM TYPE SWEEPER TO CONTROL THE DUST. ALL COSTS CONNECTED WITH THIS WORK SHALL BE INCLUDED IN THE PRICE BID OF OTHER ITEMS.

200 SHRINKAGE: 20 PERCENT ADDITIONAL VOLUME IS INCLUDED FOR SHRINKAGE IN EARTH
010 EMBANKMENT.

200 REMOVAL OF INLETS AND MANHOLES SHALL CONSIST OF REMOVING THE CASTING, RINGS,
048 BARREL, BASE, PLUGGING OR CAPPING OF EXISTING LINES, AND BACKFILLING TO GRADE. ALL LABOR, EQUIPMENT, MATERIALS, AND DISPOSITION OF ITEMS INVOLVED IN THE REMOVAL SHALL BE INCLUDED IN THE PRICE BID FOR "REMOVAL OF INLETS" OR "REMOVAL OF MANHOLES."

200 TREE REMOVAL: TREE REMOVAL WITHIN THE RIGHT OF WAY LIMITS AND EASEMENTS IS
057 NOT A SEPARATE PAY ITEM. THE COST OF TREE REMOVAL SHALL BE INCIDENTAL TO THE PRICE BID FOR "CLEARING AND GRUBBING."

200 CONCRETE REMOVAL: REMOVAL OF P.C. CONCRETE SIDEWALKS AND DRIVEWAYS SHALL
080 BE PAID FOR AS "REMOVAL OF CONCRETE."

200 SCARIFYING AND RECOMPACTION OF EMBANKMENT AREAS: AFTER REMOVING TOPSOIL
090 FROM ORIGINAL GROUND UNDER ALL ROADWAY EMBANKMENT AREAS, AN ADDITIONAL ONE FOOT SHALL BE SCARIFIED AND RECOMPACTED. ALL SCARIFYING AND RECOMPACTING SHALL BE INCLUDED IN PRICE BID FOR "COMMON EXCAVATION." THE FOLLOWING AREAS SHALL BE SUBCUT BELOW THE SUBGRADE ELEVATION TO THE DEPTH SHOWN TO A POINT 1 FOOT BEHIND THE BACK OF THE NEW CURB. AN ADDITIONAL 1 FOOT BELOW THE SUBCUT SHALL BE SCARIFIED AND RECOMPACTED. 20% OF THE SUBCUT QUANTITY HAS BEEN ADDED TO THE EXCAVATION AND EMBANKMENT QUANTITIES TO PROVIDE FOR SHRINKAGE. ALL OTHER CUT SECTIONS SHALL BE SCARIFIED 1 FOOT BELOW THE SUBGRADE AND RECOMPACTED.

98+67 TO 105+00	1 FOOT
111+00 TO 114+00	1 FOOT
118+75 TO 122+50	2 FEET
135+50 TO 138+00	1 FOOT
140+50 TO 141+50	1 FOOT
141+50 TO 143+75	2 FEET
145+25 TO 149+75	2 FEET
149+75 TO 155+50	1 FOOT
168+75 TO 172+50	2 FEET

200 WASTE DISPOSAL: ALL EXCESS EXCAVATION AND OLD CONCRETE SIDEWALKS, DRIVEWAYS,
252 CURB AND GUTTER, PAVEMENT, BITUMINOUS SURFACING, ETC., SHALL BE DISPOSED OF OFF THE HIGHWAY RIGHT OF WAY AT A SITE SELECTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE FOLLOWING PROPERTY OWNERS ADJACENT TO THE PROJECT HAVE EXPRESSED A WILLINGNESS TO PROVIDE A DISPOSAL SITE FOR EXCESS EXCAVATION MATERIAL. ANY CONDITIONS ASSOCIATED WITH THAT DISPOSAL ARE A MATTER BETWEEN THE CONTRACTOR AND THE PROPERTY OWNER. DISPOSAL IN WETLAND AREAS WILL NOT BE APPROVED. THE COST OF DISPOSAL (AND OBTAINING OF THE DISPOSAL AREA) SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS.

ADJACENT OWNERS:

KENNETH PORSBORG 663-3572

200 COMPACTION AND DENSITY CONTROL: COMPACTION AND DENSITY CONTROLS SHALL BE IN
360 ACCORDANCE WITH SECTION 203.02 G OF THE STANDARD SPECIFICATIONS. (USING AASHTO T-180). PONDING OF WATER ADJACENT TO ROADWAY CONSTRUCTION WILL NOT BE ALLOWED. THE SUBGRADE SOILS SHALL BE CONDITIONED SO THE MOISTURE CONTENT SHALL BE NOT LESS THAN THE OPTIMUM MOISTURE CONTENT AND NOT MORE THAN 5% OVER THE OPTIMUM MOISTURE CONTENT.

200 WATER: THE QUANTITY OF WATER REQUIRED FOR COMPACTION, FOR THE BASE COURSE,
P01 AND FOR USE AS A DUST PALLIATIVE HAS BEEN INCLUDED IN THE QUANTITIES AND SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "WATER." WATER IS AVAILABLE FOR PURCHASE FROM THE CITY OF MANDAN. CONTRACTOR MUST ABIDE BY THE CITY'S WATER SALE POLICY.

200 REMOVAL OF INLETS: AT LOCATIONS SHOWN IN THE PLANS FOR "REMOVAL OF INLETS",
P02 AT THE INTERSECTION OF OLD RED TRAIL AND SUNSET DRIVE, THE WORK SHALL BE PERFORMED IN THE FOLLOWING MANNER. THE CONTRACTOR SHALL CAREFULLY REMOVE THE CASTINGS AND DELIVER THEM TO THE CITY OF MANDAN'S PUBLIC WORKS SHOP. THE CONCRETE BARREL OR BOX AND CONCRETE BASE SHALL BE REMOVED ENTIRELY. IF THE EXISTING PIPES ARE NO LONGER REQUIRED FOR DRAINAGE, THEY SHALL BE REMOVED. IF THE PLANS SHOW THE EXISTING PIPES BEING EXTENDED, THE CONTRACTOR SHALL CAREFULLY REMOVE THE LAST SECTION OF PIPE. THE HOLES RESULTING FROM INLET REMOVAL SHALL BE FILLED WITH BASE MATERIAL.

202 SAWING BITUMINOUS PAVEMENT-FULL DEPTH: THE EXISTING BITUMINOUS PAVEMENTS
P01 SHALL BE SAWED FULL DEPTH AT THE LOCATIONS INDICATED ON THE PLAN AND PROFILE SHEETS OR AS OTHERWISE DIRECTED BY THE ENGINEER IN THE FIELD. ALL COSTS FOR LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO PERFORM THE FULL DEPTH SAW CUT SHALL BE INCLUDED IN THE PRICE BID FOR "SAWING BITUMINOUS PAVEMENT FULL DEPTH." AT SEVERAL LOCATIONS EXISTING PCC CONCRETE NEEDS TO BE SAWED. THIS SAWING SHALL BE INCIDENTAL TO THE PRICE BID FOR "REMOVAL OF CONCRETE."

202 REMOVAL OF PIPE-ALL TYPES AND SIZES: AT PIPE REMOVAL LOCATIONS FOR CULVERTS
P02 UNDER PRIVATE DRIVEWAYS THE ADJACENT OWNER WILL DETERMINE IF THEY CLAIM THE SALVAGED CULVERT AND END SECTIONS. AT CULVERTS CROSSING THE EXISTING ROADWAY THE CITY OF MANDAN WILL DETERMINE IF THEY WANT THE SALVAGED CULVERT. SALVAGED CULVERTS SHALL BE DELIVERED TO AN OWNER SPECIFIED LOCATION. ALL OTHER PIPE SHALL BECOME PROPERTY OF THE CONTRACTOR AND BE REMOVED FROM THE PROJECT.

203 APPROXIMATE EARTHWORK QUANTITIES FOR THIS PROJECT HAVE BEEN CALCULATED AS
P01 FOLLOWS:

LOCATION	EXCAVATION	EMBANKMENT	TOPSOIL
BEG. TO END	25,204*	14,948	14,924*
HILLSIDE ROAD	2,934*	2,716	1,550*

* COMMON EXCAVATION QUANTITY IS A TOTAL OF THESE TWO QUANTITIES.

GENERAL NOTES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	6
OLD RED TRAIL GENERAL NOTES		

PAYMENT FOR EXCAVATION SHALL BE IN ACCORDANCE WITH SECTION 203.03B-CONTRACT PLAN QUANTITY UNLESS FIELD GRADE CHANGES ARE MADE. THE EXISTING TOPSOIL ON THIS PROJECT SHALL BE REMOVED TO ITS FULL DEPTH, BUT NOT TO EXCEED SIX INCHES, AND STOCKPILED. UPON COMPLETION OF THE GRADING OPERATIONS, THE TOPSOIL SHALL BE SPREAD EVENLY OVER THE AREAS TO BE SEED OR SODDED. THE REMOVAL, STOCKPILING, AND SPREADING OF THE EXISTING TOPSOIL SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE MEASURED AND PAID FOR AS "COMMON EXCAVATION." ALL EXCESS EXCAVATION AND TOPSOIL SHALL BE DISPOSED OF OFF THE RIGHT-OF-WAY AT A SITE SECURED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THERE WILL BE NO SEPARATE MEASUREMENT OR PAYMENT FOR COMPACTED EMBANKMENT, AND ALL COSTS INCIDENTAL TO PLACING IN LAYERS, COMPACTING, DISKING, WATERING, MIXING, SLOPING, AND OTHER NECESSARY OPERATIONS FOR CONSTRUCTION OF EMBANKMENTS WILL BE INCLUDED IN THE CONTRACT PRICE FOR "COMMON EXCAVATION".

203 P02 STORM WATER DISCHARGE AND EROSION CONTROL REQUIREMENTS: BEFORE WORK CAN BEGIN ON THIS CONTRACT, THE CONTRACTOR MUST COMPLY WITH THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIREMENTS AND THE ND POLLUTANT DISCHARGE ELIMINATION SYSTEM (NDPDES), AS FOLLOWS:

A. THE CONTRACTOR MUST FILE A "NOTICE OF INTENT TO OBTAIN COVERAGE UNDER NDPDES GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY" (NOI). THIS FORM MUST BE FILED WITH THE ND HEALTH AND CONSOLIDATED LABORATORIES AT LEAST FIVE DAYS BEFORE CONSTRUCTION BEGINS.

230 P01 RESHAPING INSLOPE: DURING PHASE 1 OF CONSTRUCTION, THE RIGHT SHOULDER OF THE EXISTING ROADWAY SHALL BE TEMPORARILY WIDENED. EMBANKMENT NECESSARY FOR CONSTRUCTING THE TEMPORARY WIDENING SHALL BE OBTAINED FROM WITHIN THE PROJECT LIMITS. THE INSLOPE OF THE TEMPORARY WIDENING SHALL NOT EXCEED 3:1. ALL COSTS ASSOCIATED WITH CONSTRUCTION OF THE TEMPORARY WIDENING INCLUDING LABOR, EQUIPMENT AND MATERIAL SHALL BE INCLUDED IN THE PER MILE PRICE BID FOR "RESHAPING INSLOPE."

300 P01 AGGREGATE BASE COURSE: ONE THOUSAND TONS OF AGGREGATE BASE COURSE HAVE BEEN PROVIDED FOR MAINTAINING TRAFFIC. IT SHALL BE USED AS DIRECTED BY THE ENGINEER IN THE FIELD.

302 P01 BLENDED BASE COURSE: ALL P.C.C. PAVEMENT AND CURB AND GUTTER SHALL HAVE 8" (MINIMUM) OF BLENDED BASE COURSE MATERIAL PLACED BENEATH THEM. DRIVEWAYS SHALL HAVE 4" OF BLENDED BASE COURSE MATERIAL BENEATH THEM.

302 P02 BITUMINOUS, AGGREGATE AND CONCRETE MATERIAL SHALL BE USED TO PRODUCE THE BLENDED BASE COURSE. MATERIAL SHALL BE PROCESSED TO A MAXIMUM SIZE OF TWO (2) INCHES WITH 90 TO 100 PERCENT PASSING THE ONE AND ONE-HALF (1-1/2) INCH SIEVE. THE BLENDED BASE COURSE SHALL CONSIST OF A MINIMUM OF 50 PERCENT OF CONCRETE MATERIAL BY WEIGHT. THE REMAINDER OF THE BASE SHALL CONSIST OF CLASS 5 OR PROCESSED ASPHALT MATERIAL MEETING THE GRADATION REQUIREMENTS LISTED ABOVE. BLENDING THE MATERIAL ON THE ROADWAY WILL BE ALLOWED. ALL COSTS TO SIZE, BLEND, PLACE AND COMPACT THE MATERIAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "BLENDED BASE COURSE", TON. COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 302.40E OF THE STANDARD SPECIFICATIONS. MOISTURE CONTENT OF MATERIAL SHALL NOT EXCEED 5 PERCENT OF OPTIMUM WHEN COMPACTED TO 85% OF MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T-180. THERE ARE NOT SUFFICIENT MATERIALS WITHIN THE PROJECT TO PRODUCE THE BASE COURSE AS REQUIRED. THE CONTRACTOR SHALL SECURE THE SOURCE OF THE MATERIALS PROPOSED FOR USE ON THE PROJECT AND SHALL INCLUDE HAULING COSTS IN THE UNIT PRICE BID FOR "BLENDED BASE COURSE", TON.

400 P01 AUTOMATIC BATCHING EQUIPMENT: THE AUTOMATIC BATCHING EQUIPMENT AS SPECIFIED IN AASHTO M-156 WILL NOT BE REQUIRED ON THIS PROJECT.

400 P02 HOT BITUMINOUS PAVEMENT: THE 8" HOT BITUMINOUS PAVEMENT SHALL BE LAID IN 3 LIFTS WITH THE TOP LIFT HAVING A DEPTH OF APPROXIMATELY 2 INCHES. THE 6" HOT BITUMINOUS PAVEMENT SHALL BE LAID IN 3 EQUAL 2 INCH LIFTS. THE 4" HOT BITUMINOUS PAVEMENT SHALL BE LAID IN 2 EQUAL 2 INCH LIFTS. BEFORE THE NEXT LIFT CAN BE PLACED, THE PRECEDING LIFT SHALL HAVE BEEN COMPACTED AND COOLED TO 100° F.

550 P01 SURFACE TOLERANCE: AFTER THE CONCRETE HAS HARDENED SUFFICIENTLY, THE PAVEMENT SURFACE SHALL BE TESTED WITH A 10-FOOT STRAIGHT EDGE. AREAS SHOWING HIGH SPOTS OF MORE THAN 1/4 INCH BUT NOT EXCEEDING 5/8 INCH IN 10 FEET SHALL BE GROUND DOWN WITH AN APPROVED GRINDING TOOL TO AN ELEVATION WHERE DEVIATION IS LESS THAN 1/4 INCH. AREAS WHERE DEVIATIONS EXCEED 5/8 INCH SHALL BE GROUND WITH DIAMOND GRINDING EQUIPMENT TO AN ELEVATION WHERE DEVIATION IS LESS THAN 1/4 INCH OR THE PAVEMENT SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. THE AREA OF PAVEMENT REMOVED SHALL BE AT LEAST 5 FEET IN LENGTH AND AT LEAST THE FULL WIDTH OF THE LANE INVOLVED. IF THE LIMITS OF REMOVAL EXTEND TO WITHIN 5 FEET OF A TRANSVERSE JOINT, THE PAVEMENT SHALL BE REMOVED TO THAT JOINT.

550 P01 THE REQUIREMENTS FOR THE TRANSVERSE METAL TINE FINISH OF SECTION 550.04-J-6 (FINAL SURFACE FINISH) OF THE STANDARD SPECIFICATIONS SHALL BE DELETED.

550 P01 CONCRETE PROTECTION: ADJACENT P.C.C. PAVEMENT SHALL BE PROTECTED DURING THE APPLICATION OF ALL BITUMINOUS AND ASPHALT MATERIALS TO PREVENT ANY DISCOLORATION OF THE PAVEMENT. FAILURE TO COMPLY WILL RESULT IN THE CONTRACTOR HAVING TO CLEAN THE PAVEMENT AT THE CONTRACTOR'S OWN EXPENSE. THE P.C.C. PAVEMENT SLAB SHALL NOT BE USED AS A TABLE FOR STOCKPILING, MIXING, OR DRYING OF ANY MATERIAL.

550 P01 THE SURFACE OF THE BLENDED BASE COURSE SHALL BE TRIMMED AS PER SECTION 550.04.B. SECTION 550.04.B OF THE STANDARD SPECIFICATIONS SHALL BE REVISED TO ELIMINATE TRIMMING THE SUBGRADE BY AUTOMATICALLY CONTROLLED TRIMMING EQUIPMENT. THE SUBGRADE SHALL NOT VARY FROM ANY POINT BY MORE THAN 0.06 FOOT FROM THE PRESCRIBED ELEVATION. THE ENGINEER WILL SET APPROPRIATE STAKES FOR USE IN SHAPING THE SUBGRADE TO REQUIRED SECTION AND TO THE ESTABLISHED GRADE. THE CONTRACTOR SHALL PRESERVE THE LINE AND GRADE STAKES AS LONG AS THEY ARE NEEDED. ALL MATERIALS FROM TRIMMING OPERATIONS MUST BE INCORPORATED INTO THE PROJECT. IF NOT, THE TONNAGE AS DETERMINED BY THE ENGINEER, WILL BE DEDUCTED FROM THE APPROPRIATE QUANTITIES.

550 P02 HIGH EARLY STRENGTH CONCRETE: HIGH EARLY STRENGTH CONCRETE INCLUDED IN THE QUANTITIES SHALL BE USED FOR CONSTRUCTION OF THE STREET APPROACHES AND TO COMPLETE GAPS LEFT IN THE CONCRETE PAVEMENT FOR TRAFFIC CONTROL. THE EXACT LOCATIONS, USE, AND QUANTITY OF HIGH EARLY STRENGTH CONCRETE SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER.

GENERAL NOTES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	7
OLD RED TRAIL GENERAL NOTES		

- 704 010 MAINTAINING ACCESS: THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ACCESS TO ALL RESIDENTIAL DWELLING AND BUSINESS ESTABLISHMENTS ADJACENT TO THIS PROJECT. FINAL DETAILS ON LOCATION OF ACCESS POINTS AND CONSTRUCTION PROCEDURES SHALL BE WORKED OUT WITH THE ENGINEER IN THE FIELD PRIOR TO START OF THE PROJECT.
- 704 016 TRAFFIC CONTROL SUPERVISOR: TRAFFIC CONTROL SUPERVISOR SHALL BE PROVIDED ON THIS PROJECT.
- 704 P01 TUBULAR MARKERS: TUBULAR MARKERS SHALL MEET THE DIMENSIONS, COLOR CONFIGURATION, AND INSTALLATION DETAILS SHOWN IN THE STANDARD DRAWINGS. THE CONTRACTOR SHALL USE TWO (2) WEIGHTS ON EACH TUBULAR MARKER. ALL COSTS ASSOCIATED WITH PROVIDING, INSTALLING, MAINTAINING, AND REMOVING TUBULAR MARKERS AND ADDITIONAL WEIGHTS, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "TUBULAR MARKERS".
- 704 P02 TRAFFIC CONTROL SIGNS AND DEVICES: THE CONTRACTOR WILL BE PAID FOR THE HIGHEST NUMBER OF UNITS IN USE AT ANY ONE TIME FOR SIGNS AND DEVICES EVEN THOUGH CONTRACTOR MUST MOVE SIGNS AND DEVICES FROM ONE COMPLETED AREA TO THE NEXT.
- 706 010 FIELD LABORATORY: IF DEEMED UNNECESSARY BY THE ENGINEER IN THE FIELD, THE ITEM "FIELD LABORATORY" SHALL BE DELETED.
- 708 020 SEEDING: THE FOLLOWING SEED MIXTURE WILL BE USED ON THIS PROJECT: TYPE B, CLASS V. ALL SEEDED AREAS SHALL BE HYDRO MULCH SEEDED. HYDRO MULCHING SHALL MEET THE REQUIREMENTS OF SEC 708.02 B3 AND SEC 708.02 C3.

GRASS SPECIES	VARIETY	POUNDS PURE LIVE SEED PER ACRE
KENTUCKY BLUEGRASS	RH 120 MATOUS	200
CREEPING RED FESCUE (OR) HARD FESCUE	RH 120 MATOUS OR DURAR RH 120 MATOUS	40
TOTAL		240

- 708 P01 EROSION CONTROL FABRIC SHALL BE "LAND LOK TRM 450" AS MANUFACTURED BY SYNTHETIC INDUSTRIES OR APPROVED EQUAL. MINIMUM ROLL WIDTH SHALL BE 12 FEET.
- 714 P01 CONCRETE PIPE TIES (TIE BOLTS): UNLESS OTHERWISE SHOWN ON THE PLANS, THE FLARED END SECTION AND THE END SECTIONS OF PIPE ON ALL CONCRETE PIPE INSTALLATIONS SHALL BE TIED AS SHOWN ON STANDARD DRAWING D-714-22. ON CULVERTS WITHOUT FLARED END SECTIONS, THE END THREE SECTIONS SHALL BE TIED TOGETHER. THE COST FOR CONCRETE PIPE TIES (TIE BOLTS) SHALL BE INCIDENTAL TO OTHER ITEMS.
- 722 P01 MANHOLE CASTING: ALL NEW AND EXISTING MANHOLES LOCATED IN PAVEMENT SURFACES SHALL HAVE FLOATING MANHOLE CASTINGS INSTALLED. THE CASTING SHALL BE INSTALLED AS SHOWN ON THE DETAIL. ALL NEW AND EXISTING MANHOLES LOCATED OUTSIDE OR OFF OF THE ROADWAY SURFACE SHALL RETAIN THE CASTINGS AND COVERS CURRENTLY IN PLACE OR HAVE THE STANDARD MANHOLE CASTINGS (SEE STD. DRAWING D-722-5) INSTALLED. AT NEW MANHOLE LOCATIONS, THE MANHOLE CASTING SHALL BE INCLUDED IN THE PRICE BID FOR "MANHOLES." AT EXISTING MANHOLE LOCATIONS, THE CASTING REMOVAL, THE NEW CASTING, AND THE INSTALLATION OF THE NEW CASTING SHALL BE INCLUDED IN THE PRICE BID FOR "ADJUST MANHOLE." ALL OLD MH CASTINGS SHALL BECOME THE PROPERTY OF THE CITY OF MANDAN. THE CONTRACTOR SHALL DELIVER THEM TO THE LOCATION DESIGNATED BY THE CITY OF MANDAN.
- 722 P02 ADJUST MANHOLE: FROM STA 146+00 TO 171+00 THERE ARE 8 MANHOLES THAT MAY NEED TO BE ADJUSTED TWO TIMES, ONCE FOR THE TEMPORARY ROAD AND ONCE FOR THE FINAL ROADWAY. ONLY ONE BID ITEM "ADJUST MANHOLE" SHALL BE PAID AT EACH LOCATION FOR THE TWO ADJUSTMENTS.

- 724 010 STORM DRAINS: AT SEVERAL LOCATIONS, THE NEW SEWER IS TO BE INSTALLED INTO AN EXISTING MANHOLE OR INLET BARREL. THE COST OF CUTTING INTO THE MANHOLES OR INLET BARRELS AND GROUTING OF SEWER LEADS SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS.
- 724 015 SALVAGED ITEMS: ALL EXISTING WATER MAIN GATE VALVES, CAST IRON FITTINGS, HYDRANTS, MANHOLES (PRECAST), REINFORCED CONCRETE PIPE, INLET CASTINGS, MANHOLE CASTINGS, ETC., SALVAGED, SHALL BECOME THE PROPERTY OF THE CITY OF MANDAN AND SHALL BE DELIVERED TO A SITE DESIGNATED BY THE CITY.
- 724 P01 INSTALL 6 IN. HYDRANT: ALL COSTS FOR PIPING, FITTINGS, AND COUPLINGS REQUIRED FOR CONNECTION TO EXISTING MAINS SHALL BE INCLUDED IN THE PRICE BID FOR "INSTALL 6" HYDRANT".
- 724 P02 REMOVE HYDRANT: WHERE HYDRANTS ARE REMOVED AND THE EXISTING HYDRANT LEAD IS NOT EXTENDED TO A NEW HYDRANT, HYDRANT LEAD PIPING SHALL BE REMOVED AND THE TEE ON THE WATERMAIN SHALL BE PLUGGED. ALL COSTS INCLUDED WITH THE PRICE BID FOR "REMOVE HYDRANT".
- 724 P03 GATE VALVES: EXTENSION RODS SHALL BE PROVIDED ON ALL NEW VALVES. RODS SHALL BRING OPERATING NUT TO WITHIN 4' OF THE VALVE BOX FINISHED GRADE. PAYMENT FOR GATE VALVES SHALL BE FULL COMPENSATION FOR INSTALLING GATE VALVES AND INCIDENTALS INCLUDING BUT NOT LIMITED TO THE VALVE, VALVE BOX, EXTENSION RODS AND ADJUSTMENT OF THE VALVE BOX TO FINAL GRADE.
- 724 P04 THE UNIT PRICE BID FOR TAPPING SLEEVES SHALL INCLUDE ALL COSTS FOR FURNISHING AND INSTALLING THE FL X MJ VALVE, EXTENSION RODS AND VALVE BOX.
- 748 020 CURB ENDS: ON STREET RETURNS AND OTHER LOCATIONS WHERE THE NEW CURB AND GUTTER ENDS AND DOES NOT ABUT EXISTING CURB AND GUTTER, THE END TWO (2) FEET OF THE CURB SHALL BE TAPERED FROM 6" IN HEIGHT TO 0". A 1/2" PREMOLDED EXPANSION JOINT WHICH IS FULL DEPTH AND THE SAME SHAPE AS THE CURB AND GUTTER SHALL BE INSTALLED JUST AHEAD OF THE TAPER. AN 18" TIE BAR SHALL BE INSTALLED ACROSS THE JOINT.
- 748 040 DOWEL BARS INSTALLED AT EXPANSION JOINTS IN THE CURB AND GUTTER WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE PRICE BID FOR "CURB AND GUTTER - TYPE I."
- 748 P01 CURB AND GUTTER: CURB AND GUTTER ON THIS PROJECT SHALL BE TYPE I AS SHOWN ON STANDARD DRAWING D-748-1 EXCEPT THAT THE GUTTER SECTION OF CURB AND GUTTER ADJACENT TO CONCRETE PAVEMENT SHALL BE POURED AT THE SAME DEPTH AS THE PAVEMENT.
- 750 P01 DRIVEWAYS: ALL DRIVEWAYS SHALL BE CONSTRUCTED USING HIGH EARLY STRENGTH CONCRETE. DRIVES SHALL BE CONSTRUCTED 1/2 AT A TIME TO FACILITATE ACCESS TO ADJACENT PROPERTY UNLESS OTHERWISE APPROVED BY THE ENGINEER. ALL DRIVEWAYS SHALL BE 6" DEPTH UNLESS OTHERWISE SHOWN ON PLAN SHEETS.
- 754 050 SIGN SUPPORTS: THE SIGN SUPPORTS "STEEL GALVANIZED POSTS - SQUARE TUBE PERFORATED" WERE DESIGNED USING A MINIMUM YIELD STRENGTH OF 55,000 PSI AND THE DESIGN REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS." THE WIND SPEED OF 75 MPH WAS USED. THE SQUARE TELESCOPING STEEL POSTS SHALL HAVE ALL HOLES PUNCHED COMPLETELY. ALL METAL SHALL BE REMOVED FROM THE PUNCHED HOLES.
- 754 P01 EXISTING SIGNS & SUPPORTS: EXISTING SIGNS AND SUPPORTS TO BE REMOVED AND SALVAGED WILL BE INSPECTED AND EXISTING CONDITIONS DOCUMENTED BY THE ENGINEER. THE CONTRACTOR SHALL REMOVE THESE SIGNS & SUPPORTS WITH CARE. SALVAGED SIGNS & SUPPORTS ARE TO BE DELIVERED TO THE CITY OF MANDAN'S PUBLIC WORKS DEPARTMENT. ANY SIGNS OR SUPPORTS DAMAGED DURING REMOVAL AND DELIVERY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

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GENERAL NOTES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	8
OLD RED TRAIL GENERAL NOTES		

762 025 PREFORMED PATTERNED PAVEMENT MARKING - LINES AND MESSAGE (GROOVED): THE CONTRACTOR SHALL MILL OR SAW THE PAVEMENT IN THE AREAS WHERE PLANS CALL FOR PREFORMED PATTERNED PAVEMENT MARKINGS (GROOVED). THE MILLING OR SAW DEPTH SHALL BE 40 MILS DEEP, THE SAME WIDTH AND LENGTH OF LINES, AND THE ACTUAL AREA OF THE ARROWS AND MESSAGES. THE SPACE BETWEEN THE LETTERS AND LETTER OPENINGS SHALL NOT BE MILLED OR SAWED. THE LOOSE MATERIAL SHALL BE REMOVED FROM THE GROOVE USING AIR PRESSURE. UPON COMPLETION OF CLEANING THE GROOVE, THE PREFORMED PATTERNED PAVEMENT MARKING SHALL BE INSTALLED AS SPECIFIED BY THE MANUFACTURER. EQUIPMENT USED TO COMPLETE GROOVING SHALL NOT CAUSE STRAIN OR DAMAGE TO THE PAVEMENT. THE COST OF GROOVING, CLEANING, FURNISHING, AND INSTALLING THE PAVEMENT MARKINGS SHALL BE INCLUDED IN THE PRICE BID FOR "PREFORMED PATTERNED PAVEMENT MARKING - VARIOUS WIDTHS OF LINES AND MESSAGES GROOVED".

762 102 PREAPPROVAL OF WHITE AND YELLOW PAVEMENT MARKING PAINT IS REQUIRED AND WILL BE SAMPLED, TESTED AND ACCEPTED ACCORDING TO SECTION 880.01 A.2 OF THE SUPPLEMENTAL SPECIFICATIONS.

762 P01 PAVEMENT MARKING: THE FOLLOWING PAVEMENT MARKING PAINTED LINES AND MESSAGES HAVE BEEN ADDED TO THE QUANTITIES FOR MARKING, FOR USE IF THE CONTRACTOR IS UNABLE TO PLACE PERMANENT PAVEMENT MARKING BECAUSE OF SPECIFIED SEASONAL LIMITATIONS. QUANTITIES HAVE BEEN INCLUDED FOR THE FOLLOWING PAINTED LINES AND MESSAGES:

PAVEMENT MARKING PAINTED 4IN LINE	19,053 LF
PAVEMENT MARKING PAINTED 8IN LINE	256 LF
PAVEMENT MARKING PAINTED 24 IN LINE	149 LF
PAVEMENT MARKING PAINTED MESSAGE	52 SF

CONTRACTOR IS ADVISED THAT THESE QUANTITIES MAY OR MAY NOT BE USED.

ON PCC PAVEMENT THE PAINTED MARKINGS SHALL BE PLACED IN THE SAME LOCATION AS THE PERMANENT MARKINGS SO THEY ARE REMOVED BY GROOVING OPERATIONS. ON HOT BITUMINOUS PAVEMENTS, THE PAINTED MARKINGS SHALL BE OFFSET FROM THE LOCATION OF THE PERMANENT MARKINGS SO THEY ARE ULTIMATELY COVERED BY SEAL COATING OPERATIONS.

766 P01 36 EXISTING MAILBOXES SHALL BE REMOVED AND RESET USING V-LOC MAILBOX SUPPORT SYSTEMS AS SUPPLIED BY 3D SPECIALTIES, INC. OR APPROVED EQUAL. IN ADDITION 23 MAILBOXES WHICH ARE ALREADY FITTED WITH V-LOC SYSTEMS SHALL BE REMOVED AND RESET. THE PAY ITEM "MAILBOX - ALL TYPES" 36 EACH SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, AND MATERIALS FOR ALL WORK ASSOCIATED WITH MAILBOX WORK, INCLUDING MOVING MAILBOXES MULTIPLE TIMES FOR CONSTRUCTION PHASING AND RELOCATING MAILBOXES PREVIOUSLY FITTED WITH V-LOC SUPPORTS.

770 001 OVERHEAD LINES CLEARANCE: MINIMUM HORIZONTAL AND VERTICAL CLEARANCE BETWEEN LIGHT AND/OR SIGNAL STANDARDS AND POWER LINES SHALL BE AS SHOWN FOR THE FOLLOWING POWER LINE VOLTAGES:

POWER LINE VOLTAGE	HORIZONTAL CLEARANCE	VERTICAL CLEARANCE
0-15,000	5'	6'
15,000-50,000	5'	7'
50,000 PLUS	5'+0.033' PER KV OVER 50 KV	7'+0.033' PER KV OVER 50 KV

770 024 LIGHT STANDARDS: THE LIGHT STANDARDS FOR OLD RED TRAIL SHALL BE OF THE DAVIT TYPE AND DESIGNED FOR SINGLE 6 FOOT MAST ARMS AND SHALL BE GALVANIZED. THE BASE SHALL BE OF THE ANCHOR TYPE. MOUNTING HEIGHTS SHALL BE AS NOTED IN THE PLANS.

770 700 LUMINAIRES: THE HIGH-PRESSURE SODIUM VAPOR LUMINAIRES SHALL BE INTERNAL BALLAST-CONSTANT WATTAGE, 120X 240 VOLTAGE, OPERATED ON 240 VOLTS. THE LAMP SHALL BE 250 WATT OR 150 WATT, CLEAR HIGH PRESSURE SODIUM, 55 VOLT.

- LEGEND - LIGHTING:
- 150-WATT SODIUM VAPOR LUMINAIRE 5° TILT.
 - 250-WATT SODIUM VAPOR LUMINAIRE WITH 0° TILT.
 - 250-WATT SODIUM VAPOR LUMINAIRE WITH 5° TILT.

770 P02 LUMINAIRE DESIGN CRITERIA: THE ACCEPTED DESIGN FOR THE LUMINAIRES SHALL PROVIDE NOT LESS THAN .8 AVERAGE MAINTAINED FOOTCANDLES AND A UNIFORMITY RATIO (AVERAGE MAINTAINED TO MINIMUM MAINTAINED) OF NOT GREATER THAN 3.5:1 USING THE FOLLOWING PARAMETERS.

OVERHANG	6 FT.
LAMP LOSS FACTOR (LLF)	.7
WIDTH OF LIGHTED AREA	ACTUAL ROADWAY
SPACING:	AS DESIGNED
CONFIGURATION:	AS DESIGNED
MOUNTING HEIGHT:	40 FT.
LAMP:	250 W HPS
TILT:	5.0° OR 0.0° TILT
REFRACTOR:	GLASS

THE FOLLOWING LUMINAIRES MEET THE REQUIREMENTS FOR THIS DESIGN:

A.) HUBBELL RM-G SERIES. MEDIUM, SEMI-CUTOFF, IES TYPE III DISTRIBUTION. PHOTOMETRIC CURVE NO. HP03156 AND HP04461.

B.) CROUSE HINDS OVX SERIES. MEDIUM, SEMI-CUTOFF IES TYPE III DISTRIBUTION. PHOTOMETRIC CURVE NO. OVX253EG.

C.) GENERAL ELECTRIC M2RR SERIES. MEDIUM, SEMI-CUTOFF IES TYPE III DISTRIBUTION. PHOTOMETRIC CURVE NO. GE7260.

COMPUTER DATA FOR ALL PROPOSED FIXTURES MUST BE FORWARDED TO THE ENGINEER FOR APPROVAL. THIS DATA MUST BE PROVIDED IN AN IES FORMAT COMPATIBLE WITH THE ENGINEERS' COMPUTER LIGHTING PROGRAM. APPROVAL MUST HAVE BEEN RECEIVED BY THE CONTRACTOR BEFORE THE LUMINAIRES MAY BE INSTALLED.

THREE (3) COPIES OF THE ISOFOOTCANDLE DATA AND UTILIZATION CURVES MUST ALSO BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE APPROVED DATA FOR EACH CASE SHALL BE USED TO DETERMINE THE CORRECT SOCKET POSITION AT EACH LUMINAIRE LOCATION. EACH LUMINAIRE SHALL BE INSTALLED WITH ITS LAMP SOCKET IN THE PROPER POSITION AND WITH A 5/0° TILT ABOVE NADIR.

770 P03 ALL CONDUITS TO BE INSTALLED UNDER EXISTING PAVED SURFACES SHALL BE BORED OR PUSHED. BORING OR PUSHING SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE PRICE BID FOR CONDUIT.

770 P04 RELOCATE LUMINAIRE: THE ITEM "RELOCATE LUMINAIRE" SHALL CONSIST OF REMOVING EXISTING LUMINAIRE FROM LOCATION SHOWN ON THE PLAN AND INSTALLING AT THE NEW LOCATION AS INDICATED.

THE CONDUCTORS PRESENTLY FEEDING THE LUMINAIRE SHALL NOT BE REUSED. INCLUDE COST OF NEW CONDUCTORS THAT ARE NOT INCLUDED ELSEWHERE ON THE BID FORM.

INCLUDED WITH THIS UNIT SHALL BE THE COST OF RELAMPING THE LUMINAIRE PRIOR TO REINSTALLATION.

770 P05 EXISTING FEED POINT E: CONTRACTOR SHALL PROVIDE TWO NEW 30/2 CIRCUIT BREAKERS OF SAME TYPE AND RATINGS AS EXISTING. ALL COST ASSOCIATED WITH THE INSTALLATION OF NEW CIRCUIT BREAKERS SHALL BE INCIDENTAL TO THE COST OF THE PROJECT.

900 P01 NOISE: PILE DRIVING, JACK HAMMERING, CONCRETE DEMOLITION OR OTHER CONSTRUCTION ACTIVITIES WHICH CAUSE DISRUPTIVE NOISE WILL NOT BE ALLOWED AFTER 10 P.M. OR BEFORE 7 A.M. THE SAWING OF CONCRETE IS EXCLUDED FROM THIS RESTRICTION.

QUANTITIES

SPEC	CODE	DESCRIPTION	UNIT	SU FUNDS	CITY FUNDS	TOTAL FUNDS
103	0100	CONTRACT BOND	L SUM	1.0	0.0	1.0
201	0330	CLEARING AND GRUBBING	L SUM	1.0	0.0	1.0
202	0105	REMOVAL OF STRUCTURE	L SUM	1.0	0.0	1.0
202	0112	REMOVAL OF CONCRETE	SY	813.7	0.0	813.7
202	0130	REMOVAL OF CURB & GUTTER	LF	3951.0	0.0	3951.0
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	33044.0	84.0	33128.0
202	0153	SAW BITUMINOUS SURFACING-FULL DEPTH	LF	2385.0	36.0	2421.0
202	0169	REMOVAL OF END SECTION - ALL TYPES & SIZES	EACH	2.0	0.0	2.0
202	0174	REMOVAL OF PIPE - ALL TYPES & SIZES	LF	1253.0	440.0	1693.0
202	0210	REMOVAL OF MANHOLES	EACH	1.0	0.0	1.0
202	0230	REMOVAL OF INLETS	EACH	4.0	0.0	4.0
202	0237	REMOVAL OF MEDIAN DRAIN - PRECAST CONCRETE	EACH	1.0	0.0	1.0
203	0101	COMMON EXCAVATION TYPE A	CY	40128.0	4484.0	44612.0
216	0100	WATER	M GAL	1303.0	80.0	1383.0
230	0110	RESHAPING INSLOPE	MILE	0.5	0.0	0.5
302	0100	SALVAGED BASE COURSE	TON	2600.0	0.0	2600.0
302	0501	BLENDED BASE COURSE	TON	26425.0	1450.0	27875.0
401	0100	MC70 OR 250 LIQUID ASPHALT	GAL	6955.0	2175.0	9130.0
401	0112	RC250, 800 LIQUID OR CRS2 EMULSIFIED ASPHALT	GAL	5785.0	2175.0	7960.0
401	0150	SS1H OR CSS1H OR MSI EMULSIFIED ASPHALT	GAL	1505.0	315.0	1820.0
408	0190	HOT BITUMINOUS PAVEMENT CL 33	TON	6205.0	1395.0	7600.0
408	0445	PG58-28 ASPHALT CEMENT	TON	373.0	84.0	457.0
420	0145	COVER COAT MATERIAL CL 43	TON	210.0	80.0	290.0
550	0105	6" NON-REINF. CONCRETE PAVEMENT CL AE	SY	631.5	0.0	631.5
550	0112	8" NON-REINF. CONCRETE PAVEMENT CL AE	SY	32083.0	0.0	32083.0
550	0174	8" NON-REINF. CONCRETE PAVEMENT CL AE-HIGH EARLY	SY	3500.0	0.0	3500.0
550	0212	CONCRETE END BLOCK	SY	59.0	0.0	59.0
550	0958	LONGITUDINAL JOINT SILICONE SEAL	LF	7522.0	0.0	7522.0
702	0100	MOBILIZATION	L SUM	1.0	0.0	1.0
704	0100	FLAGGING	M HR	600.0	70.0	670.0

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	10
OLD RED TRAIL QUANTITIES		

QUANTITIES

SPEC	CODE	DESCRIPTION	UNIT	SU FUNDS	CITY FUNDS	TOTAL FUNDS
704	1000	TRAFFIC CONTROL SIGNS	UNITS	1857.0	98.0	1955.0
704	1052	TYPE III BARRICADE	EACH	15.0	2.0	17.0
704	1060	DELINEATOR DRUMS	EACH	476.0	75.0	551.0
704	1067	TUBULAR MARKERS	EACH	374.0	0.0	374.0
708	1020	RIP RAP - LOOSE ROCK	CY	20.0	20.0	40.0
708	1310	EROSION CHECKS	LF	100.0	0.0	100.0
708	1350	SEDIMENT CONTROL FENCING	LF	2200.0	0.0	2200.0
708	2950	SEEDING-HYDRO MULCH	ACRE	18.5	3.1	21.6
708	5800	EROSION CONTROL FABRIC	SY	56.0	616.0	672.0
709	0402	GEOTEXTILE SEPARATION FABRIC TYPE S2	SY	40.0	40.0	80.0
714	0210	PIPE CONC REINF 15IN CL III-STORM DRAIN	LF	80.0	0.0	80.0
714	0315	PIPE CONC REINF 18IN CL III-STORM DRAIN	LF	395.0	0.0	395.0
714	0620	PIPE CONC REINF 24IN CL III-STORM DRAIN	LF	647.0	0.0	647.0
714	0710	PIPE CONC REINF 27IN CL III-STORM DRAIN	LF	775.0	0.0	775.0
714	0910	PIPE CONC REINF 36IN CL III-STORM DRAIN	LF	151.0	0.0	151.0
714	2130	PIPE CONC REINF ARCH 44IN x 27IN CL III	LF	124.0	0.0	124.0
714	3020	END SECT-CONC REINF 24IN	EACH	3.0	0.0	3.0
714	3095	END SECT-CONC REINF ARCH 44IN x 27IN	EACH	1.0	0.0	1.0
714	5000	PIPE CORR STEEL .064IN 12IN	LF	112.0	0.0	112.0
714	5015	PIPE CORR STEEL .064IN 18IN	LF	0.0	301.0	301.0
714	5035	PIPE CORR STEEL .064IN 24IN	LF	0.0	268.0	268.0
714	5800	END SECTION CORR STEEL .064IN 12IN	EACH	6.0	0.0	6.0
714	5810	END SECTION CORR STEEL .064IN 18IN	EACH	0.0	16.0	16.0
714	5820	END SECTION CORR STEEL .064IN 24IN	EACH	0.0	6.0	6.0
722	0110	MANHOLE 60IN	EACH	7.0	0.0	7.0
722	0120	MANHOLE 72IN	EACH	1.0	0.0	1.0
722	0130	MANHOLE 84IN	EACH	2.0	0.0	2.0
722	0315	MANHOLE CASTING	EACH	6.0	0.0	6.0
722	1110	MANHOLE RISER 60IN	LF	34.6	0.0	34.6
722	1120	MANHOLE RISER 72IN	LF	7.3	0.0	7.3

STATE	PROJECT	SHEET
ND	SU-1-988(008)019	//
OLD RED TRAIL QUANTITIES		

QUANTITIES

SPEC	CODE	DESCRIPTION	UNIT	SU FUNDS	CITY FUNDS	TOTAL FUNDS
722	1130	MANHOLE RISER 84IN	LF	9.1	0.0	9.1
722	3510	INLET - TYPE 2	EACH	17.0	0.0	17.0
722	3520	INLET - TYPE 2 DOUBLE	EACH	3.0	0.0	3.0
722	3920	INLET - SLOTTED DRAIN 18IN	LF	230.0	0.0	230.0
722	6160	ADJUST INLET	EACH	2.0	0.0	2.0
722	6200	ADJUST MANHOLE	EACH	23.0	2.0	25.0
722	6240	ADJUST UTILITY APPURTENANCE	EACH	37.0	16.0	53.0
724	0400	HYDRANT - INSTALL 6 IN	EACH	5.0	0.0	5.0
724	0430	REMOVE HYDRANT	EACH	2.0	0.0	2.0
724	0530	TAPPING SLEEVE & VALVE - 12 INCH x 6 INCH	EACH	2.0	0.0	2.0
724	0810	WATERMAIN 6 IN PVC	LF	62.0	0.0	62.0
724	2002	REMOVE 6 IN VALVE	EACH	2.0	0.0	2.0
748	0140	CURB & GUTTER - TYPE 1	LF	16838.0	442.0	17280.0
750	0100	SIDEWALK CONCRETE	SY	228.9	0.0	228.9
750	1010	DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	SY	1448.3	0.0	1448.3
750	1025	DRIVEWAY CONCRETE 8"-HIGH EARLY STRENGTH	SY	1938.8	0.0	1938.8
754	0116	FLAT SHEET FOR SIGNS TYPE 2 REFLECTIVE SHEETING	SF	206.3	0.0	206.3
754	0117	FLAT SHEET FOR SIGNS TYPE 3A REFLECTIVE SHEETING	SF	156.8	0.0	156.8
754	0162	REMOVE & RESET DELINEATORS	EACH	22.0	15.0	37.0
754	0191	FLEXIBLE DELINEATORS - TYPE B	EACH	3.0	0.0	3.0
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	358.4	0.0	358.4
754	0592	RESET SIGN PANEL	EACH	6.0	0.0	6.0
762	0103	PVMT MK PAINTED MESSAGE	SF	37.0	0.0	37.0
762	0122	PREFORMED PATTERNED PVMT MK MESSAGE-GROOVED	SF	37.0	0.0	37.0
762	0420	SHORT TERM 4 INCH LINE - TYPE 'R'	LF	12030.0	0.0	12030.0
762	1104	PVMT MK PAINTED 4IN LINE	LF	32927.0	0.0	32927.0
762	1108	PVMT MK PAINTED 8IN LINE	LF	256.0	0.0	256.0
762	1124	PVMT MK PAINTED 24IN LINE	LF	169.0	0.0	169.0
762	1204	PLASTIC PVMT MK FILM 4 IN LINE	LF	3263.0	0.0	3263.0

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	12
OLD RED TRAIL QUANTITIES		

QUANTITIES

SPEC	CODE	DESCRIPTION	UNIT	SU FUNDS	CITY FUNDS	TOTAL FUNDS
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	14572.0	0.0	14572.0
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	256.0	0.0	256.0
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED	LF	129.0	0.0	129.0
762	1360	PAVEMENT MARKING 4 IN LINE - MASKING	LF	2288.0	0.0	2288.0
764	0115	3-CABLE GUARDRAIL	LF	0.0	1000.0	1000.0
766	0100	MAILBOX-ALL TYPES	EACH	36.0	0.0	36.0
770	0020	CONCRETE FOUNDATION - HIGHWAY LIGHTING	EACH	60.0	0.0	60.0
770	0050	CONCRETE FOUNDATION - FEED POINT - TYPE A	EACH	1.0	1.0	2.0
770	0100	PULL BOX	EACH	2.0	0.0	2.0
770	0210	CABLE TRENCH - TYPE 1	LF	39.0	8693.0	8732.0
770	0330	2IN DIAMETER RIGID CONDUIT	LF	15440.0	562.0	16002.0
770	0504	UNDERGROUND CONDUCTOR NO4-TYPE RHW	LF	32388.0	18046.0	50434.0
770	0605	UNDERGROUND CONDUCTOR NO6-TYPE THW	LF	16194.0	9023.0	25217.0
770	0740	FEED POINT - TYPE III - PAD MOUNTED	EACH	1.0	1.0	2.0
770	1076	LT STD 6FT MA 40FT MT HT	EACH	59.0	0.0	59.0
770	4120	HP SODIUM VAPOR LUMINAIRE-150 WATT	EACH	0.0	21.0	21.0
770	4140	HP SODIUM VAPOR LUMINAIRE-250 WATT	EACH	59.0	0.0	59.0
770	4540	RELOCATE LIGHT STANDARD	EACH	1.0	0.0	1.0
770	4560	REMOVE LIGHT STANDARD	EACH	6.0	0.0	6.0
770	4750	50FT WOOD SERVICE POLE	EACH	0.0	21.0	21.0

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	13
OLD RED TRAIL BASIS OF ESTIMATE		

BASIS OF ESTIMATE

SURFACING

BLENDED BASE COURSE @ 1.6 TON/CY + 25%	2.0 TON/CY
HOT BITUMINOUS PAVEMENT CLASS 33 @ 2 TON/CY	0.056 TON/SY/IN
P.G. 58-28 ASPHALT CEMENT @ 6% OF HOT BITUMINOUS PAVEMENT	0.0036 TON/SY/IN
TACK COAT SS-1H OR CSS-1H OR MS1 EMULS ASPH @ 0.05 GAL/SY	0.05 GAL/SY
PRIME COAT MC-70 OR 250 LIQUID ASPHALT @ 0.35 GAL/SY	0.35 GAL/SY
8" NON REINFORCED CONCRETE PAVEMENT	1.00 SY/SY
SEAL COAT RC-250, 800 OR CRS-2 EMULS ASPH @ 0.35 GAL/SY	0.35 GAL/SY
COVER COAT MATERIAL CLASS 43 @ 25 LBS/SY	0.0125 TON/SY

GRADING

- WATER:** 10 GAL/CY OF ESTIMATED EMBANKMENT QUANTITIES AND 20 GAL/TON OF BLENDED BASE COURSE. AN ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE QUANTITIES FOR USE AS A DUST PALLIATIVE.
- TOPSOIL:** TOPSOIL SHALL BE REMOVED AND REPLACED FOR A MINIMUM DEPTH OF 6 INCHES ON THE AREAS THAT WILL BE DISTURBED BY THE CONSTRUCTION. SALVAGING, STOCKPILING, AND SPREADING TOPSOIL FROM EXCAVATION AREAS SHALL BE MEASURED AND PAID FOR AS "COMMON EXCAVATION".
- SEEDING:** THE ENTIRE AREA WITHIN THE RIGHT OF WAY THAT IS DISTURBED BY CONSTRUCTION ACTIVITIES, EXCLUDING SURFACED AREAS SHALL BE SEEDED. THE EXACT LIMITS SHALL BE DETERMINED IN THE FIELD.
- MULCHING:** THE ENTIRE AREA TO BE SEEDED.

LIST OF STANDARDS AND BENCH MARKS

LIST OF BENCH MARKS

NOTE:
VERTICAL CONTROL IS BASED ON NAVD OF 1929

NO	DESCRIPTION	LOCATION	ELEVATION
-	CHISEL "X"	S. END BOX CULVERT - W. OF 7TH DAY ADVENTIST	1940.75
-	PIPE IN CONC.	PROP. COR. - NE LOT COR. HOUSE #3901	1976.15
-	N. RIM W.V.	EXISTING W.V. E. OF HOUSE #4005	1966.45
-	TN - HYDRANT	1ST S. OF INT. 37TH ST NW & ORT	1990.71
-	TN - HYDRANT	W. SIDE ORT BETWEEN HILLSIDE & 34TH ST NW	1984.29
-	WOOD POST	TOP 3 1/2" SQ. POST - W. OF MAILBOX #2111	1982.34
-	LOT LITE	TOP OF SW COR. BASE - 1ST N. OF N. ENTRANCE TO LOBBY SEVEN SEAS	1953.66
-	CONC. BASE	SW COR. CONC. LOT LITE - NE COR. CONOCO LOT	1938.69
-	BOLT	TOP OF BOLT - ST. SIDE ST. LITE #2 - 1ST SE OF CONOCO	1926.25
-	BOLT	TOP OF BOLT - ST. SIDE ST. LITE #3	1912.39
-	BOLT	TOP OF BOLT - ST. SIDE ST. LITE #4	1898.68
-	BOLT	TOP OF BOLT - ST. SIDE ST. LITE #5	1883.01
-	BOLT	TOP OF BOLT - ST. SIDE ST. LITE #7	1867.52

LIST OF CONTROL POINTS

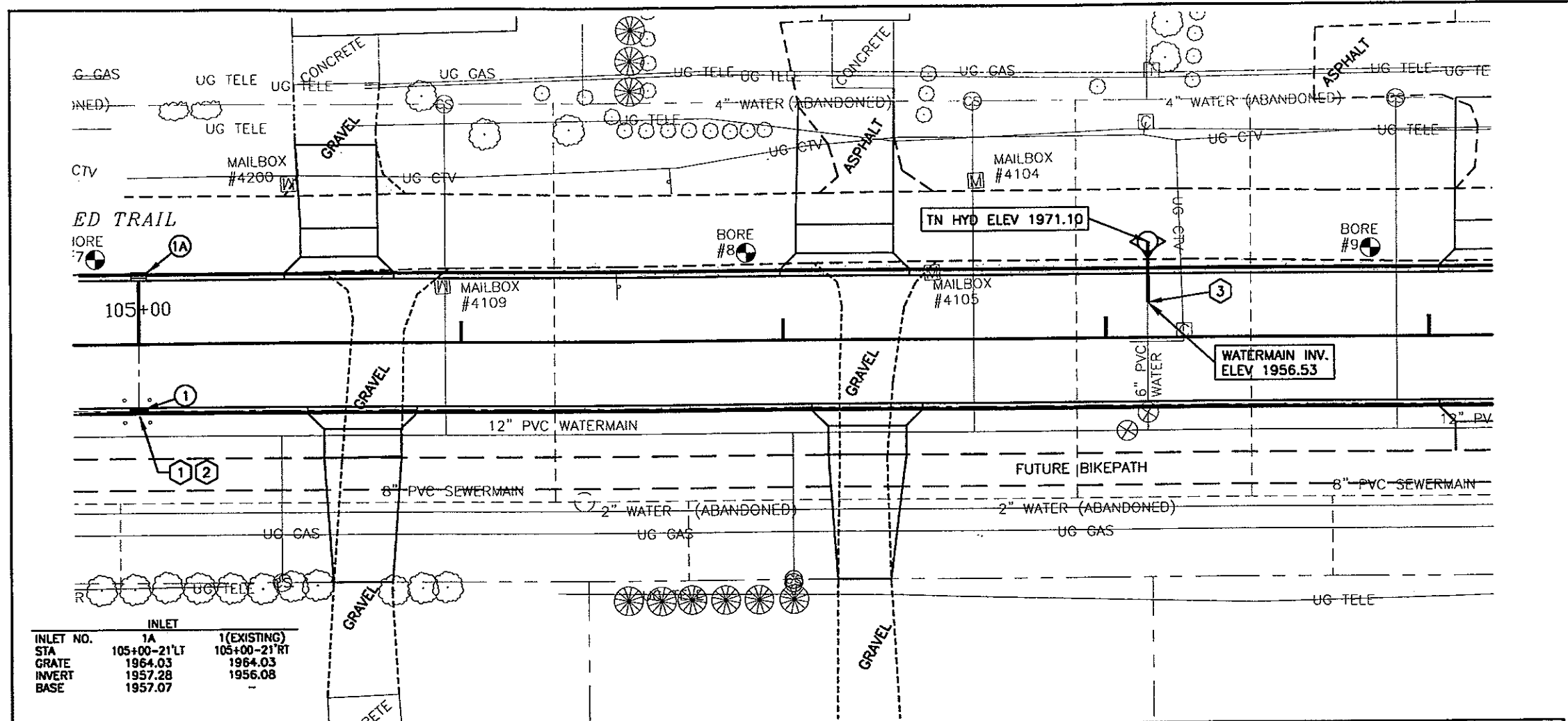
DESCRIPTION	COORDINATES	STATION AND OFFSET OR DESCRIPTION
CPT#100	430,651.43 N, 1,866,499.63 E	REBAR-GPS #97907-2 - ON HILLTOP - SE COR INT SUNSET & ORT
CPT#101	430,959.82 N, 1,865,588.70 E	REBAR-TOP OF BACKSLOPE - E SIDE ORT - SE OF "FARM CREDIT" SIGN
CPT#102	431,505.08 N, 1,864,740.40 E	PROP. COR. - SW COR. RIDGE MOTEL - GPS #97907-3
CPT#103	432,227.43 N, 1,863,902.00 E	RR SPIKE - E. OF ORT - APPROX LOT LINE BETWEEN #2026 & #2110
CPT#105	432,768.60 N, 1,863,199.46 E	REBAR - ON BACKSLOPE (EMPTY LOT) N. OF HOUSE #3001 ORT
CPT#106	433,345.37 N, 1,862,950.03 E	REBAR - SW COR. - ORT AND NYGREN DRIVE
CPT#107	433,645.78 N, 1,862,871.77 E	PROP COR - NE COR "JEM" CONSTRUCTION
CPT#108	434,467.84 N, 1,862,581.18 E	GPS #97907-4 - "T" POST - 1/4 COR
CPT#109	434,832.07 N, 1,862,646.74 E	SHOT ON COVER GPS MONUMENT 97907-5
CPT#110	435,048.56 N, 1,862,341.36 E	"T" POST - PROP COR - SW COR INT 37TH ST. NW & ORT
CPT#112	436,679.51 N, 1,860,942.26 E	REBAR - GPS #97907-7 - SW OF MAILBOX #4209 - CHURCH OF NAZARENE
CPT#114	437,148.38 N, 1,860,229.47 E	CURB STOP - IN FRONT OF 7TH DAY ADVENTIST CHURCH GPS #97907-8
CPT#116	437,018.13 N, 1,859,234.84 E	REBAR - SE COR ORT & 34TH AVE NW
CPT#117	437,028.02 N, 1,859,977.08 E	REBAR - ±100' W OF PC OF CURVE TO THE RIGHT /±22' N OF N END OF N-S TREE ROW
CPT#122	434,488.22 N, 1,862,980.91 E	REBAR - SE COR RADIO TOWER LOT - HILLSIDE ROAD
CPT#123	434,173.89 N, 1,863,317.52 E	REBAR - BY MAILBOX #3405 - HILLSIDE ROAD
CPT#124	434,676.01 N, 1,863,240.25 E	REBAR - EAST SHOULDER HILLSIDE ROAD N. OF 35TH ST.
CPT#127	437,236.43 N, 1,860,674.83 E	REBAR - WEST SIDE OF HIGHLAND RD E. OF HOUSE #4401
CPT#130	433,233.63 N, 1,863,699.33 E	S. END - HILLSIDE RD - E. SHOULDER E. OF #3201
CPT#132	437,155.12 N, 1,859,680.39 E	REBAR IN FIELD - N. SIDE ORT - NE OF BOX CULVERT
CPT#134	438,882.49 N, 1,860,470.67 E	40d SPIKE/CHSR - BACK YARD HOUSE #4900
CPT#136	429,380.80 N, 1,866,706.13 E	REBAR - W. SIDE SUNSET DRIVE ACROSS FROM AMOCO

LIST OF STANDARDS

STANDARD NO.	DESCRIPTION
D-550-2	LONGITUDINAL JOINT DETAILS
D-550-5	TRANSVERSE CONSTRUCTION JOINT DETAILS
D-704-8	BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS
D-704-9,10,11,12	CONSTRUCTION SIGN DETAILS
D-704-13	BARRICADE DETAILS
D-704-14,15	CONSTRUCTION SIGN AND BARRICADE ASSEMBLY DETAILS
D-704-23	CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS
D-704-24	CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS
D-704-25	CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS
D-708-2	TEMPORARY EROSION AND SILTATION CONTROLS
D-714-1	REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
D-714-2	REINFORCED CONCRETE PIPE ARCH CULVERTS AND END SECTIONS
D-714-4	CORRUGATED STEEL PIPE CULVERTS & END SECTIONS
D-714-22	CONCRETE PIPE TIES
D-722-2	INLET - TYPE 2
D-722-3A	INLET - SLOTTED DRAIN
D-722-5	MANHOLE DETAILS
D-724-1	WATER WORKS
D-748-1	VALLEY GUTTER AND CURB AND GUTTER
D-750-1	CONCRETE DRIVEWAY (URBAN)
D-750-2	SIDEWALKS AND CURB RAMPS
D-754-1	ASSEMBLY DETAILS
D-754-3	BREAK AWAY BASE
D-754-4	MULTI DIRECTIONAL BREAK AWAY BASE
D-754-9	LETTER AND ARROW DETAILS
D-754-21	REFLECTORIAL DELINEATORS
D-754-23	ASSEMBLY DETAILS
D-754-24	MOUNTING DETAILS PERFORATED TUBE
D-754-26,27,28,29	SIGN PUNCHING, STRINGER, AND SUPPORT LOCATION
39,55	DETAILS FOR REGULATORY, WARNING, AND GUIDE SIGNS
D-754-76	STREET NAME SIGN ASSEMBLY DETAILS
D-754-80	LIGHT STANDARD, SIGNAL STANDARD, AND SPAN WIRE MOUNTED SIGN ASSEMBLY DETAIL
D-762-1	PAVEMENT MARKING MESSAGE DETAILS
D-762-4	PAVEMENT MARKING
D-762-6	SHORT TERM PAVEMENT MARKING
D-764-32	THREE CABLE GUARDRAIL
D-766-1	MAILBOX LOCATION DETAILS
D-770-1	CONCRETE FOUNDATIONS (TRAFFIC SIGNALS AND HIGHWAY LIGHTING)
D-770-2	FEED POINT (ROADWAY LIGHTING)
D-770-3	PULL BOX DETAIL
D-770-4	LIGHTING AND SIGNAL DETAILS
D-770-5	LIGHT STANDARD DETAILS

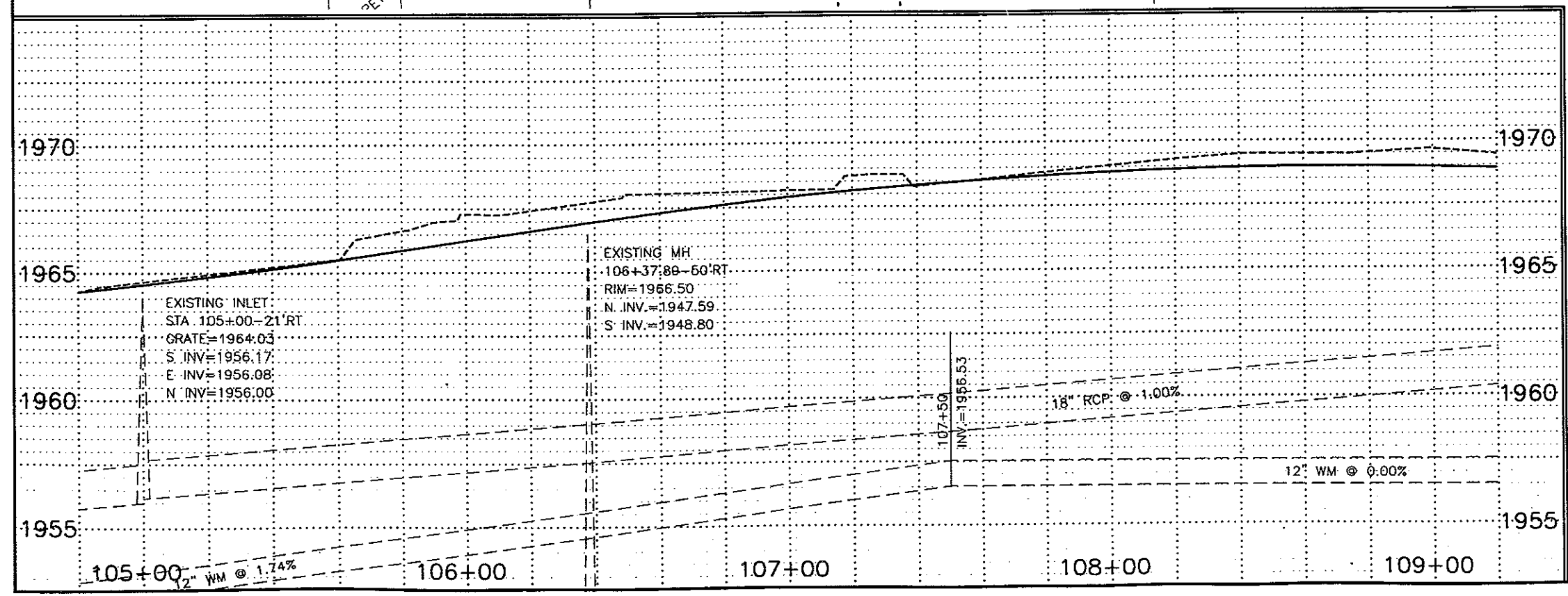
NOTE: STANDARD DRAWINGS ARE INCLUDED IN THE BACK OF THE PLANS.

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	15
OLD RED TRAIL		
STA. 105+00 TO STA. 109+00		
UNDERGROUND UTILITY LAYOUT		

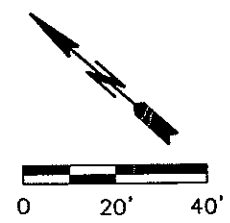


HYDRANT - INSTALL 6 IN.	
STA 108+13-30'LT	1 EA
WATERMAIN 6 IN. PVC	
STA 108+13-11'LT TO 108+13-30'LT	19 LF
INLET - TYPE 2 DOUBLE V GRATE	
#1A	1 EACH
PIPE, CONC. REINF. CL III STORM DRAIN	
105+00-04'LT TO #1A	18'X16 LF
ADJUST INLET	
#1	1 EACH

INLET		
INLET NO.	1A	1 (EXISTING)
STA	105+00-21'LT	105+00-21'RT
GRATE	1964.03	1964.03
INVERT	1957.28	1956.08
BASE	1957.07	-

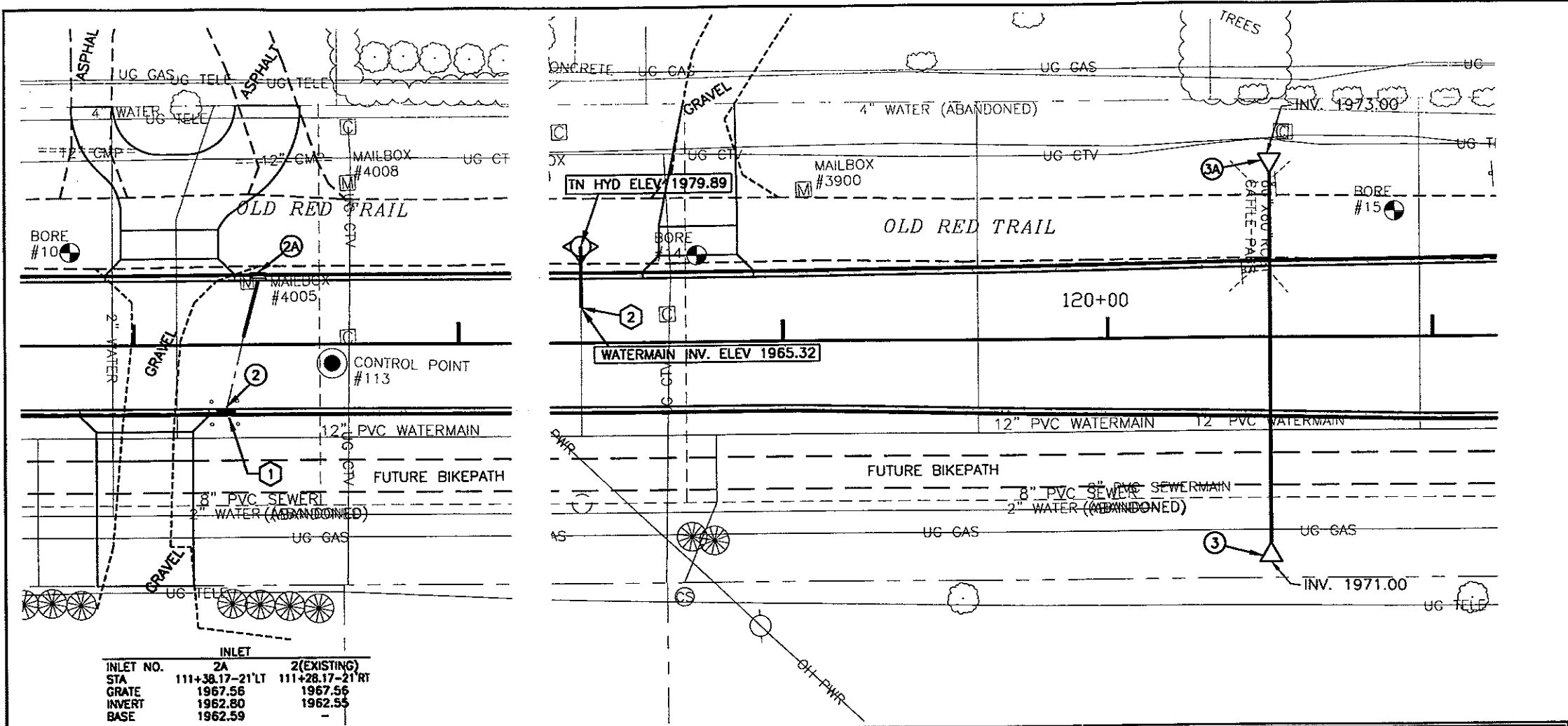


- CONSTRUCTION NOTES**
- 1 REMOVE TYPE-D DELINEATORS NEAR INLETS. ALL COSTS INCLUDED IN THE UNIT PRICE BID FOR "ADJUST INLET."
 - 2 EXISTING INLET IS WRAPPED IN TWO LAYERS OF 8 MIL. POLY. ALL COSTS ASSOCIATED IN REMOVING THE POLY SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "ADJUST INLET."
 - 3 ALL COSTS ASSOCIATED WITH THE CONNECTION TO THE EXISTING WATERMAIN ARE INCIDENTAL.

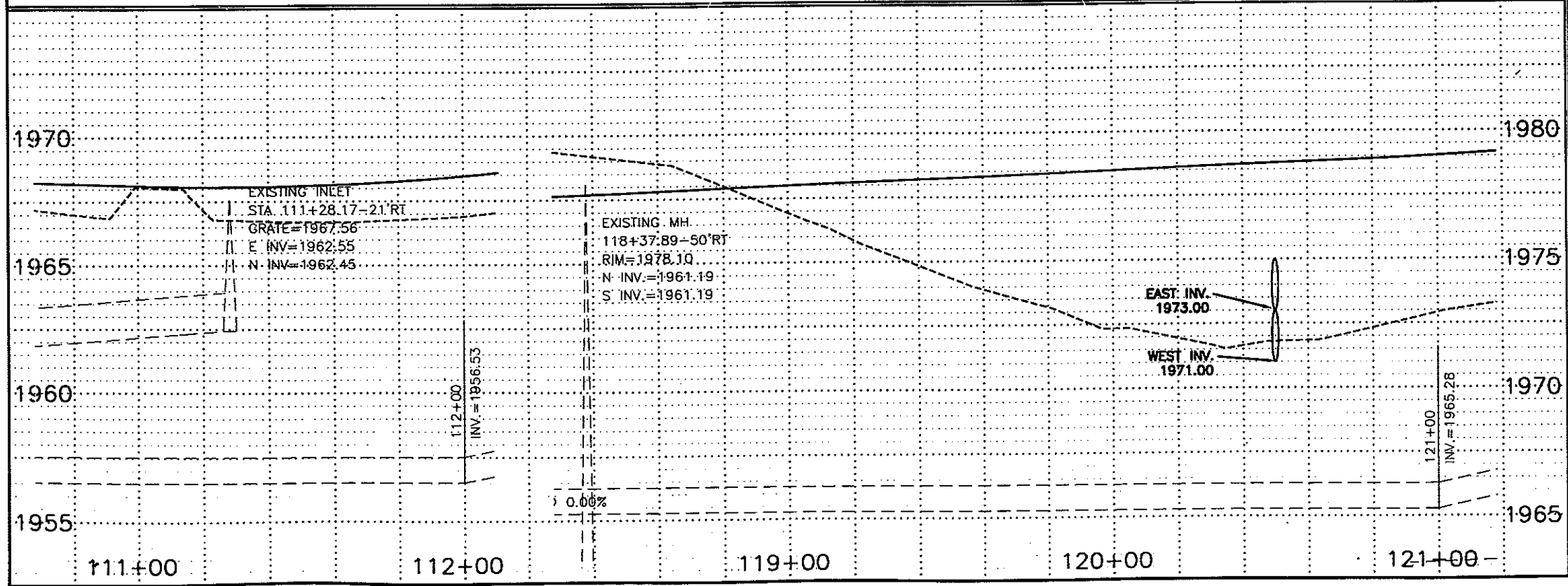


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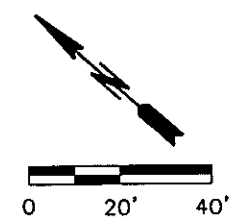
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	16
OLD RED TRAIL STA. 110+75 TO STA. 112+00 STA. 118+50 TO STA. 121+00 UNDERGROUND UTILITY LAYOUT		



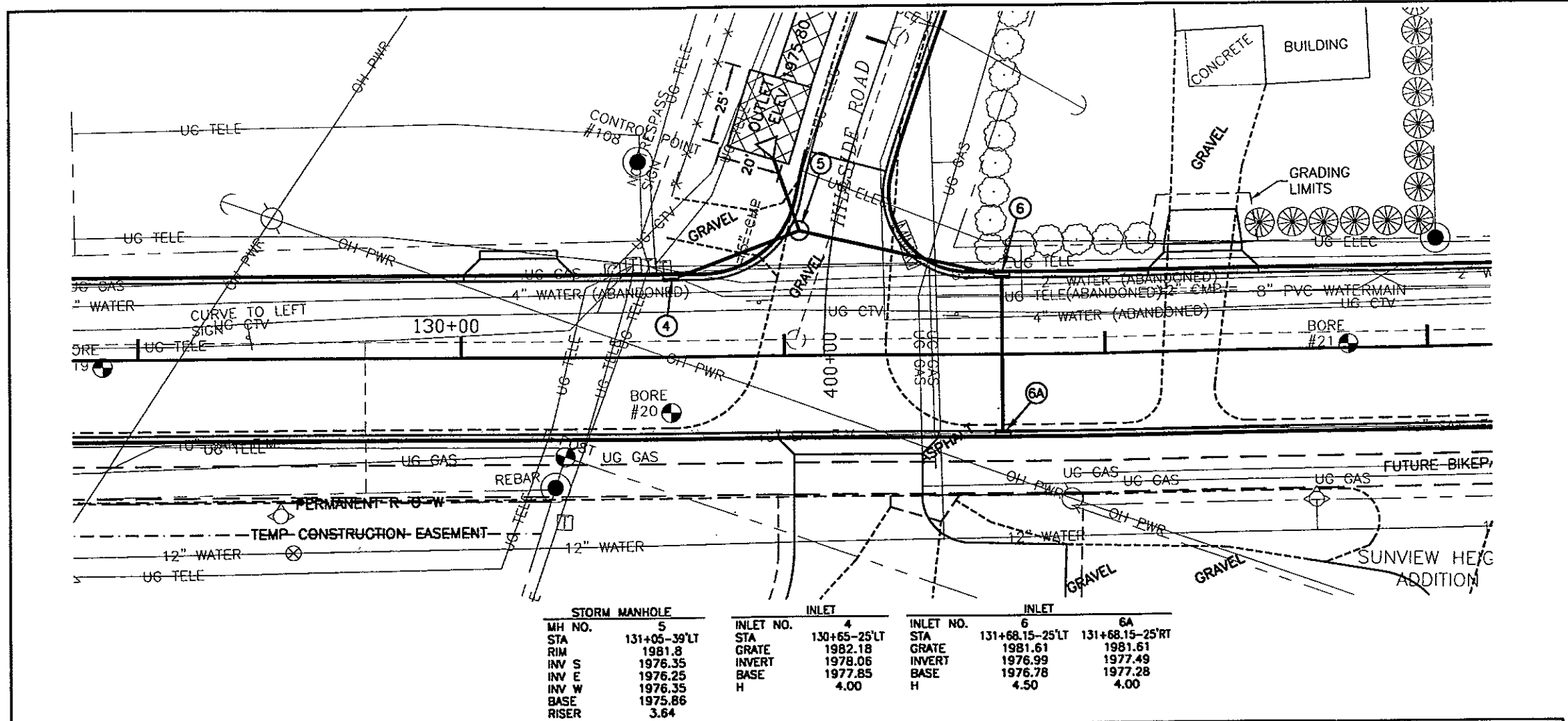
REMOVAL OF STRUCTURE	
120+50 LT	1 LS
END SECTION, CONC. REINF.	
#3 120+50-70'RT	24"-1 EACH
#3A 120+50-56'LT	24"-1 EACH
PIPE, CONC. REINF. CL III STORM DRAIN	
111+38.17-04'LT TO #2A	18"x18 LF
#3A TO #3	24"x114 LF
HYDRANT - INSTALL 6 IN.	
STA 118+38-30'LT	1 EA
WATERMAIN 6 IN. PVC	
STA 118+38-11'LT TO 118+58-30'LT	19 LF
INLET - TYPE 2 DOUBLE "D" GRATE	
#2A	1 EACH
ADJUST INLET	
#2	1 EACH



- CONSTRUCTION NOTES**
- ① REMOVE TYPE-D DELINEATORS NEAR INLETS. ALL COSTS INCLUDED IN THE UNIT PRICE BID FOR "ADJUST INLET."
 - ② ALL COSTS ASSOCIATED WITH THE CONNECTION TO THE EXISTING WATERMAIN ARE INCIDENTAL.

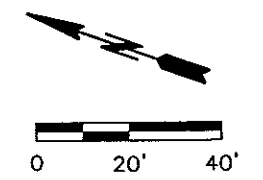
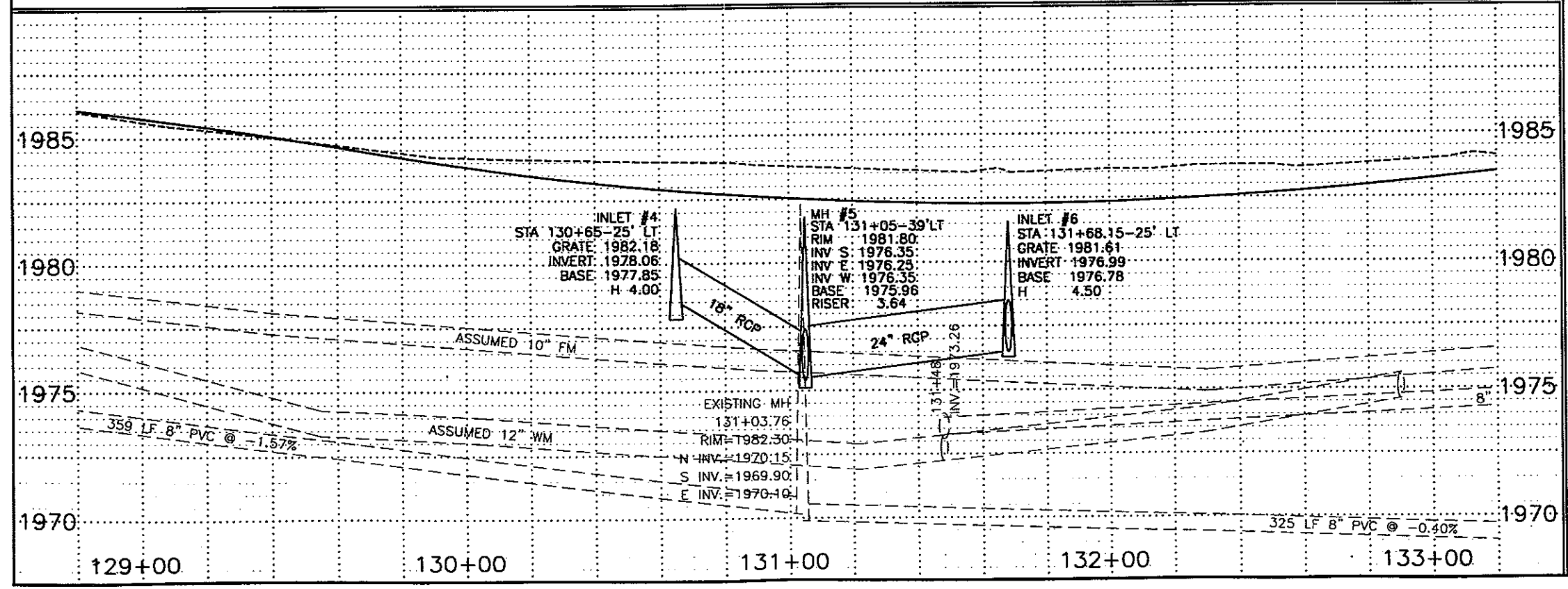


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	17
OLD RED TRAIL		
STA. 129+00 TO STA. 133+00		
UNDERGROUND UTILITY LAYOUT		

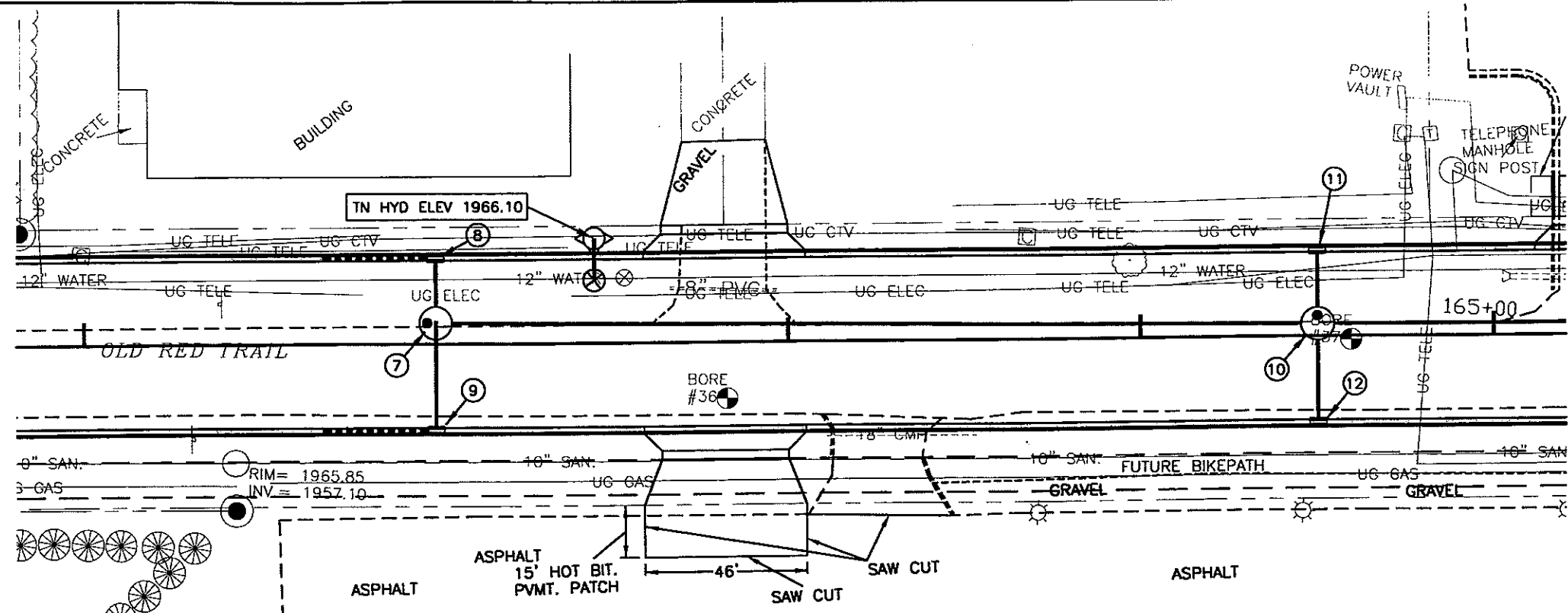


MANHOLE	
#5	60"-1 EACH
MANHOLE RISER	
#5	60"-4.48 LF
INLET - TYPE 2 "V" GRATE	
#4	1 EACH
INLET - TYPE 2 DOUBLE "D" GRATE	
#6	1 EACH
#6A	1 EACH
PIPE, CONC. REINF. CL III STORM DRAIN	
#4 TO #5	18"x42 LF
#5 TO #6	24"x64 LF
#6A TO #6	18"x50 LF
#5 TO OUTLET	24"x24 LF
END SECTION REINF. CONC.	
OUTLET	24" - 1 EACH
EROSION CONTROL FABRIC	
OUTLET	56 SY

STORM MANHOLE		INLET		INLET	
MH NO.	5	INLET NO.	4	INLET NO.	6
STA	131+05-39'LT	STA	130+65-25'LT	STA	131+68.15-25'LT
RIM	1981.8	GRATE	1982.18	GRATE	1981.61
INV S	1976.35	INVERT	1978.06	INVERT	1976.99
INV E	1976.25	BASE	1977.85	BASE	1976.78
INV W	1976.35	H	4.00	H	4.50
BASE	1975.86				4.00
RISER	3.64				

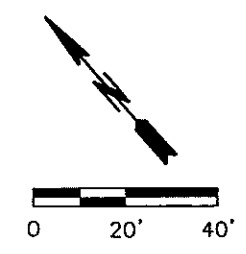
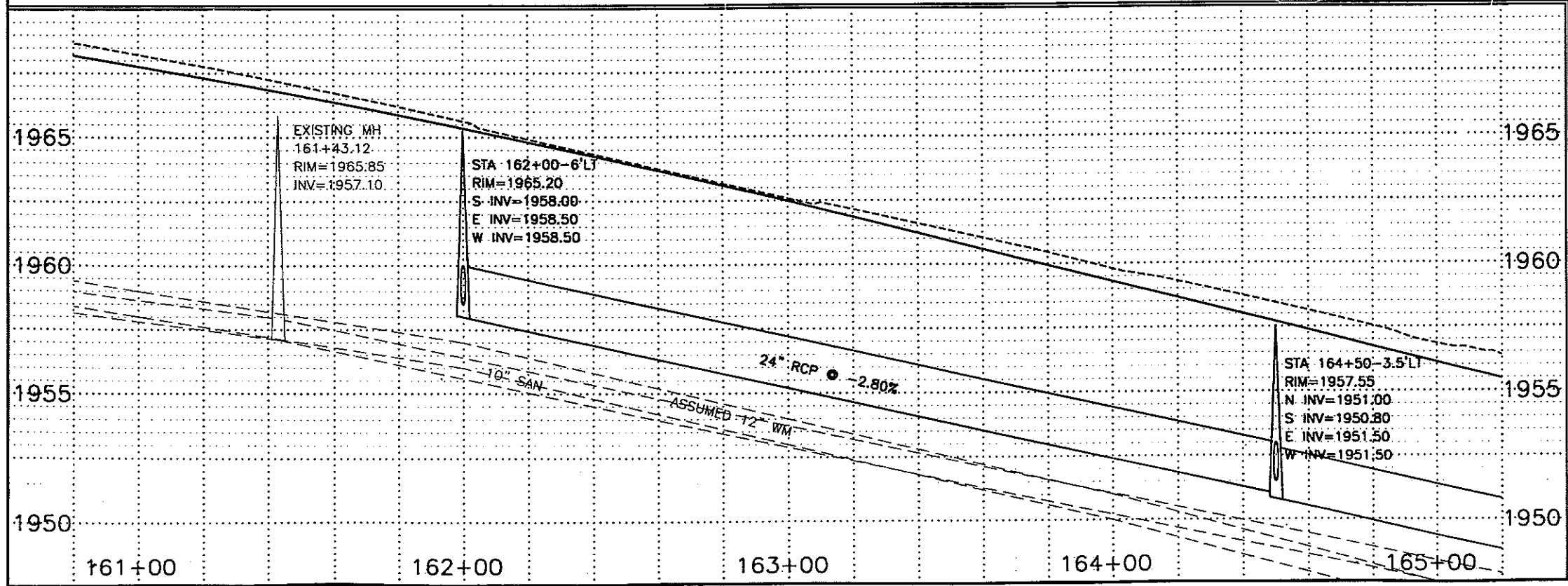


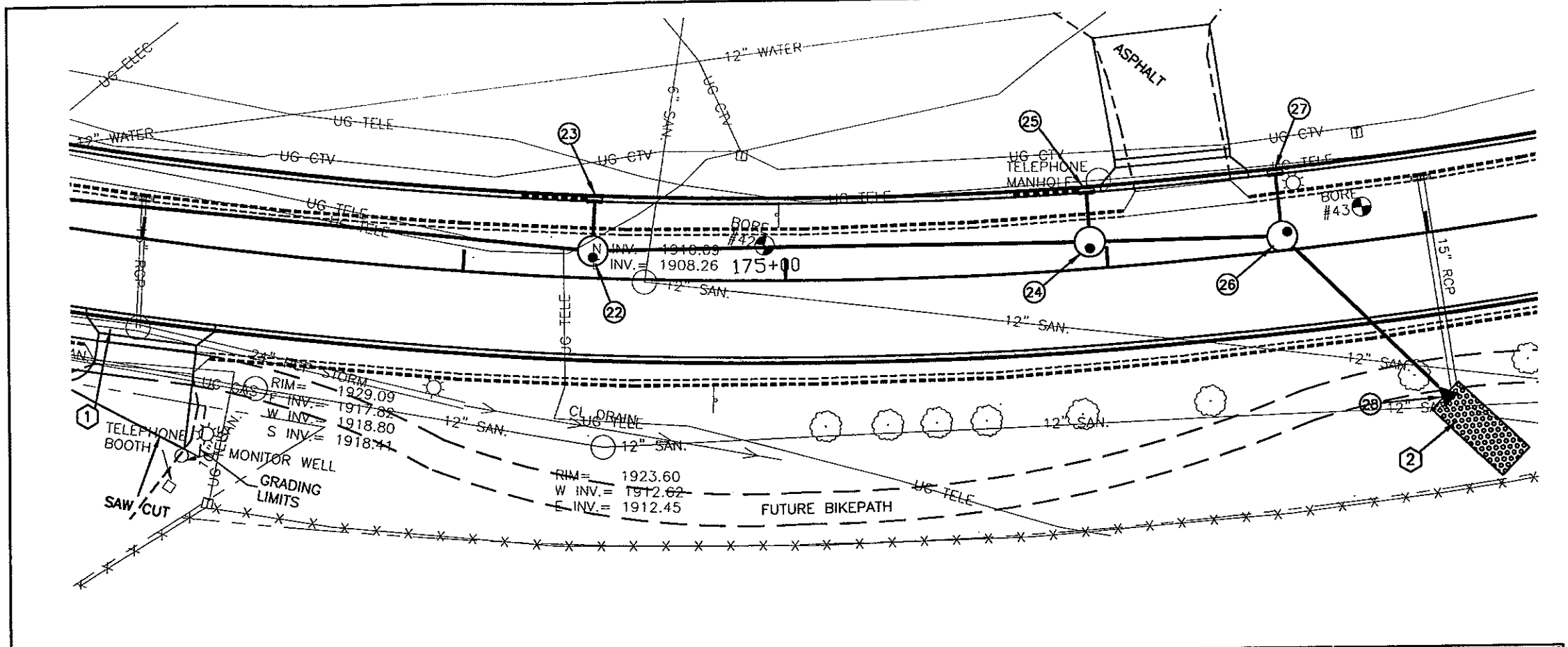
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MANHOLE	
#7	60"-1 EACH
#10	60"-1 EACH
MANHOLE RISER	
#7	60"x5.25 LF
#10	60"x4.80 LF
INLET - TYPE 2 V" GRATE	
#8	1 EACH
#9	1 EACH
#11	1 EACH
#12	1 EACH
INLET SLOTTED DRAIN	
#8 AND BACK	18"x30 LF
#9 AND BACK	18"x30 LF
PIPE, CONC. REINF. CL III STORM DRAIN	
#7 TO #10	24"x246 LF
#10 TO 165+00	24"x48 LF
#8 TO #7	18"x16 LF
#9 TO #7	18"x28 LF
#11 TO #10	18"x16 LF
#12 TO #10	18"x28 LF
HYDRANT - INSTALL 6 IN.	
STA 162+45-30'LT	1 EA
TAPPING SLEEVE & VALVE 12 IN. X 6 IN.	
STA 162+45-18'LT	1 EA
WATERMAIN 6 IN. PVC	
STA 162+45-18'LT TO 162+45-30'LT	12 LF

STORM MANHOLE		INLET		INLET		
MH NO.	7	10	8	9	11	12
STA	162+00-06'LT	164+50-3.5'LT	162+00-25'LT	162+00-25'RT	164+50-25'LT	164+50-25'RT
RIM	1965.20	1957.55	1964.68	1964.68	1957.03	1957.03
INV N	-	1951.00	1959.06	1959.06	1951.91	1951.91
INV S	1958.00	1950.80	1958.85	1958.85	1951.70	1951.70
INV E	1958.50	1951.50	5.50	5.50	5.00	5.00
INV W	1958.50	1951.50				
BASE	1957.75	1950.55				
RISER	5.25	4.80				





MANHOLE	
#22	72"-1 EACH
#24	84"-1 EACH
#26	84"-1 EACH
MANHOLE RISER	
#22	72"x7.33 LF
#24	84"x4.89 LF
#26	84"x4.17 LF
INLET - TYPE 2 "V" GRATE	
#23	1 EACH
#25	1 EACH
#27	1 EACH
INLET SLOTTED DRAIN	
#23 AND BACK	18"x20 LF
#25 AND BACK	18"x20 LF
PIPE, CONC. REINF. CL III STORM DRAIN	
#22 TO #24	27"x138 LF
#23 TO #22	36"x151 LF
#23 TO #22	18"x16 LF
#25 TO #24	18"x16 LF
#27 TO #26	18"x17 LF
PIPE, CONC. REINF. ARCH CL III STORM DRAIN	
#24 TO #26	44"x27"x56 LF
#26 TO #28	44"x27"x68 LF
END SECTION - CONC. REINF. ARCH	
#28-STA 177+00-53'RT	44"x27"-1 EACH

REMOVAL OF END SECTION-ALL TYPES & SIZES
 174+03-42'RT 1 EACH
 177+00-50'RT 1 EACH

REMOVAL OF PIPE-ALL TYPES & SIZES
 173+00 C TO 173+03-28'RT 28 LF
 173+03-28'RT TO 174+03-42'RT 100 LF
 177+00-18'LT TO 177+00-50'RT 68 LF

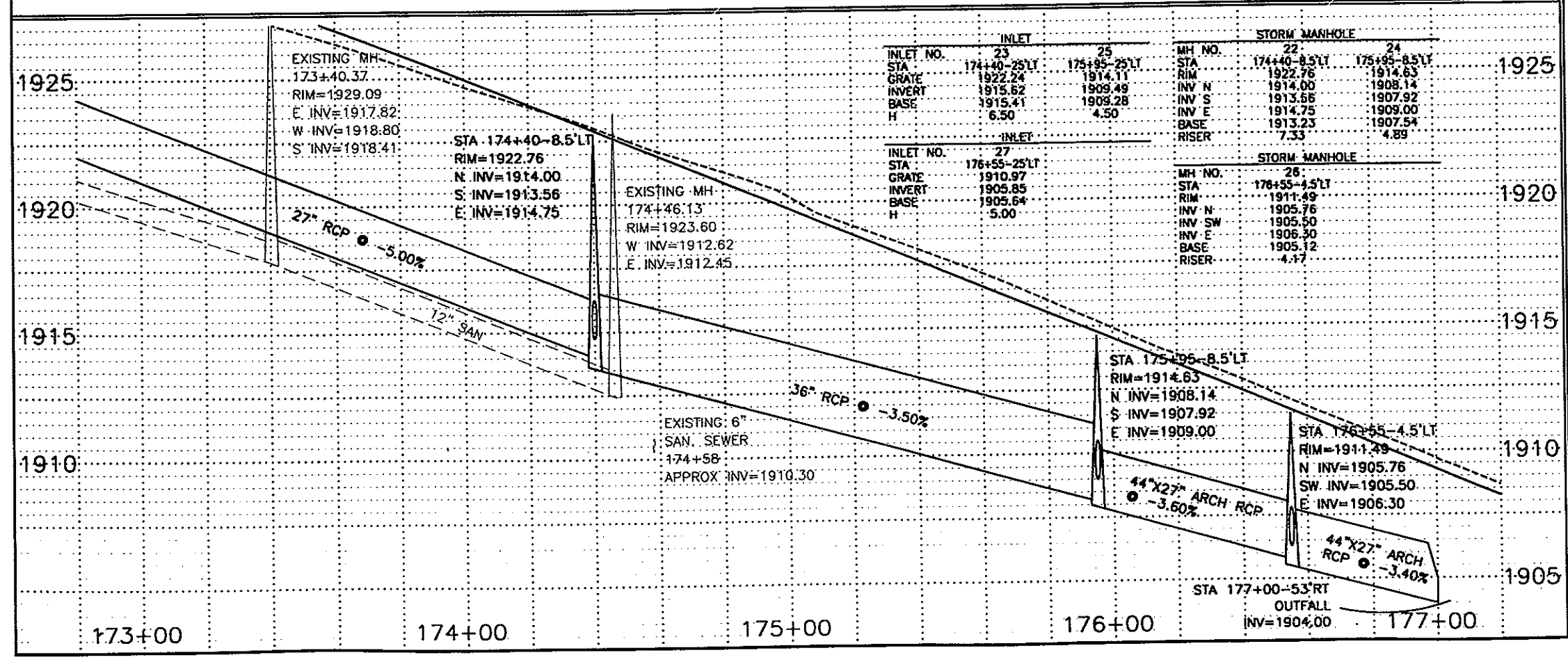
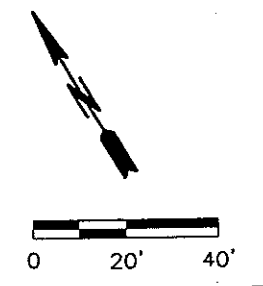
REMOVAL OF MANHOLES
 173+03-28'RT 1 EACH

REMOVAL OF INLETS
 177+00-18'LT 1 EACH

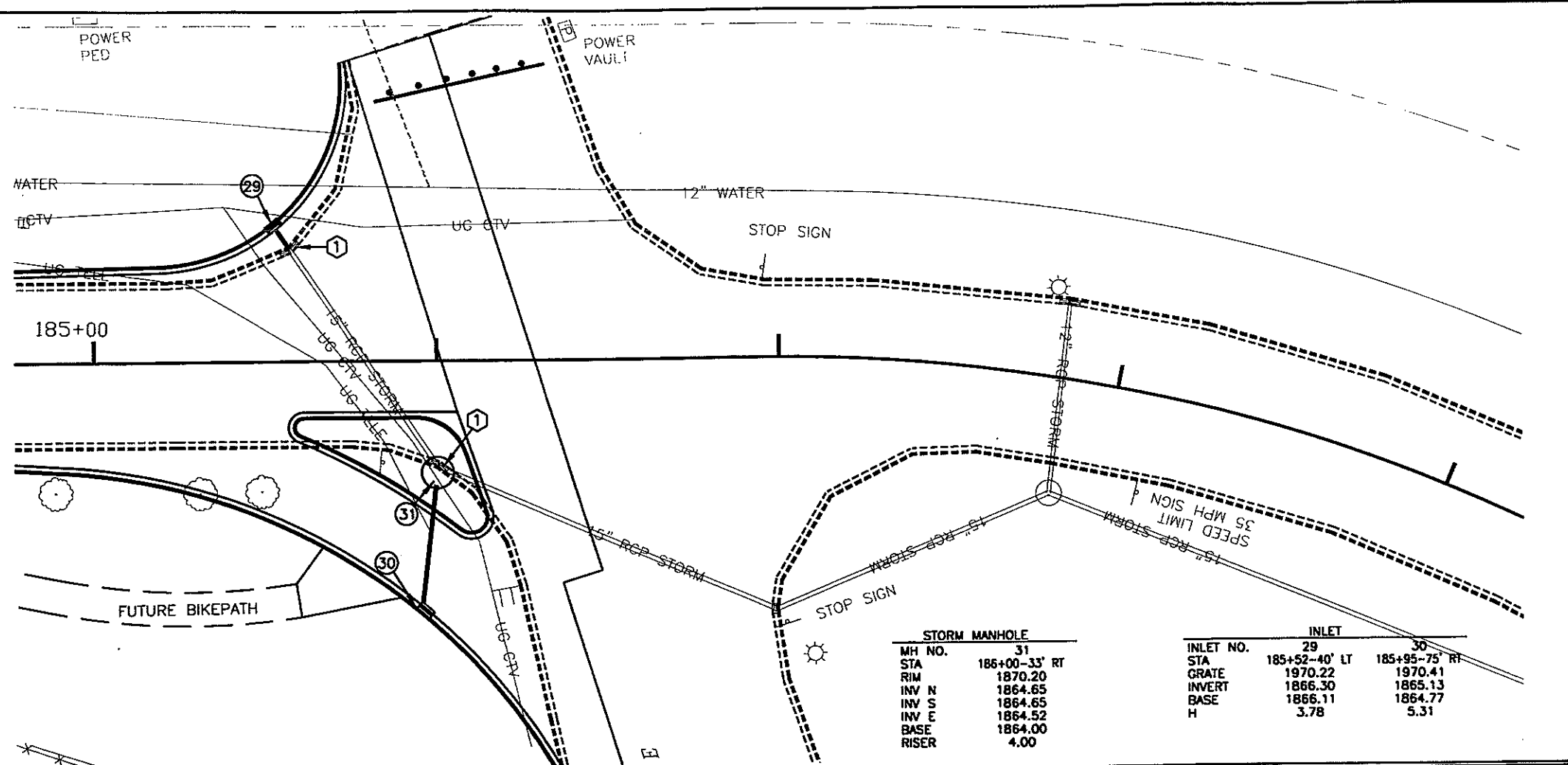
RIPRAP - LOOSE ROCK
 177+00 RT 20 CY

GEOTEXTILE SEPARATION FABRIC
 177+00 RT 40 SY

- CONSTRUCTION NOTES**
- EXISTING STORM SEWER PIPE TO BE ABANDONED IN PLACE. ENDS SHALL BE PLUGGED WITH CONCRETE. ALL COSTS INCLUDED IN OTHER ITEMS.
 - REGRADE EXISTING OUTFALL DITCH TO THE FENCE AS DIRECTED BY THE ENGINEER. ALL COSTS INCLUDED IN THE PRICE BID FOR "RIPRAP-LOOSE ROCK."

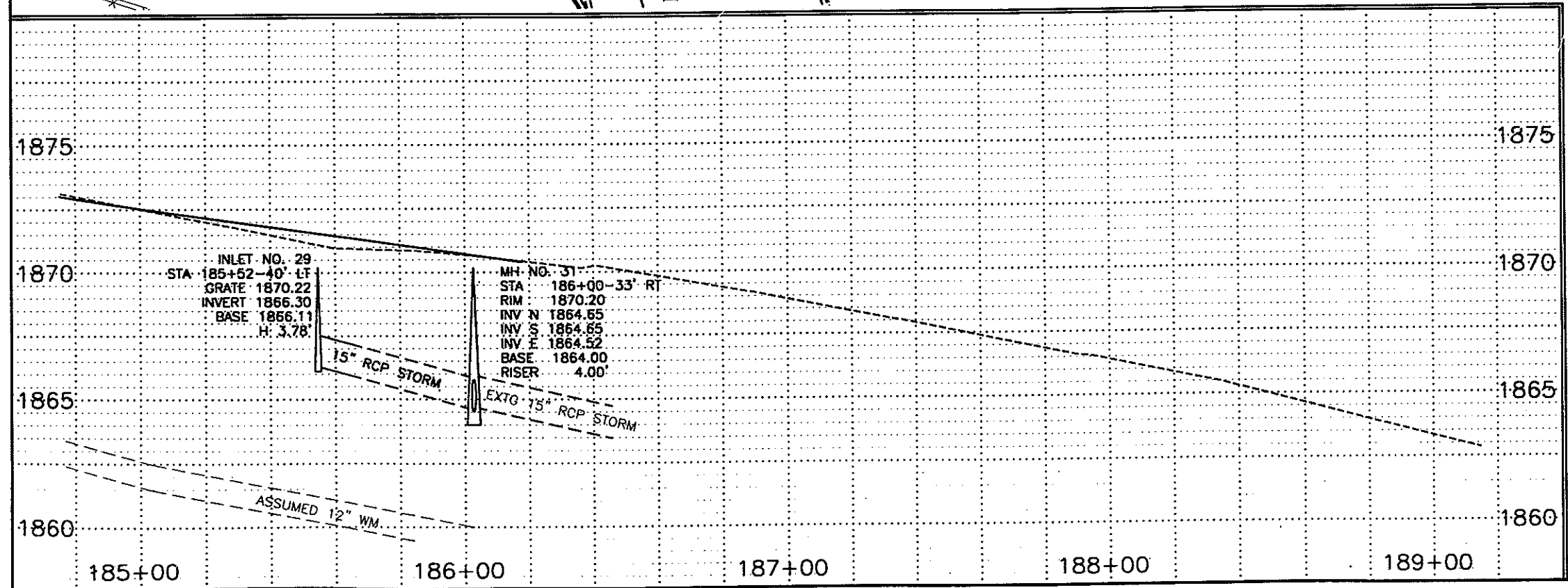


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	22
OLD RED TRAIL STA. 185+00 TO STA. 189+00 UNDERGROUND UTILITY LAYOUT		



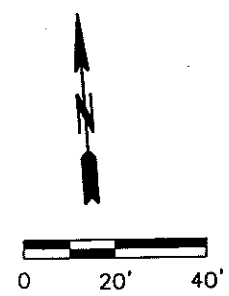
MANHOLE	
#31	60"-1 EACH
MANHOLE RISER	
#31	60"x4.00 LF
INLET - TYPE 2 "V" GRATE	
#29	1 EACH
INLET - TYPE 2 DOUBLE "D" GRATE	
#30	1 EACH
PIPE, CONC. REINF. CL III STORM DRAIN	
#29 TO #31	15"x16 LF
#30 TO #31	15"x48 LF
#31	15"x16 LF
REMOVAL OF PIPE -ALL TYPES & SIZES	
#29	8 LF
#31	16 LF
REMOVAL OF INLETS	
186+00-33' RT	1 EACH
185+54-33' LT	1 EACH

STORM MANHOLE		INLET	
MH NO.	31	INLET NO.	29
STA	186+00-33' RT	STA	185+52-40' LT
RIM	1870.20	GRATE	1970.22
INV N	1864.65	INVERT	1866.30
INV S	1864.65	BASE	1866.11
INV E	1864.52	H	3.78
BASE	1864.00		
RISER	4.00		



CONSTRUCTION NOTES

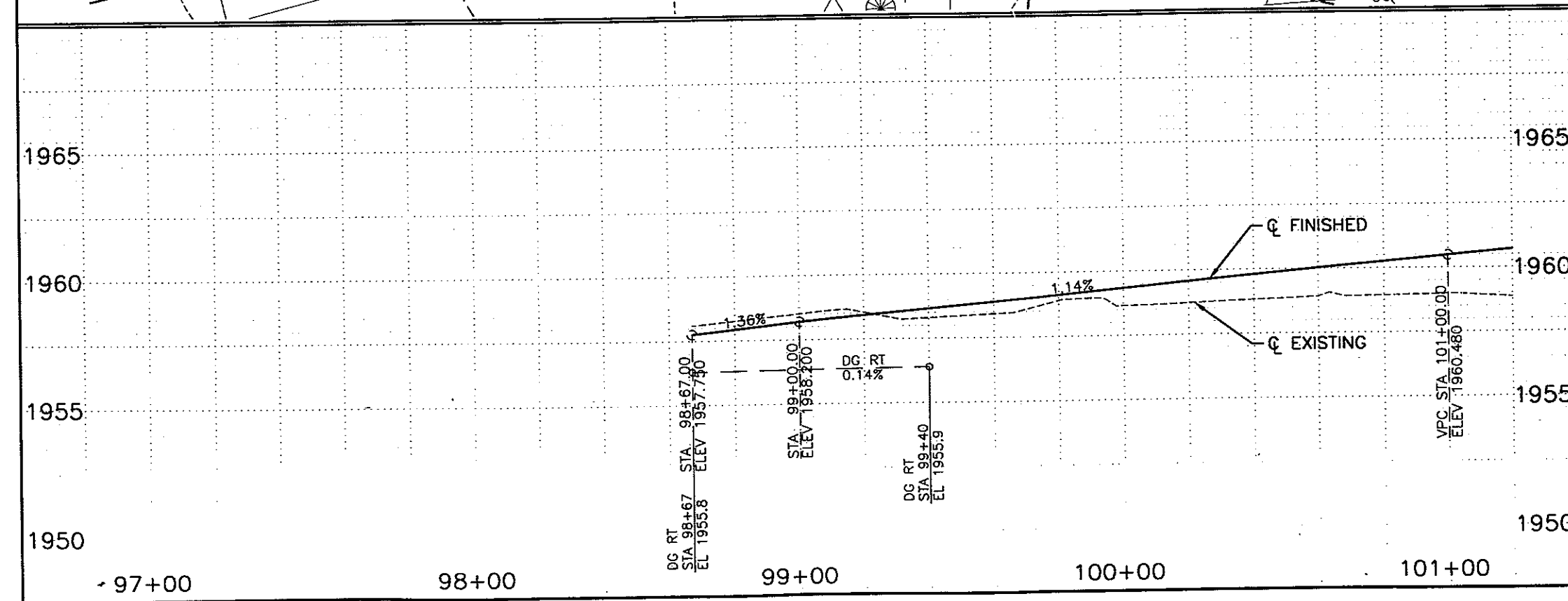
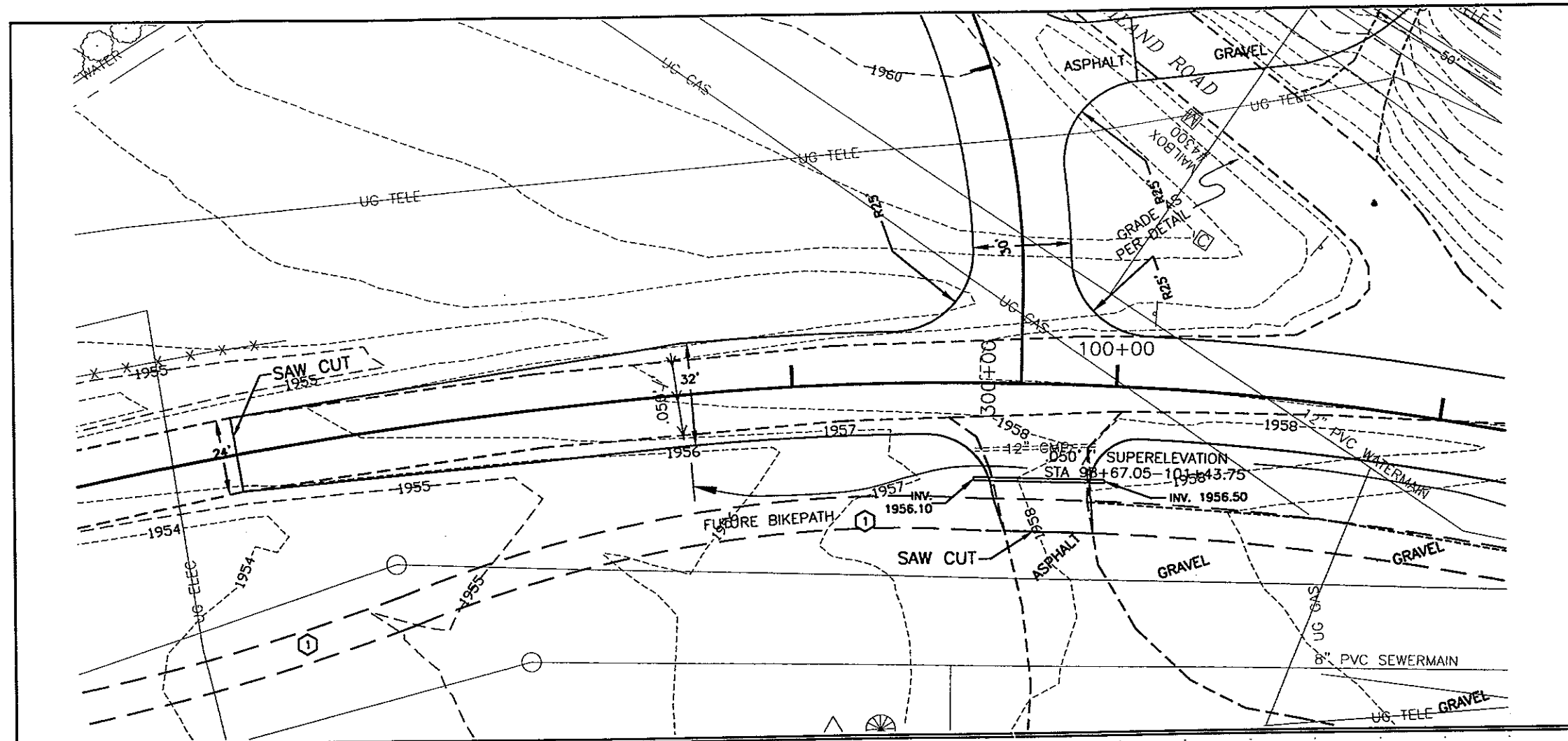
① CONTRACTOR SHALL REMOVE INLETS IN THEIR ENTIRETY. CONTRACTOR SHALL PROTECT EXISTING RCP PIPES DURING REMOVAL PROCESS. THE LAST SECTION OF PIPE SHALL BE REMOVED AND NEW PIPING SHALL BE INSTALLED FROM THE EXPOSED JOINT TO THE NEW MANHOLE OR INLET LOCATION.



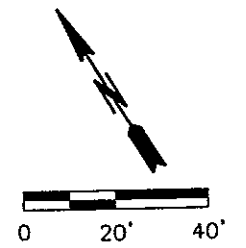
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	23
OLD RED TRAIL STA. 97+00 TO STA. 101+00 CURB & GUTTER LAYOUT		

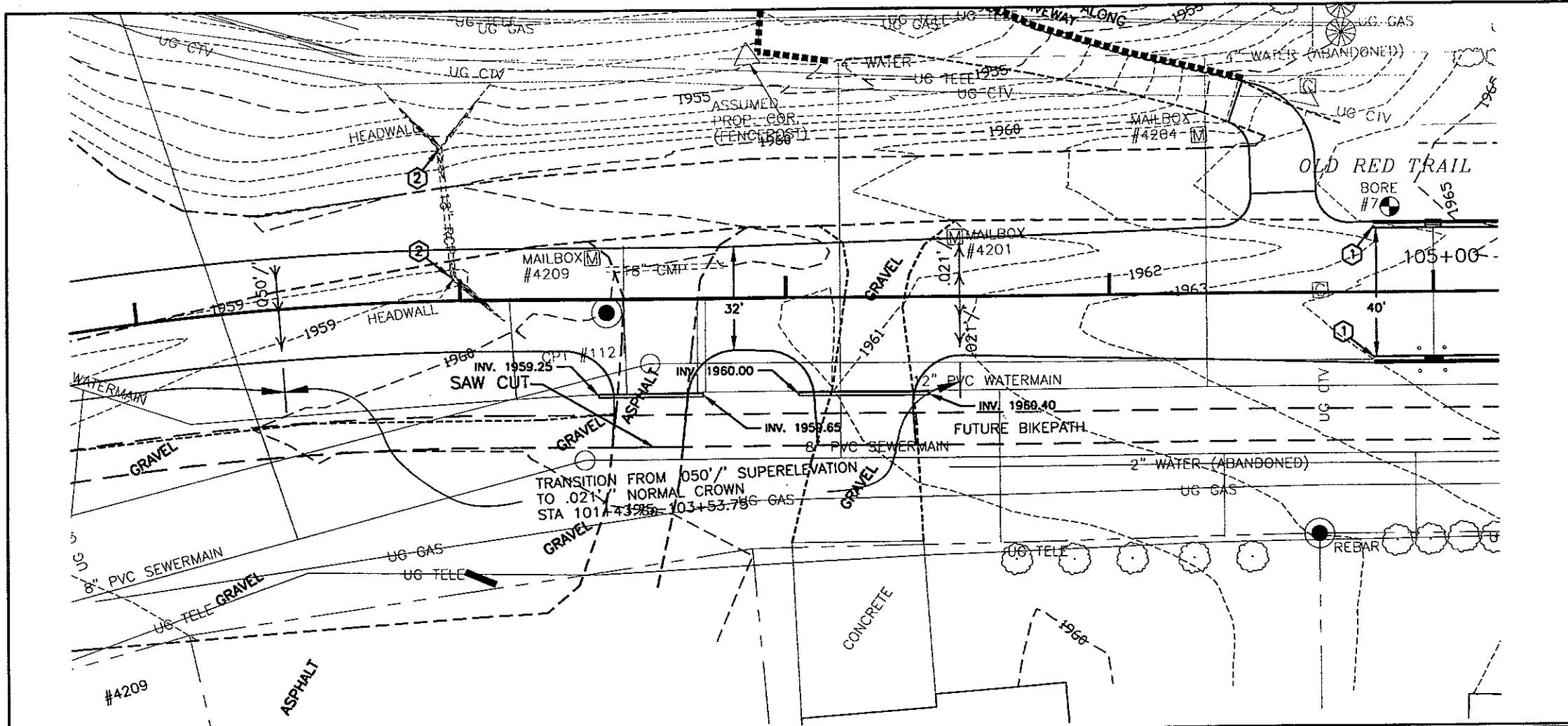
SAW BITUMINOUS SURFACING-FULL DEPTH	
97+27	24 LF
99+77 RT	28 LF
REMOVAL OF BITUMINOUS SURFACING	
97+27 TO 101+00	1143.1 SY
99+77 RT	132.5 SY
PIPE CORR. STEEL 12 IN.	
99+77-30' RT	40 LF
END SECTION CORR. STEEL 12 IN.	
99+77-30' RT	2 EACH
REMOVAL OF PIPE-ALL TYPES & SIZES	
99+75 RT	38 LF



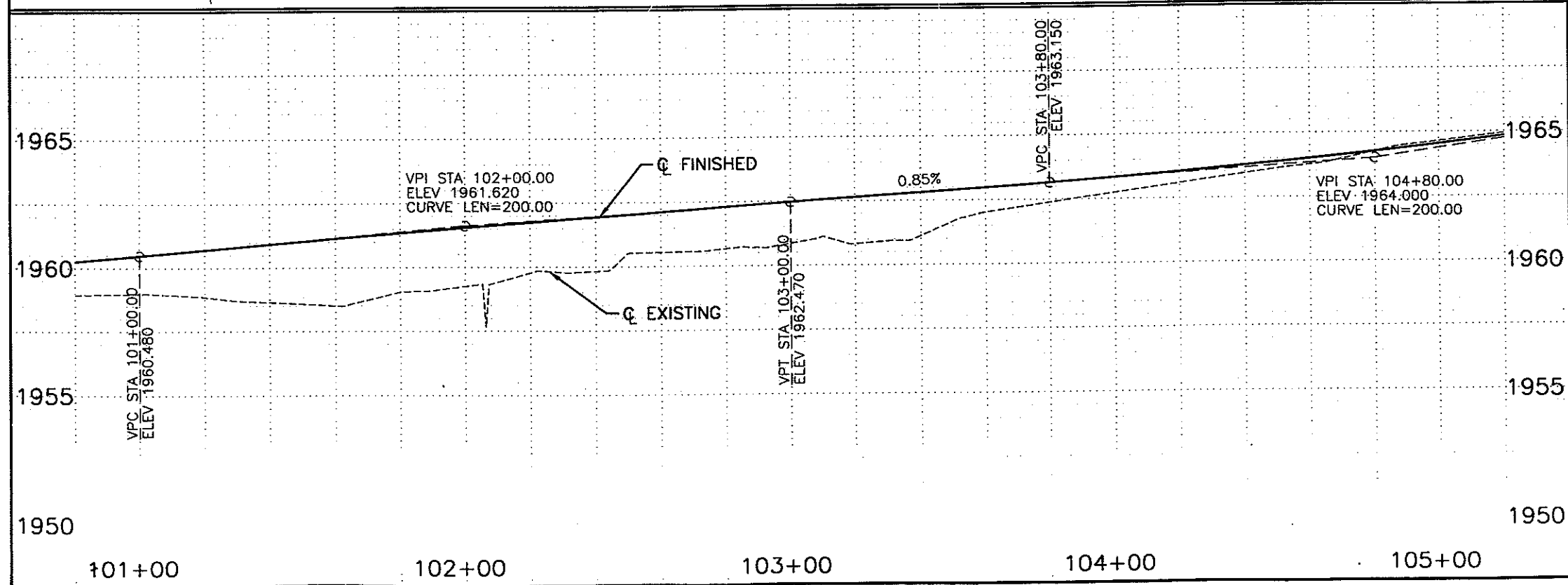
CONSTRUCTION NOTES
 ① NO GRADING NECESSARY FOR FUTURE BIKEPATH TO STA 99+60. BEGIN GRADING OPERATIONS AT STA 99+60.



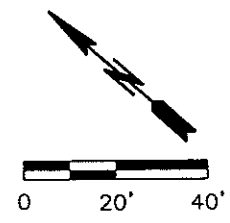
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	24
OLD RED TRAIL		
STA. 101+00 TO STA. 105+00		
CURB & GUTTER LAYOUT		



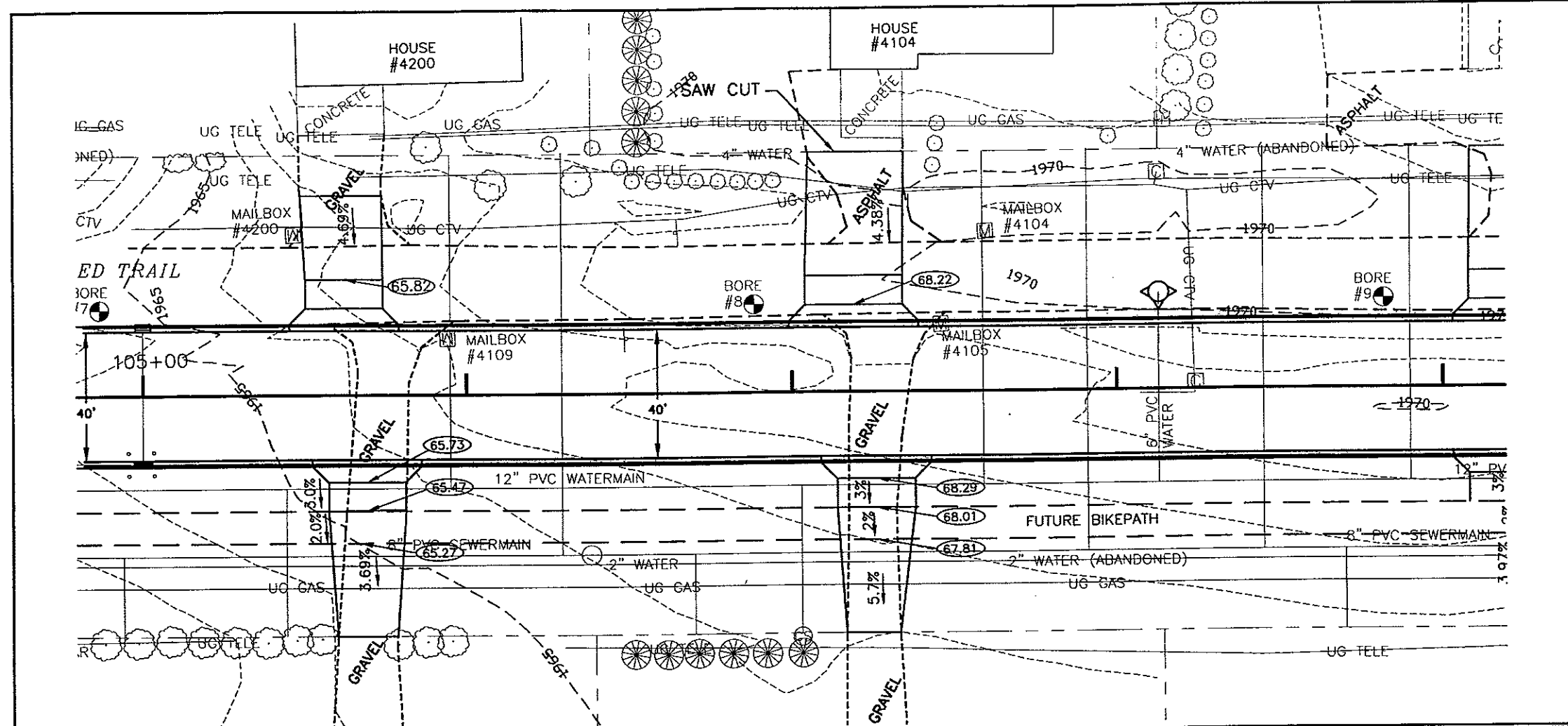
SAW BITUMINOUS SURFACING-FULL DEPTH	
102+58 RT	22 LF
REMOVAL OF BITUMINOUS SURFACING	
101+00 TO 105+00	1028.3 SY
102+60 RT	179.5 SY
ADJUST MANHOLE	
102+37 RT	1 EACH
102+58 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
102+87 RT	1 EACH WGV
102+90 RT	1 EACH WGV
PIPE CORR. STEEL 12 IN.	
102+58-30' RT	32 LF
103+24-30' RT	40 LF
END SECTION CORR. STEEL 12 IN.	
102+58-30' RT	2 EACH
103+24-30' RT	2 EACH
REMOVAL OF PIPE-ALL TYPES & SIZES	
102+60 LT	38 LF
101+98 LT	42 LF
CURB & GUTTER - TYPE 1	
104+81 LT TO 105+00 LT	19 LF
104+81 RT TO 105+00 RT	19 LF



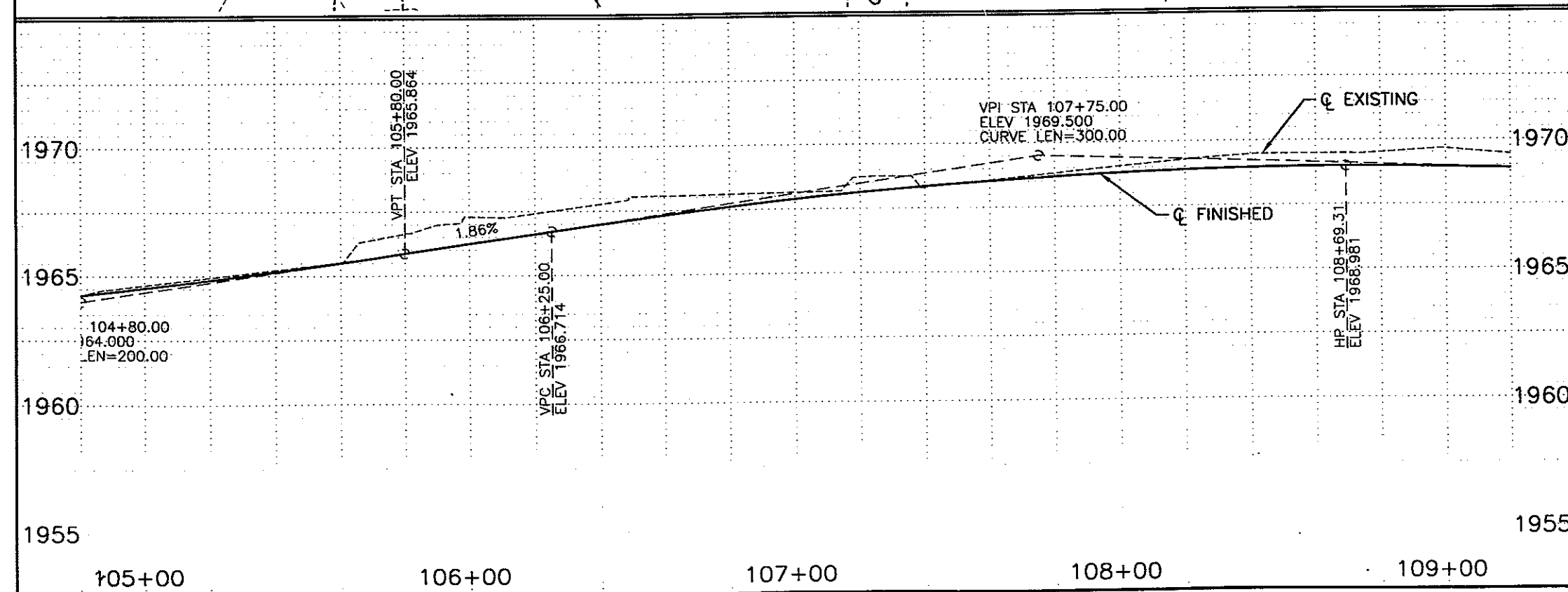
- CONSTRUCTION NOTES**
- ① TAPER FROM 6" HIGH CURB TO 0" HIGH CURB IN 2'. INSTALL EXPANSION JOINT BEFORE TAPER.
 - ② REMOVAL OF HEADWALL IS INCIDENTAL TO THE PRICE BID "REMOVAL OF PIPE."



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	25
OLD RED TRAIL STA. 105+00 TO STA. 109+00 CURB & GUTTER LAYOUT		

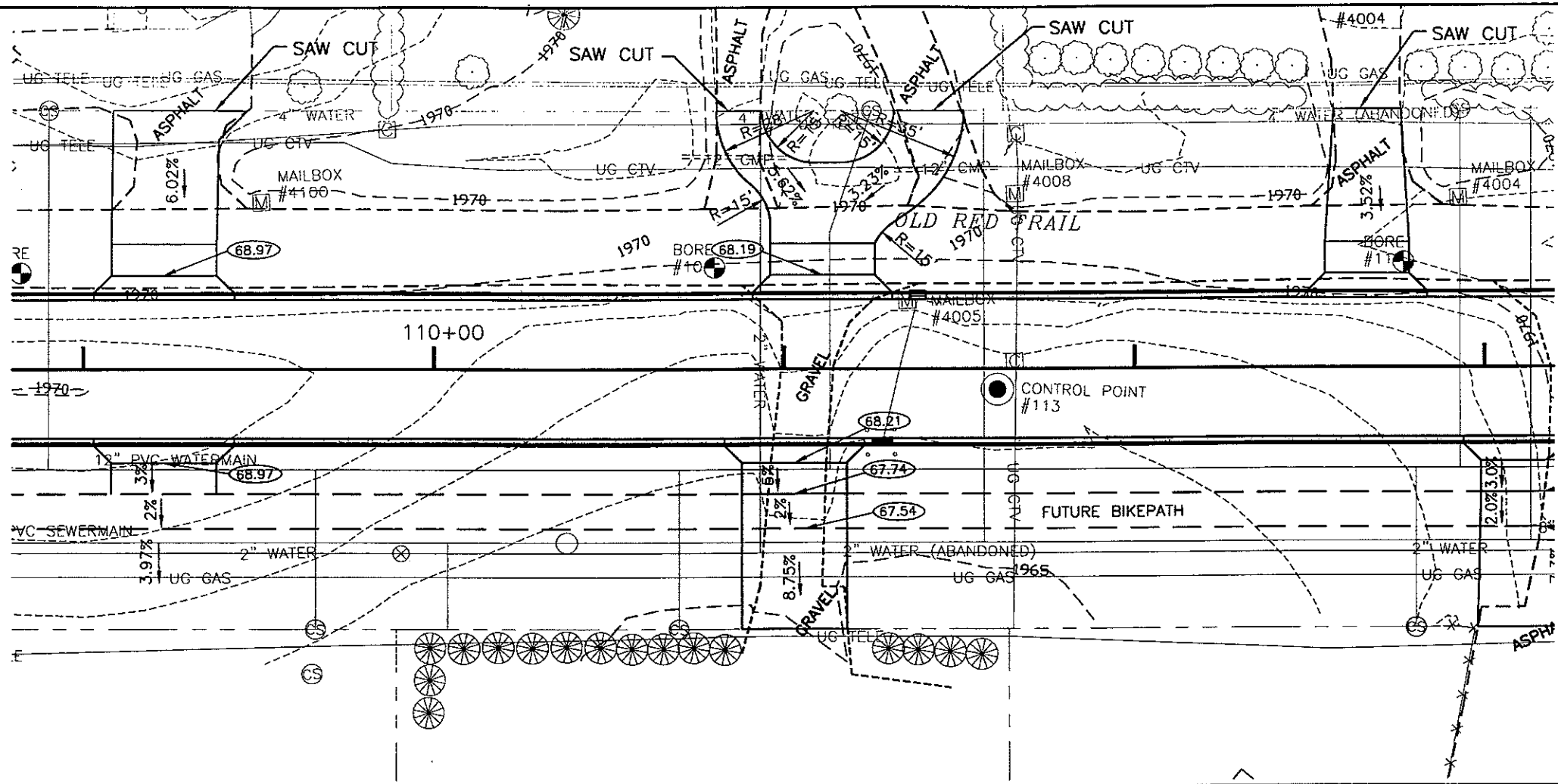


SAW BITUMINOUS SURFACING--FULL DEPTH	
107+19 LT	30 LF
REMOVAL OF BITUMINOUS SURFACING	
105+00 TO 109+00 LT	1003.9 SY
107+19 LT	76.6 SY
ADJUST MANHOLE	
106+37 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
108+10 RT	1 EACH WGV
108+13 RT	1 EACH WGV
CURB & GUTTER - TYPE 1	
105+00 TO 109+00 LT	400 LF
105+00 TO 109+00 RT	400 LF
DRIVEWAY CONCRETE--HIGH EARLY STRENGTH	
105+62 LT - 24'	41.3 SY
105+69 RT - 24'	41.3 SY
107+19 LT - 30'	50.6 SY
107+26 RT - 24'	41.3 SY



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	26
OLD RED TRAIL		
STA. 109+00 TO STA. 113+00		
CURB & GUTTER LAYOUT		



SAW BITUMINOUS SURFACING-FULL DEPTH

109+23 LT	40 LF
110+90 LT	13 LF
111+43 LT	19 LF
112+66 LT	20 LF

REMOVAL OF BITUMINOUS SURFACING

109+00 TO 113+00 LT	963.7 SF
109+23 LT	85.6 SY
110+90 LT	45.8 SY
111+43 LT	62.8 SY
112+66 LT	68.5 SY

CURB & GUTTER - TYPE 1

109+00 TO 113+00 LT	400 LF
109+00 TO 113+00 RT	400 LF

DRIVEWAY CONCRETE-HIGH EARLY STRENGTH

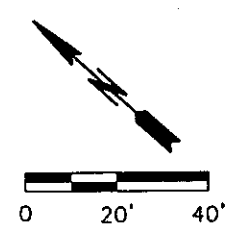
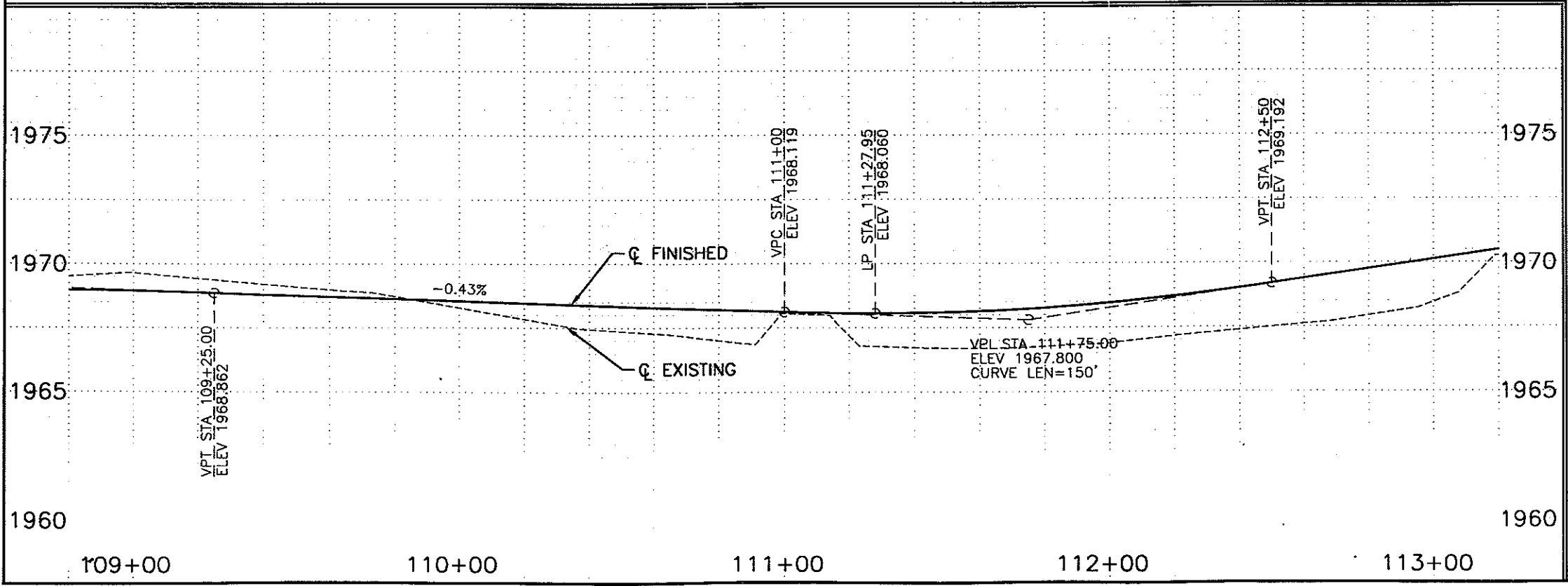
109+23 LT - 30'	50.6 SY
109+23 RT - 30'	50.6 SY
111+03 RT - 30'	50.6 SY
111+11 LT - 30'	50.6 SY
112+66.5 LT - 24'	41.3 SY

ADJUST MANHOLE

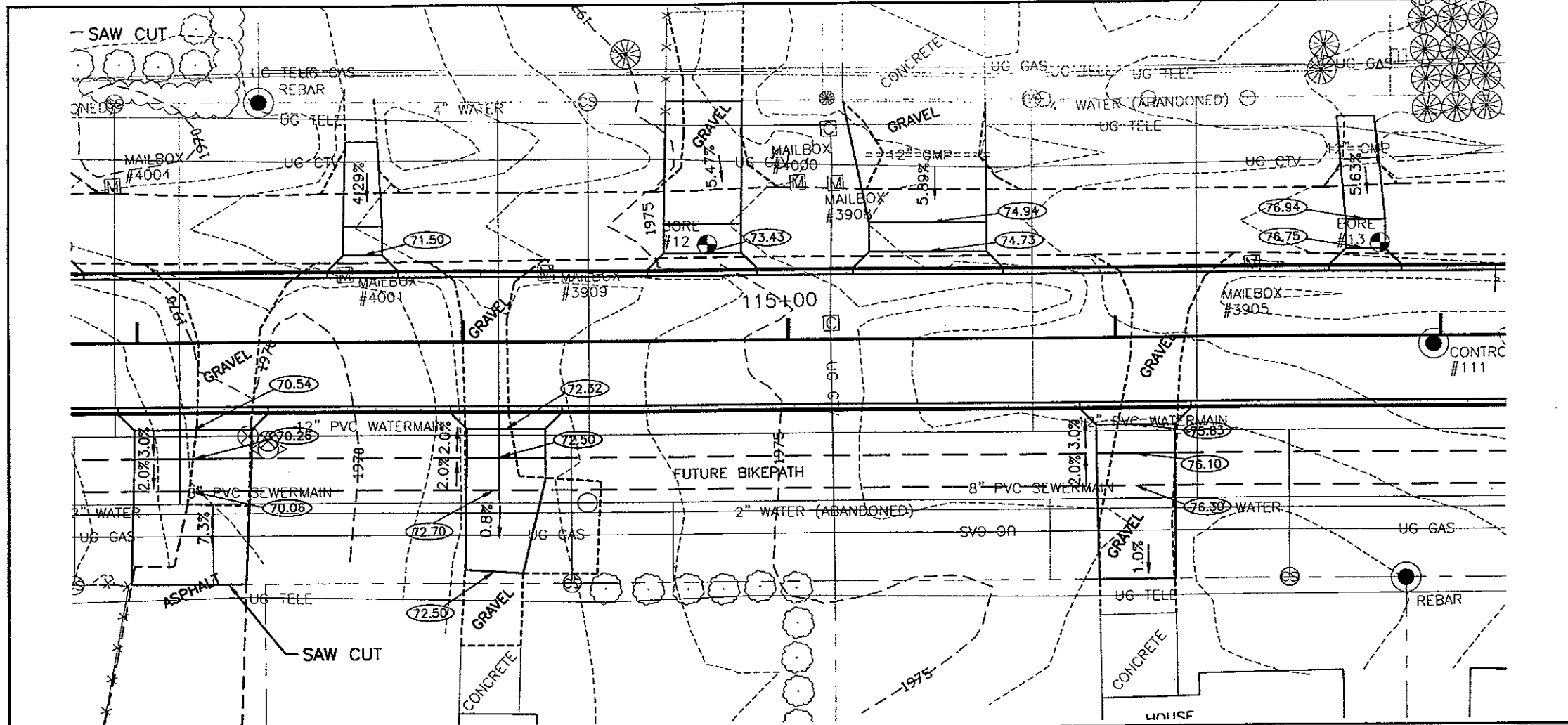
110+37 RT	1 EA
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REMOVAL OF PIPE-ALL TYPES & SIZES

111+50 LT	30 LF
110+85 LT	30 LF



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	27
OLD RED TRAIL		
STA. 113+00 TO STA. 117+00		
CURB & GUTTER LAYOUT		



SAW BITUMINOUS SURFACING-FULL DEPTH
113+17 RT 35 LF

REMOVAL OF BITUMINOUS SURFACING
113+00 TO 117+00 LT 926.5 SY
113+17 RT 65.5 SY

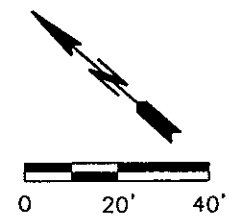
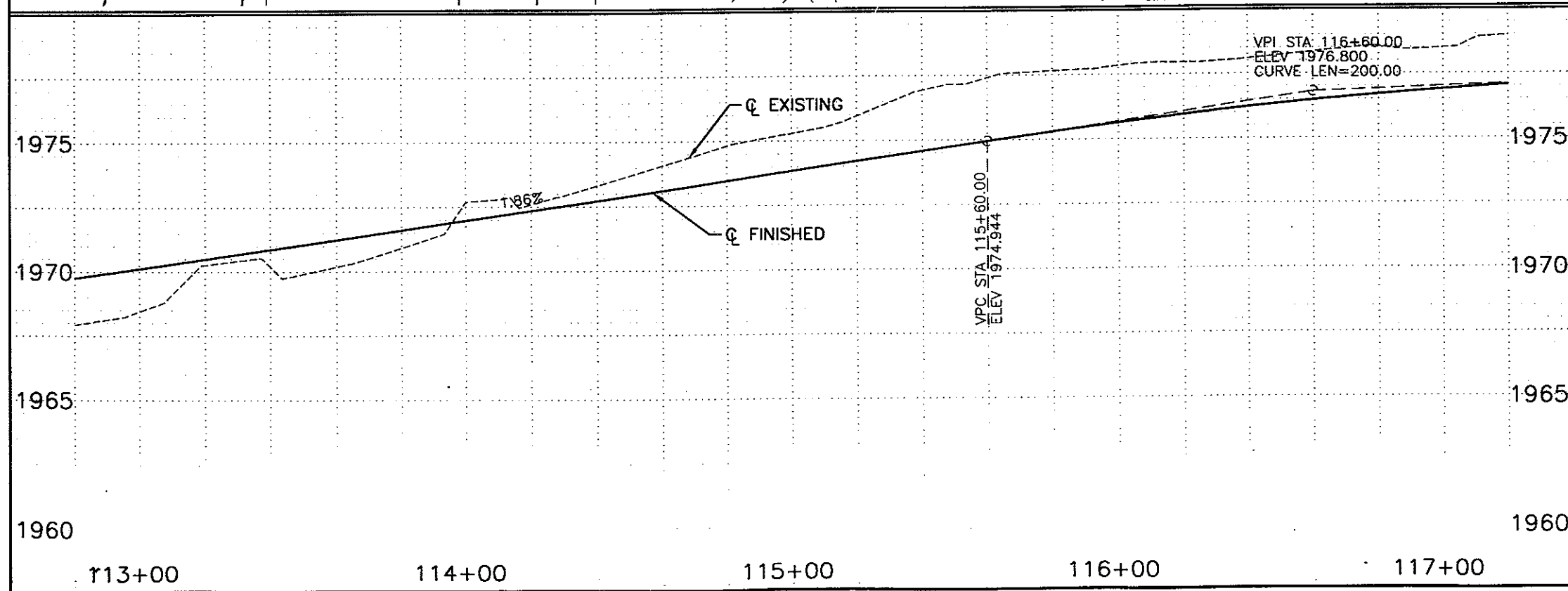
CURB & GUTTER - TYPE 1
113+00 TO 117+00 LT 400 LF
113+00 TO 117+00 RT 400 LF

DRIVEWAY CONCRETE-HIGH EARLY STRENGTH
113+17 RT - 36' 60.0 SY
113+69 LT - 12' 22.6 SY
114+13 RT - 24' 41.3 SY
114+73 LT - 24' 41.3 SY
115+43 LT - 36' 60.0 SY
116+06 RT - 24' 41.3 SY
116+77 LT - 12' 22.6 SY

ADJUST MANHOLE
114+37 RT 1 EACH

ADJUST UTILITY APPURTENANCES
113+37 RT 1 EACH WGV
113+40 RT 1 EACH WGV

REMOVAL OF PIPE-ALL TYPES & SIZES
115+45 LT 40 LF
116+75 LT 16 LF



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	28
OLD RED TRAIL STA. 117+00 TO STA. 121+00 CURB & GUTTER LAYOUT		

SAW BITUMINOUS SURFACING-FULL DEPTH
 117+91 LT 24 LF

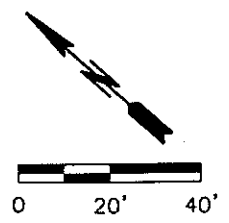
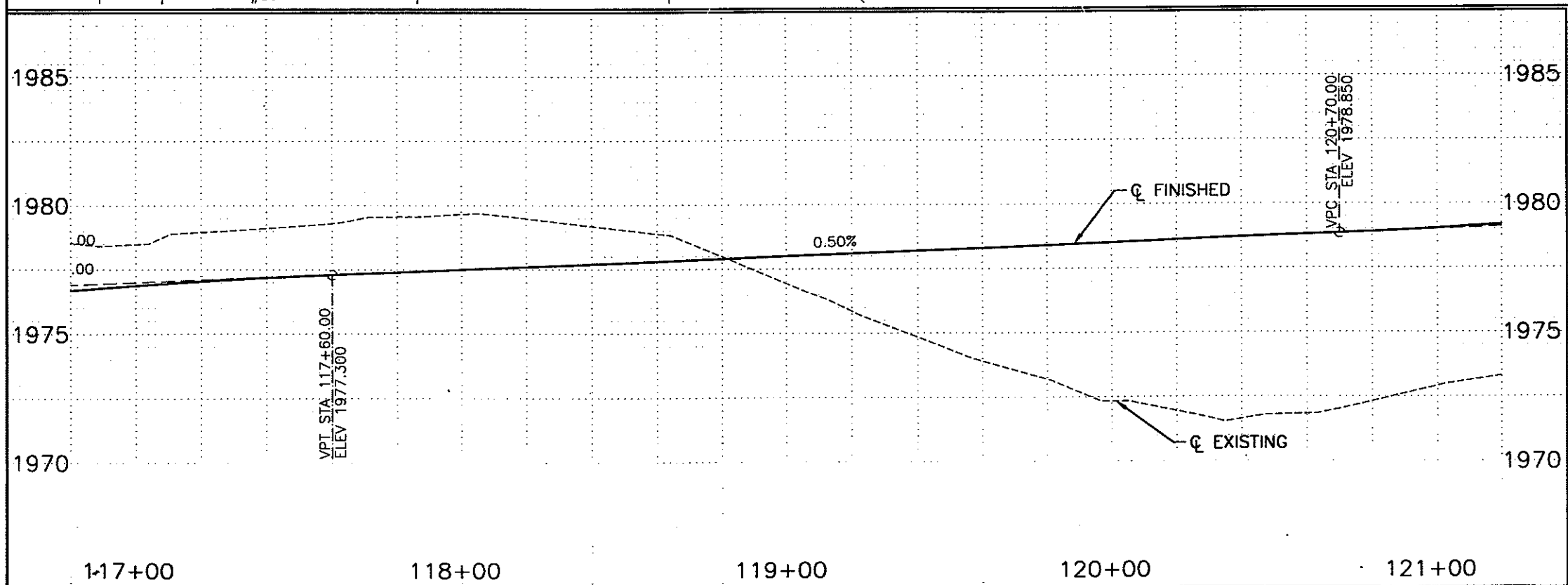
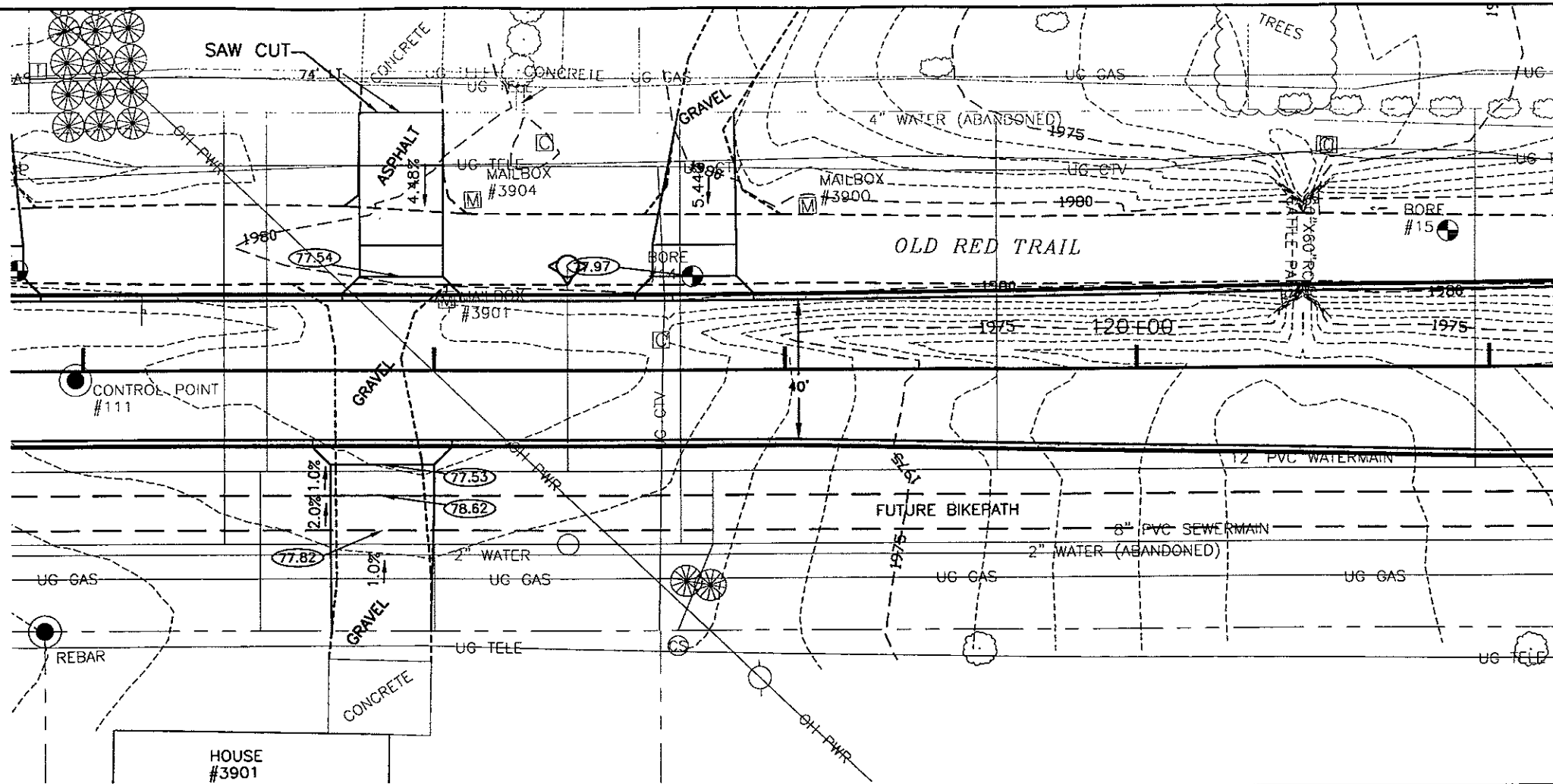
REMOVAL OF BITUMINOUS SURFACING
 117+00 TO 121+00 LT 909.1 SY
 117+91 LT 78.2 SY

CURB & GUTTER - TYPE 1
 117+00 TO 121+00 LT 400 LF
 117+00 TO 121+00 RT 400 LF

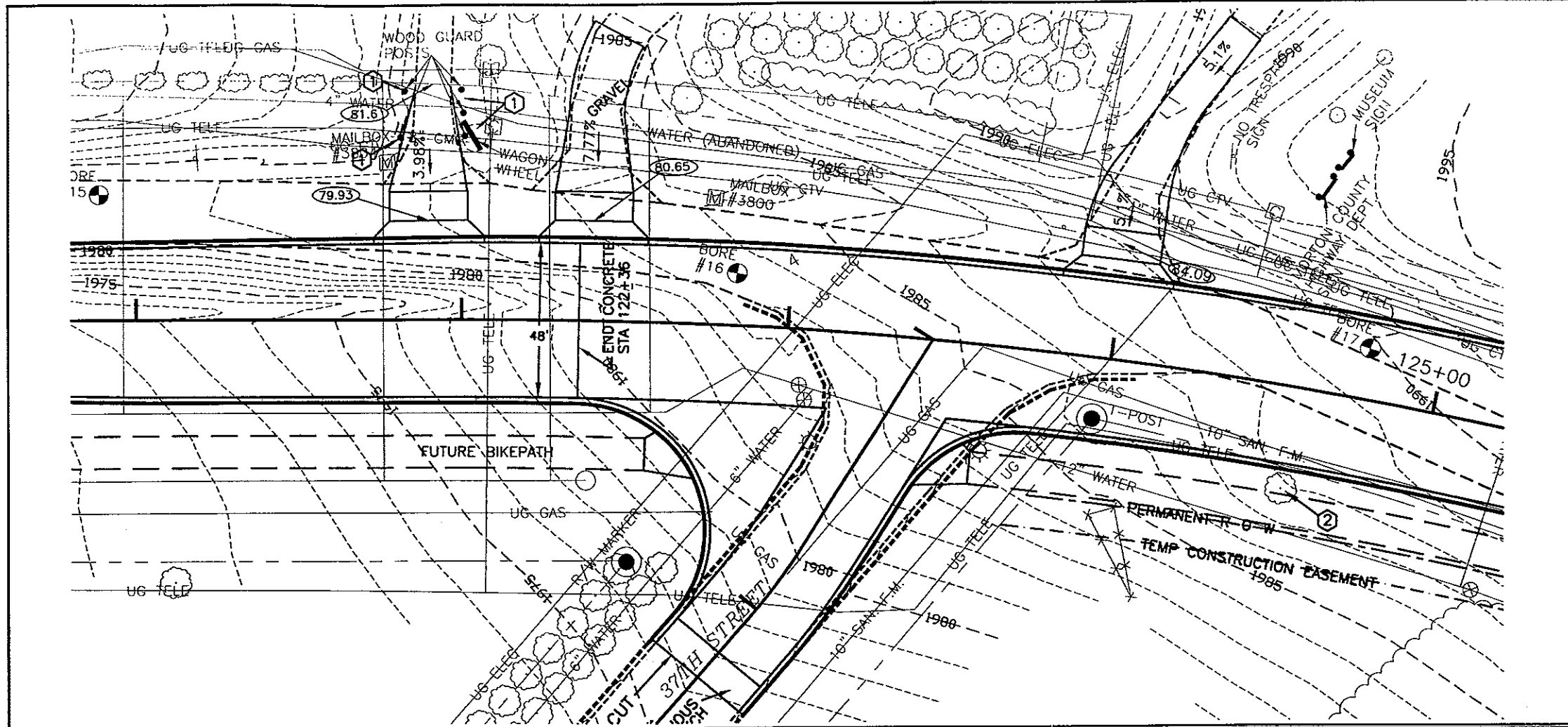
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH
 117+85 RT - 30' 50.6 SY
 117+90.6 LT - 24' 41.3 SY
 118+74 LT - 24' 41.3 SY

ADJUST MANHOLE
 118+37 RT 1 EACH

ADJUST UTILITY APPURTENANCE
 118+35 RT 1 EACH WGV
 118+38 RT 1 EACH WGV

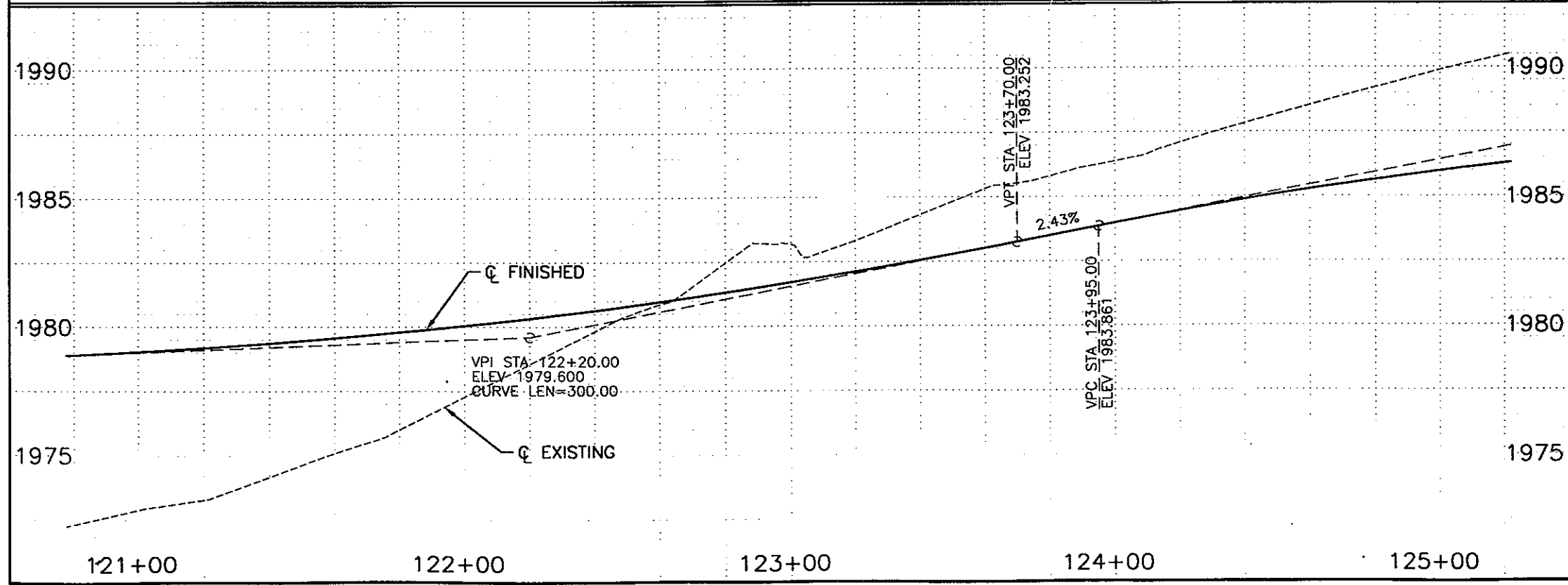


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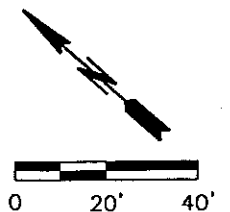


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	29
OLD RED TRAIL STA. 121+00 TO STA. 125+00 CURB & GUTTER LAYOUT		

REMOVAL OF BITUMINOUS SURFACING	
121+00 TO 125+00	1038.3 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AF	
122+36 TO 125+00	1408 SY
CURB & GUTTER - TYPE 1	
121+00 TO 125+00 LT	400 LF
121+00 TO 122+36 RT	136 LF
123+78 TO 125+00 RT	122 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
121+90 LT - 24'	41.3 SY
122+40 LT - 24'	41.3 SY
123+99 LT - 24'	41.3 SY
SIDEWALK CONCRETE	
122+63 RT. (RAMP)	13.4 SY
123+52 RT. (RAMP)	14.6 SY
ADJUST MANHOLE	
122+37 RT	1 EACH
ADJUST UTILITY APPURTENANCES	
122+00 RT	1 EACH WGV
122+83 RT	1 EACH WGV
123+04 RT	1 EACH WGV
123+06 RT	1 EACH WGV
REMOVAL OF PIPE-ALL TYPES & SIZES	
121+90 LT	24 LF

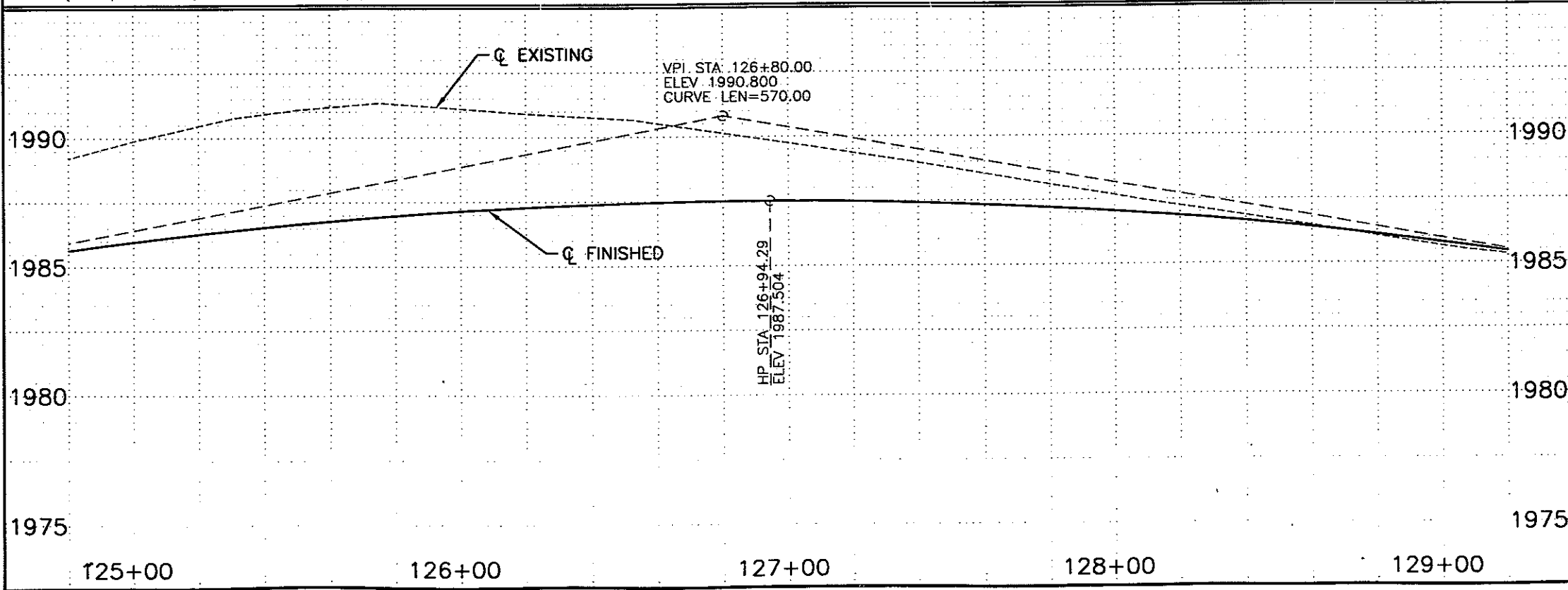
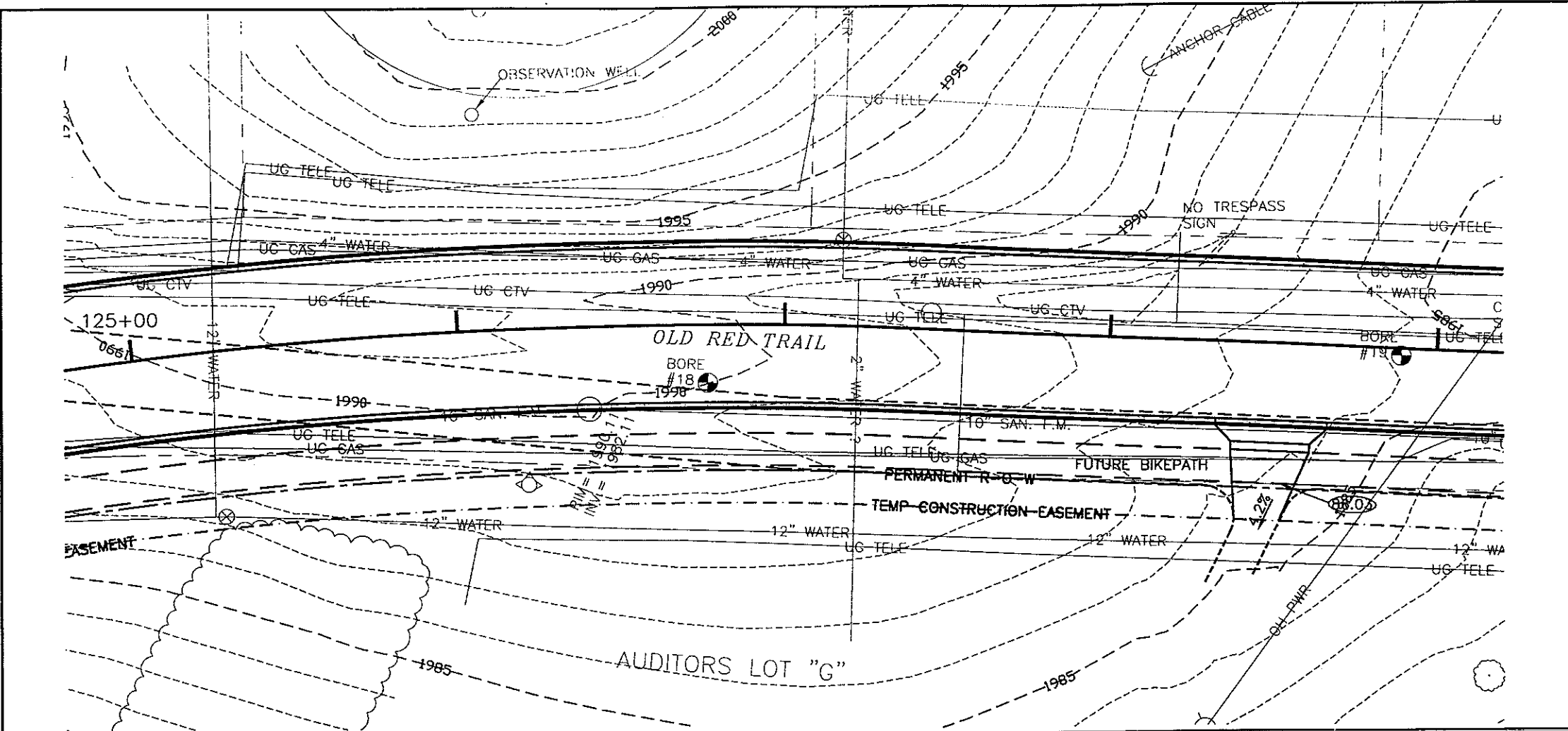


- CONSTRUCTION NOTES**
- ① REMOVE WOOD POSTS AND WAGON WHEEL. THEY ARE THE PROPERTY OF THE ADJACENT LANDOWNER AND SHALL BE DELIVERED TO AN OWNER APPROVED LOCATION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CLEAR & GRUB TREES

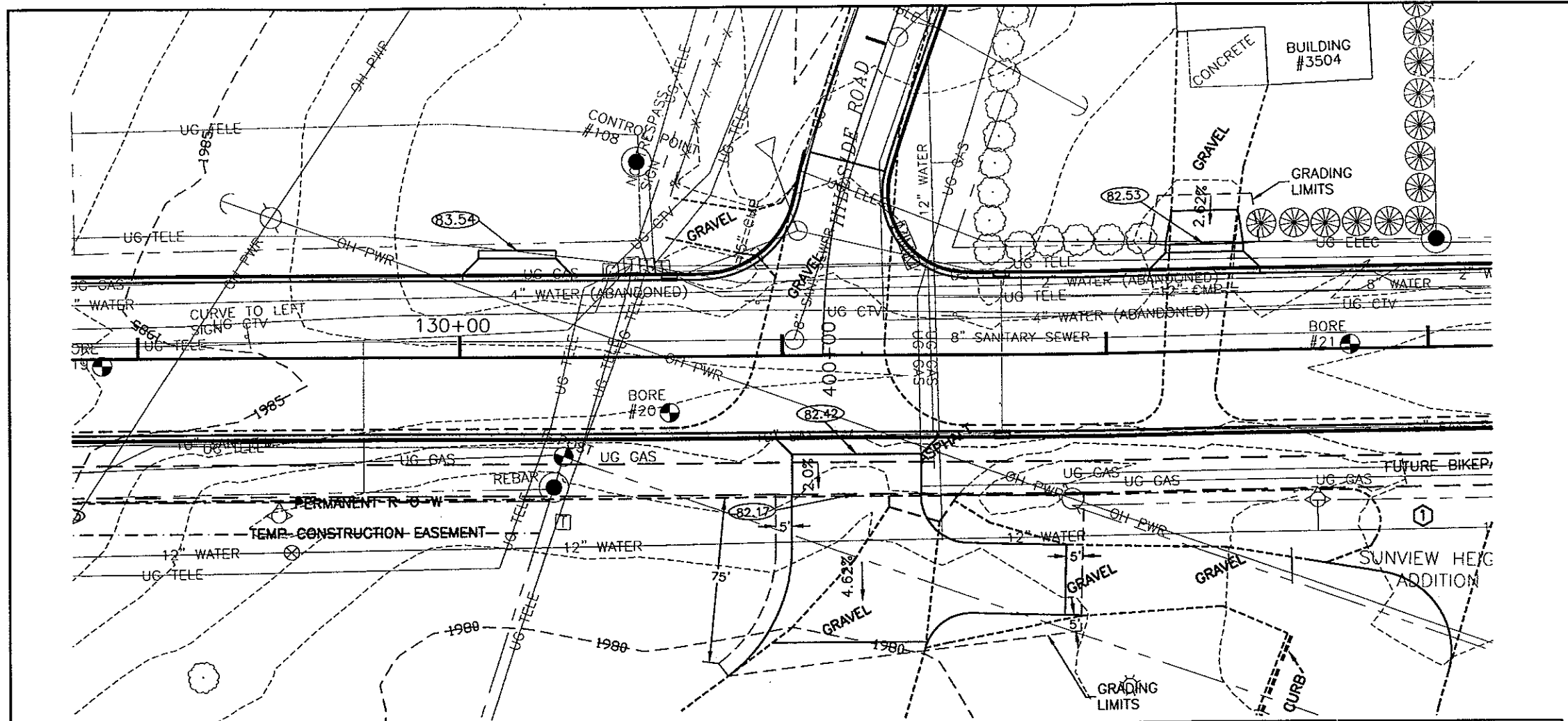


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	30
OLD RED TRAIL		
STA. 125+00 TO STA. 129+00		
CURB & GUTTER LAYOUT		

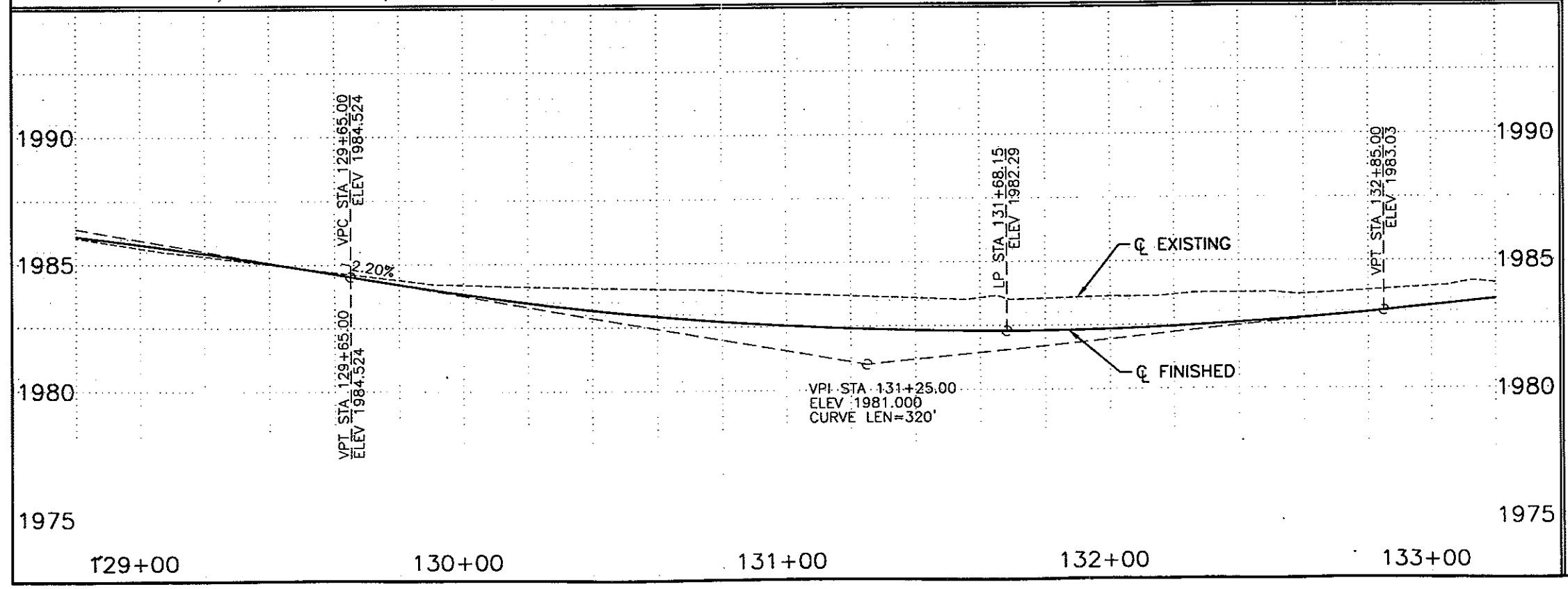
REMOVAL OF BITUMINOUS SURFACING	
125+00 TO 129+00	1089 SY
8IN NON-REINF CONCRETE PAVEMENT CL AE	
125+00 TO 129+00	2133 SY
CURB & GUTTER - TYPE 1	
125+00 TO 129+00 LT	400 LF
125+00 TO 129+00 RT	400 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
128+50 RT - 24'	23.9 SY
ADJUST MANHOLE	
126+40 RT	1 EACH
ADJUST UTILITY APPURTENANCES	
125+20 RT	1 EACH WGV
127+16 LT	1 EACH WGV
MANHOLE CASTING	
127+45 LT	1 EACH



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	31
OLD RED TRAIL		
STA. 129+00 TO STA. 133+00		
CURB & GUTTER LAYOUT		

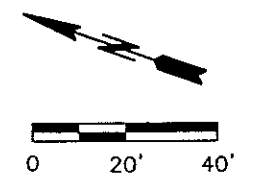


REMOVAL OF BITUMINOUS SURFACING	
129+00 TO 133+00	993 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
129+00 TO 133+00	2133 SY
CURB & GUTTER - TYPE 1	
129+00 TO 130+75 LT	175 LF
131+58 TO 133+00 LT	142 LF
129+00 TO 133+00 RT	400 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
130+18 LT - 24'	23.9 SY
132+31 LT - 24'	23.9 SY
DRIVEWAY CONCRETE BIN-HIGH EARLY STRENGTH	
131+23 RT - 40'	37.3 SY
MANHOLE CASTING	
131+04 LT - 40'	1 EACH
ADJUST UTILITY APPURTENANCES	
131+48 RT	1 EACH WGV
131+51 LT	1 EACH WGV
REMOVAL OF PIPE-ALL TYPES & SIZES	
130+90 LT	20 LF
132+30 LT	30 LF



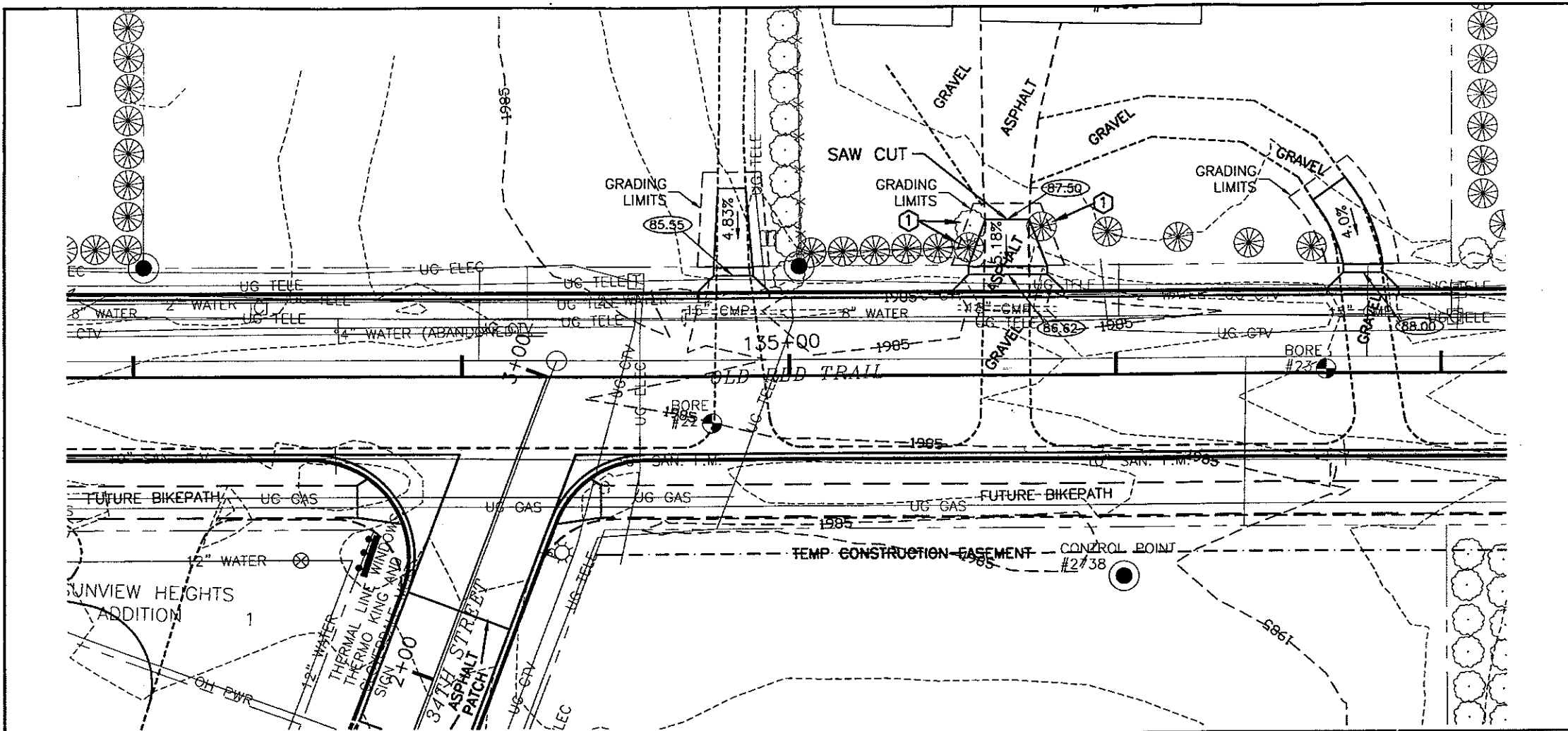
CONSTRUCTION NOTES

① EXISTING GRAVEL DRIVEWAY SHALL BE REMOVED. GRAVEL SHALL BE STRIPPED AND TOPSOIL SPREAD IN ITS PLACE. ALL COSTS INCLUDED IN THE PRICE BID "COMMON EXCAVATION."

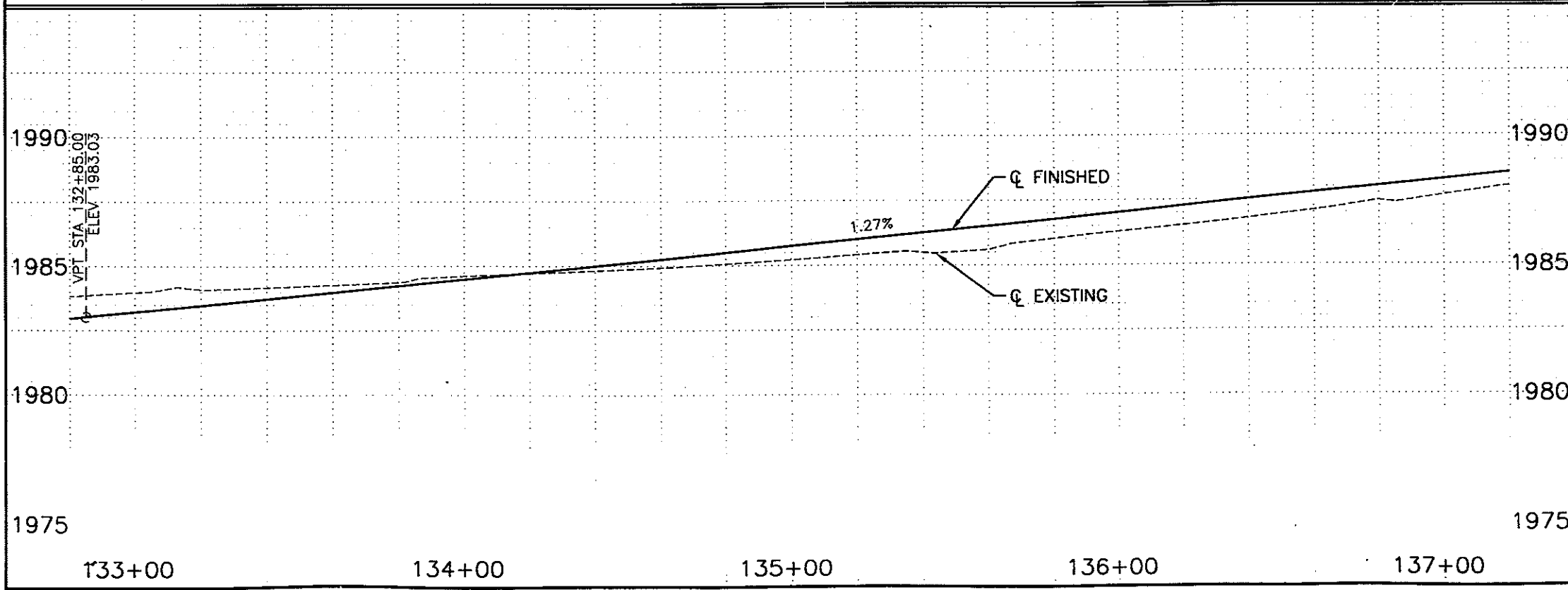


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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	32
OLD RED TRAIL		
STA. 133+00 TO STA. 137+00		
CURB & GUTTER LAYOUT		

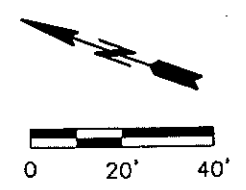


SAW BITUMINOUS SURFACING-FULL DEPTH	
135+67	14 LF
REMOVAL OF BITUMINOUS SURFACING	
133+00 TO 137+00	978 SY
135+67 LT	35.9 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AF	
133+00 TO 137+00	2133 SY
CURB & GUTTER - TYPE 1	
133+00 TO 137+00 LT	400 LF
133+00 TO 133+54 RT	54 LF
134+56 TO 137+00 RT	244 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
134+83 LT - 12'	14.0 SY
135+67 LT - 24'	23.9 SY
136+76 LT - 12'	14.0 SY
SIDEWALK CONCRETE	
133+73 RT. (RAMP)	12.8 SY
134+38 RT. (RAMP)	12.5 SY
MANHOLE CASTING	
134+29 LT	1 EACH
REMOVAL OF PIPE-ALL TYPES & SIZES	
134+85 LT	30 LF
135+65 LT	30 LF
136+80 LT	24 LF

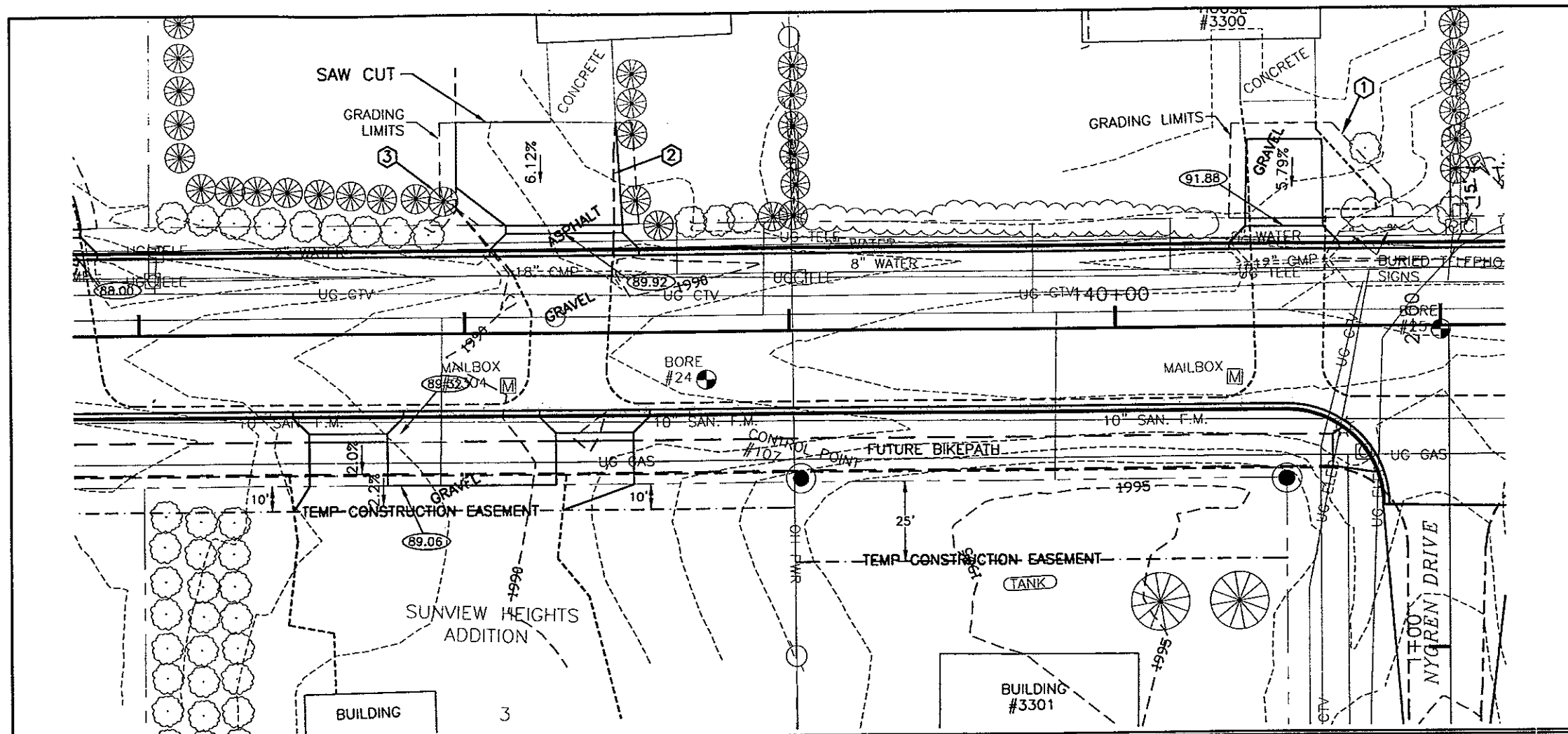


CONSTRUCTION NOTES

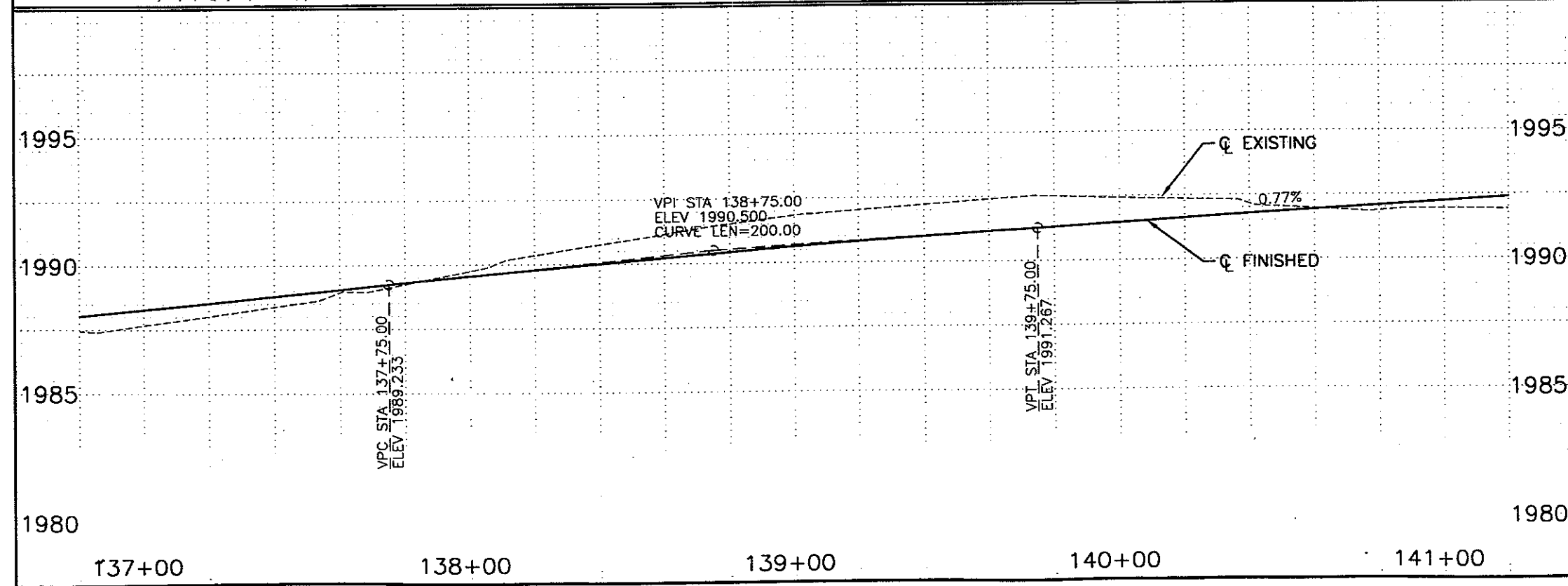
① CONTRACTOR SHALL PROTECT TREE WHEN COMPLETING THE REGRADING OF THE DRIVEWAY. ALL COSTS INCIDENTAL TO OTHER ITEMS.



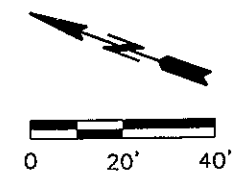
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	33
OLD RED TRAIL		
STA. 137+00 TO STA. 141+00		
CURB & GUTTER LAYOUT		



SAW BITUMINOUS SURFACING-FULL DEPTH	
138+13 LT	30 LF
REMOVAL OF BITUMINOUS SURFACING	
137+00 TO 141+00	978 SY
138+31 LT	237.3 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AF	
137+00 TO 141+00	2133 SY
CURB & GUTTER - TYPE 1	
137+00 TO 141+00 LT	400 LF
137+00 TO 140+53 RT	353 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
138+31 LT - 36'	34.0 SY
140+52 LT - 24'	23.9 SY
DRIVEWAY CONCRETE BIN-HIGH EARLY STRENGTH	
137+80 - 40'	37.3 SY
SIDEWALK CONCRETE	
140+71 RT. (RAMP)	12.2 SY
MANHOLE CASTING	
138+28 LT	1 EACH
ADJUST UTILITY APPURTENANCE	
137+00 LT	1 EACH WGV
137+03 LT	1 EACH WGV
REMOVAL OF PIPE-ALL TYPES & SIZES	
138+30 LT	36 LF
140+52 LT	30 LF



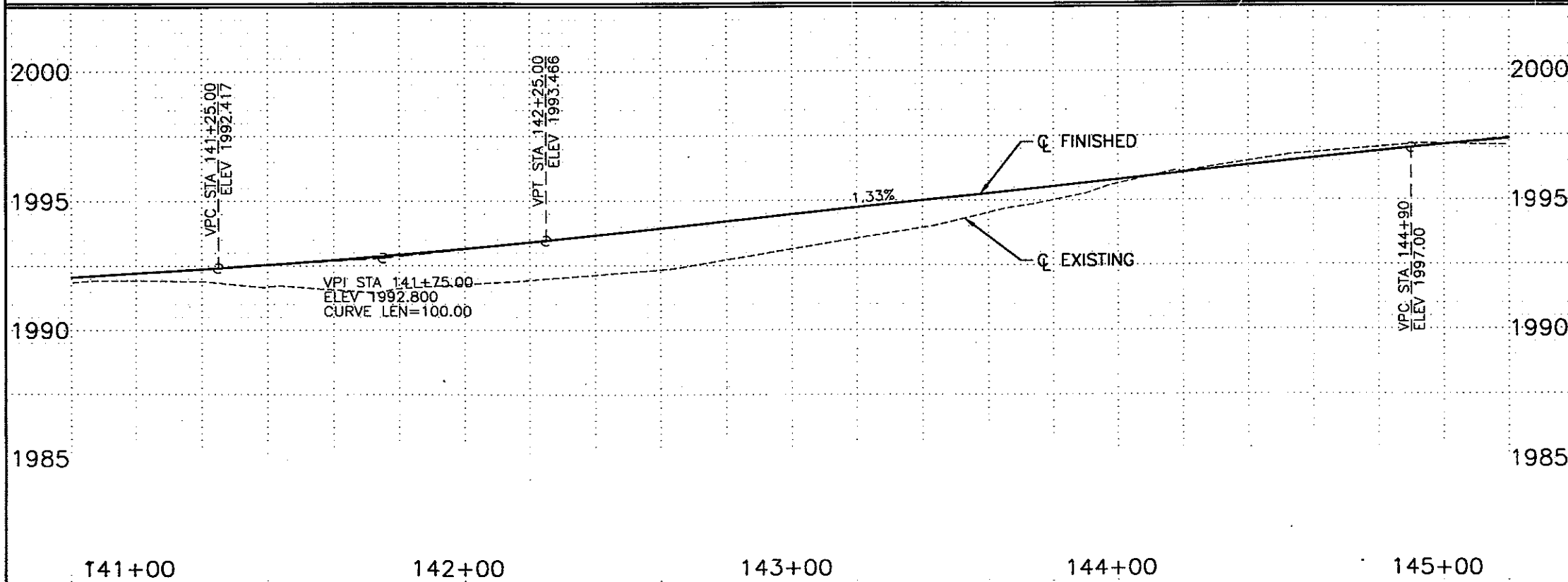
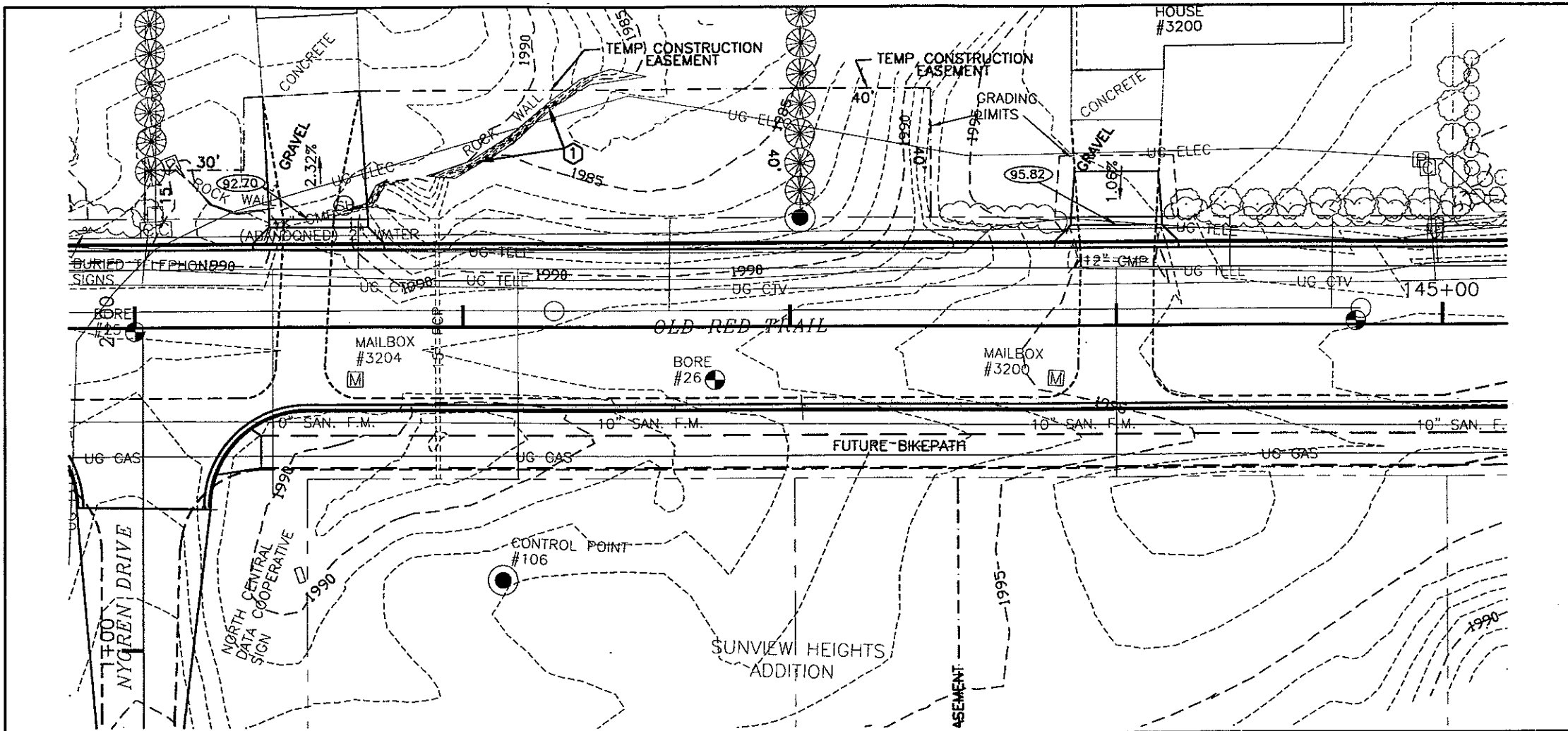
- CONSTRUCTION NOTES**
- ① CONTRACTOR SHALL PROTECT EXISTING BRICK EDGING IN PLACE DURING REGRADING OF DRIVEWAY OR SHALL RESTORE TO EXISTING CONDITION IF REMOVAL IS REQUIRED. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CONTRACTOR SHALL REMOVE AND REPLACE RR TIE LANDSCAPING ALONG EDGE OF DRIVEWAY. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ③ CONTRACTOR SHALL RELOCATE TREE TO OWNER DESIGNATED LOCATION. ALL COSTS INCIDENTAL TO OTHER ITEMS.



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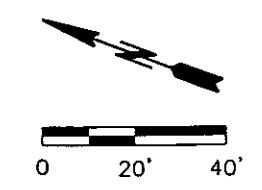
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	34
OLD RED TRAIL		
STA. 141+00 TO STA. 145+00		
CURB & GUTTER LAYOUT		

REMOVAL OF BITUMINOUS SURFACING	
141+00 TO 145+00	978 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
141+00 TO 145+00	2133 SY
CURB & GUTTER - TYPE 1	
141+00 TO 145+00 LT	400 LF
141+53 TO 145+00 RT	347 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
141+56 LT - 30'	29.0 SY
144+00 LT - 28'	27.3 SY
SIDEWALK CONCRETE	
141+34 RT. (RAMP)	12.8 SY
MANHOLE CASTING	
142+28 LT	1 EACH
144+75 LT	1 EACH
ADJUST UTILITY APPURTENANCES	
141+39 LT	1 EACH WGV
141+42 LT	1 EACH WGV
141+69 LT	1 EACH CS
142+16 LT	1 EACH CS
144+00 LT	1 EACH CS
REMOVAL OF PIPE-ALL TYPES & SIZES	
141+60 LT	30 LF
141+93	78 LF
144+00 LT	24 LF

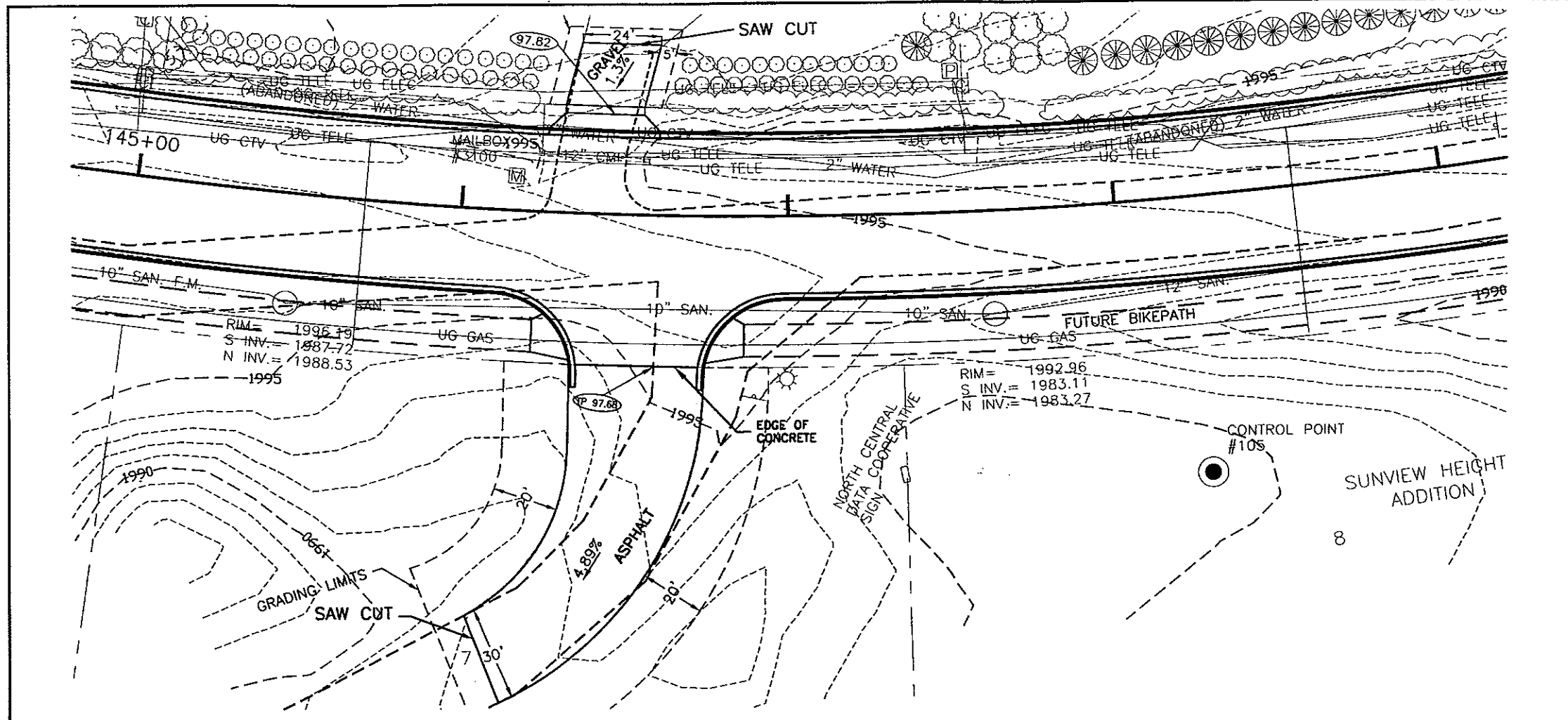


CONSTRUCTION NOTES

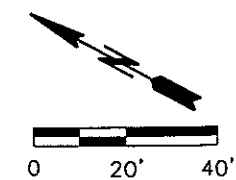
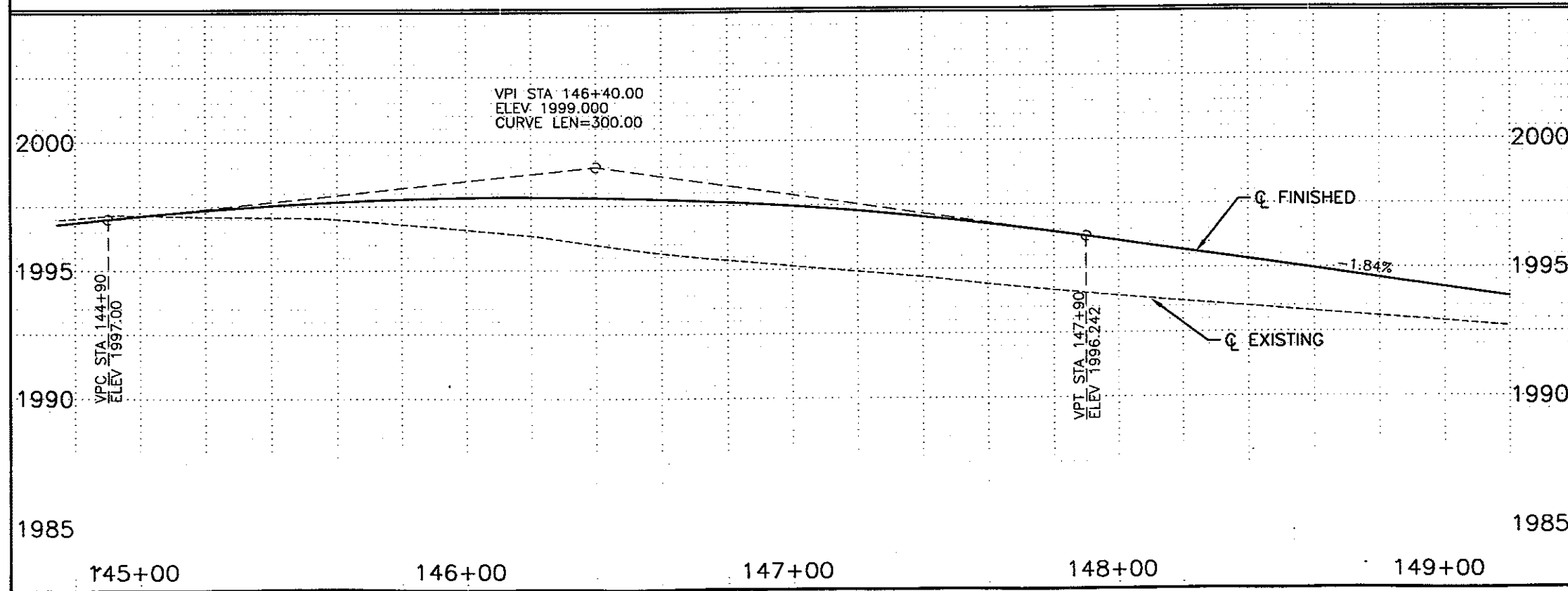
① AT THE TIME OF PLAN SUBMITTAL, THE PROPERTY AT THIS LOCATION CONTAINED ROCK WALLS AS SHOWN. IN THE FALL OF 1999, THE LANDSCAPING IN THIS PROPERTY WILL BE MODIFIED TO MATCH INTO THE ROADWAY CONSTRUCTED UNDER THIS PROJECT.



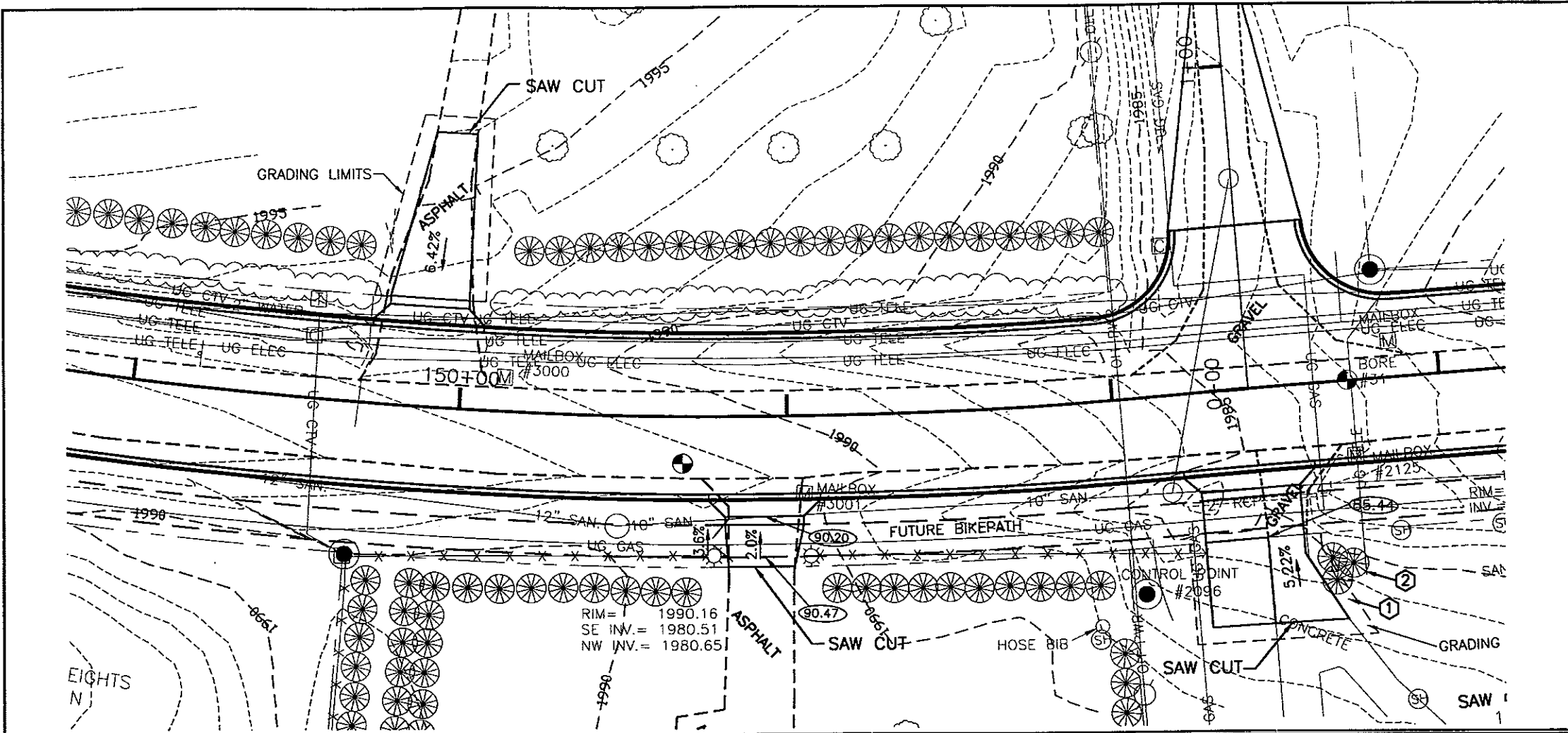
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	35
OLD RED TRAIL		
STA. 145+00 TO STA. 149+00		
CURB & GUTTER LAYOUT		



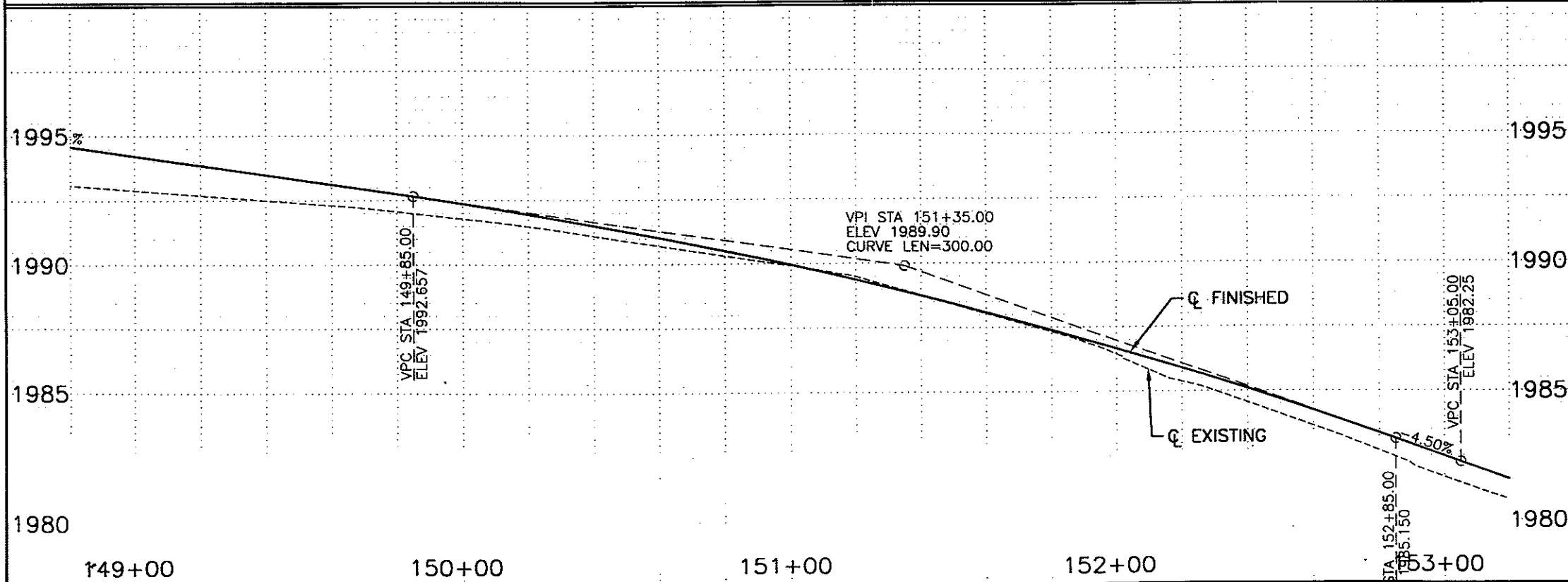
SAW BITUMINOUS SURFACING-FULL DEPTH	
146+15 RT	30 LF
REMOVAL OF CONCRETE	
146+42 LT	8.2 SY
REMOVAL OF BITUMINOUS SURFACING	
145+00 TO 149+00	1176 SY
146+54 RT	477.0 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AE	
146+43 LT	52.1 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
145+00 TO 149+00	2292 SY
CURB & GUTTER - TYPE 1	
145+00 TO 149+00 LT	400 LF
145+00 TO 149+00 RT	402 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
146+43 LT - 24'	23.9 SY
SIDEWALK CONCRETE	
146+28 RT. (RAMP)	12.4 SY
148+84 RT. (RAMP)	12.4 SY
ADJUST MANHOLE	
145+49 RT	1 EACH
146+00 LT	1 EACH
147+63 RT	1 EACH
ADJUST UTILITY APPURTENANCES	
146+24 LT	1 EACH GS
147+52 LT	1 EACH WGV
147+55 LT	1 EACH WGV
REMOVAL OF PIPE-ALL TYPES & SIZES	
146+40 LT	34 LF



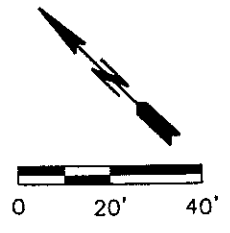
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	36
OLD RED TRAIL		
STA. 149+00 TO STA. 153+00		
CURB & GUTTER LAYOUT		



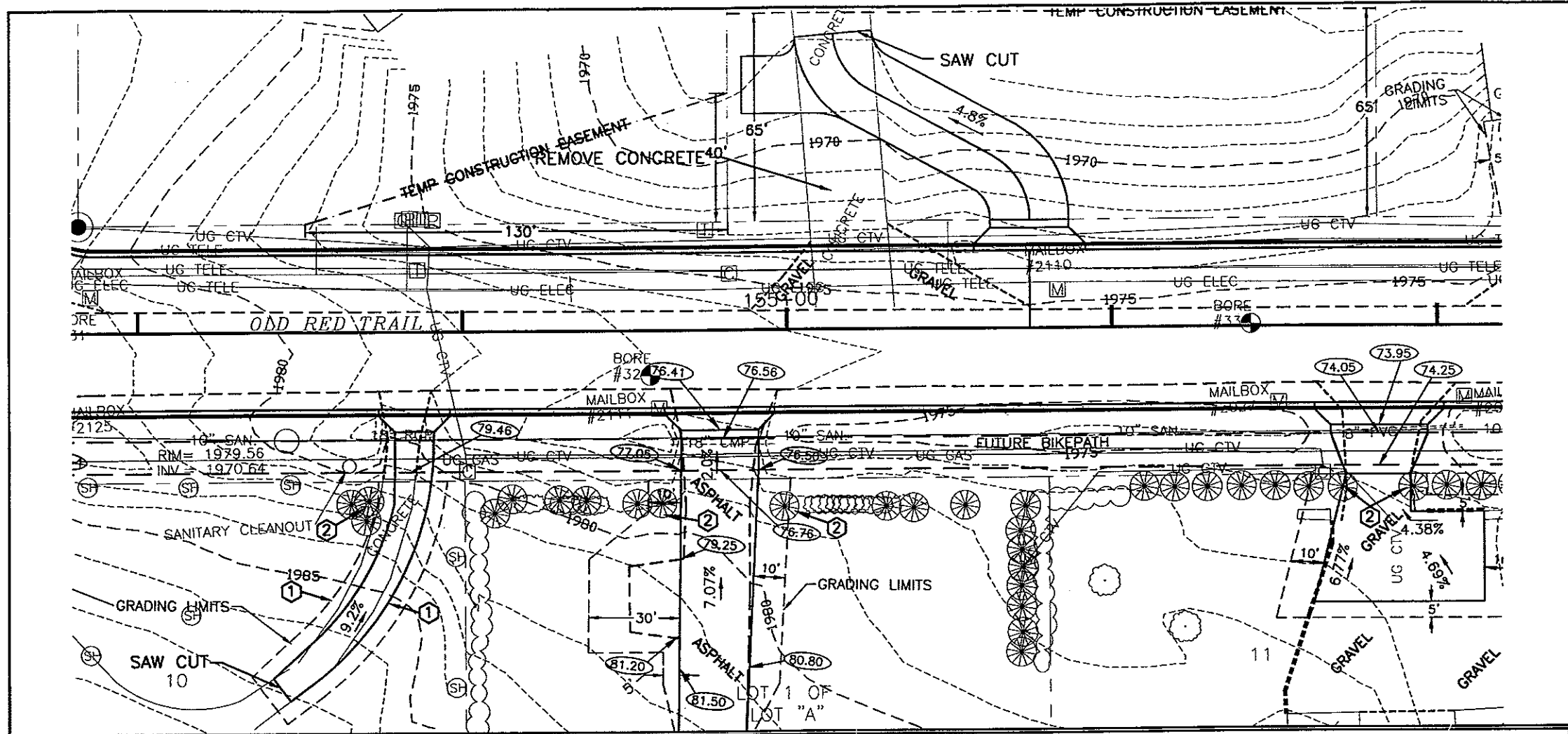
SAW BITUMINOUS SURFACING-FULL DEPTH	
149+89 LT	13 LF
150+92 RT	20 LF
REMOVAL OF CONCRETE	
152+45 RT	45.9 SY
REMOVAL OF BITUMINOUS SURFACING	
149+00 TO 153+00	1133 SY
149+89 LT	192.7 SY
150+94 RT	68.7 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AF	
152+40 RT	45.9 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AF	
149+00 TO 153+00	2133 SY
CURB & GUTTER - TYPE 1	
149+00 TO 153+00 RT	400 LF
149+00 TO 151+96 LT	296 LF
152+87 TO 153+00 LT	13 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
149+89 LT - 24'	23.9 SY
150+92 RT - 24'	23.9 SY
152+40 RT - 30'	29.0 SY
ADJUST MANHOLE	
150+50 RT	1 EACH
152+16 RT	1 EACH
ADJUST UTILITY APPURTENANCES	
149+70 LT	1 EACH CS
152+66 LT	1 EACH WGV
152+72 LT	1 EACH WGV
REMOVAL OF PIPE-ALL TYPES & SIZES	
152+40 RT	40 LF



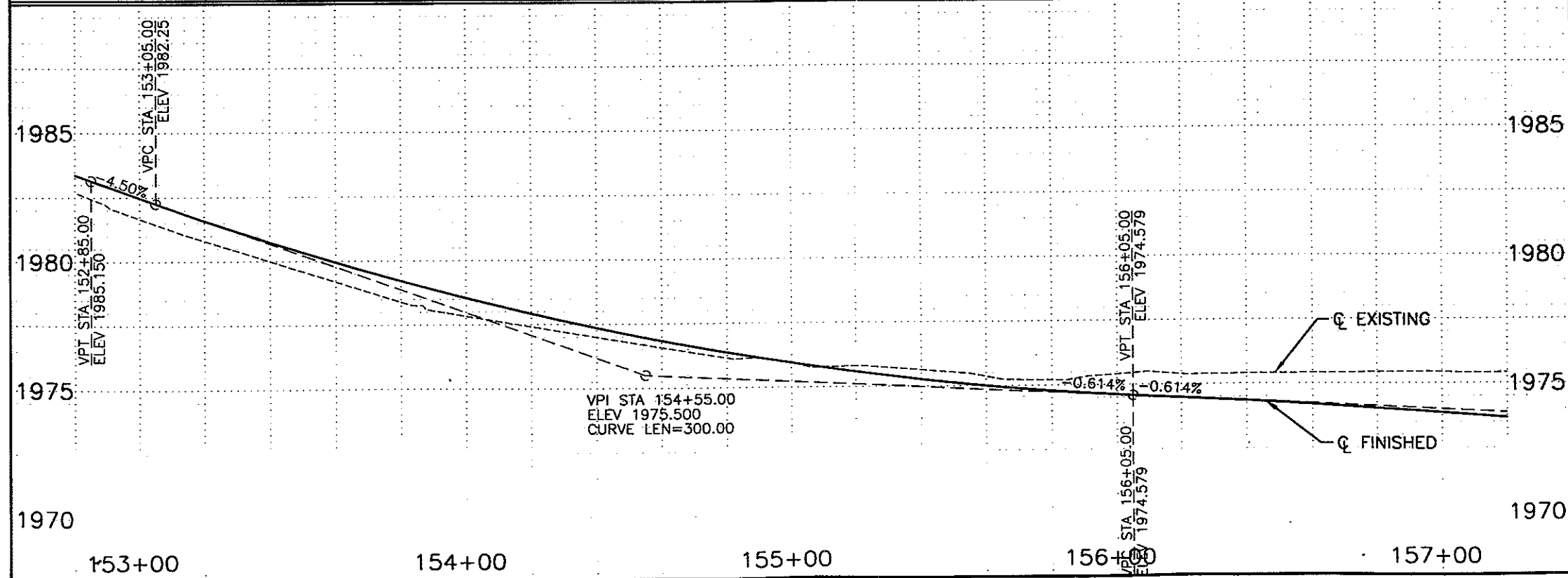
- CONSTRUCTION NOTES**
- ① SPRINKLER SYSTEM SHALL BE ADJUSTED ALONG NEW DRIVEWAY. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CONTRACTOR SHALL PROTECT TREES DURING SHAPING OPERATIONS. ALL COSTS INCIDENTAL TO OTHER ITEMS.



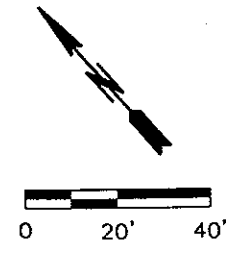
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	37
OLD RED TRAIL STA. 153+00 TO STA. 157+00 CURB & GUTTER LAYOUT		



SAW BITUMINOUS SURFACING-FULL DEPTH	
154+79 RT	22 LF
REMOVAL OF CONCRETE	
153+80 RT	82.6 SY
REMOVAL OF BITUMINOUS SURFACING	
153+00 TO 157+00	1111 SY
154+80 RT	255.7 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AE	
153+78 RT	104.1 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AE	
153+00 TO 157+00	2133 SY
CURB & GUTTER - TYPE 1	
153+00 TO 157+00 LT	400 LF
153+00 TO 157+00 RT	400 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
153+78 RT - 12'	14.0 SY
154+79 RT - 24'	23.9 SY
155+75 LT - 24'	23.9 SY
156+82 RT - 30'	29.0 SY
ADJUST MANHOLE	
153+45 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
153+56 LT	1 EACH CS
153+65 RT	1 EACH SC
155+50 LT	1 EACH CS
REMOVAL OF PIPE-ALL TYPES & SIZES	
153+80 RT	18 LF
154+80 RT	32 LF
156+80 RT	52 LF

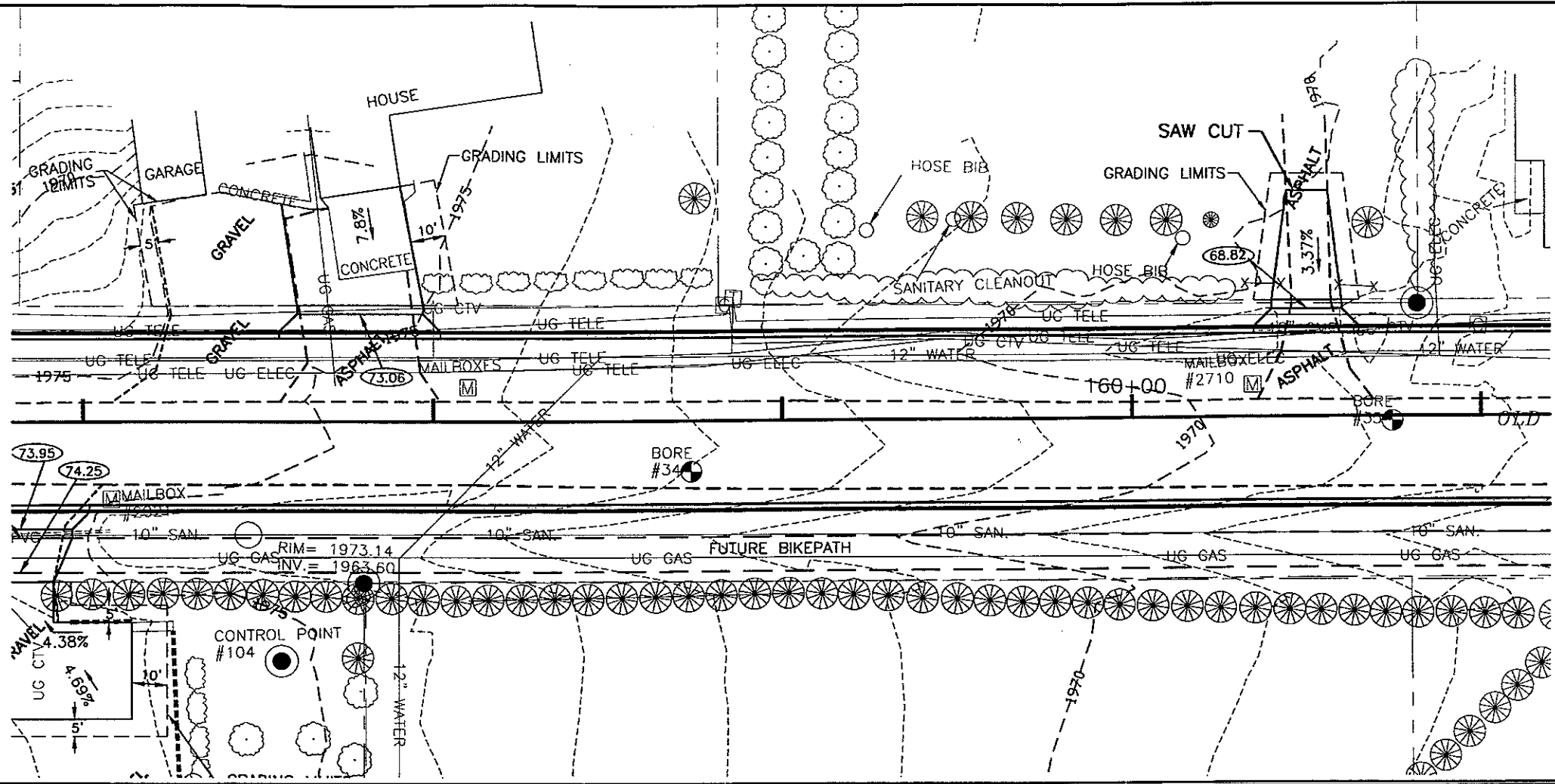


- CONSTRUCTION NOTES**
- ① SPRINKLER SYSTEM SHALL BE ADJUSTED ALONG NEW DRIVEWAY. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CONTRACTOR SHALL PROTECT TREES DURING SHAPING OPERATIONS. ALL COSTS INCIDENTAL TO OTHER ITEMS.

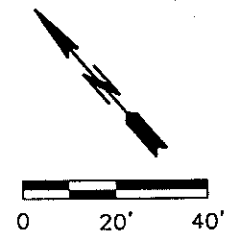
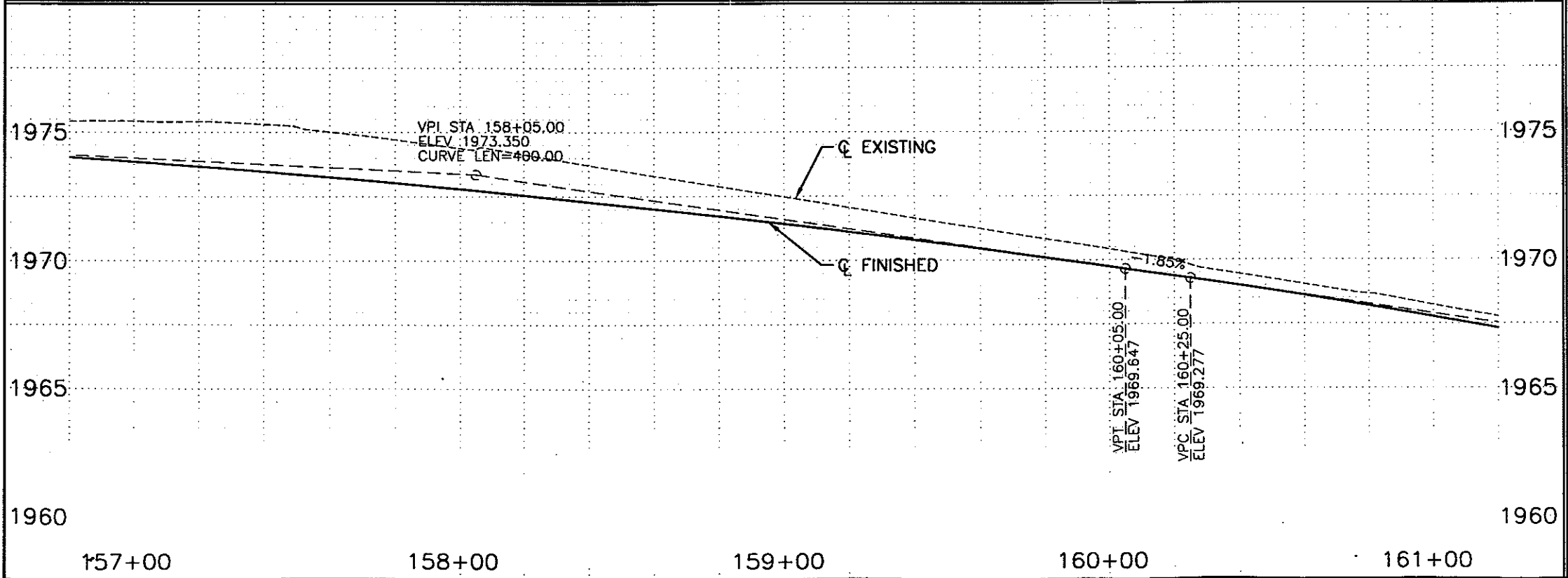


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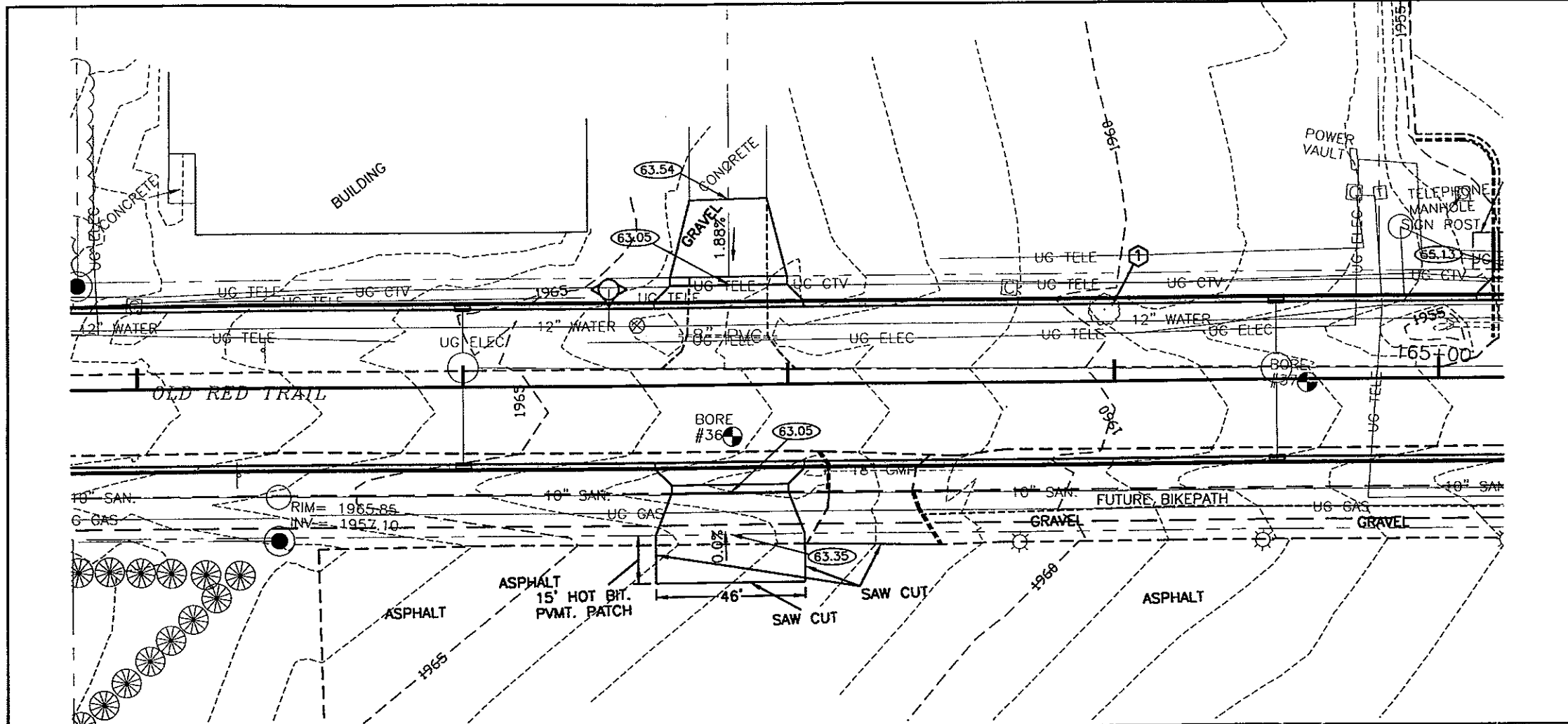
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	38
OLD RED TRAIL		
STA. 157+00 TO STA. 161+00		
CURB & GUTTER LAYOUT		



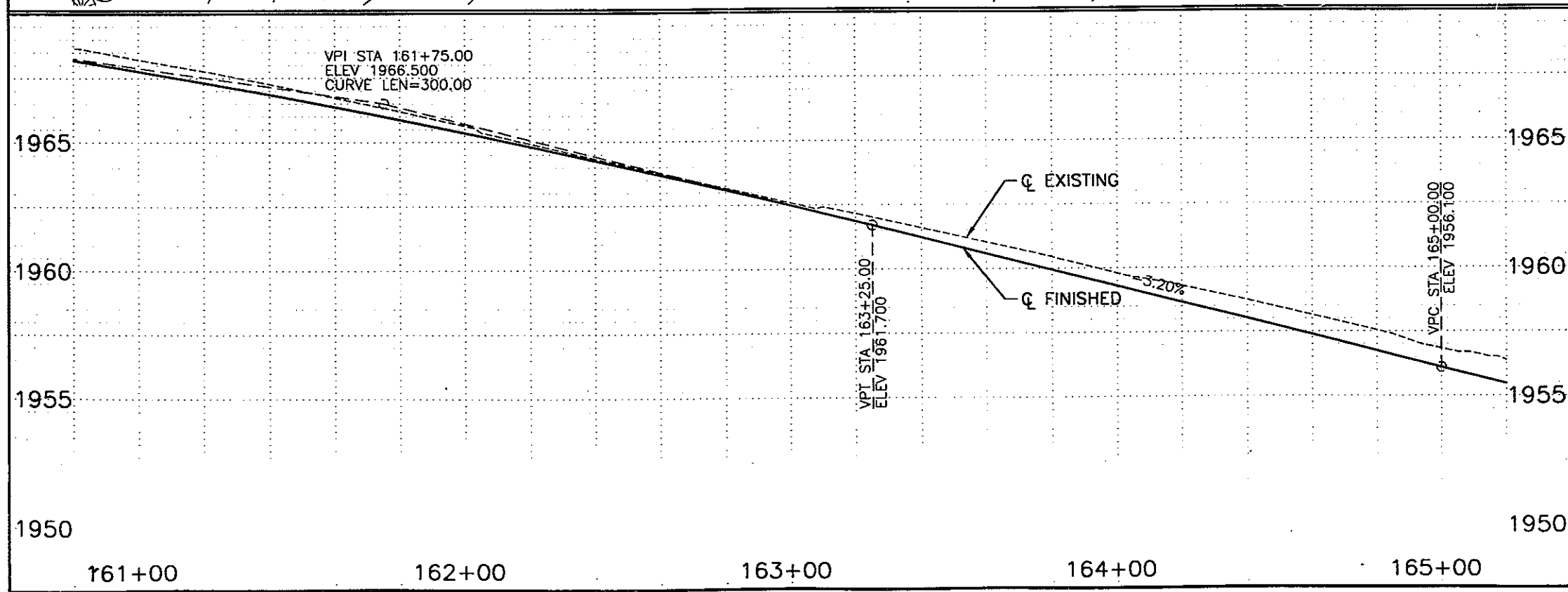
SAW BITUMINOUS SURFACING-FULL DEPTH	
160+50 LT	12 LF
REMOVAL OF CONCRETE	
157+83 LT	59 SY
REMOVAL OF BITUMINOUS SURFACING	
157+00 TO 161+00	1111 SY
157+83 LT	146 SY
160+50 LT	102.8 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AE	
157+79 LT	122.4 SY
GIN NON-REINF. CONCRETE PAVEMENT CL AE	
157+00 TO 161+00	2133 SY
CURB & GUTTER - TYPE 1	
157+00 TO 161+00 LT	400 LF
157+00 TO 161+00 RT	400 LF
DRIVEWAY CONCRETE-HIGH EARLY STRENGTH	
157+79 LT - 36'	34.0 SY
160+50 LT - 20'	20.6 SY
ADJUST MANHOLE	
157+47 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
158+00 LT	1 EACH CS
158+28 LT	1 EACH GWV
REMOVAL OF PIPE-ALL TYPES & SIZES	
160+50 LT	32 LF



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	39
OLD RED TRAIL		
STA. 161+00 TO STA. 165+00		
CURB & GUTTER LAYOUT		

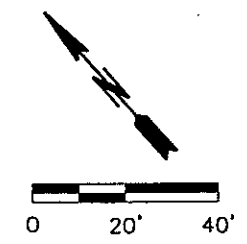


SAW BITUMINOUS SURFACING-FULL DEPTH	
162+82 RT	70 LF
163+25 RT	42 LF
REMOVAL OF CURB & GUTTER	
163+13 RT	12 LF
163+38 RT	18 LF
REMOVAL OF BITUMINOUS SURFACING	
161+00 TO 165+00	1134 SY
162+82 RT	61 SY
163+25 RT	93.3 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
161+00 TO 165+00	2133 SY
CURB & GUTTER - TYPE 1	
161+00 TO 165+00 LT	400 LF
161+00 TO 165+00 RT	400 LF
DRIVEWAY CONCRETE BIN-HIGH EARLY STRENGTH	
162+82 LT - 36'	34.0 SY
162+82 RT - 36'	34.0 SY
ADJUST MANHOLE	
161+43 RT	1 EACH
ADJUST UTILITY APPURTENANCES	
162+54 LT	1 EACH WCV
REMOVAL OF PIPE-ALL TYPES & SIZES	
162+80 LT	32 LF
163+30 RT	40 LF



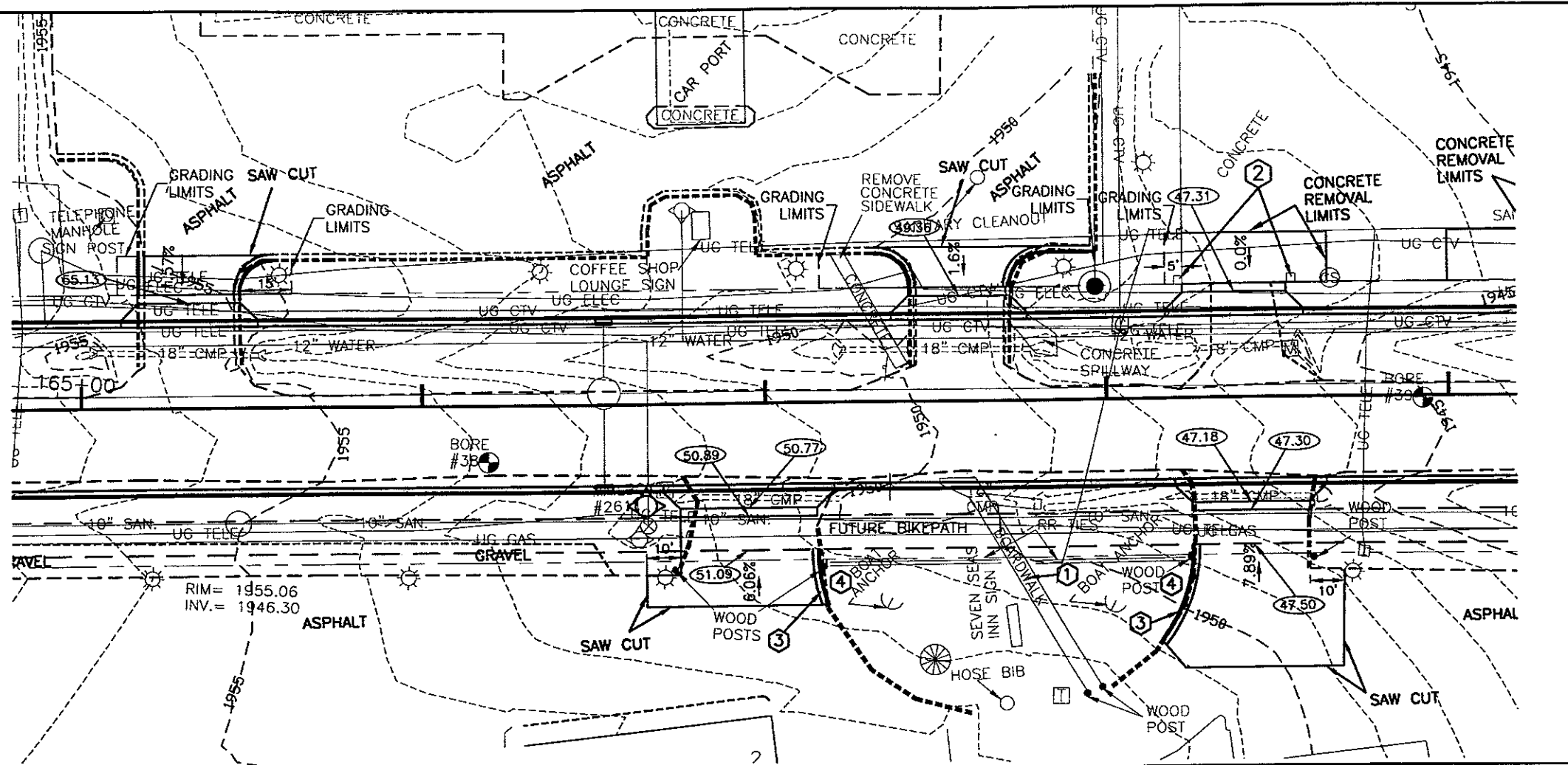
CONSTRUCTION NOTES

① CLEAR & GRUB TREES



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	40
OLD RED TRAIL		
STA. 165+00 TO STA. 169+00		
CURB & GUTTER LAYOUT		



SAW BITUMINOUS SURFACING-FULL DEPTH

165+32 LT	40 LF
166+95 RT	64 LF
167+57 LT	55 LF
168+42 RT	86 LF

REMOVAL OF CONCRETE

167+20 TO 167+42 LT	15 SY
167+51 TO 167+81 RT	13 SY
167+72 TO 167+86 LT	12 SY
168+23 TO 168+65 LT	70 SY

REMOVAL OF CURB & GUTTER

165+17 LT	33 LF
165+47 LT	39 LF
166+79 RT	31 LF
167+17 RT	17 LF
167+42 LT	43 LF
167+72 LT	54 LF
168+25 RT	38 LF
168+60 RT	27 LF

REMOVAL OF BITUMINOUS SURFACING

165+00 TO 169+00	1129 SY
165+32 LT	136 SY
166+97 RT	179 SY
167+57 LT	138 SY
168+43 RT	258 SY

GIN NON-REINF. CONCRETE PAVEMENT CL AE

168+23 TO 168+65 LT	70 SY
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GIN NON-REINF. CONCRETE PAVEMENT CL AE

165+00 TO 169+00	2133 SY
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CURB & GUTTER - TYPE 1

165+17 LT	12 LF
165+47 LT	18 LF
167+17 RT	10 LF
167+42 LT	19 LF
167+72 LT	33 LF
168+25 RT	15 LF
165+00 TO 169+00 LT	400 LF
165+00 TO 169+00 RT	400 LF

DRIVEWAY CONCRETE BIN-HIGH EARLY STRENGTH

165+31.74 LT - 30'	29.0 SY
166+95 RT - 40'	37.3 SY
167+57 LT - 30'	29.0 SY
168+37.5 LT - 30'	29.0 SY
168+42 RT - 34'	32.3 SY

ADJUST MANHOLE

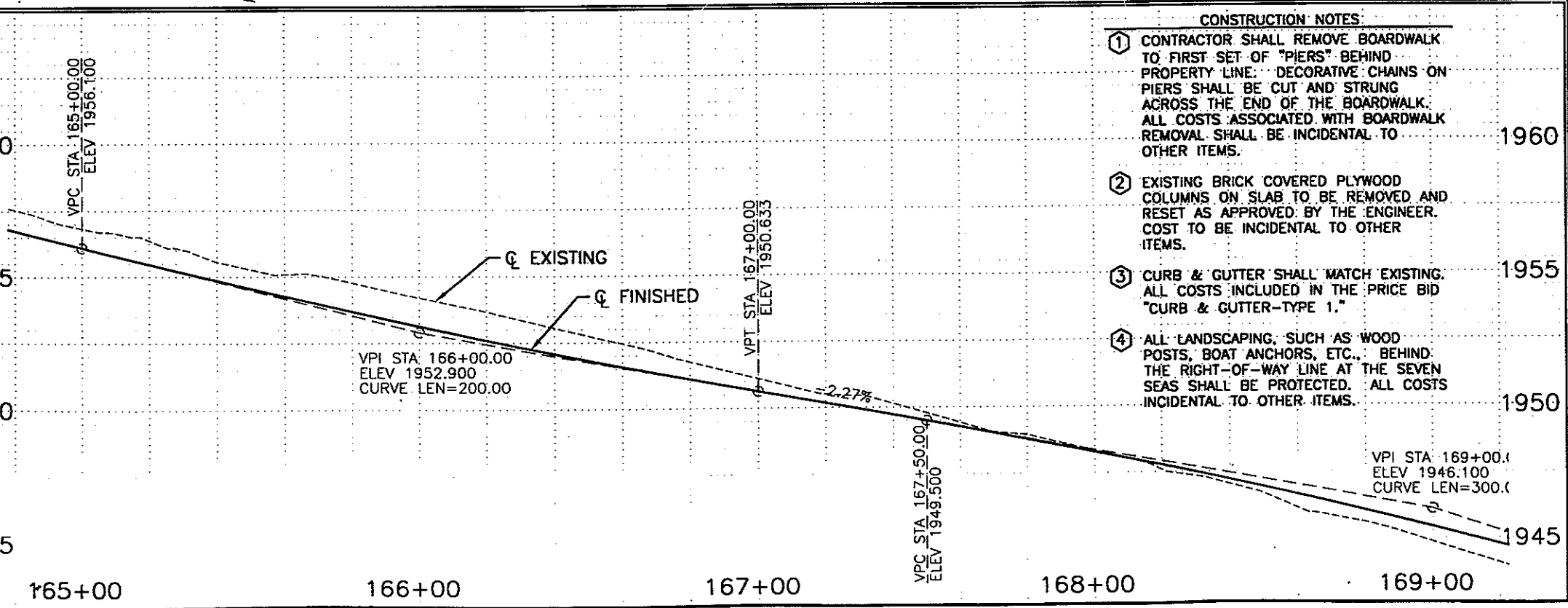
165+45 RT	1 EACH
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ADJUST UTILITY APPURTENANCE

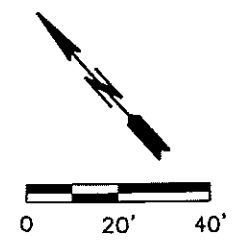
168+66 LT	1 EACH CS
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REMOVAL OF PIPE-ALL TYPES & SIZES

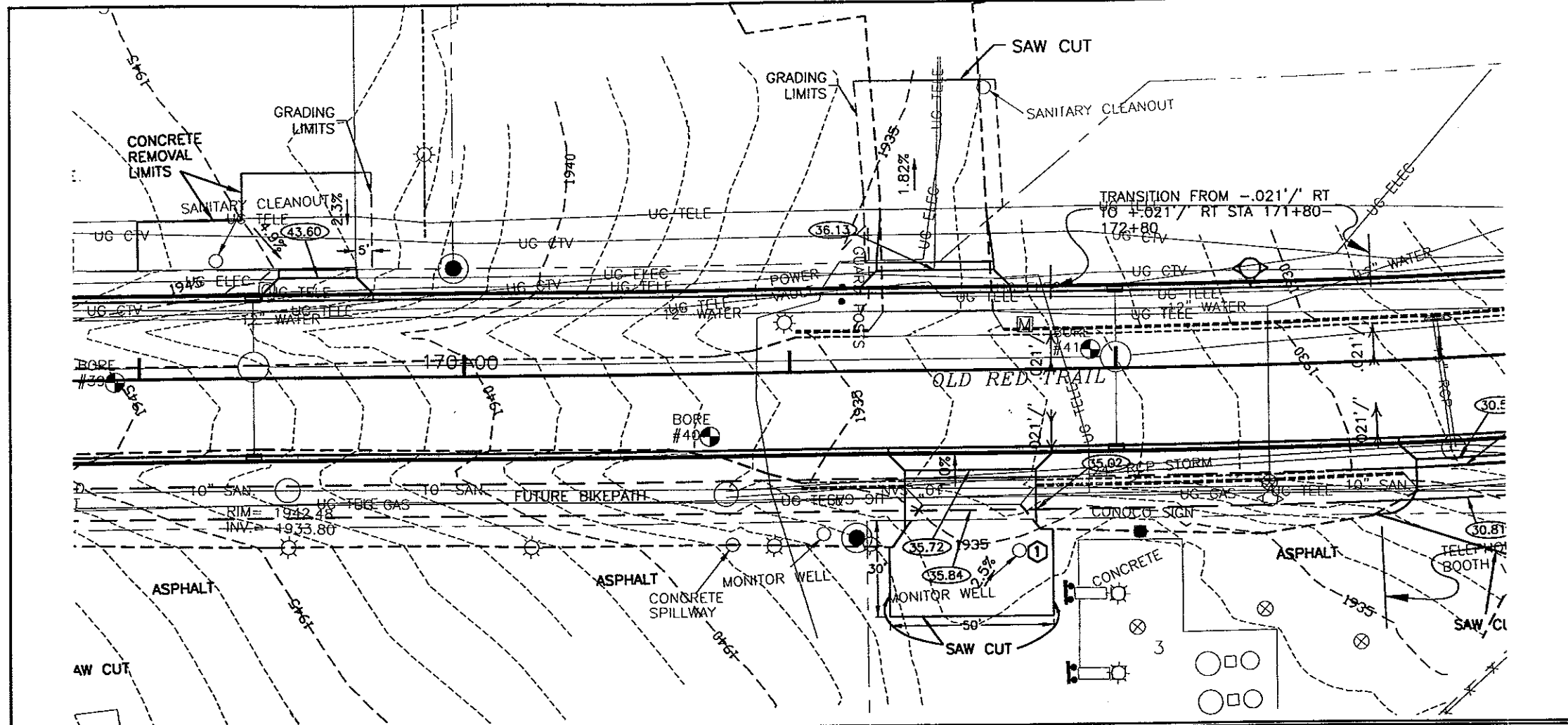
165+30 LT	50 LF
167+00 RT	44 LF
167+60 LT	56 LF
168+40 LT & RT	66 LF



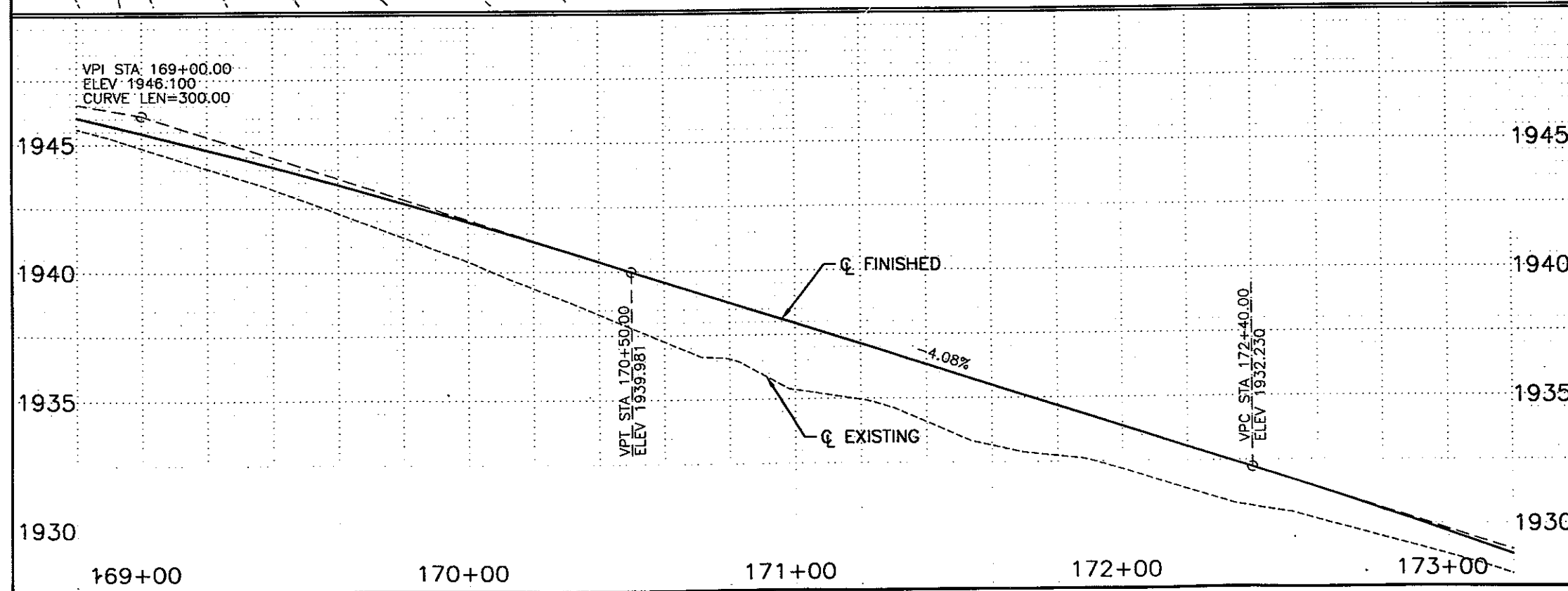
- CONSTRUCTION NOTES:**
- ① CONTRACTOR SHALL REMOVE BOARDWALK TO FIRST SET OF "PIERS" BEHIND PROPERTY LINE. DECORATIVE CHAINS ON PIERS SHALL BE CUT AND STRUNG ACROSS THE END OF THE BOARDWALK. ALL COSTS ASSOCIATED WITH BOARDWALK REMOVAL SHALL BE INCIDENTAL TO OTHER ITEMS.
 - ② EXISTING BRICK COVERED PLYWOOD COLUMNS ON SLAB TO BE REMOVED AND RESET AS APPROVED BY THE ENGINEER. COST TO BE INCIDENTAL TO OTHER ITEMS.
 - ③ CURB & GUTTER SHALL MATCH EXISTING. ALL COSTS INCLUDED IN THE PRICE BID "CURB & GUTTER-TYPE 1."
 - ④ ALL LANDSCAPING, SUCH AS WOOD POSTS, BOAT ANCHORS, ETC., BEHIND THE RIGHT-OF-WAY LINE AT THE SEVEN SEAS SHALL BE PROTECTED. ALL COSTS INCIDENTAL TO OTHER ITEMS.



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	41
OLD RED TRAIL		
STA. 169+00 TO STA. 173+00		
CURB & GUTTER LAYOUT		

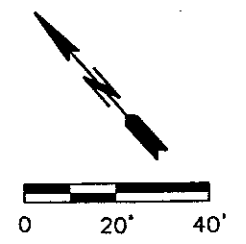


SAW BITUMINOUS SURFACING--FULL DEPTH	
171+45 LT	34 LF
171+55 RT	100 LF
REMOVAL OF CONCRETE	
169+00 TO 169+67 RT	171 SY
171+45 LT	22 SY
171+55 RT	23 SY
REMOVAL OF CURB & GUTTER	
171+02 TO 173+00 LT	198 LF
171+02 TO 173+00 RT	198 LF
REMOVAL OF BITUMINOUS SURFACING	
169+00 TO 173+00	1642 SY
171+45 LT	264 SY
171+55 RT	179 SY
6IN NON-REINF. CONCRETE PAVEMENT CL AE	
169+00 TO 169+67 LT	171 SY
6IN NON-REINF. CONCRETE PAVEMENT CL AE	
169+00 TO 173+00	2133 SY
CURB & GUTTER - TYPE 1	
169+00 TO 173+00 LT	400 LF
169+00 TO 173+00 RT	400 LF
DRIVEWAY CONCRETE 6IN-HIGH EARLY STRENGTH	
169+55 LT - 24'	23.9 SY
171+45 LT - 36'	34.0 SY
171+55 RT - 40'	37.3 SY
ADJUST MANHOLE	
169+43 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
169+24 LT	1 EACH SC
171+70 RT	1 EACH MW



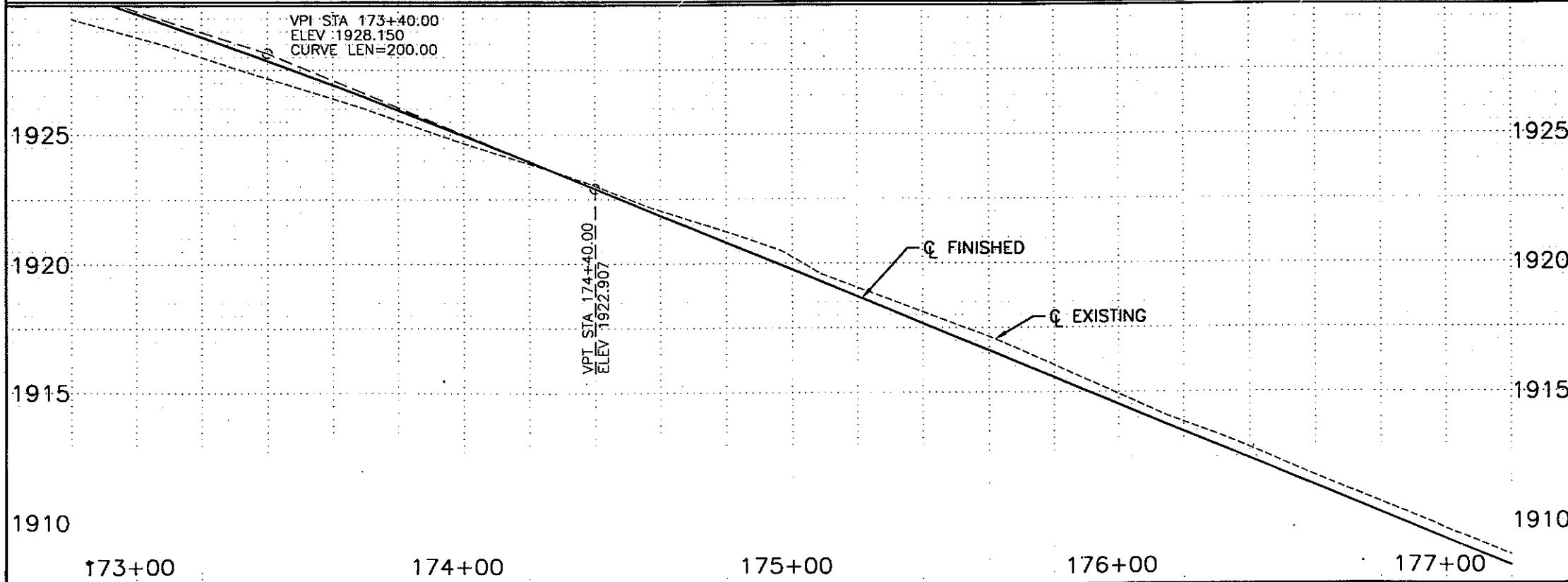
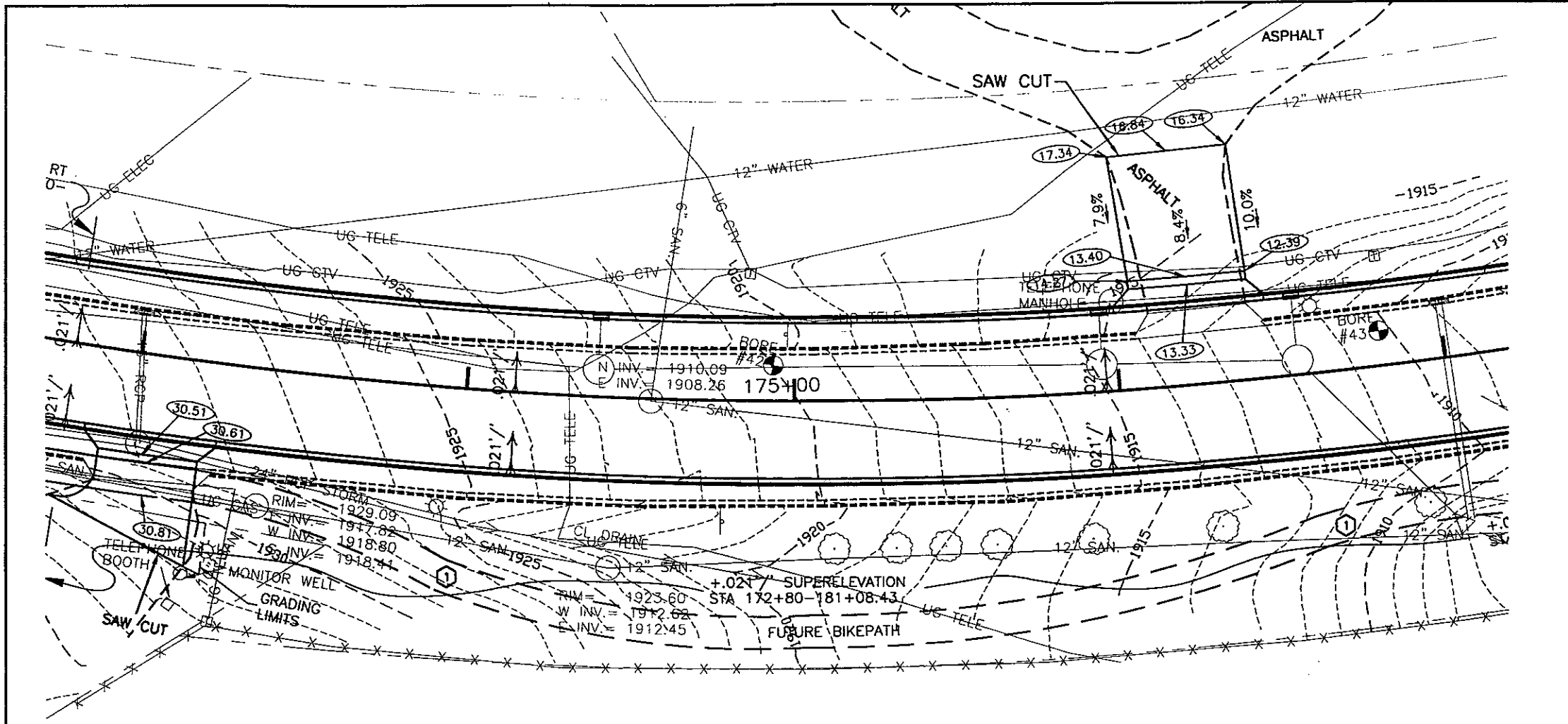
CONSTRUCTION NOTES

① CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT MONITORING WELL. ALL COSTS ASSOCIATED TO PROTECT AND ADJUST THE MONITORING WELL SHALL BE INCLUDED IN THE BID ITEM "ADJUST UTILITY APPURTENANCE."



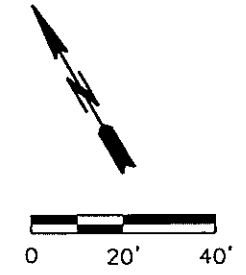
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	42
OLD RED TRAIL		
STA. 173+00 TO STA. 177+00		
CURB & GUTTER LAYOUT		

SAW BITUMINOUS SURFACING-FULL DEPTH	
173+06 RT	49 LF
176+23 LT	38 LF
REMOVAL OF CONCRETE	
173+06 RT	20 SY
176+23 LT	21 SY
REMOVAL OF CURB & GUTTER	
173+00 TO 177+00 LT	400 LF
173+00 TO 177+00 RT	400 LF
REMOVAL OF BITUMINOUS SURFACING	
173+00 TO 175+00	2000 SY
173+06 RT	89 SY
176+23 LT	174 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
173+00 TO 177+00	2133 SY
CURB & GUTTER - TYPE 1	
173+00 TO 177+00 LT	400 LF
173+00 TO 177+00 RT	400 LF
DRIVEWAY CONCRETE BIN-HIGH EARLY STRENGTH	
173+06 RT - 30'	29.0 SY
176+23 LT - 36'	34.0 SY
ADJUST MANHOLE	
173+40 RT	1 EACH
174+60 C	1 EACH
176+00 LT	1 EACH



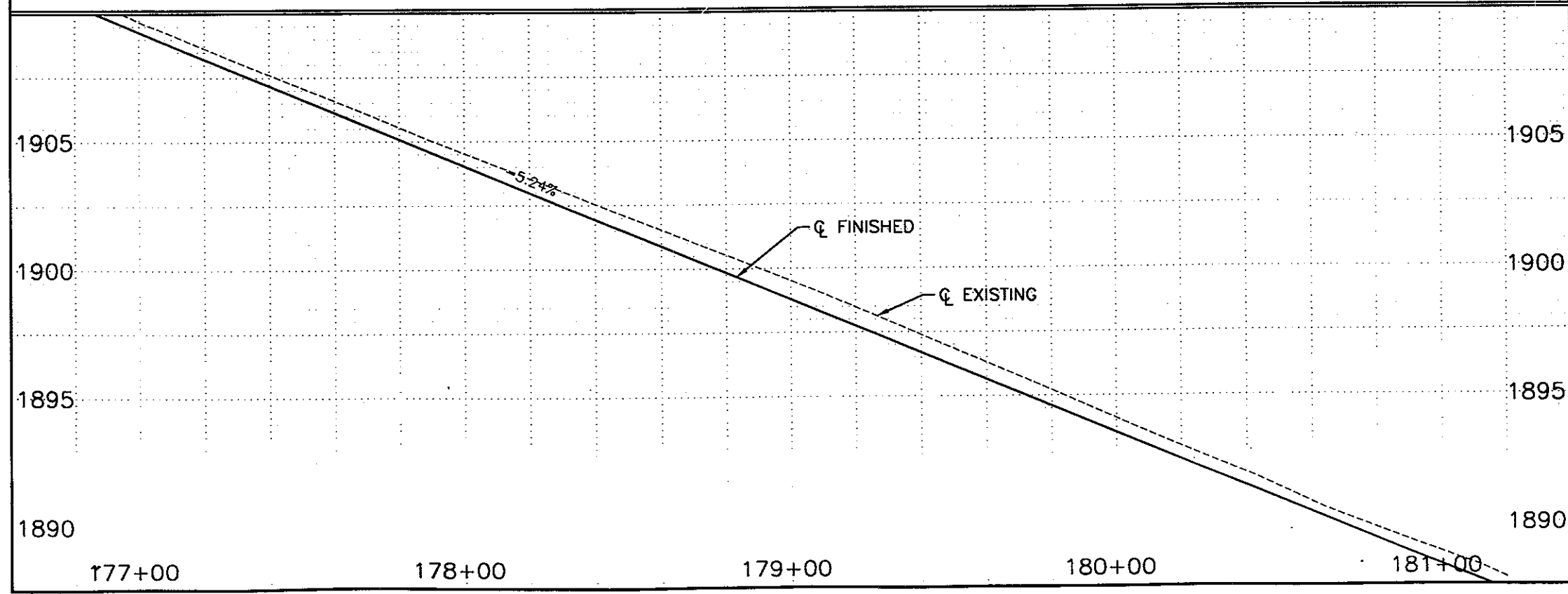
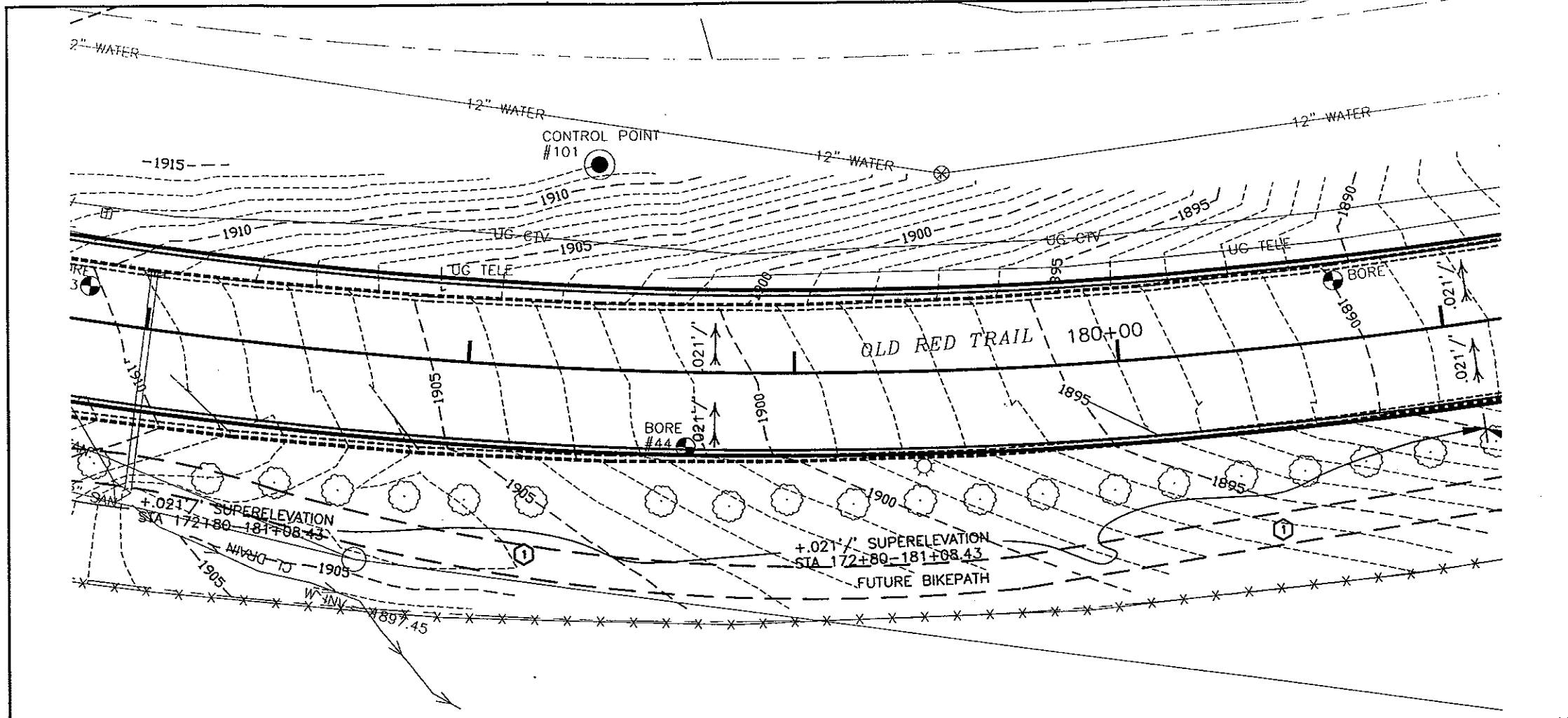
CONSTRUCTION NOTES

① NO GRADING NECESSARY FOR FUTURE BIKEPATH BEYOND STATION 172+50.

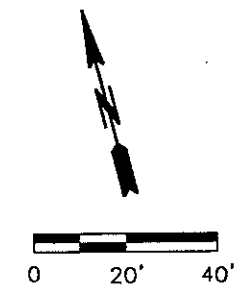


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	43
OLD RED TRAIL STA. 177+00 TO STA. 181+00 CURB & GUTTER LAYOUT		

REMOVAL OF CURB & GUTTER	
177+00 TO 181+00 LT	400 LF
177+00 TO 181+00 RT	400 LF
REMOVAL OF BITUMINOUS SURFACING	
177+00 TO 181+00	2000 SY
BIN NON-REINF. CONCRETE PAVEMENT CL. AE	
177+00 TO 181+00	2133 SY
CURB & GUTTER - TYPE 1	
177+00 TO 181+00 LT	400 LF
177+00 TO 181+00 RT	400 LF



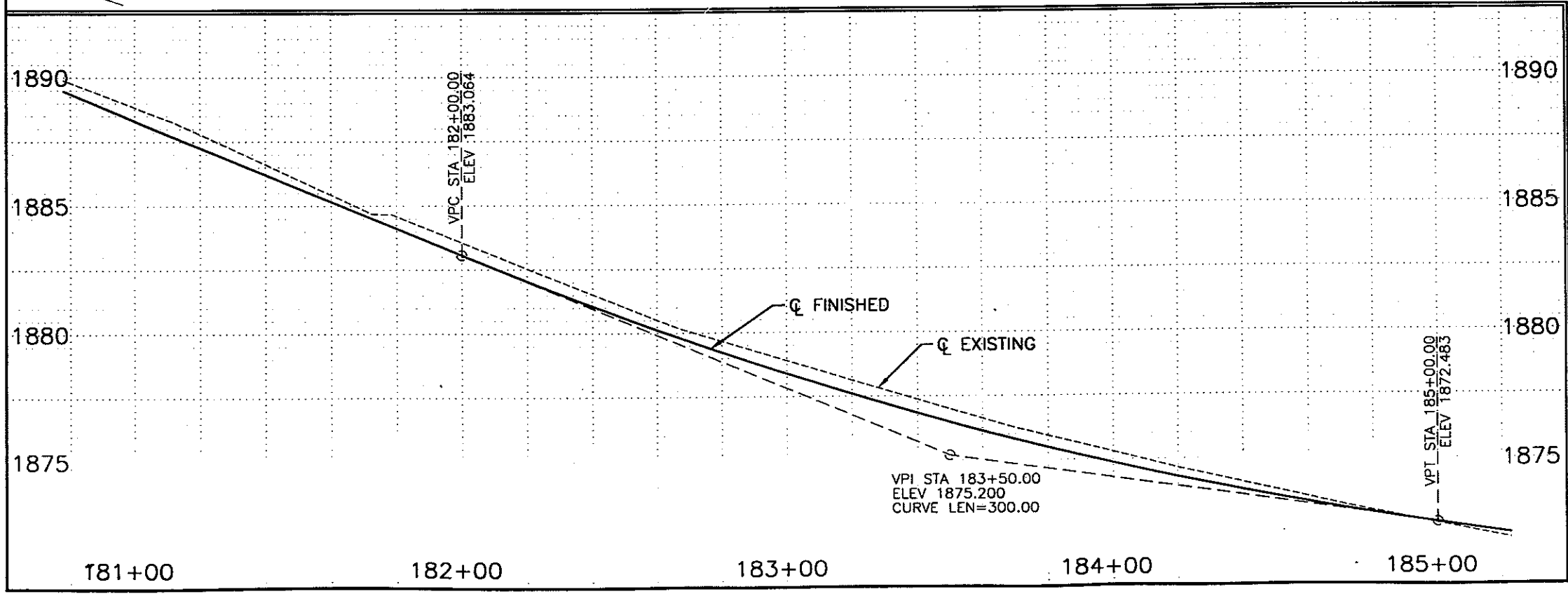
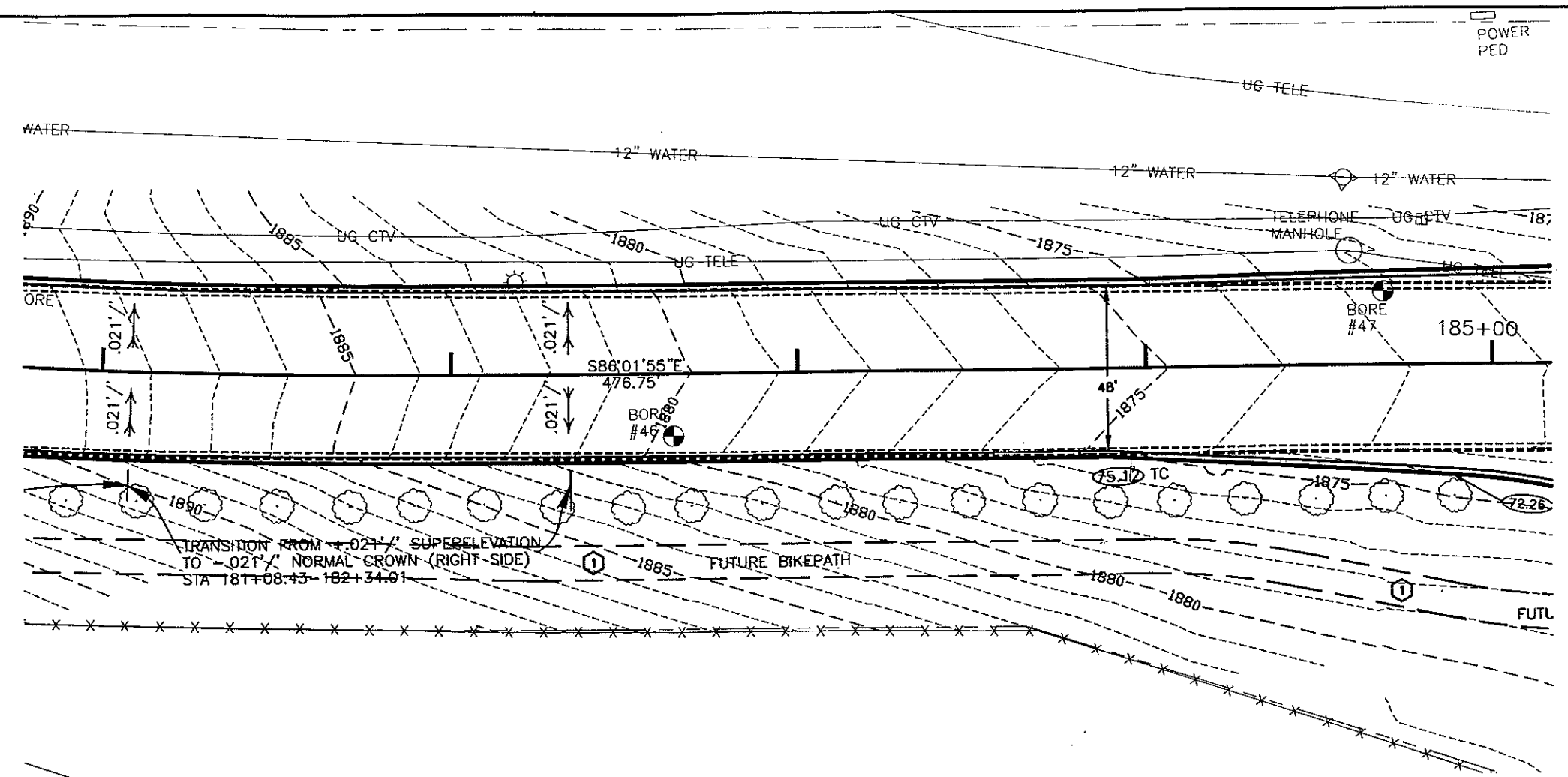
CONSTRUCTION NOTES
 ① NO GRADING NECESSARY FOR FUTURE BIKEPATH.



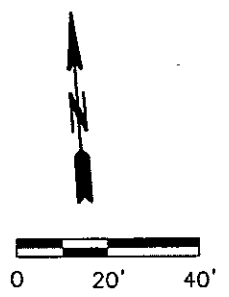
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	44
OLD RED TRAIL STA. 181+00 TO STA. 185+00 CURB & GUTTER LAYOUT		

REMOVAL OF CURB & GUTTER	
181+00 TO 185+00 LT	400 LF
181+00 TO 185+00 RT	400 LF
REMOVAL OF BITUMINOUS SURFACING	
181+00 TO 185+00	2000 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
181+00 TO 185+00	2193 SY
CURB & GUTTER - TYPE 1	
181+00 TO 185+00 LT	400 LF
181+00 TO 185+00 RT	402 LF
ADJUST MANHOLE	
184+60 LT	1 EACH

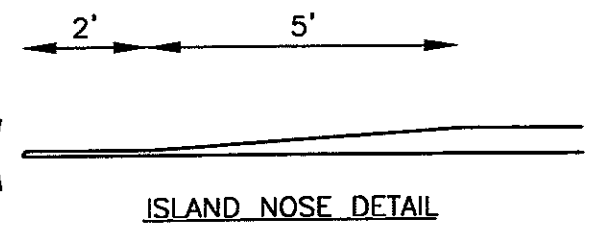
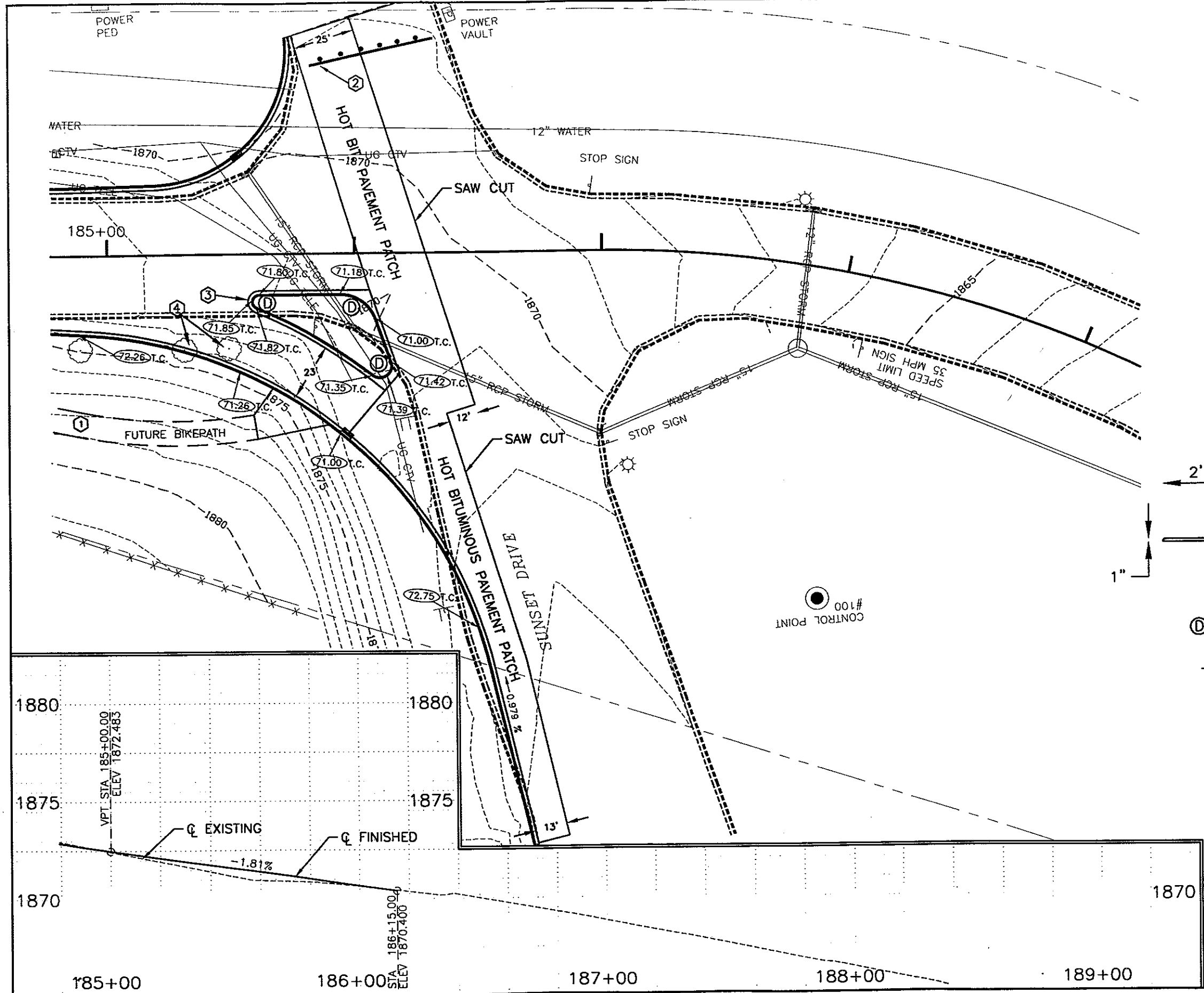


CONSTRUCTION NOTES
 ① NO GRADING NECESSARY FOR FUTURE BIKEPATH.



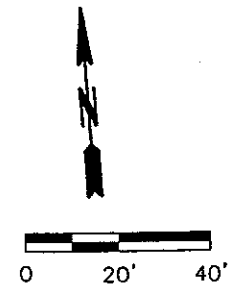
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	45
OLD RED TRAIL		
STA. 185+00 TO STA. 189+00		
CURB & GUTTER LAYOUT		

SAW BITUMINOUS SURFACING-FULL DEPTH	
186+15 (END)	384 LF
REMOVAL OF CURB & GUTTER	
185+00 TO 185+71 LT	120 LF
185+00 TO 186+71 RT	329 LF
REMOVAL OF BITUMINOUS SURFACING	
185+00 TO 186+71	1211 SY
BIN NON-REINF. CONCRETE PAVEMENT CL AE	
185+00 TO 186+01	890 SY
CURB & GUTTER - TYPE 1	
185+00 TO 185+71 LT	125 LF
185+00 TO 186+71 RT	295 LF
185+50 TO 186+17 ISLAND	146 LF
SIDEWALK CONCRETE	
185+50 TO 186+17 ISLAND	100 SY
185+67 RT (RAMP)	38 SY



ⓓ FLEXIBLE DELINEATOR-TYPE B

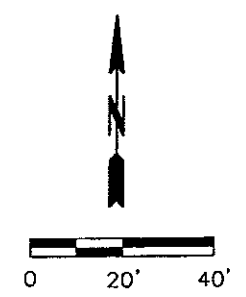
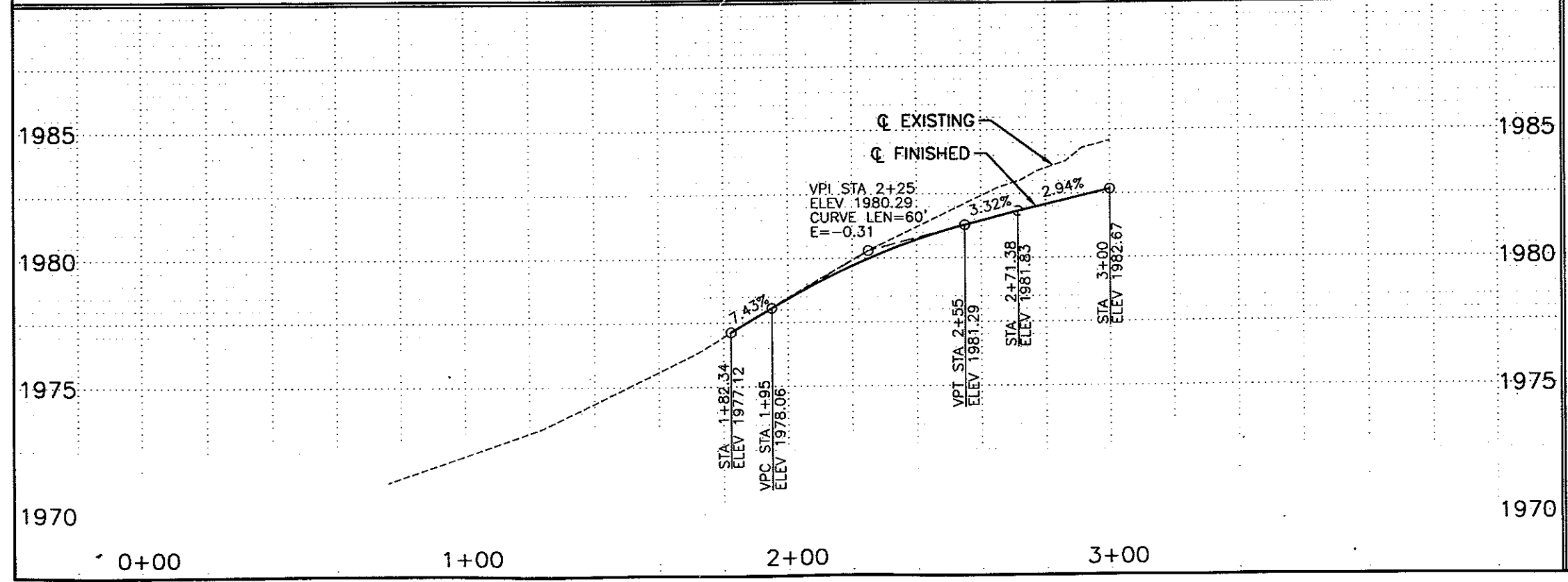
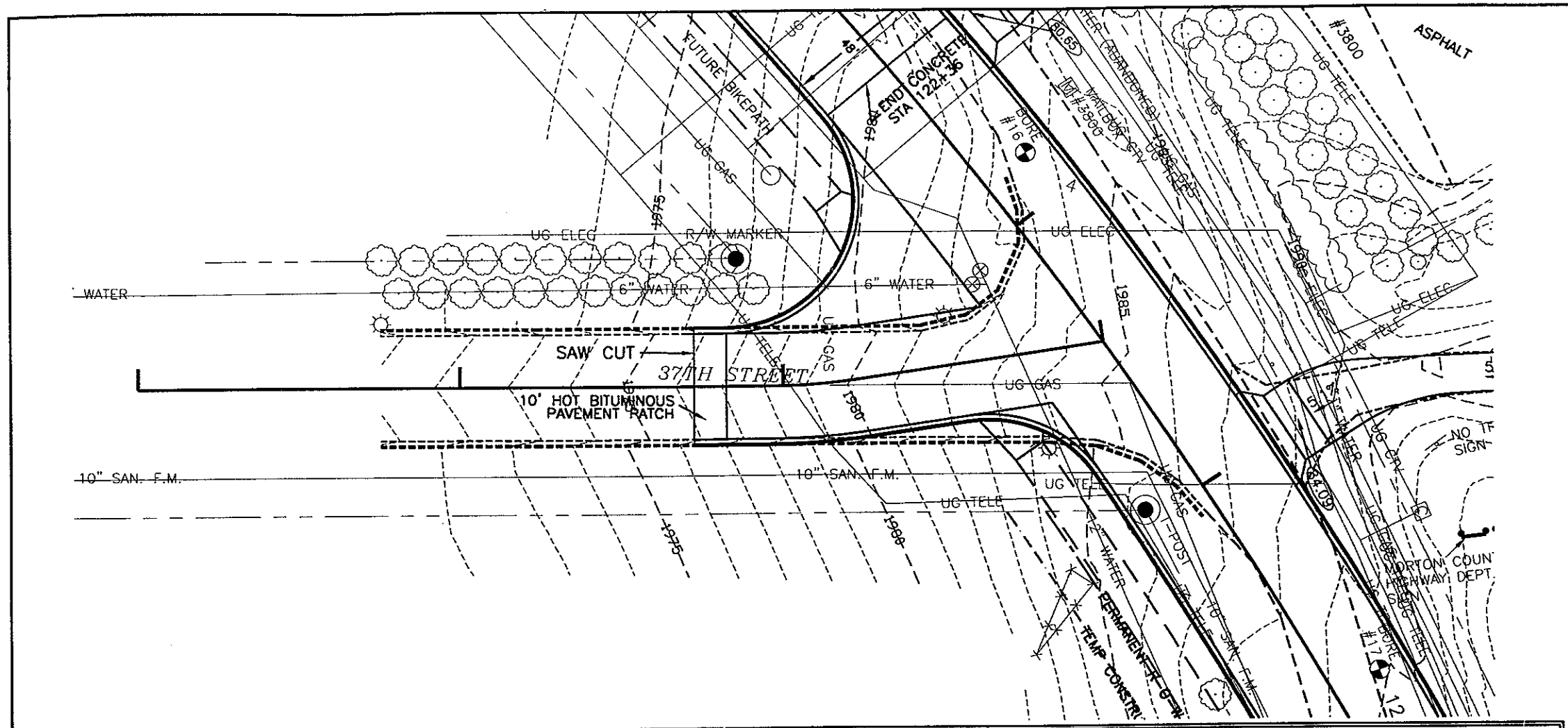
- CONSTRUCTION NOTES**
- ① NO GRADING NECESSARY FOR FUTURE BIKEPATH.
 - ② REMOVE AND RESET GUARDRAIL AS NEEDED. ALL COSTS INCIDENTAL.
 - ③ CONSTRUCT ISLAND NOSE AS PER DETAIL. ALL COSTS INCLUDED IN THE PRICE BID FOR "CURB & GUTTER - TYPE 1"
 - ④ CLEAR AND GRUB TREES



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	47
OLD RED TRAIL STA. 0+00 TO STA. 3+00 CURB & GUTTER LAYOUT 37TH STREET		

SAW BITUMINOUS SURFACING-FULL DEPTH	
1+72	33 LF
REMOVAL OF CURB & GUTTER	
1+72 TO 2+80 LT	138 LF
1+72 TO 3+22 RT	166 LF
REMOVAL OF BITUMINOUS SURFACING	
1+72 TO 3+05	654 SY
8IN NON-REINF. CONCRETE PAVEMENT CL AE	
1+82 TO 2+76	499 SY
CURB & GUTTER - TYPE 1	
1+72 TO 2+27 LT	104 LF
1+72 TO 2+90 RT	132 LF



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	48
OLD RED TRAIL STA. 0+00 TO STA. 3+00 CURB & GUTTER LAYOUT 34TH STREET		

SAW BITUMINOUS SURFACING-FULL DEPTH
1+80 33 LF

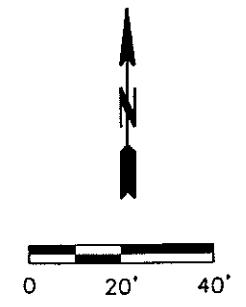
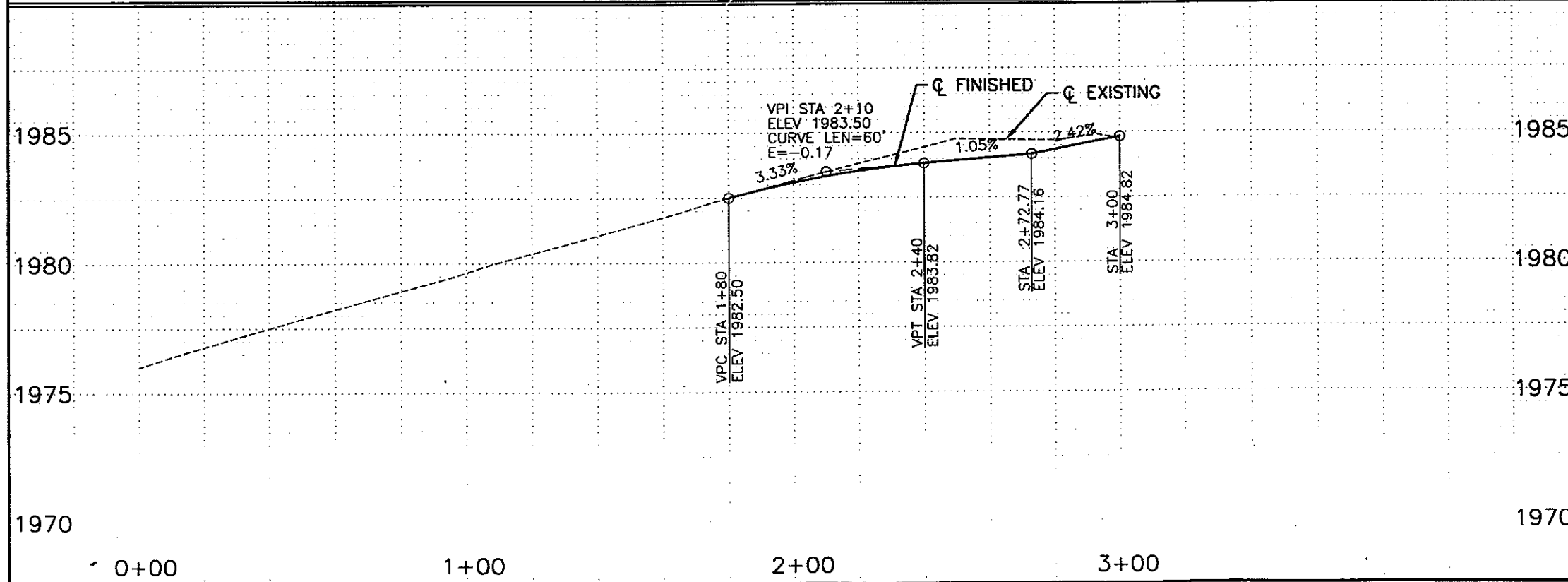
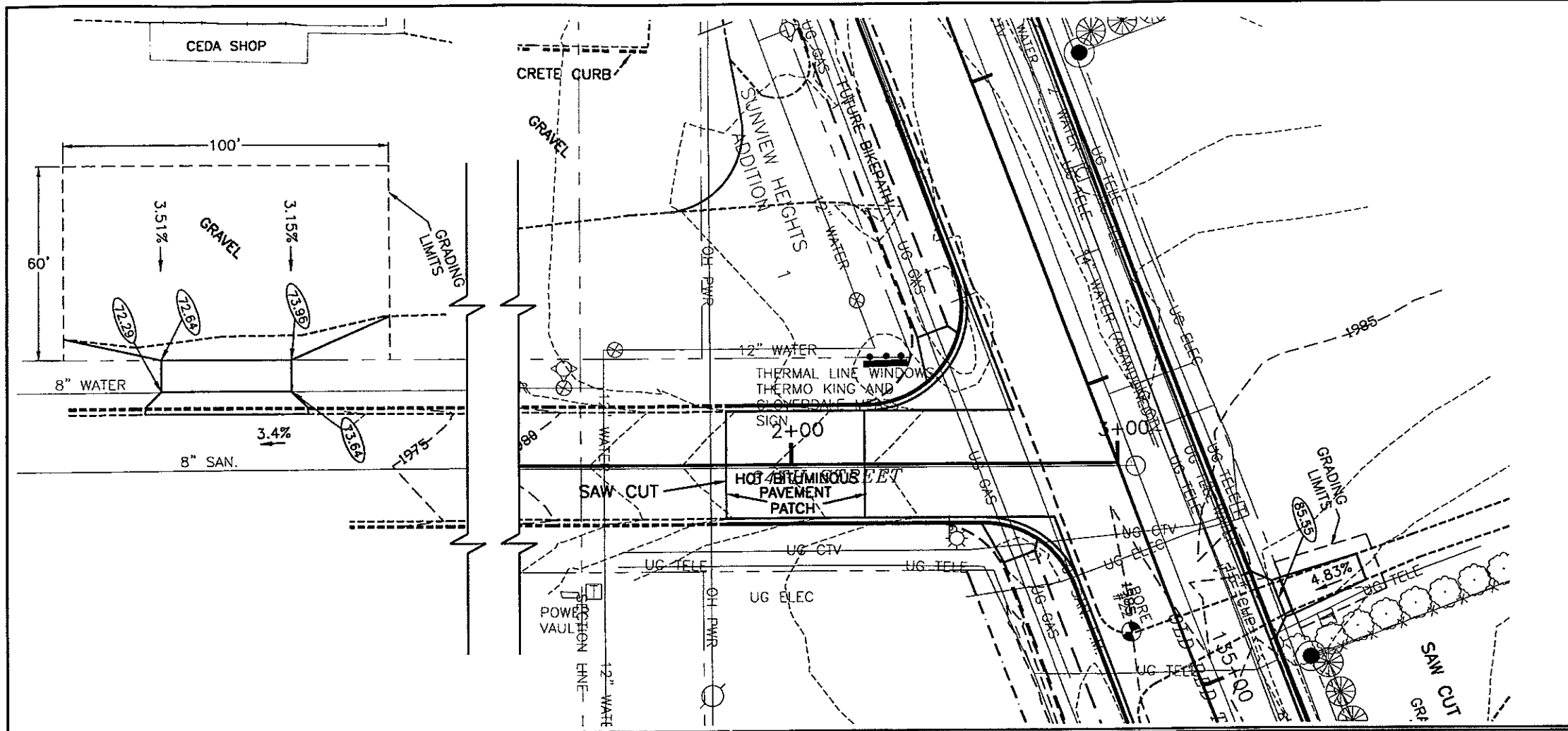
REMOVAL OF CURB & GUTTER
1+80 TO 2+25 LT 45 LF
1+80 TO 2+25 RT 45 LF

REMOVAL OF BITUMINOUS SURFACING
1+80 TO 2+53 297 SY

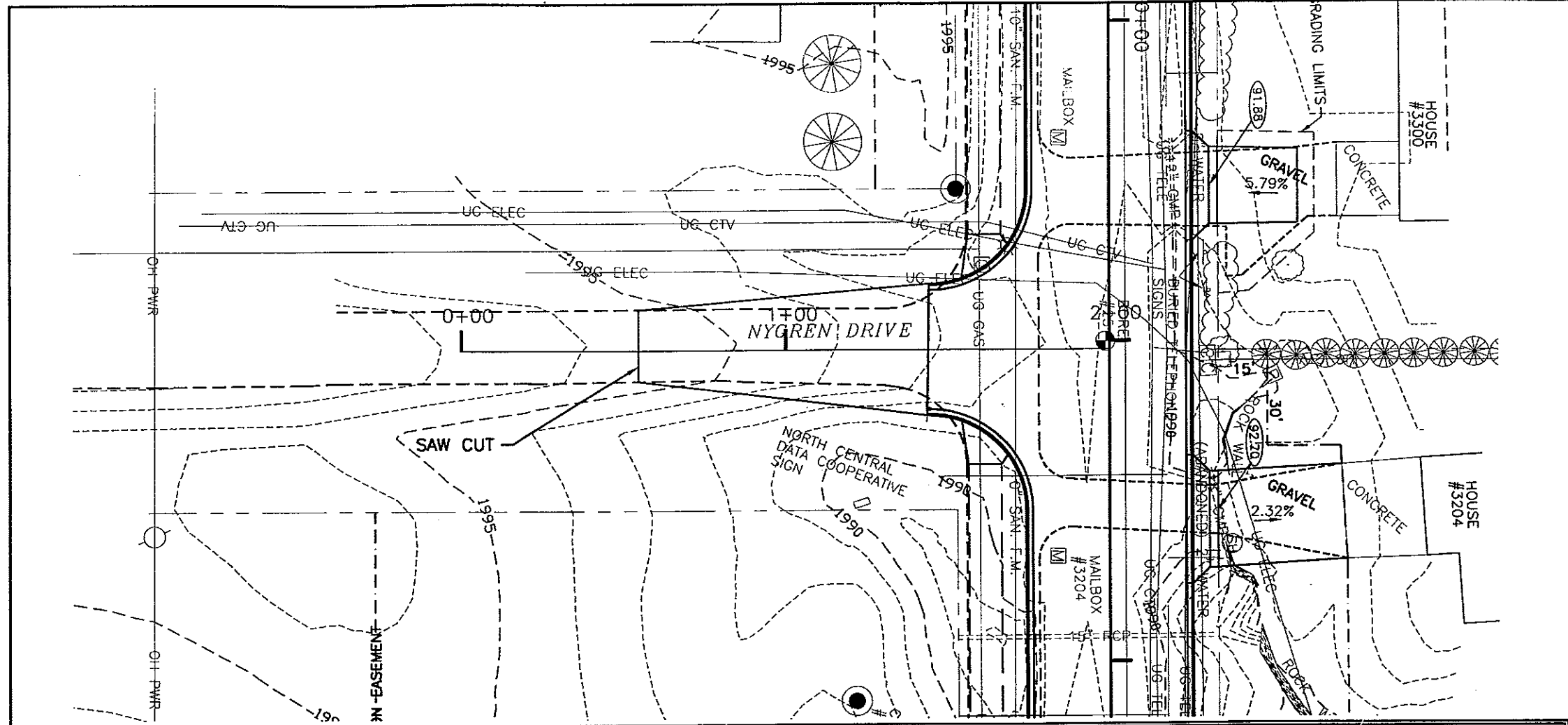
8IN NON-REINF. CONCRETE PAVEMENT CL AE
2+23 TO 2+76 252 SY

CURB & GUTTER - TYPE 1
1+80 TO 2+52 LT 104 LF
1+80 TO 2+86 RT 117 LF

DRIVEWAY CONCRETE 8IN-HIGH EARLY
CEDA DRIVE - 40' 72 SY

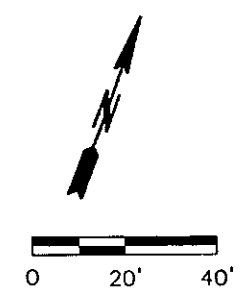
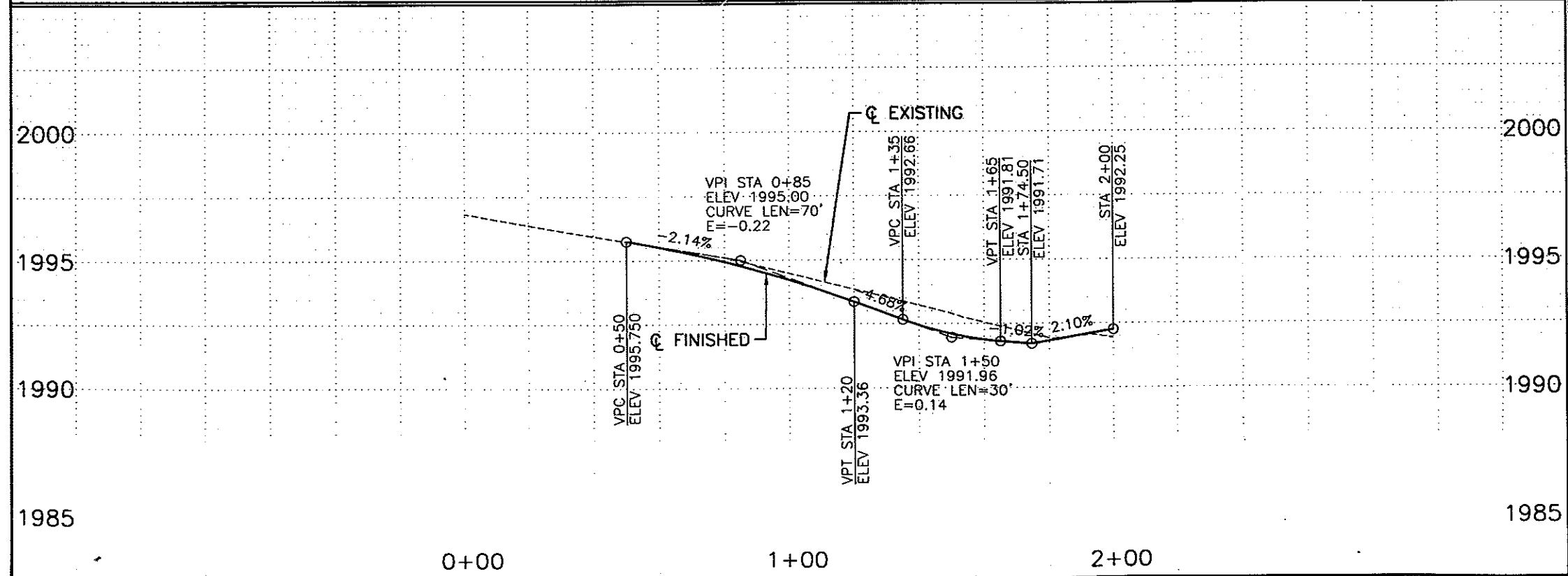


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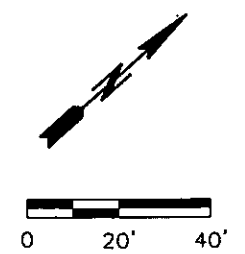
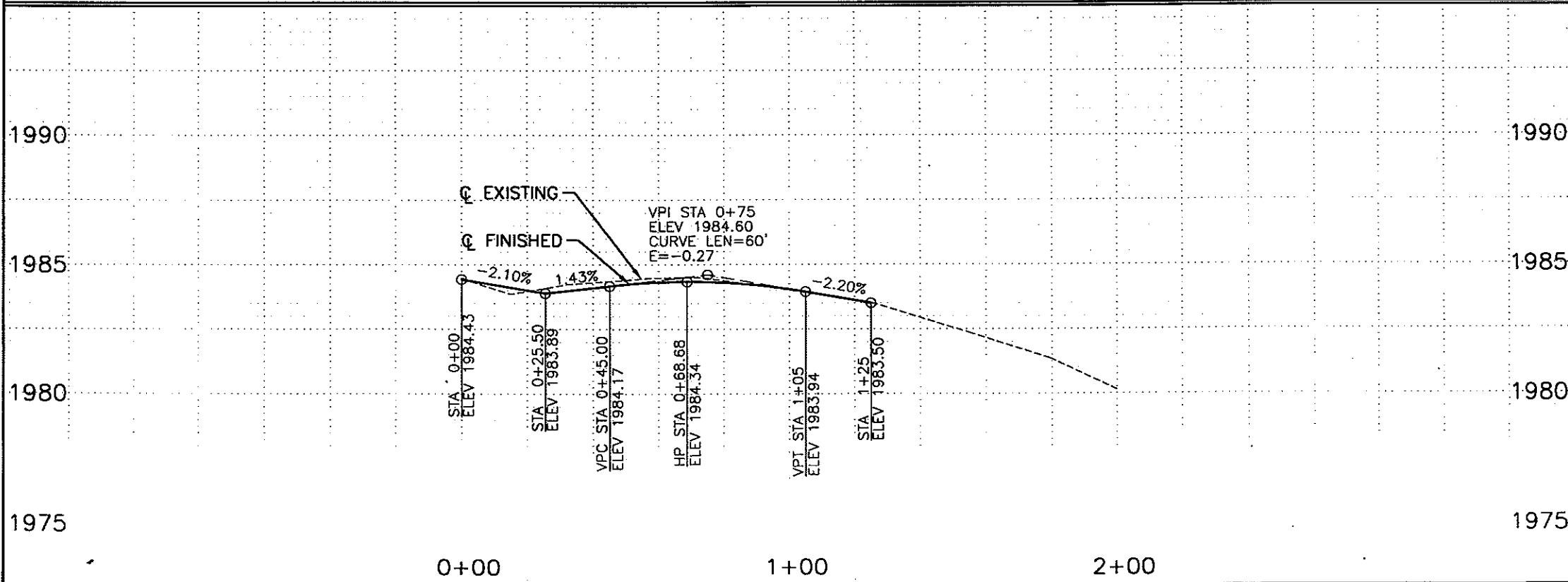
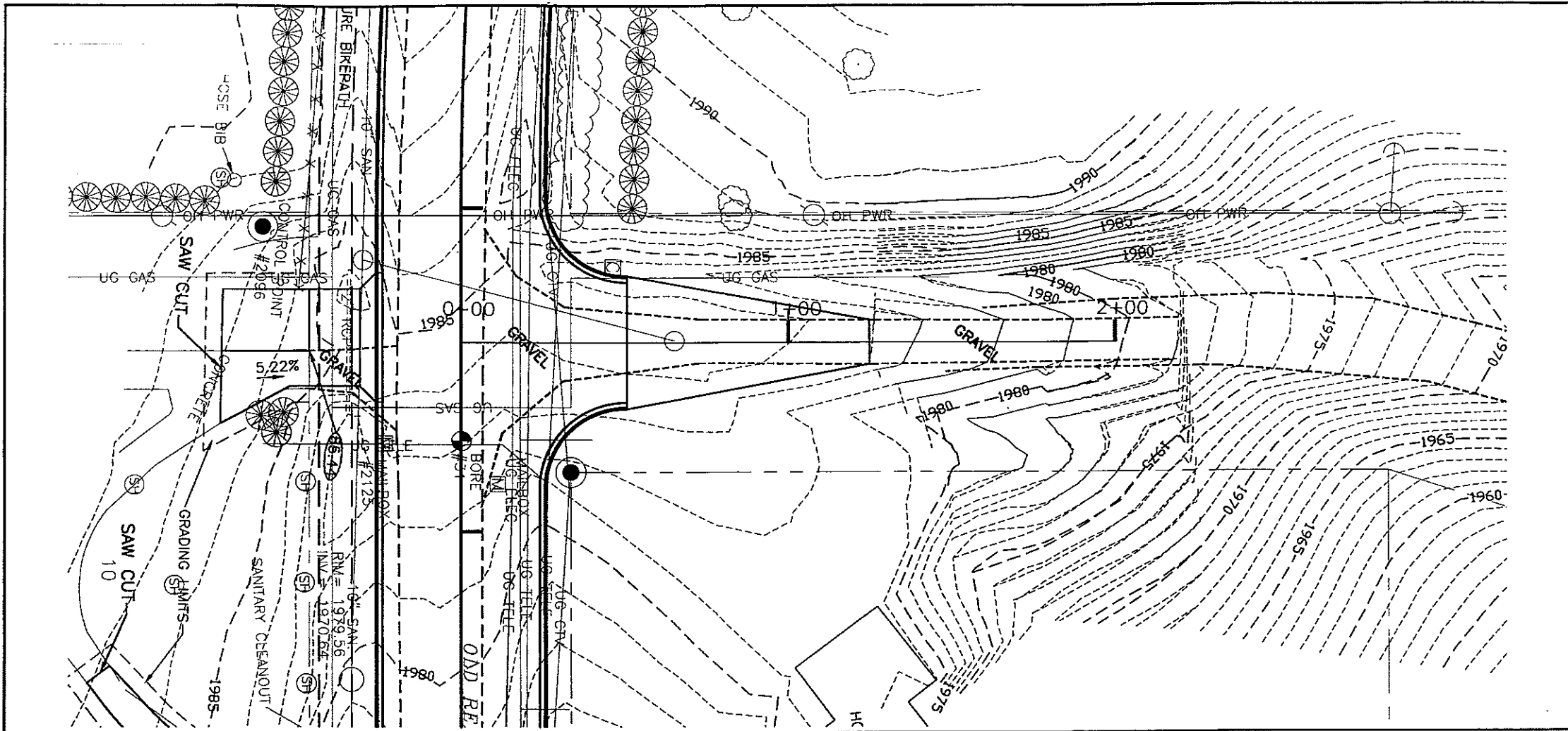
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	49
OLD RED TRAIL STA. 0+00 TO STA. 2+00 CURB & GUTTER LAYOUT NYGREN DRIVE		

SAW BITUMINOUS SURFACING-FULL DEPTH	23 LF
0+54	
REMOVAL OF BITUMINOUS SURFACING	313 SY
0+54 TO 1+56	
BIN NON-REINF. CONCRETE PAVEMENT CL. AF	177 SY
1+44 TO 1+76	
CURB & GUTTER - TYPE 1	
1+44 TO 1+76 LT	50 LF
1+44 TO 1+76 RT	50 LF

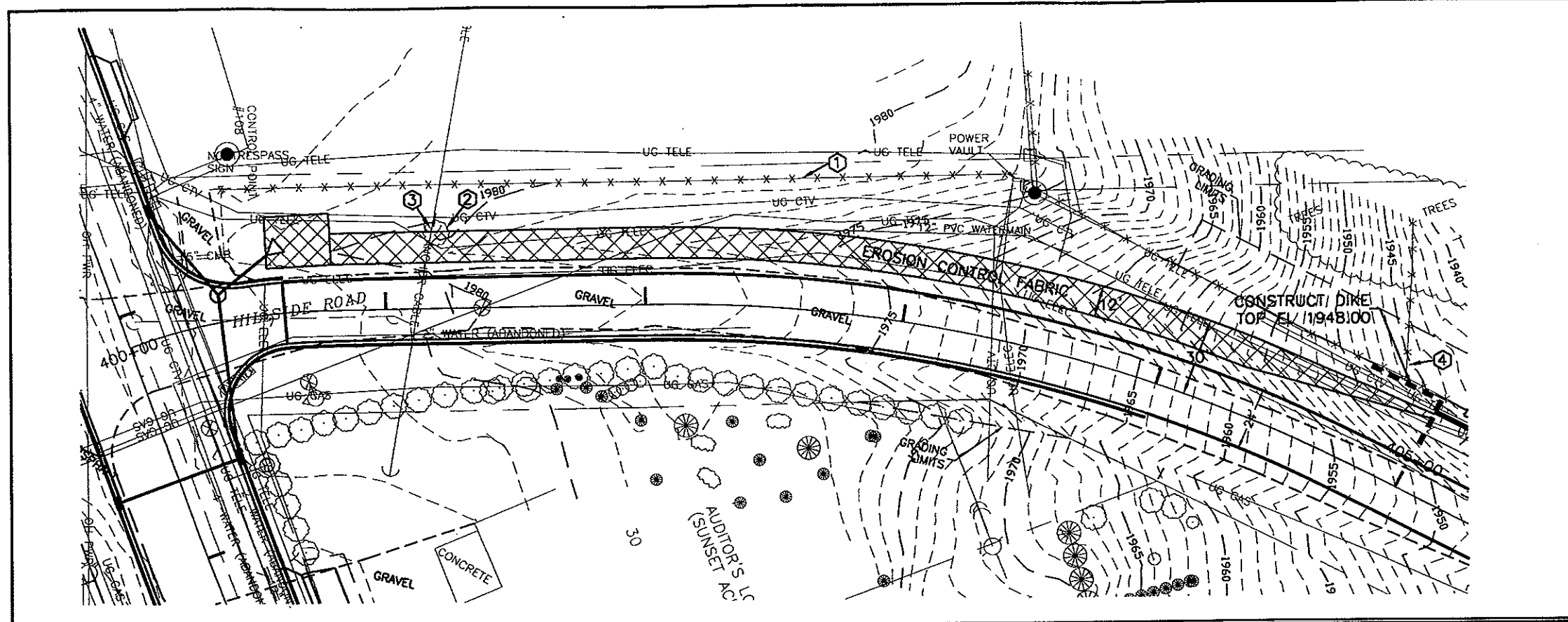


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	50
OLD RED TRAIL STA. 0+00 TO STA. 2+00 CURB & GUTTER LAYOUT 31ST ST NW		

BIN NON-REINF. CONCRETE PAVEMENT CL AE	
0+24 TO 0+50	143 SY
CURB & GUTTER - TYPE 1	
0+24 TO 0+50 LT	42 LF
0+24 TO 0+50 RT	42 LF
ADJUST MANHOLE	
0+65	1 EACH

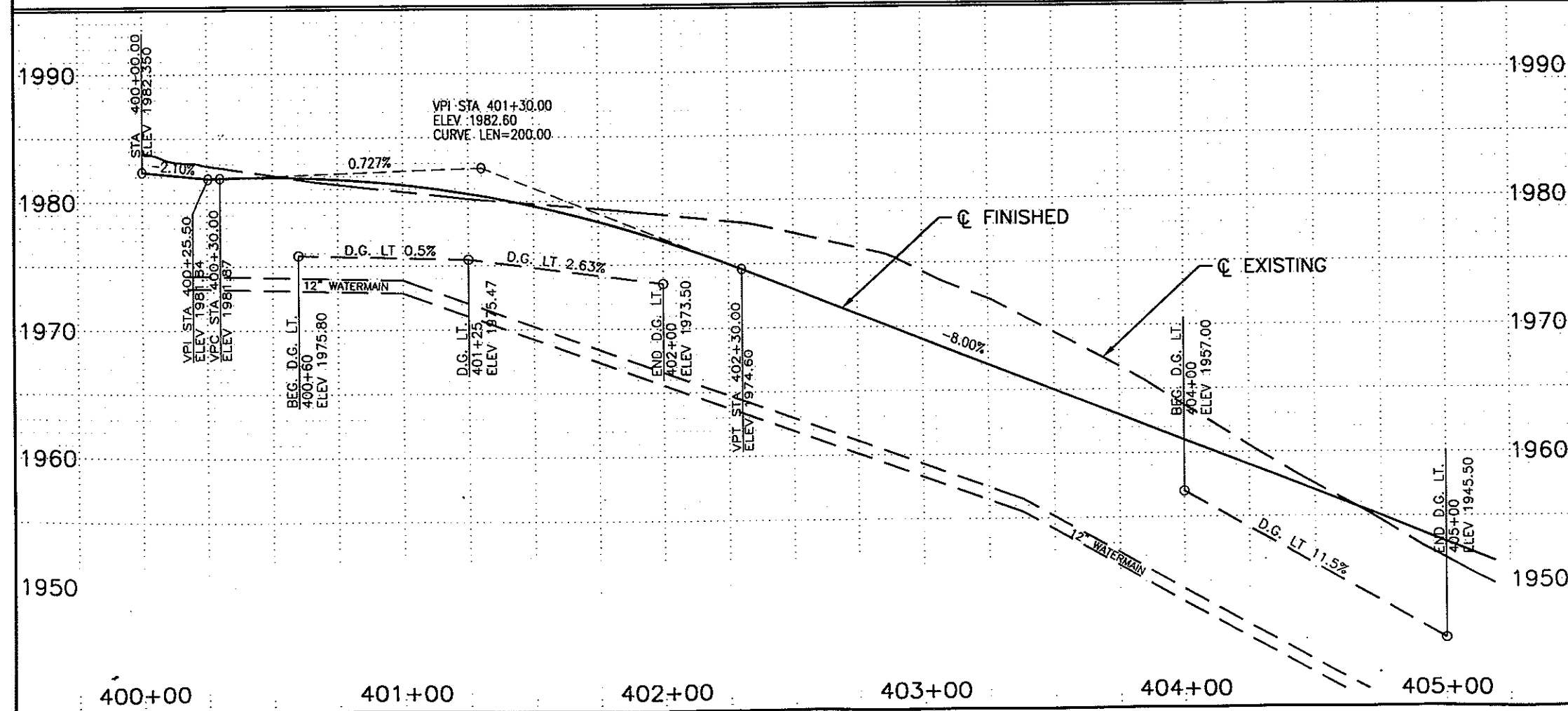


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	51
OLD RED TRAIL HILLSIDE ROAD STA 400+00 TO 405+00		



8" REINF. CONCRETE PAVEMENT-CL AE 0+24 TO +61	143 SY
EROSION CONTROL FABRIC 400+50 TO 405+00 LT	616 SY
CURB & GUTTER -- TYPE 1 400+25 TO 404+00 RT 400+25 TO 400+61 LT	385 LF 57 LF
ADJUST MANHOLE 401+01 RT	1 EACH
ADJUST UTILITY APPURTENANCE 400+65 RT 401+35 C	1 EACH WGV 1 EACH WGV

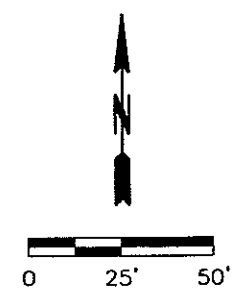
* ALL QUANTITIES ARE CITY ONLY



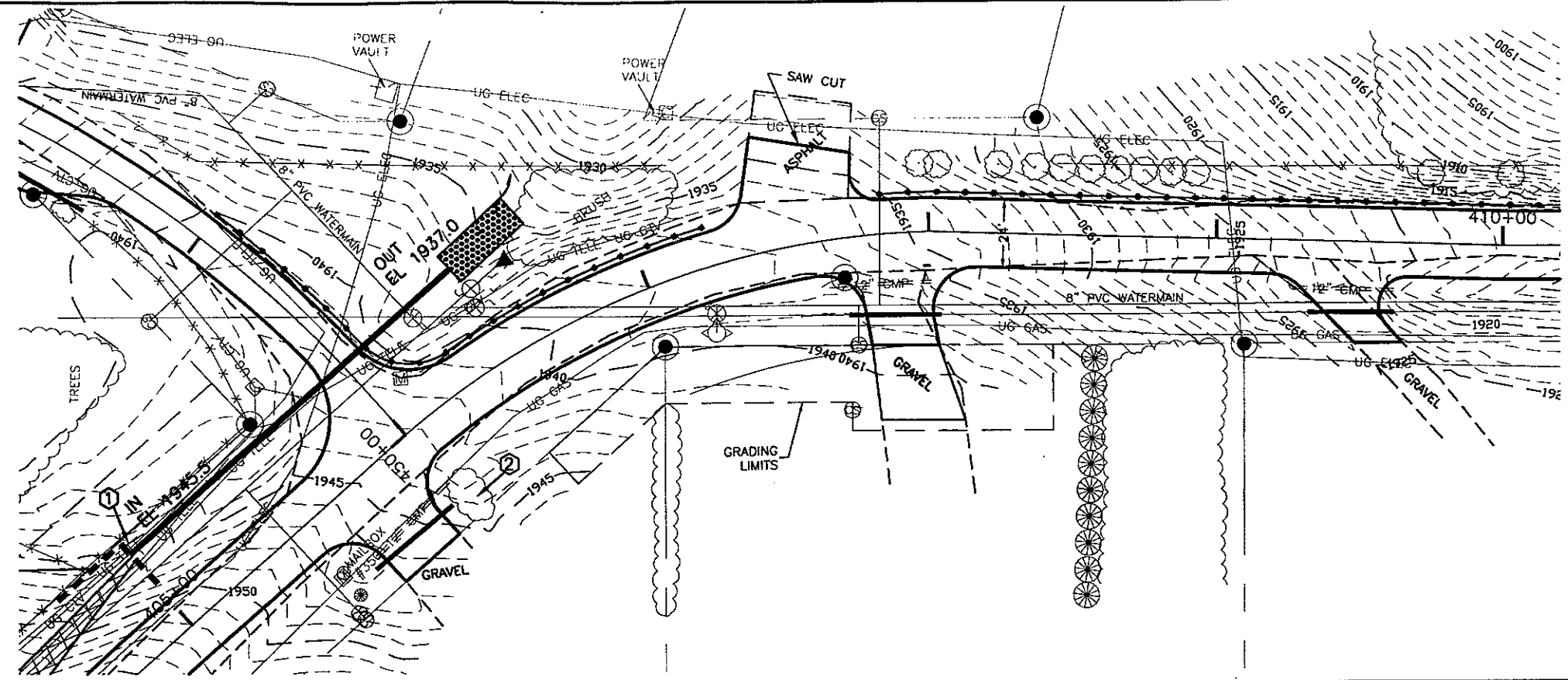
LEGEND

---	DIKE
---	PIPE, CORR. STEEL

- CONSTRUCTION NOTES
- CONTRACTOR SHALL PROTECT EXISTING FENCE DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - CONTRACTOR SHALL PROTECT TOWER ANCHOR DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - CLEAR AND GRUB TREES
 - CONTRACTOR SHALL REMOVE AND RESET FENCE AS NEEDED FOR DIKE CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.



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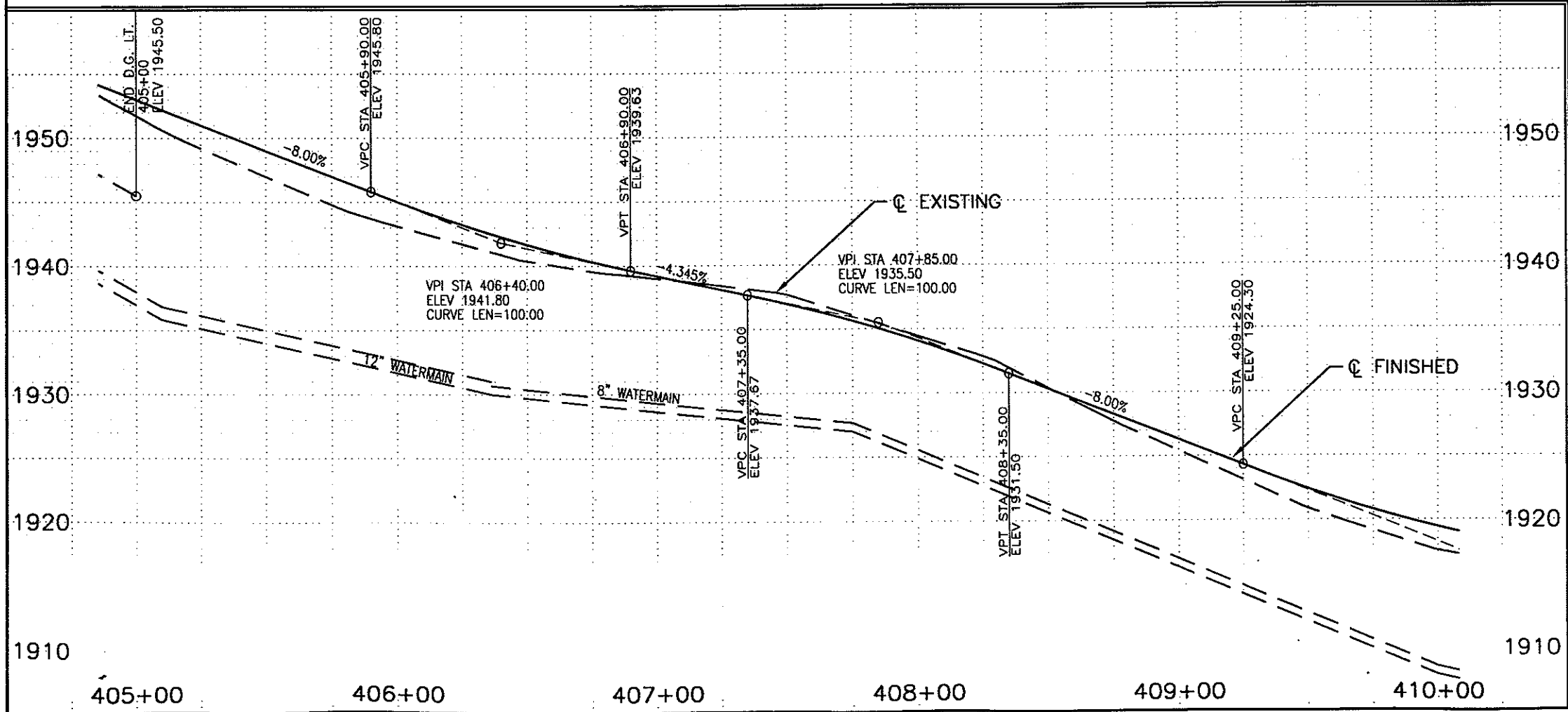
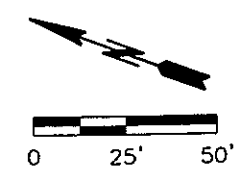


SAW BITUMINOUS SURFACING--FULL DEPTH	
407+55 LT	36 LF
REMOVE BITUMINOUS SURFACING	
407+55 LT	84 SY
PIPE CORR. STEEL	
405+00 TO 406+50 LT	24"x150 LF
405+78-29' RT	18"x35 LF
407+86-29' RT	18"x32 LF
409+47-29' RT	18"x30 LF
END SECTION CORR. STEEL	
405+00 LT	24" 1 EA
406+50 LT	24" 1 EA
405+78 RT	18" 2 EA
407+86 RT	18" 2 EA
409+47 RT	18" 2 EA
REMOVAL OF PIPE - ALL TYPES AND SIZES	
405+85 LT	40 LF
407+85 RT	32 LF
409+40 RT	36 LF
ADJUST UTILITY APPURTENANCE	
406+25 LT	1 EACH WGV
406+39 LT	1 EACH WGV
406+39 LT	1 EACH WGV
407+16 RT	1 EACH WGV
407+68 RT	1 EACH CS
3-CABLE GUARDRAIL	
406+10 TO 407+30 LT	120 LF
407+80 TO 410+00 LT	220 LF
RIPRAP - LOOSE ROCK	
406+50 LT	20 CY
GEOTEXTILE SEPARATION FABRIC	
406+50 LT	40 SY

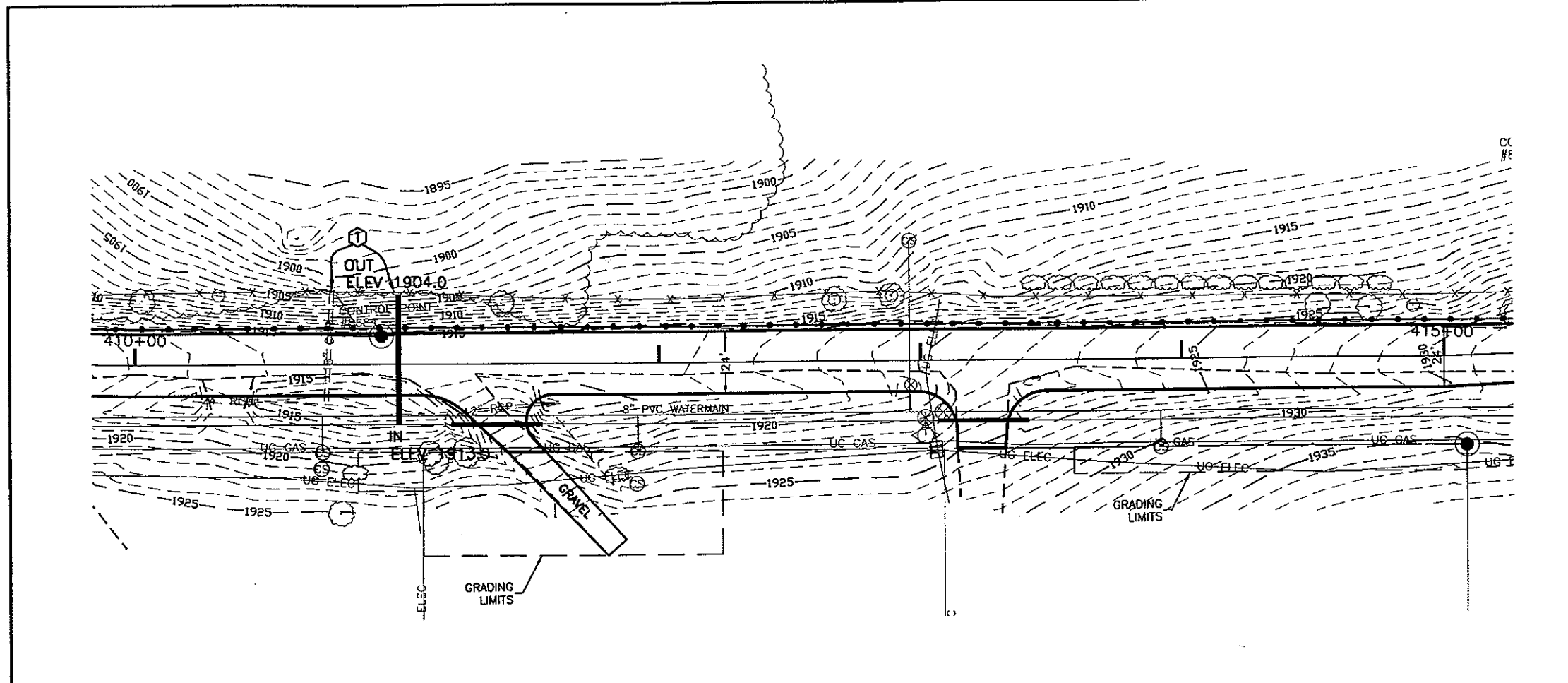
* ALL QUANTITIES ARE CITY ONLY

LEGEND	
	DIKE
	PIPE, CORR. STEEL

- CONSTRUCTION NOTES**
- ① CONTRACTOR SHALL REMOVE & RESET FENCE AS NEEDED FOR DIKE CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CLEAR AND GRUB TREES AS NEEDED



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	53
OLD RED TRAIL HILLSIDE ROAD STA 410+00 TO 415+00		



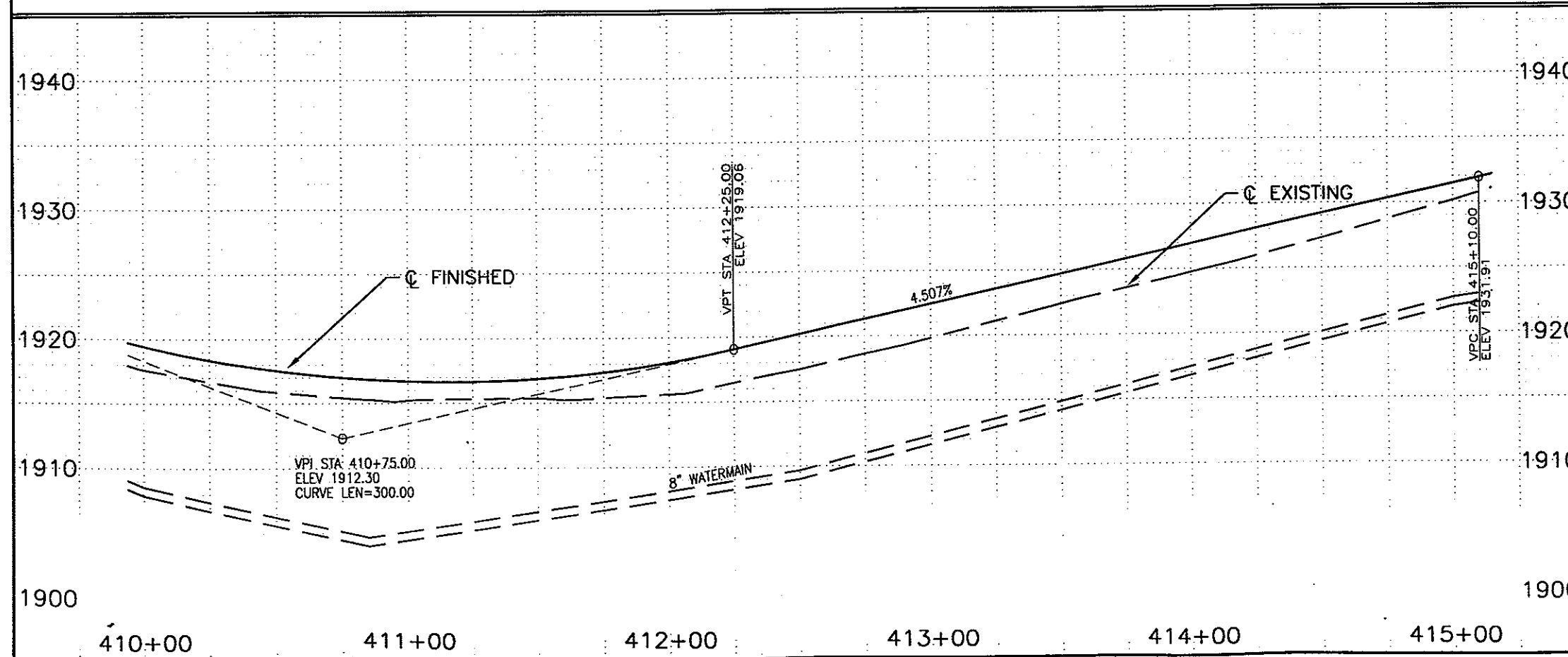
PIPE CORR. STEEL	
411+00 C	24"X50 LF
411+38 RT	18"X35 LF
413+24 RT	18"X35 LF

END SECTION CORR. STEEL	
410+70 LT & RT	24" 2 EA
410+38-29' RT	18" 2 EA
413+24-29' RT	18" 2 EA

REMOVAL OF PIPE - ALL TYPES AND SIZES	
410+35 RT	24 LF
410+74 C	42 LF
411+30 RT	40 LF
413+20 RT	50 LF

ADJUST UTILITY APPURTENANCE	
410+70 RT	1 EACH CS
411+92 RT	1 EACH CS
413+00 RT	1 EACH WGV
413+03 RT	1 EACH WGV
413+92 RT	1 EACH CS

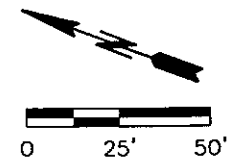
3-CABLE GUARDRAIL	
410+00 TO 415+00 LT	500 LF



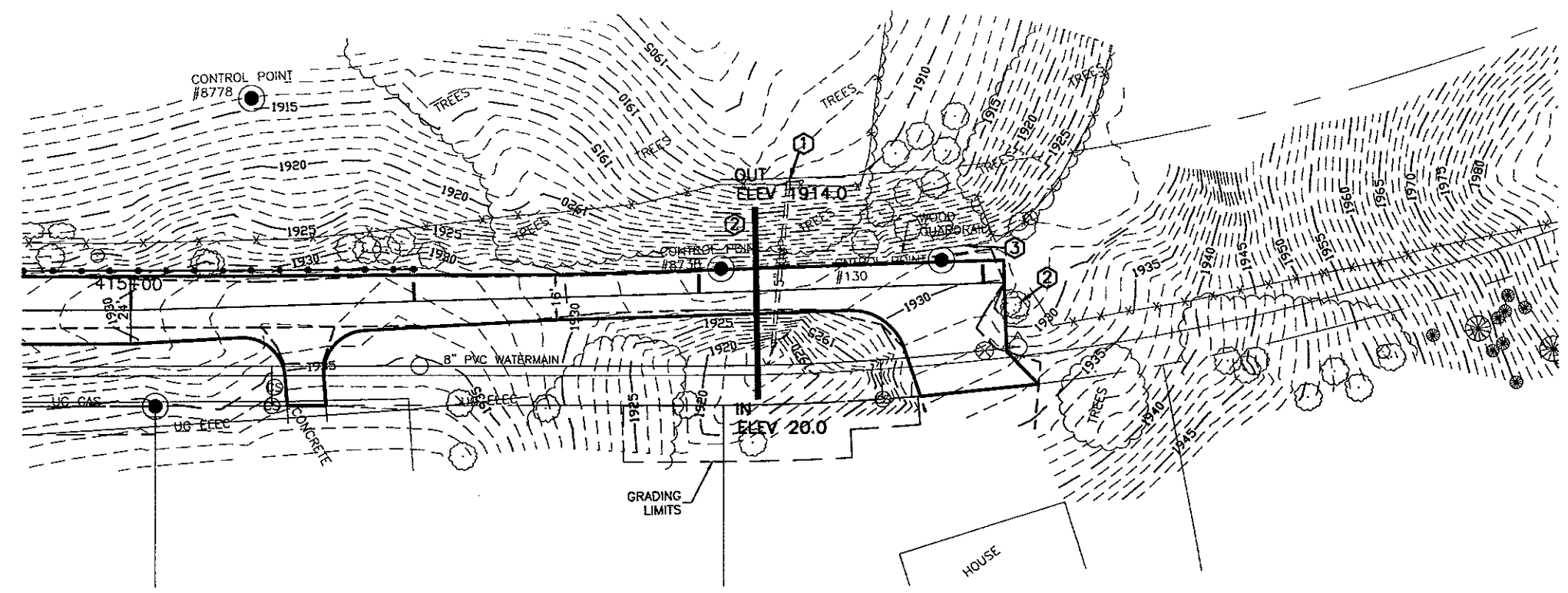
* ALL QUANTITIES ARE CITY ONLY

CONSTRUCTION NOTES

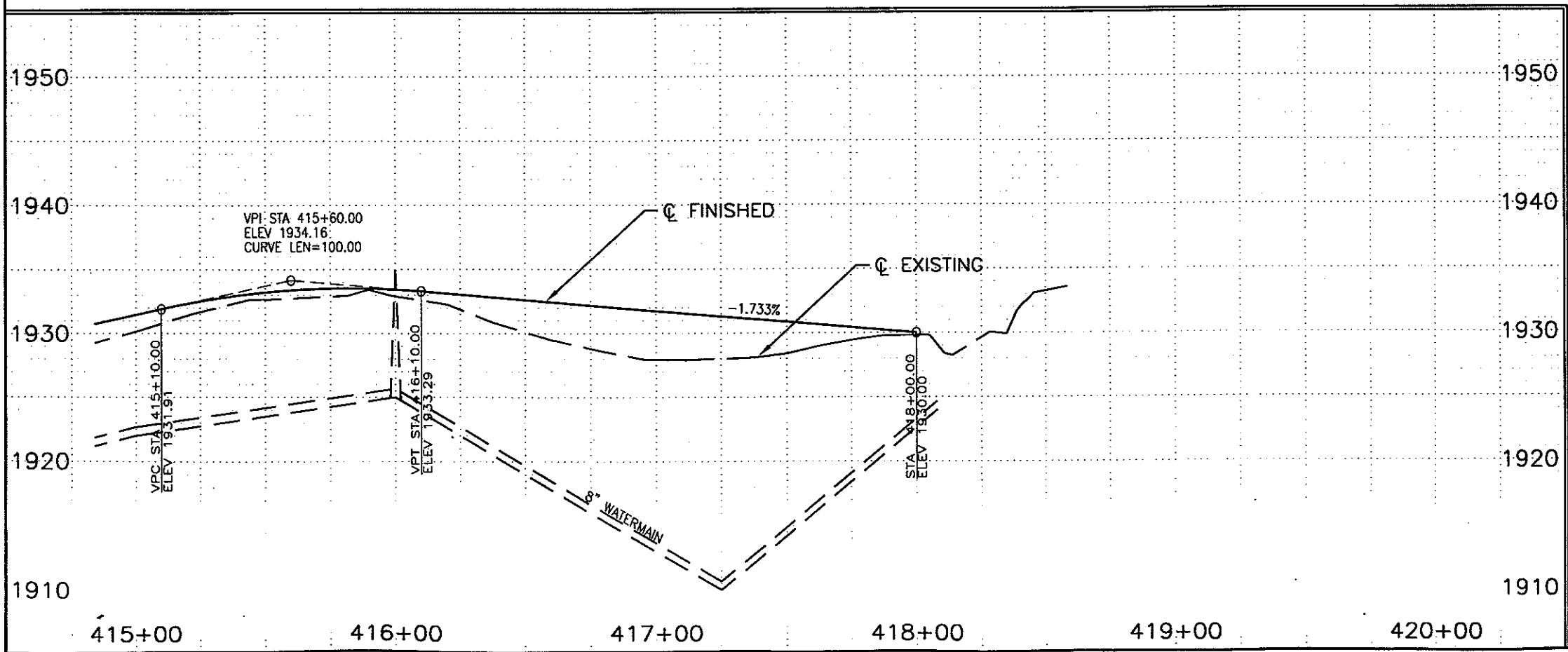
- 1 CONTRACTOR SHALL PROTECT EXISTING FENCE DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	54
OLD RED TRAIL HILLSIDE ROAD STA 415+00 TO 420+00		

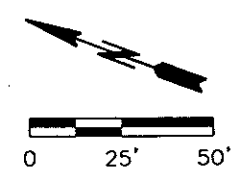


PIPE CORR. STEEL	
417+20 C	24"X68 LF
END SECTION CORR. STEEL	
417+20 LT & RT	24" 2 EA
REMOVAL OF PIPE - ALL TYPES AND SIZES	
417+27 C	60 LF
ADJUST MANHOLE	
416+00 RT	1 EACH
ADJUST UTILITY APPURTENANCE	
417+62 RT	1 EACH CS
418+02 RT	1 EACH WG
3-CABLE GUARDRAIL	
415+00 TO 415+75	75 LF

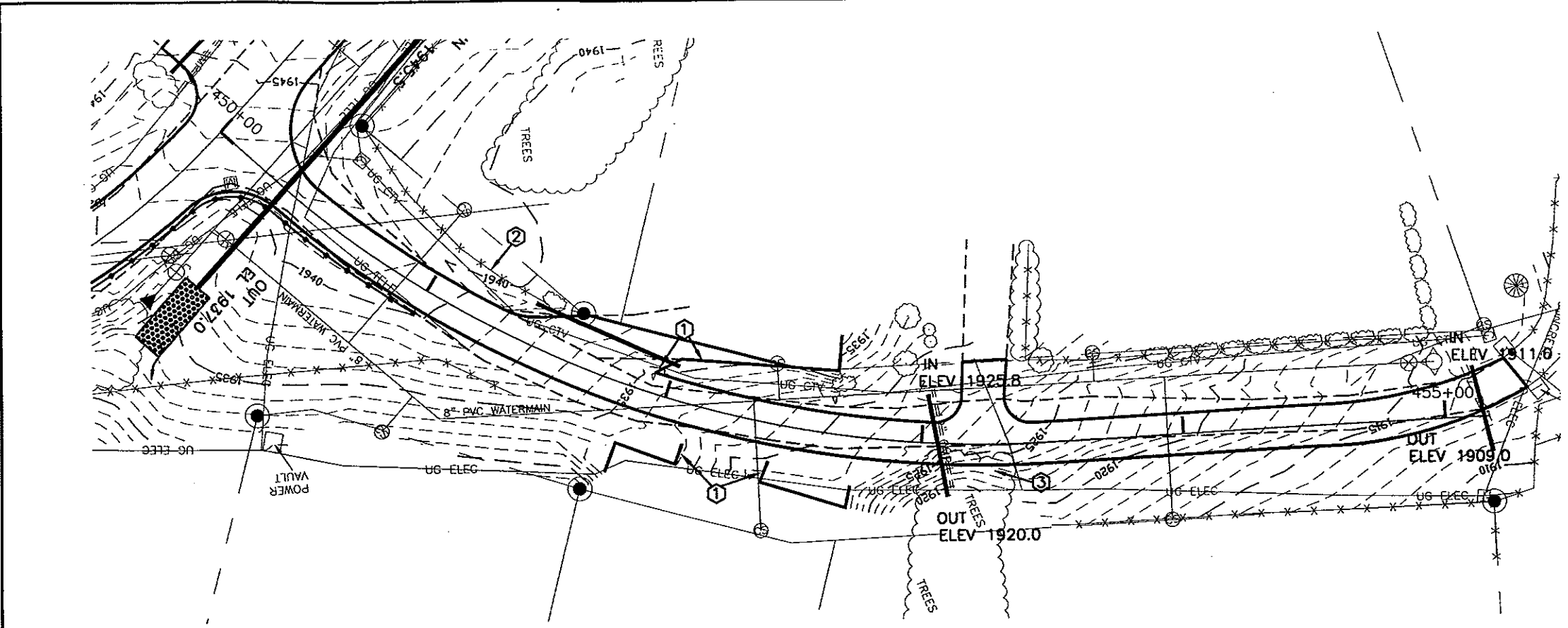


* ALL QUANTITIES ARE CITY ONLY

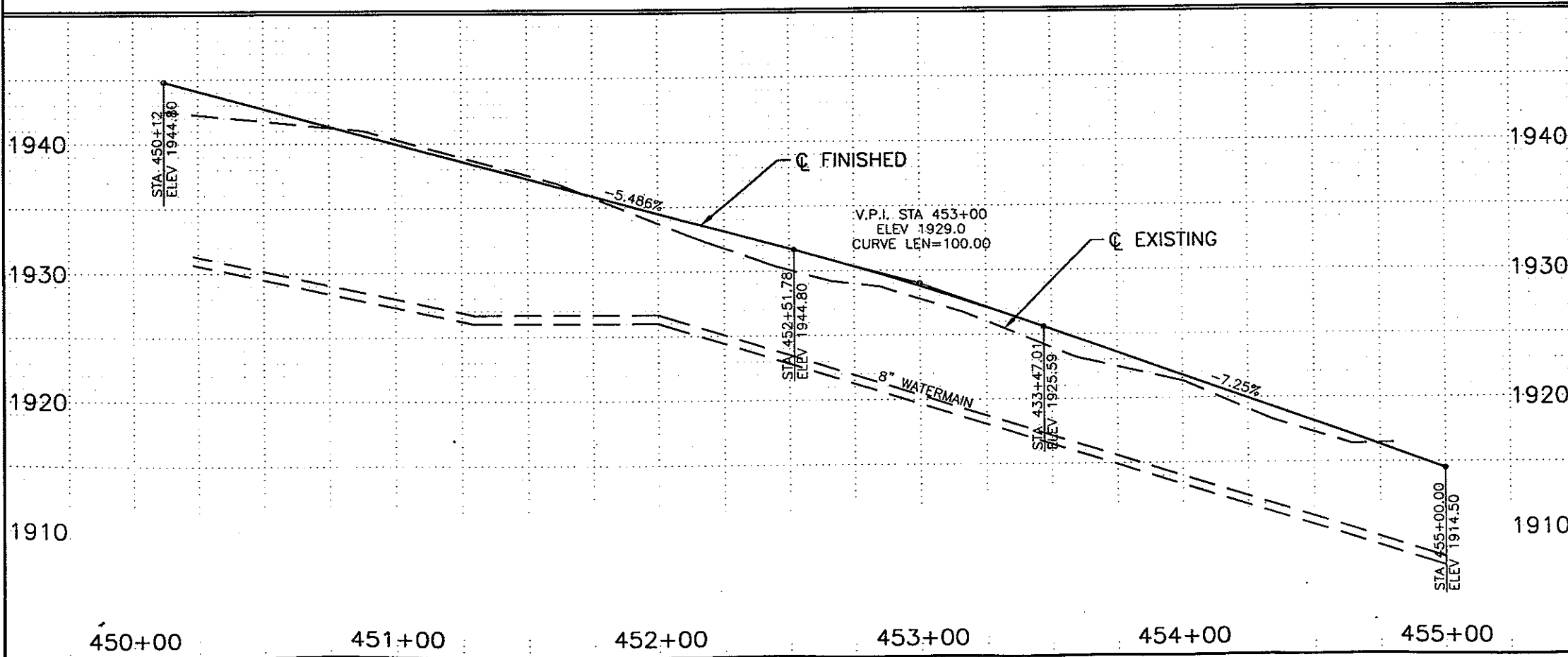
- CONSTRUCTION NOTES**
- ① CONTRACTOR SHALL PROTECT EXISTING FENCE DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CLEAR AND GRUB TREES
 - ③ CONTRACTOR SHALL PROTECT EXISTING WOOD GUARDRAIL DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	55
OLD RED TRAIL HILLSIDE ROAD STA 450+00 TO 455+00		

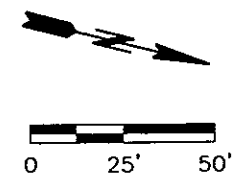


PIPE CORR. STEEL	
451+50 LT	18"X60 LF
453+10 C	18"X40 LF
455+15 C	18"X34 LF
END SECTION CORR. STEEL	
451+50 LT	18" 2 EA
453+10 LT & RT	18" 2 EA
455+15 LT & RT	18" 2 EA
REMOVAL OF PIPE - ALL TYPES AND SIZES	
451+50 LT	50 LF
453+10 C	40 LF
455+15 C	26 LF
ADJUST UTILITY APPURTENANCE	
452+40 LT	1 EACH CS
454+94 LT	1 EACH WG
3-CABLE GUARDRAIL	
450+00 TO 451+00 RT	85 LF



* ALL QUANTITIES ARE CITY ONLY

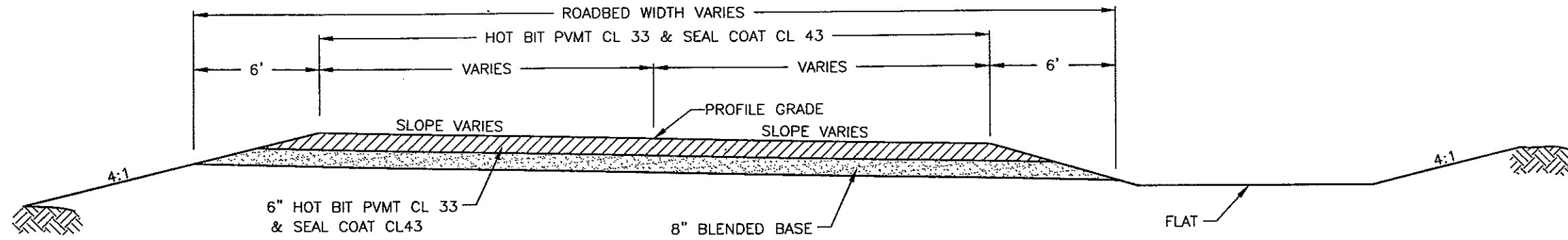
- CONSTRUCTION NOTES**
- ① CONTRACTOR SHALL PROTECT EXISTING RETAINING WALLS DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ② CONTRACTOR SHALL PROTECT EXISTING FENCE DURING CONSTRUCTION. ALL COSTS INCIDENTAL TO OTHER ITEMS.
 - ③ CLEAR AND GRUB TREES AS NEEDED



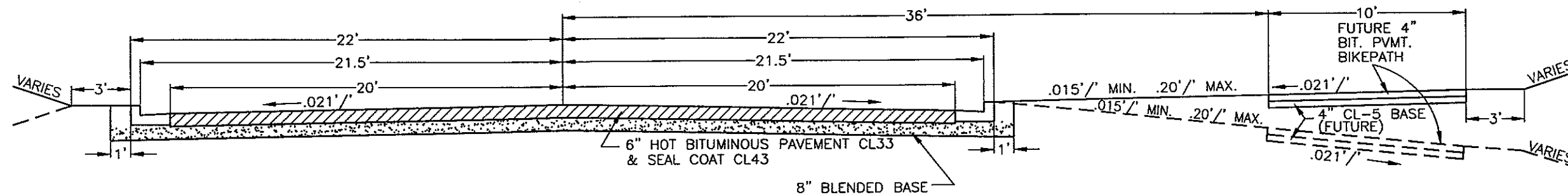
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	56
OLD RED TRAIL TYPICAL SECTIONS		

TYPICAL SECTIONS HOT BITUMINOUS PAVEMENT



TYPICAL SECTION
RURAL TRANSITION STA 97+27.73 TO STA 104+81
SLOPE AND WIDTH VARIES—SEE CURB & GUTTER SHEETS

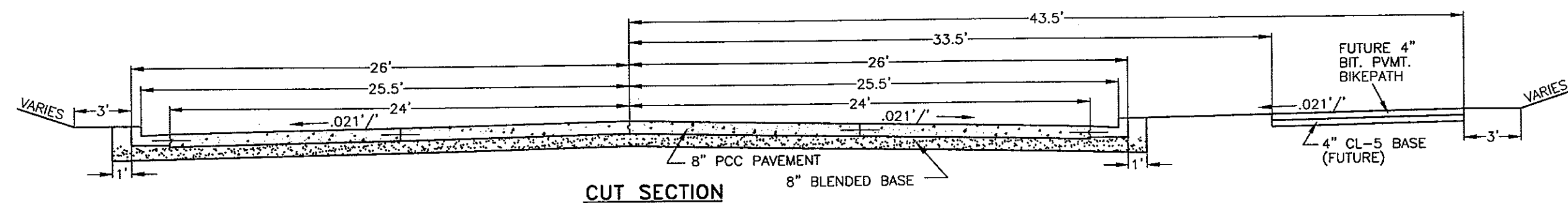
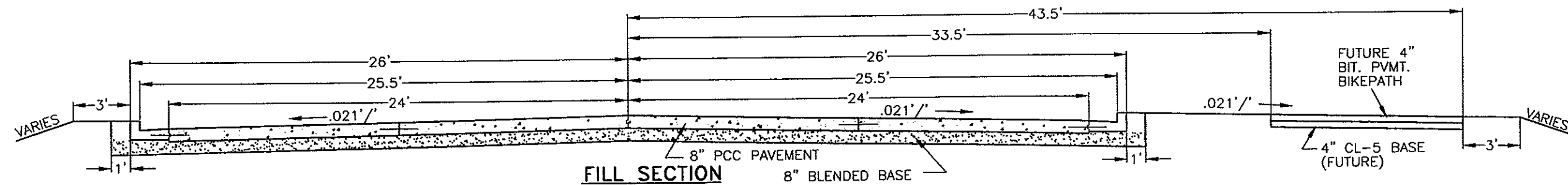


TYPICAL SECTION
STA 104+81 TO 119+03.89
URBAN TRANSITION STA. 119+03.89 TO STA 122+36

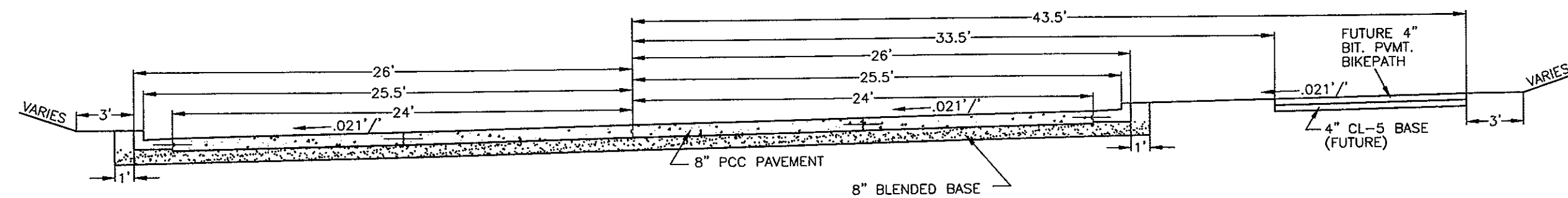
NOTE: BIKEWAY SURFACING SECTIONS SHOWN FOR FUTURE REFERENCE. BIKEWAY TO BE GRADED, TOPSOILED, & SEEDED ON THIS PROJECT TO A FINAL EARTH GRADE AT THE TOP ELEVATION OF FUTURE SURFACING.

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	57
OLD RED TRAIL TYPICAL SECTIONS CONCRETE PAVEMENT		

TYPICAL SECTIONS PCC PAVEMENT - URBAN



TYPICAL SECTION
 STA 122+36 TO STA 171+80 AND
 STA 182+34.01 TO STA 186+00

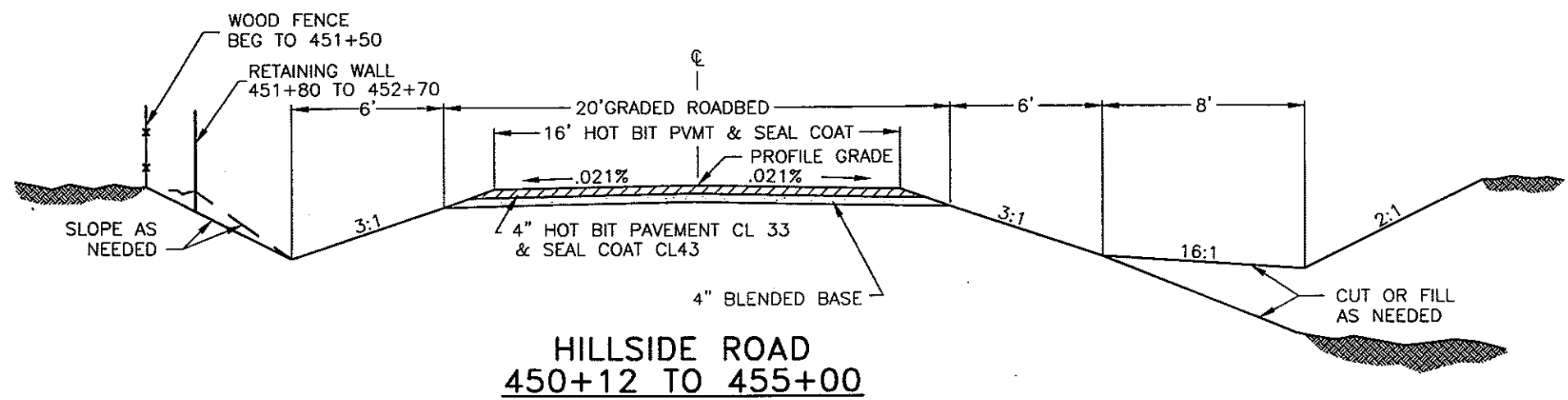
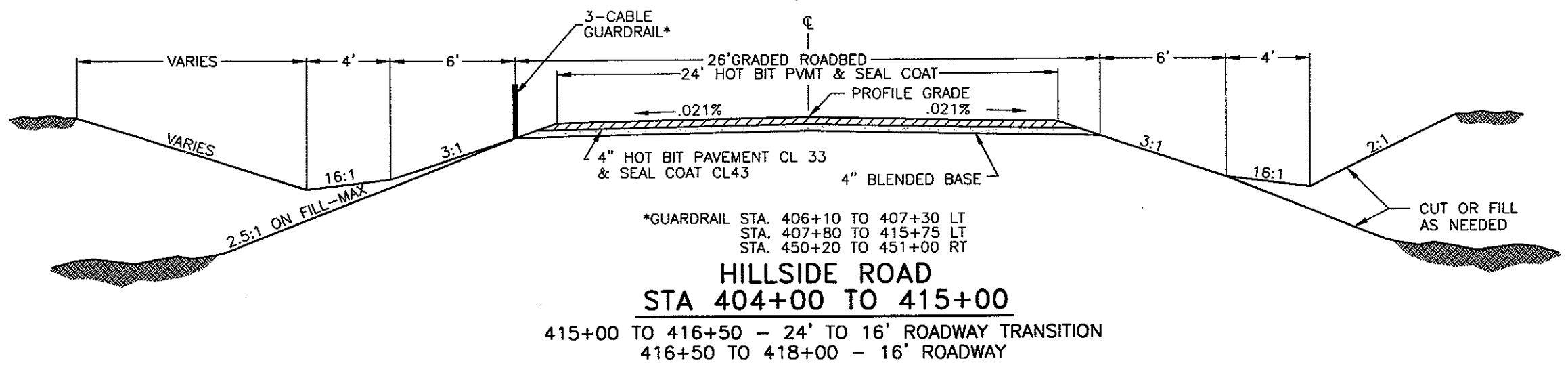
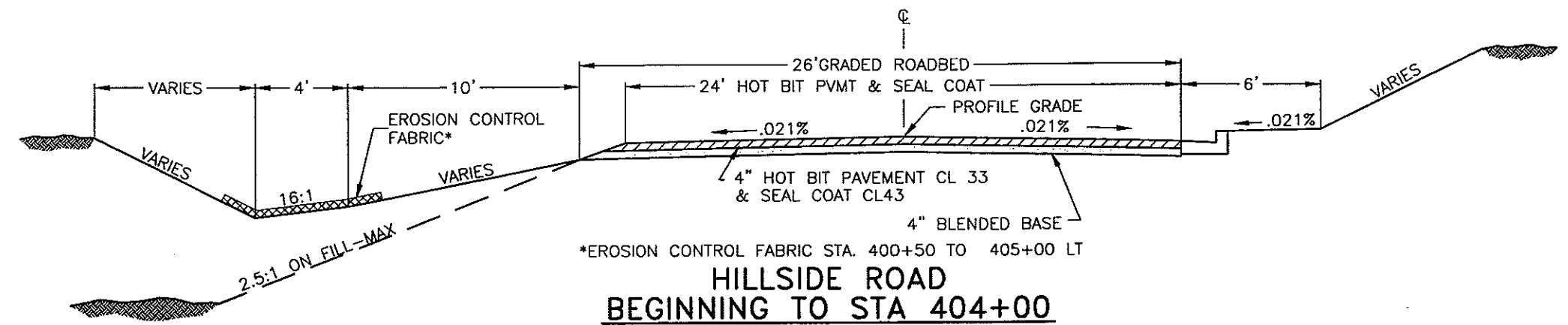


SUPERELEVATED SECTION
 STA 172+80 TO STA 181+08.43

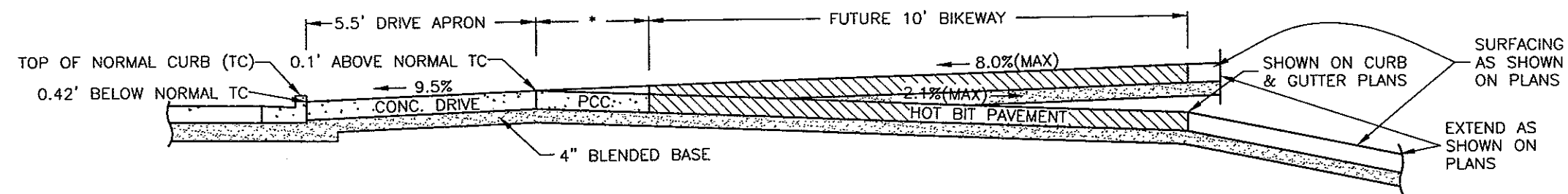
- NOTE: 1) BIKEWAY SURFACING SECTIONS SHOWN FOR FUTURE REFERENCE. BIKEWAY TO BE GRADED, TOPSOILED, & SEEDING ON THIS PROJECT TO A FINAL EARTH GRADE AT THE TOP ELEVATION OF FUTURE SURFACING.
- 2) BIKEWAY LOCATION VARIES FROM 173+20 TO 186+00. NO GRADING NECESSARY.

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	58
HILLSIDE ROAD TYPICAL SECTIONS		

TYPICAL SECTIONS HOT BITUMINOUS PAVEMENT

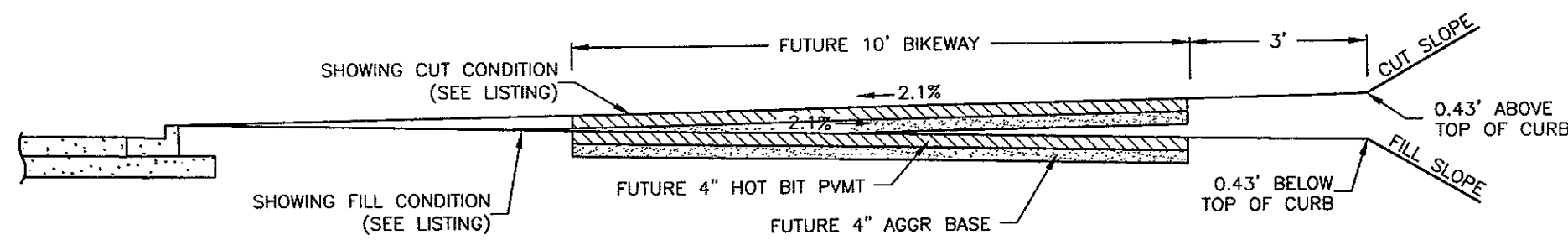


TYPICAL GRADING FOR DRIVEWAYS & BIKEWAY SLOPE DETAILS



* = 8.5' ON RT & LT STA 104+81 TO 37TH ST
2.0' ON RT & LT 37TH ST TO SUNSET DRIVE

DRIVEWAY DETAIL

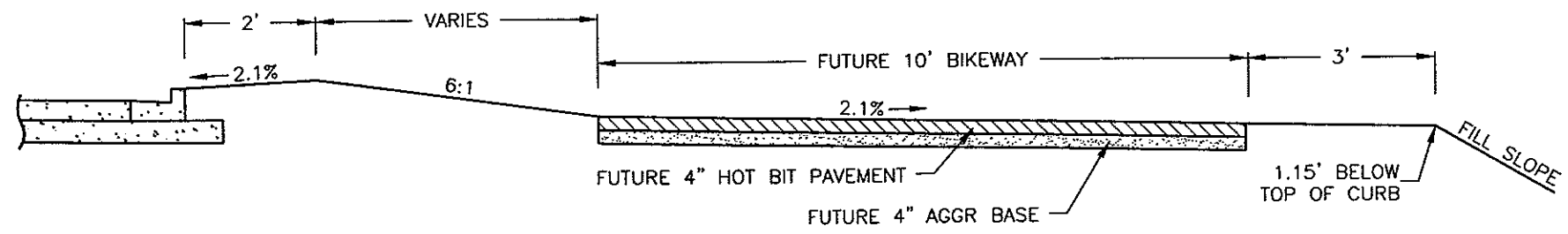


LISTING OF BIKEWAY BERM SLOPES

CUT CONDITION	FILL CONDITION
114+00 TO 118+50	104+81 TO 113+50
123+50 TO 127+50	128+00 TO 138+00
138+50 TO 141+00	141+50 TO 150+50
151+00 TO 173+20	

USE 50' TRANSITION BETWEEN SECTIONS
*FUTURE BIKEWAY LOCATION VARIES FROM
173+20 TO 186+00
NO GRADING NECESSARY

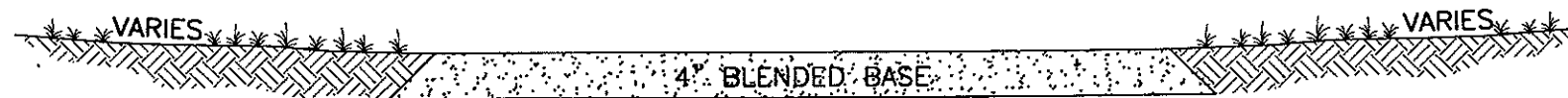
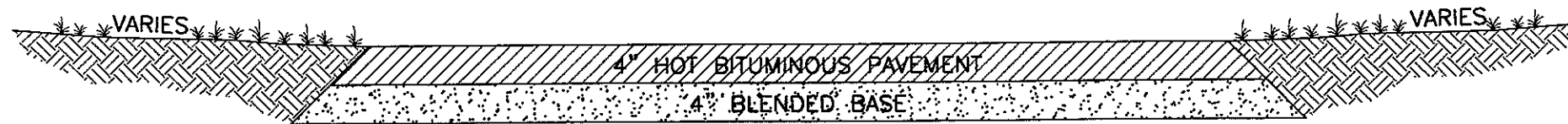
**TYPICAL BIKEWAY SLOPE DETAIL
(SHOWING CUT OR FILL CONDITIONS)**



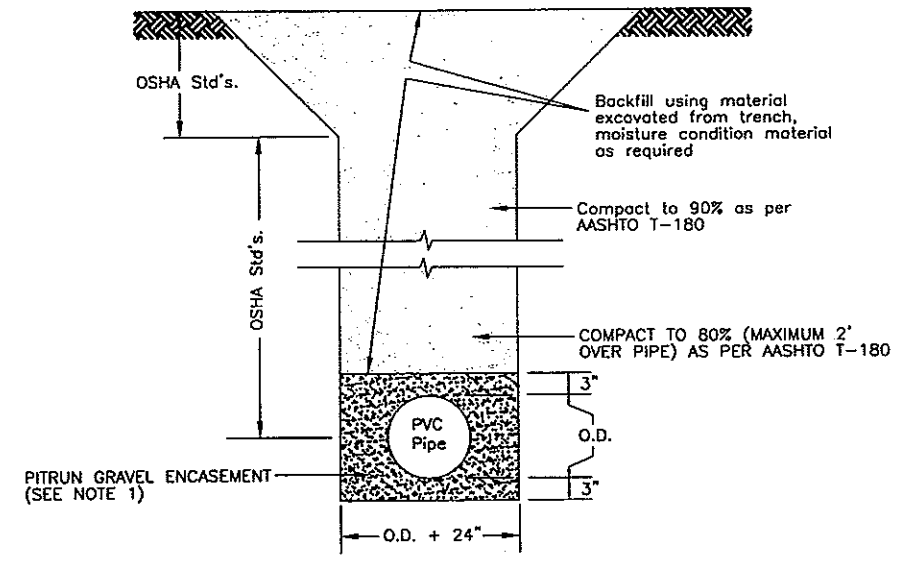
**BIKEWAY SLOPE DETAIL
STA 119+00 TO 123+00**

TYPICAL SECTIONS DRIVEWAYS

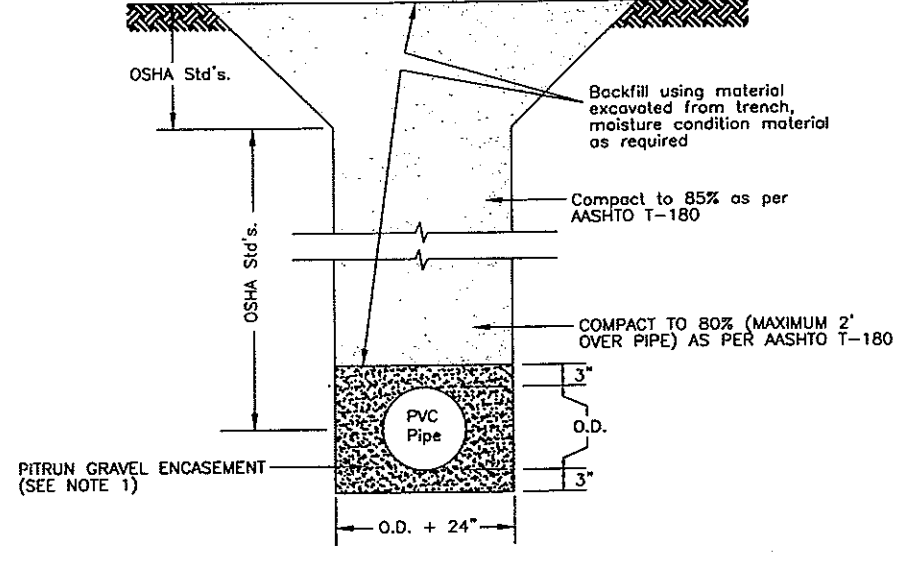
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	60
OLD RED TRAIL TYPICAL SECTIONS - DRIVEWAYS		



PIPE BEDDING AND BACKFILL DETAILS



BEDDING AND BACKFILL FOR ANY PVC PIPE UNDER EXISTING OR FUTURE ROADWAYS
N.T.S.

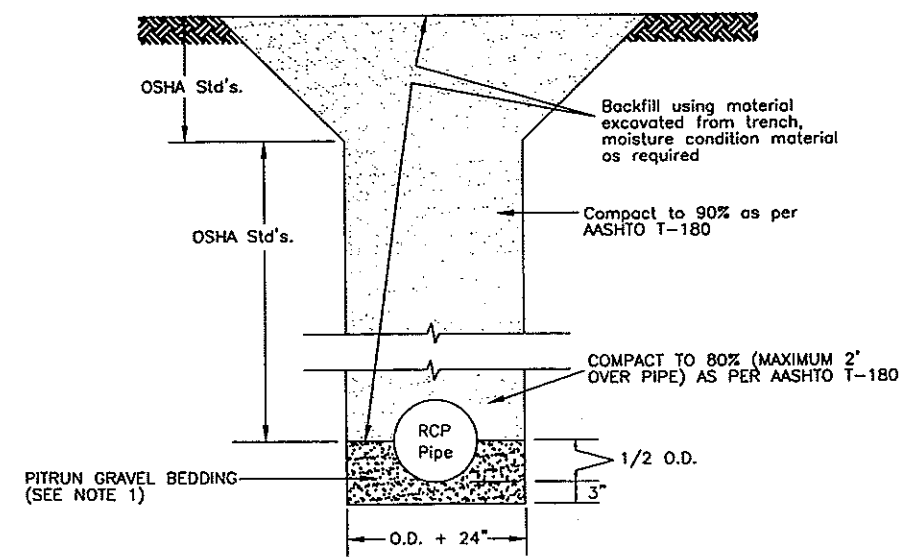


BEDDING AND BACKFILL FOR ANY PVC PIPE NOT UNDER EXISTING OR FUTURE ROADWAYS
N.T.S.

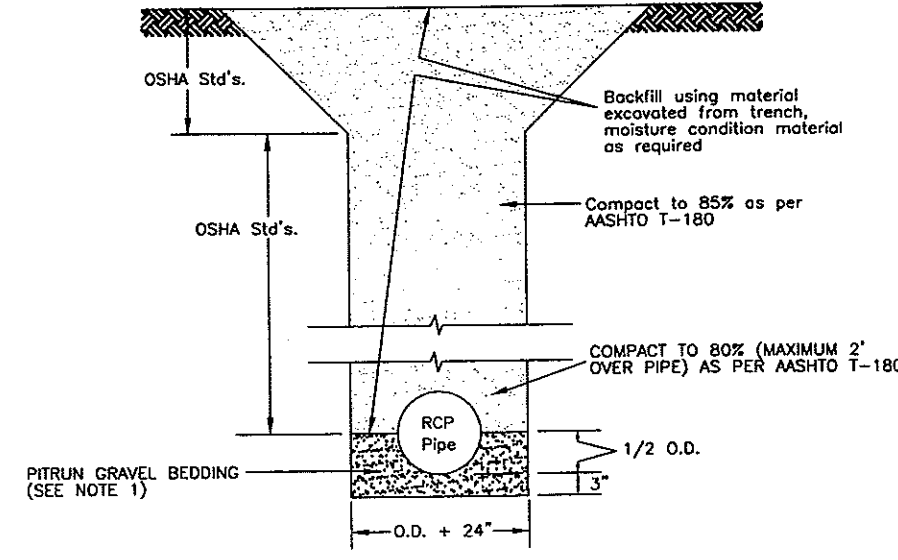
NOTES:

- 1) THE PITRUN GRAVEL ENCASEMENT SHALL MEET THE FOLLOWING GRADATION AND HAVE NO OBJECTIONABLE MATERIAL:

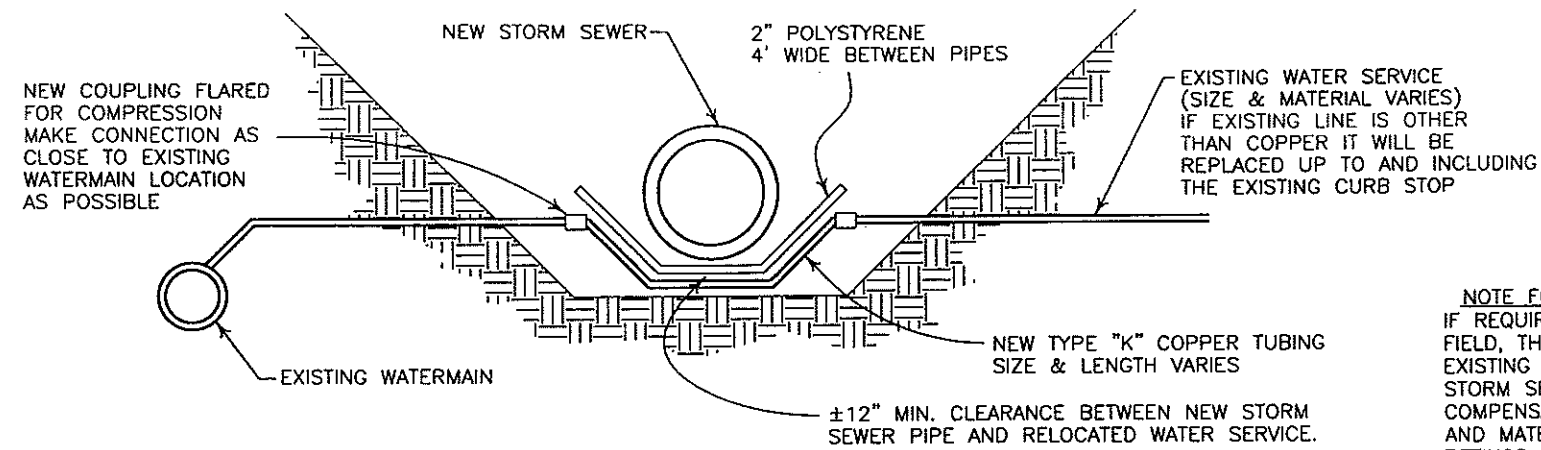
PASS 1" SIEVE	100%
PASS 3/4" SIEVE	60% TO 100%
PASS 1/4" SIEVE	40% TO 80%
- 2) **MOISTURE CONTENT:** THE MOISTURE CONTENT OF THE UPPER FOUR (4) FEET BELOW FINAL SURFACE GRADE SHALL BE FROM OPTIMUM TO +5%. THE MOISTURE CONTENT OF TRENCH MATERIAL FROM FOUR (4) FEET BELOW FINAL SURFACE GRADE TO THE TOP OF PIPE BEDDING CAN NOT BE HIGHER OR LOWER THAN WHAT WILL ALLOW COMPACTION TO THE SPECIFIED DENSITY.
- 3) UNLESS OTHERWISE SHOWN IN THE PLANS ALL COSTS FOR THE DISPOSAL OF ALL EXCESS TRENCH EXCAVATION SHALL BE INCLUDED IN THE PRICE BID FOR THE PIPE.
- 4) THESE NOTES ARE APPLICABLE TO ALL TYPES OF TRENCHES.
- 5) THE COST OF ALL BEDDING AND PITRUN BACKFILL MATERIAL SHALL BE INCLUDED IN THE PRICE BID FOR THE PIPE.



BEDDING AND BACKFILL FOR ANY RCP PIPE UNDER EXISTING OR FUTURE ROADWAYS
N.T.S.

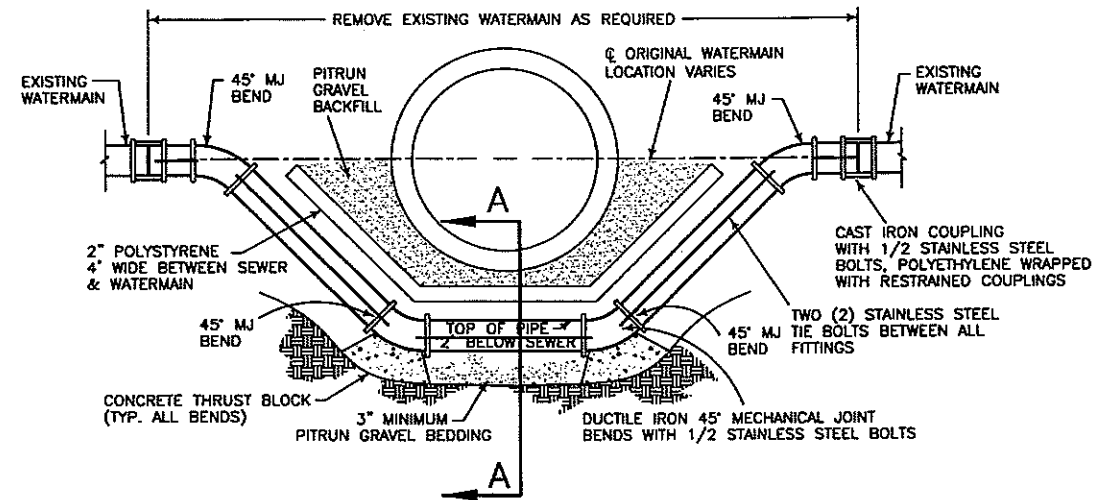


BEDDING AND BACKFILL FOR ANY RCP PIPE NOT UNDER EXISTING OR FUTURE ROADWAYS
N.T.S.



TYPICAL WATER SERVICE LINE ADJUSTMENT DETAIL
NOT TO SCALE

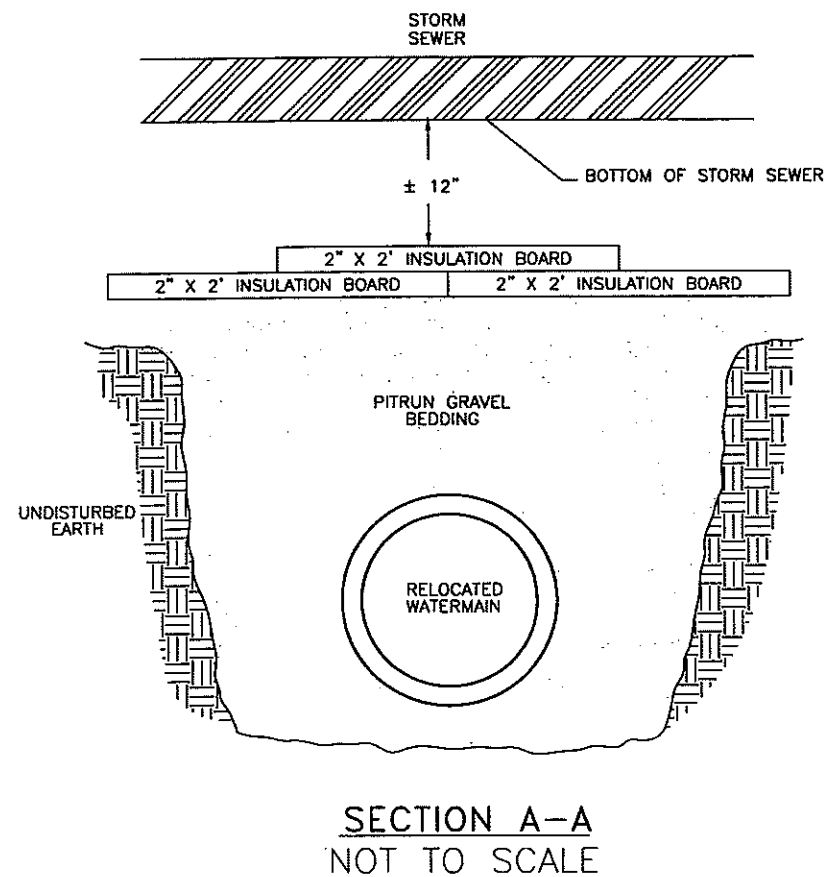
NOTE FOR WATER SERVICE ADJUSTMENT:
IF REQUIRED BY CONFLICTS FOUND IN THE FIELD, THE CONTRACTOR SHALL LOWER AN EXISTING SERVICE LINE UNDER THE NEW STORM SEWER. THE PAY ITEM SHALL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT AND MATERIALS FOR THIS WORK, INCLUDING FITTINGS REQUIRED TO ADAPT FROM THE EXISTING WATER SERVICE LINE TO THE NEW TYPE "K" COPPER TUBING. LABOR, EQUIPMENT AND MATERIALS TO INSTALL THE POLYSTYRENE INSULATION BOARD SHALL ALSO BE INCLUDED IN THE UNIT PRICE BID FOR "WATER SERVICE LINE ADJUSTMENTS". THIS PAY ITEM WILL BE ESTABLISHED IF REQUIRED PER SECTION 104.03.D.1 EXTRAWORK.



TYPICAL WATERMAIN LOWERING DETAIL
NOT TO SCALE

NOTES FOR WATERMAIN LOWERING:

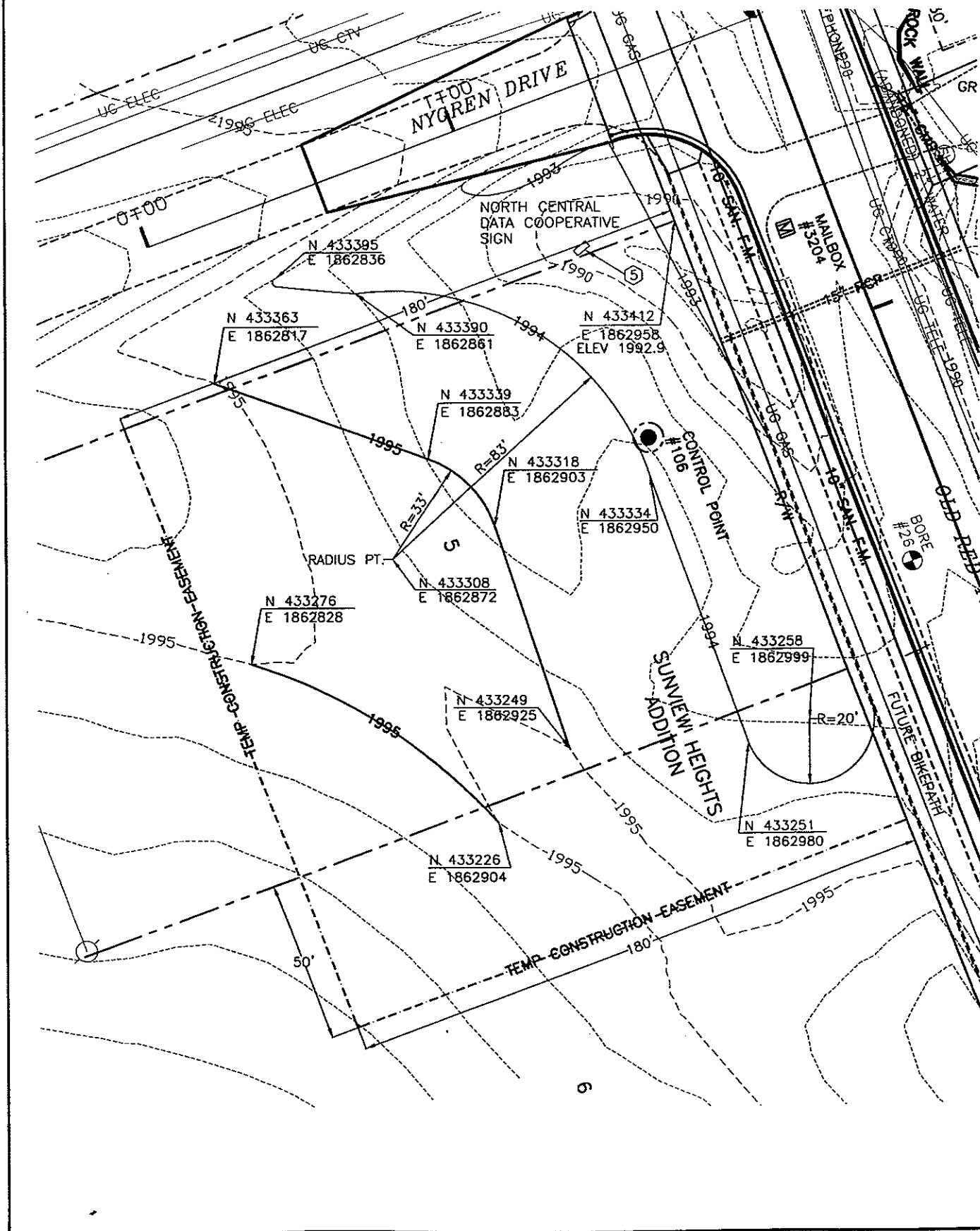
1. ALL COSTS ASSOCIATED WITH FITTINGS, TIE BOLTS, THRUST BLOCKS, INSULATION, COUPLINGS AND OTHER ITEMS SHALL BE INCLUDED IN THE PRICE BID FOR "ADJUST _IN WATERMAIN."
2. THE INSULATION SHALL BE VERY HIGH DENSITY HORIZONTAL RIGID EXTRUDED POLYSTYRENE CONFORMING TO ASTM C578-85, TYPE VII. MATERIAL SHALL HAVE A COMPRESSIVE STRENGTH OF 60 PSI, 2" THICK, AND 2' WIDE. THE JOINTS IN THE INSULATION SHALL BE STAGGERED A MINIMUM OF 1' AND SHALL BE LAID IN THREE PIECES. THE POLYSTYRENE INSULATION BOARD USED AT ALL ADJUST WATERMAIN LOCATIONS SHALL NOT BE PAID FOR SEPARATELY, RATHER SHALL BE INCLUDED IN THE PRICE BID FOR "ADJUST _IN WATERMAIN."
3. THIS UNIT PRICE WILL BE ESTABLISHED IN ACCORDANCE WITH SECTION 104.03.D.1 EXTRAWORK



SECTION A-A
NOT TO SCALE

RESHAPING LOT 5 AND LOT 6 SUNVIEW HEIGHTS ADDITION

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	63
OLD RED TRAIL SITE GRADING		



CONSTRUCTION NOTES:

- ① CONTRACTOR SHALL VERIFY LOCATION OF ALL PUBLIC AND PRIVATE UTILITIES PRIOR TO COMMENCING WORK. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED AT THE CONTRACTORS' EXPENSE.
- ② CONTRACTOR SHALL STRIP 6" OF TOPSOIL OVER ENTIRE AREA DISTURBED BY CONSTRUCTION OPERATIONS. UPON COMPLETION OF REGRADING, CONTRACTOR SHALL RESPREAD TOPSOIL TO A DEPTH OF 6".
- ③ CONTRACTOR SHALL IMPORT FILL AS REQUIRED TO FILL AND SHAPE AREA AS SHOWN.
- ④ ALL AREAS DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATIONS.
- ⑤ CONTRACTOR SHALL REMOVE SIGN AND RESET AT THE COMPLETION OF THE LOT RESHAPING. ALL COSTS INCIDENTAL TO OTHER ITEMS.

QUANTITIES

EMBANKMENT 1524 C.Y.

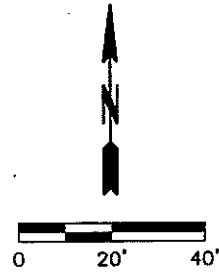
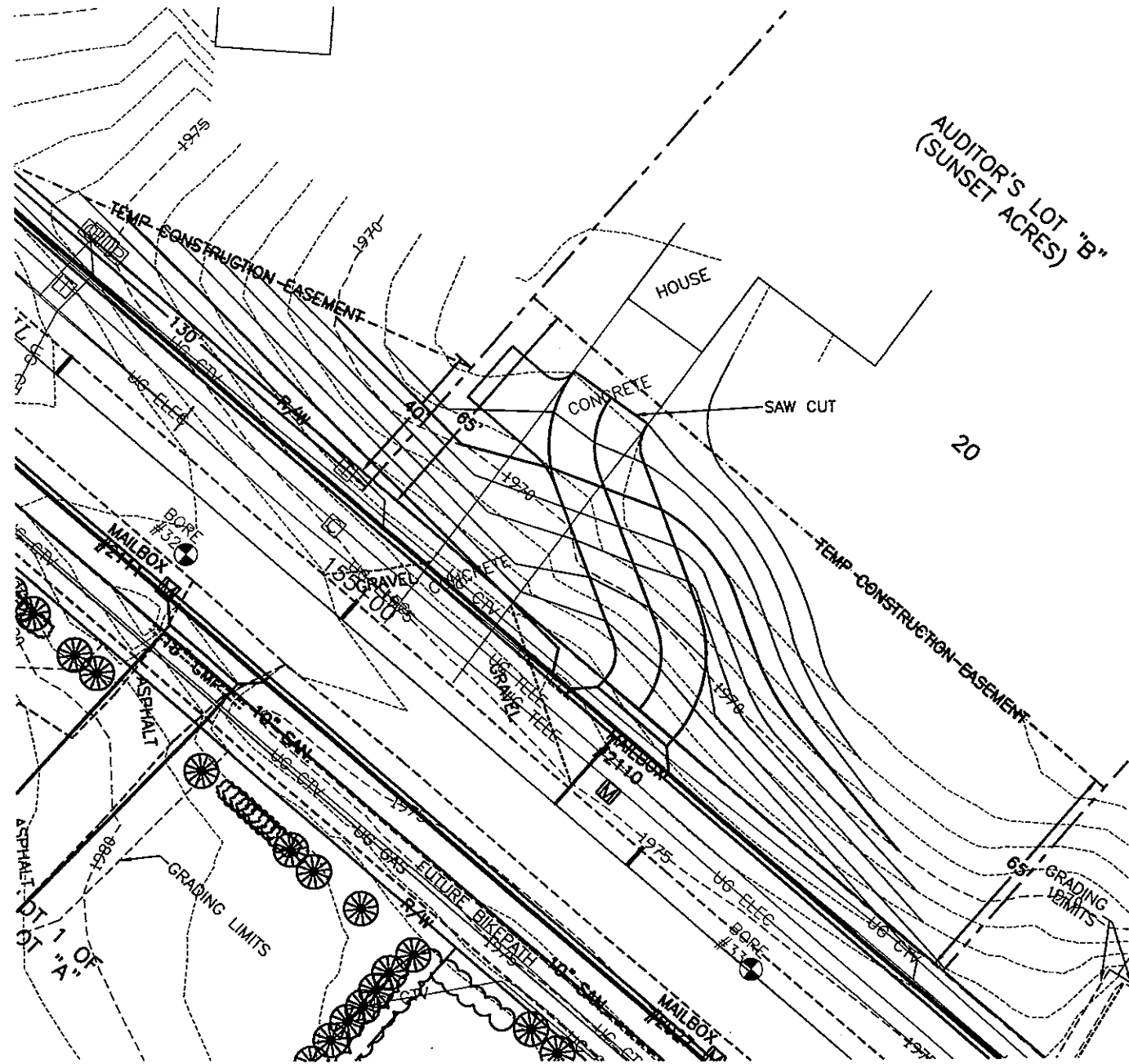
* FOR ESTIMATING USE ONLY - (NOT PAY ITEMS)



REGRADING DRIVEWAY TO LOT 20 SUNSET ACRES ADDITION

2110 OLD RED TRAIL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	64
OLD RED TRAIL SITE GRADING		



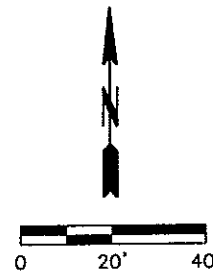
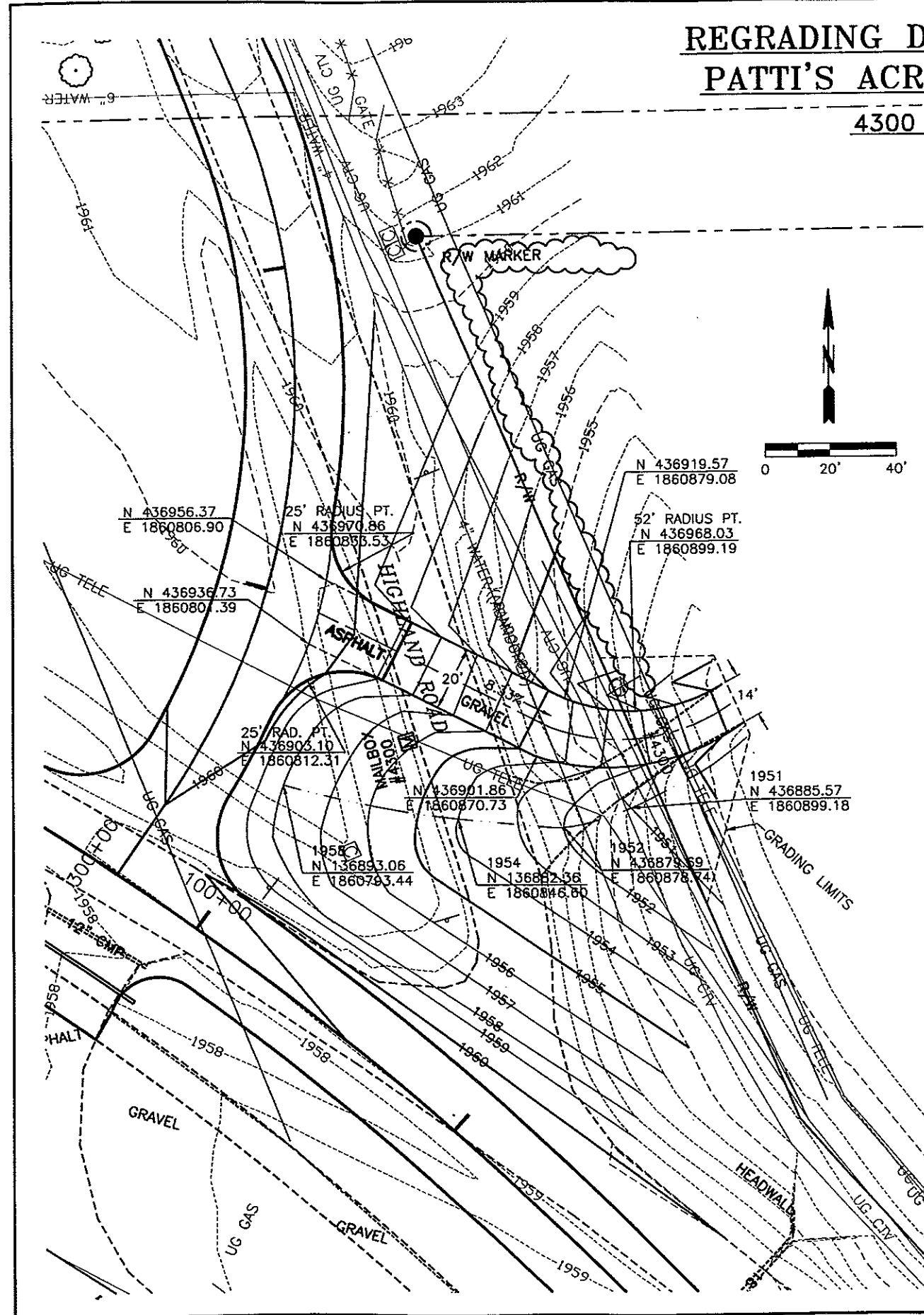
QUANTITIES	
REMOVAL OF CONCRETE	227 S.Y.
6IN NON-REINF. CONCRETE PVMT CLAE	237 S.Y.

- CONSTRUCTION NOTES:**
- ① CONTRACTOR SHALL VERIFY LOCATION OF ALL PUBLIC AND PRIVATE UTILITIES PRIOR TO COMMENCING WORK. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED AT THE CONTRACTORS' EXPENSE.
 - ② CONTRACTOR SHALL STRIP 6" OF TOPSOIL OVER ENTIRE AREA DISTURBED BY CONSTRUCTION OPERATIONS. UPON COMPLETION OF REGRADING, CONTRACTOR SHALL RESPREAD TOPSOIL TO A DEPTH OF 6".
 - ③ CONTRACTOR SHALL EXCAVATE AS REQUIRED TO SHAPE AREA AS SHOWN.
 - ④ ALL AREAS DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATIONS.

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	65
OLD RED TRAIL SITE GRADING		

REGRADING DRIVEWAY TO LOT 17 PATTI'S ACRES FIRST ADDITION

4300 OLD RED TRAIL

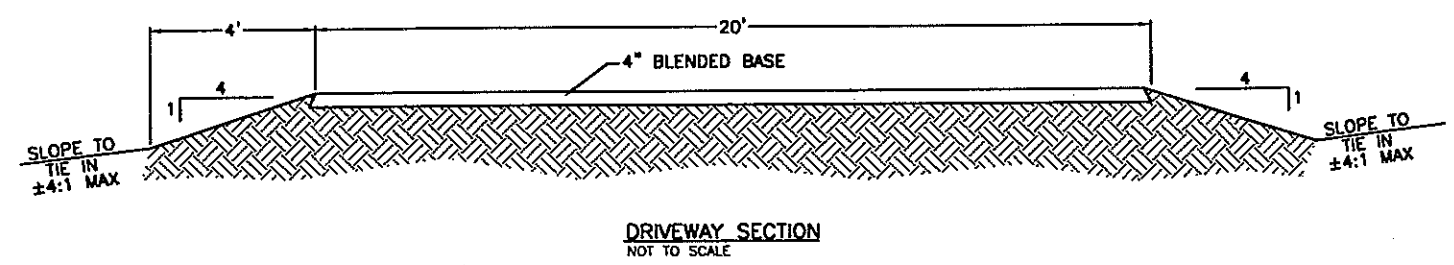


QUANTITIES

EXCAVATION	1279 C.Y.
EMBANKMENT*	256 C.Y.
REMOVAL OF GRAVEL SURFACING*	130 S.Y.
* FOR ESTIMATING USE ONLY - (NOT PAY ITEMS)	

CONSTRUCTION NOTES:

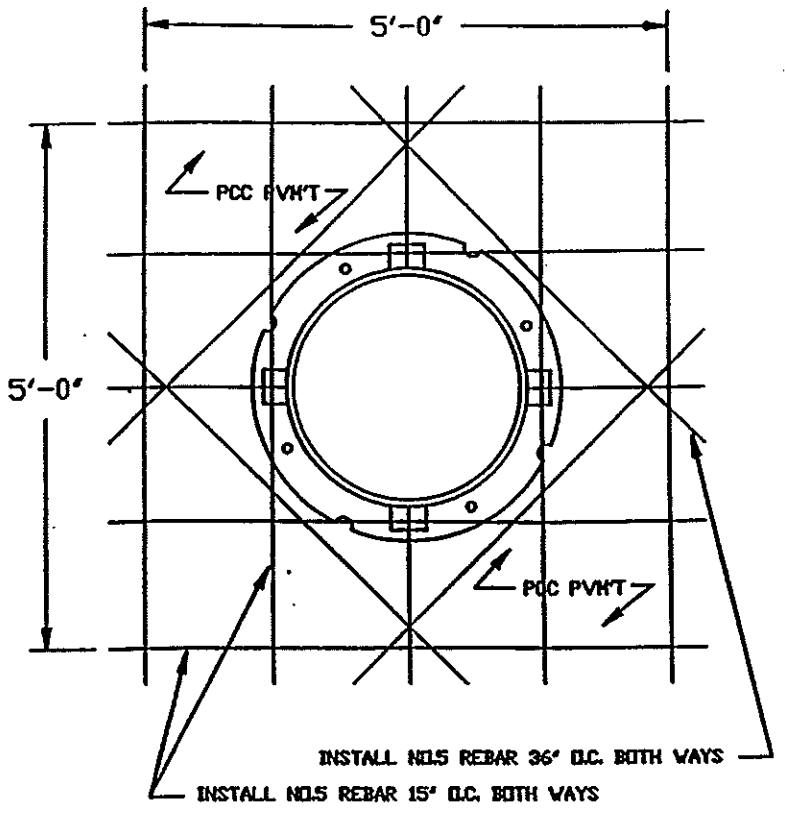
- ① CONTRACTOR SHALL VERIFY LOCATION OF ALL PUBLIC AND PRIVATE UTILITIES PRIOR TO COMMENCING WORK. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED AT THE CONTRACTORS' EXPENSE.
- ② CONTRACTOR SHALL STRIP 6" OF TOPSOIL OVER ENTIRE AREA DISTURBED BY CONSTRUCTION OPERATIONS. UPON COMPLETION OF REGRADING, CONTRACTOR SHALL RESPREAD TOPSOIL TO A DEPTH OF 6".
- ③ CONTRACTOR SHALL EXCAVATE AS REQUIRED TO SHAPE AREA AS SHOWN.
- ④ ALL AREAS DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATIONS.



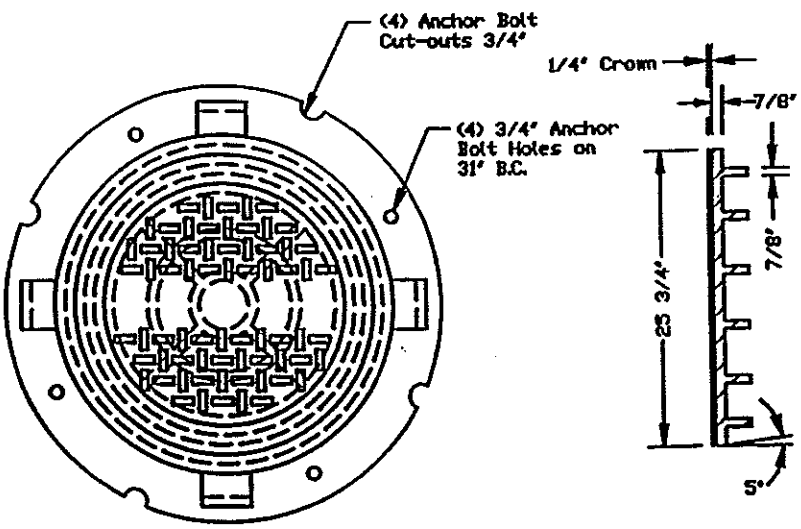
DRIVEWAY SECTION
NOT TO SCALE

G:\CIVIL\1998-8929\Grading.dwg Wed Aug 18 14:42:46 1999

STANDARD FLOATING MANHOLE CASTING

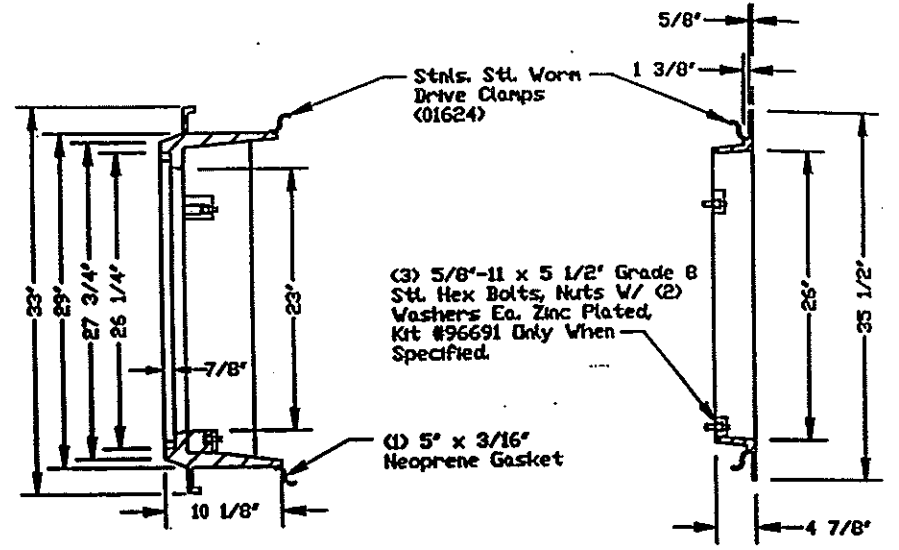


PLAN VIEW



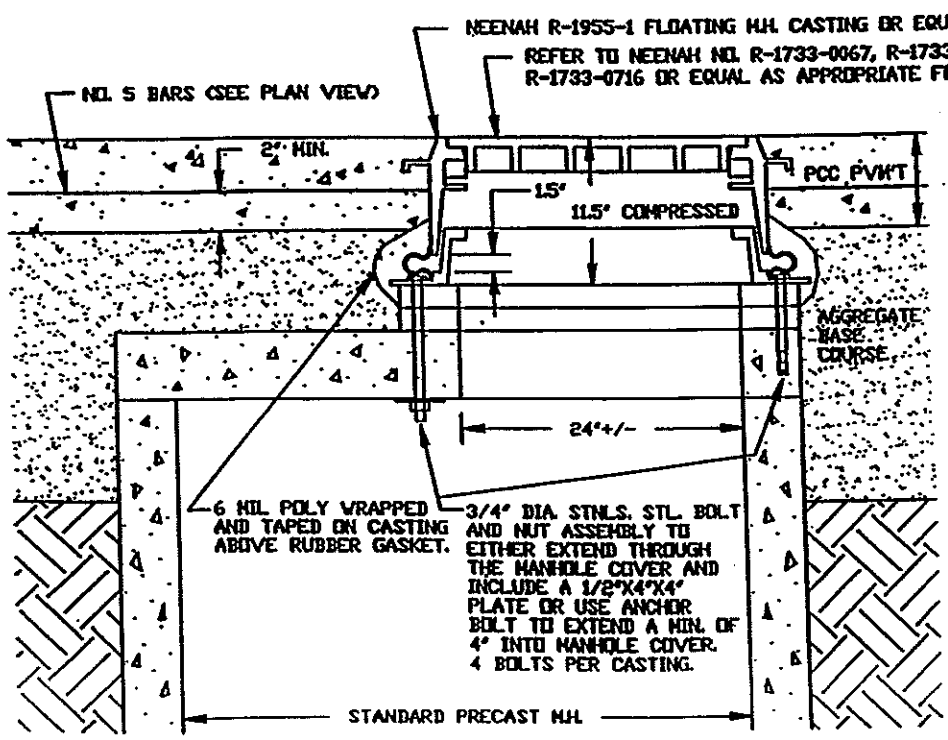
MATERIAL: Cast Gray Iron ASTM A-48, Class 358
 FINISH: Black Asphalt Emulsion
 WEIGHT: 639#/Unit

COMP. #'S LID 1733-078 207 Lbs
 or
 LID 1733-0716 109 Lbs

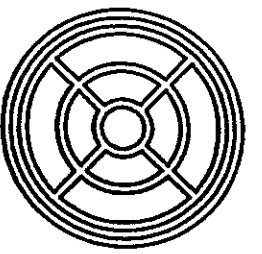


FR. 1955-004
 272 Lbs

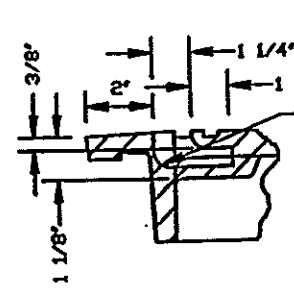
FR. 1955-003
 160 Lbs



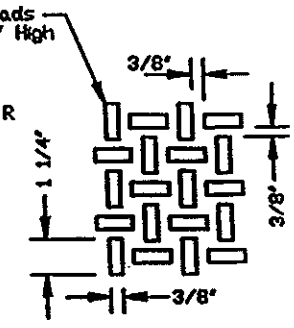
CROSS SECTION



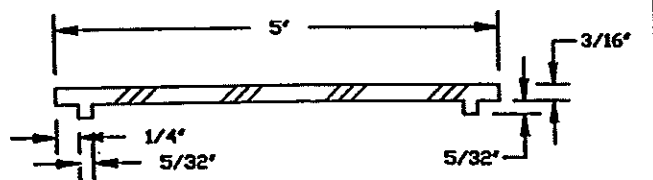
BOTTOM DETAIL
 LID ONLY



CONCEALED PICK DETAIL
 PER NF-42303

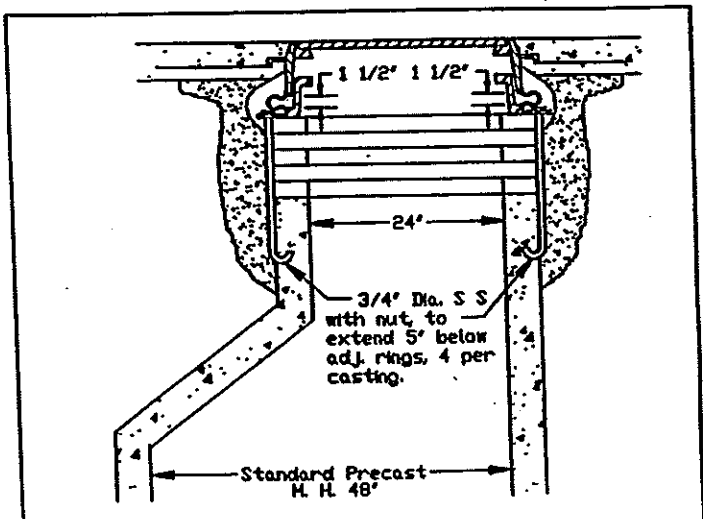


SURFACE DETAIL



SECTION OF EXTRUDED
 NEOPRENE GASKET

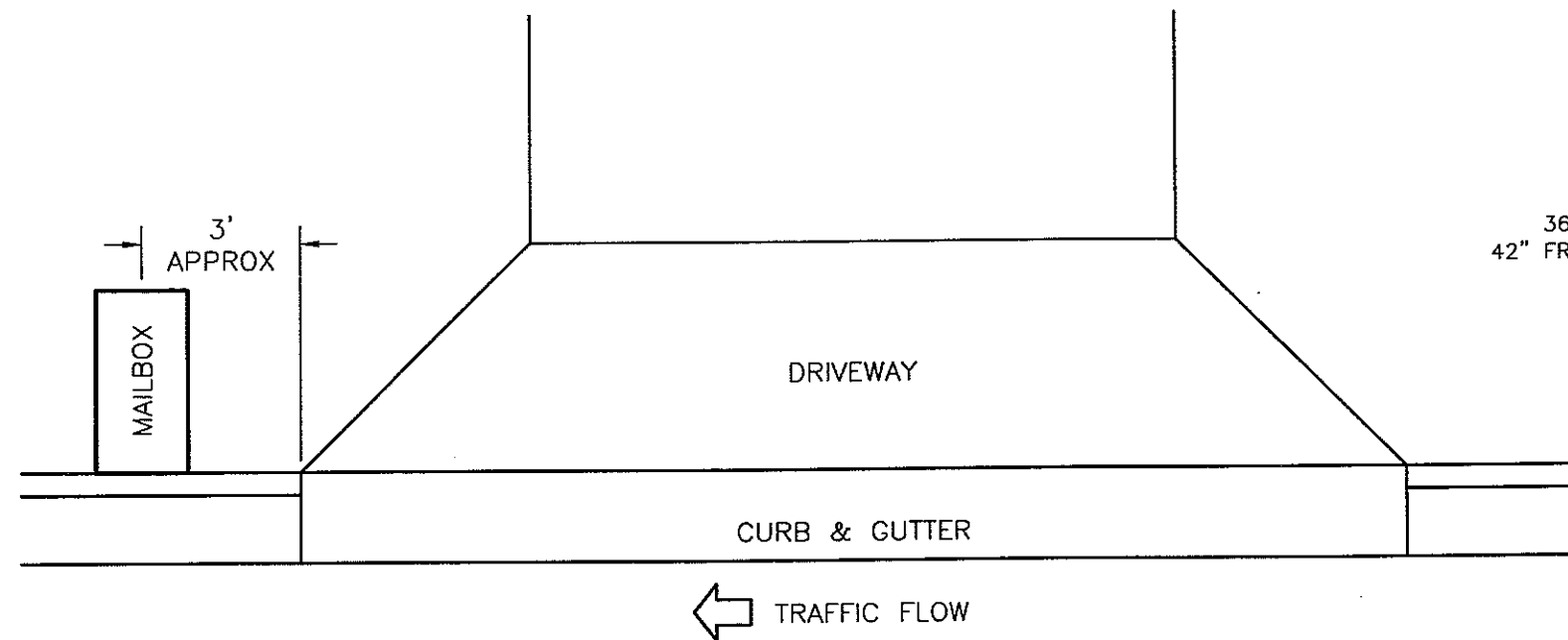
NOTES: BED FRAME IN MORTAR, INSTALL PRECAST TWO-INCH RINGS, AND PLASTER INSIDE AND OUT WITH MORTAR.
 WHEN INSTALLING AN EXISTING BOX OUT, DRILL NO.5 REBAR INTO EXISTING PVMT 6" DEEP - 15" O.C. - BARS TO BE 20" LONG.
 LENGTH OF ANCHOR BOLTS TO VARY WITH NUMBER OF ADJUSTING RINGS.
 INSTALLED COST AT EXISTING LOCATIONS SHALL BE INCLUDED IN PRICE BID FOR "MANHOLE CASTING".
 INSTALLATION COST AT NEW MANHOLE LOCATIONS SHALL BE INCLUDED IN THE PRICE BID FOR "MANHOLES".



PLAN VIEW OF CONNECTION TO
 CONICAL MANHOLE - TYPICAL

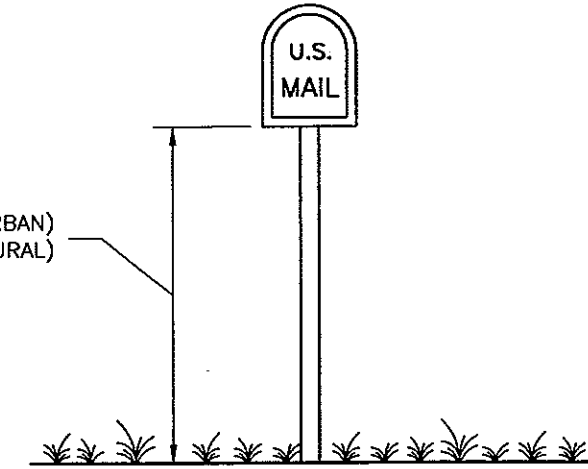
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	67
MAILBOX LOCATION DETAILS		

MAILBOX LOCATION DETAIL



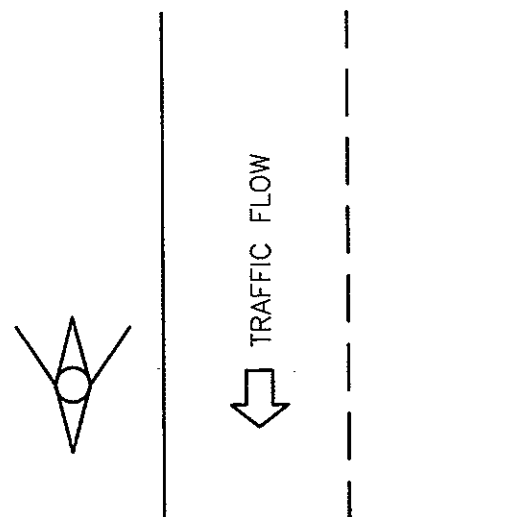
PLAN VIEW
NOT TO SCALE

36" FROM TOP OF CURB (URBAN)
42" FROM TOP OF SHOULDER (RURAL)



ELEVATION
NOT TO SCALE

THE AXIS OF THE V-LOC ANCHOR SHOULD ALIGN PARALLEL TO THE DIRECTION OF MAINLINE TRAFFIC.



PLACEMENT OF ANCHORS
NOT TO SCALE

NOTE:

1. THE MAILBOX SUPPORT AND HARDWARE DETAILS SHALL CONSIST OF THE "V-LOC MAILBOX SUPPORT SYSTEM" OR APPROVED EQUAL.
2. PLACE FACE OF MAILBOX AT BACK OF CURB IN URBAN AREAS AND 0" TO 12" OFF SHOULDER IN RURAL AREAS.

EROSION CONTROL

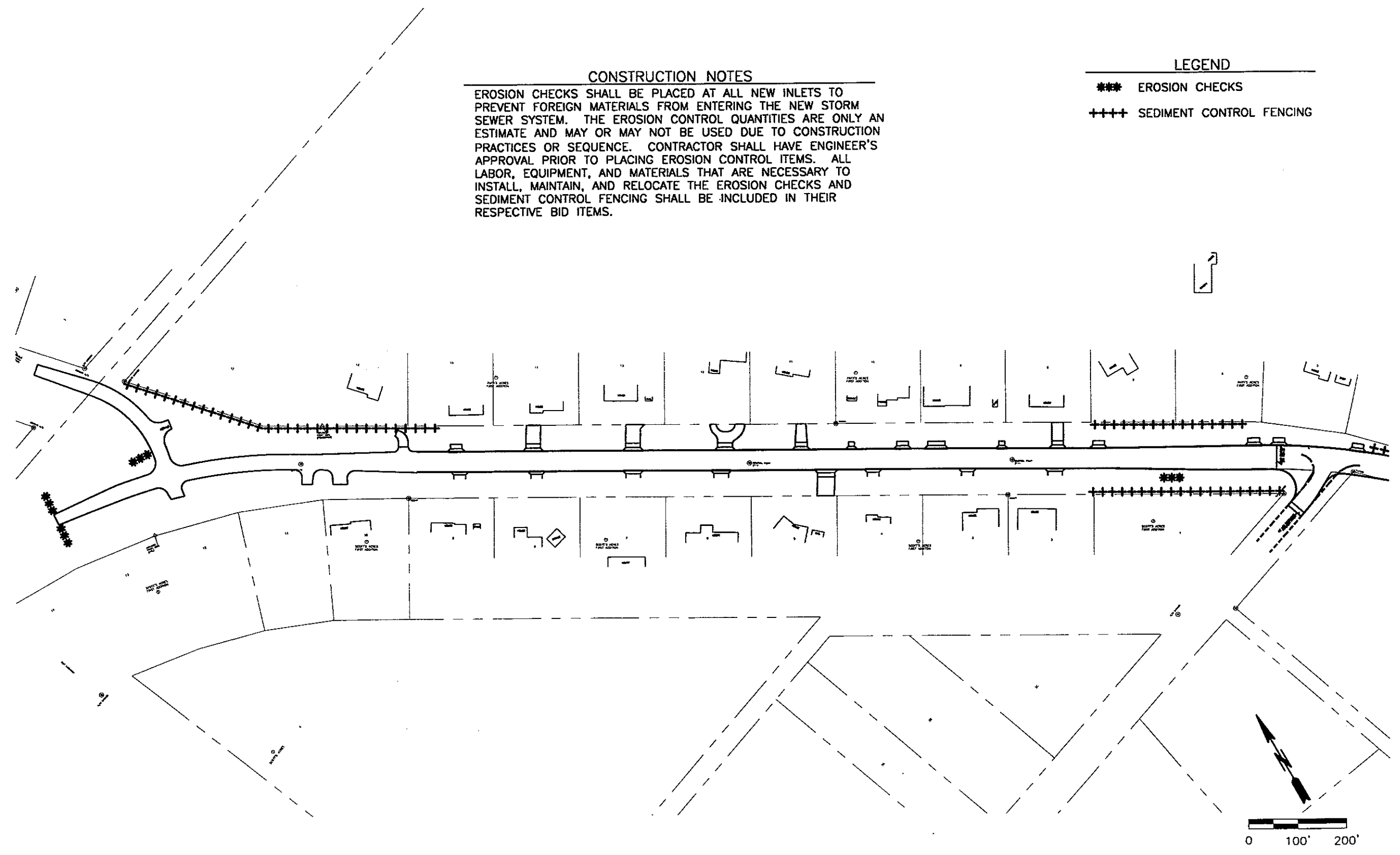
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	68
OLD RED TRAIL EROSION CONTROL		

CONSTRUCTION NOTES

EROSION CHECKS SHALL BE PLACED AT ALL NEW INLETS TO PREVENT FOREIGN MATERIALS FROM ENTERING THE NEW STORM SEWER SYSTEM. THE EROSION CONTROL QUANTITIES ARE ONLY AN ESTIMATE AND MAY OR MAY NOT BE USED DUE TO CONSTRUCTION PRACTICES OR SEQUENCE. CONTRACTOR SHALL HAVE ENGINEER'S APPROVAL PRIOR TO PLACING EROSION CONTROL ITEMS. ALL LABOR, EQUIPMENT, AND MATERIALS THAT ARE NECESSARY TO INSTALL, MAINTAIN, AND RELOCATE THE EROSION CHECKS AND SEDIMENT CONTROL FENCING SHALL BE INCLUDED IN THEIR RESPECTIVE BID ITEMS.

LEGEND

- *** EROSION CHECKS
- ++++ SEDIMENT CONTROL FENCING

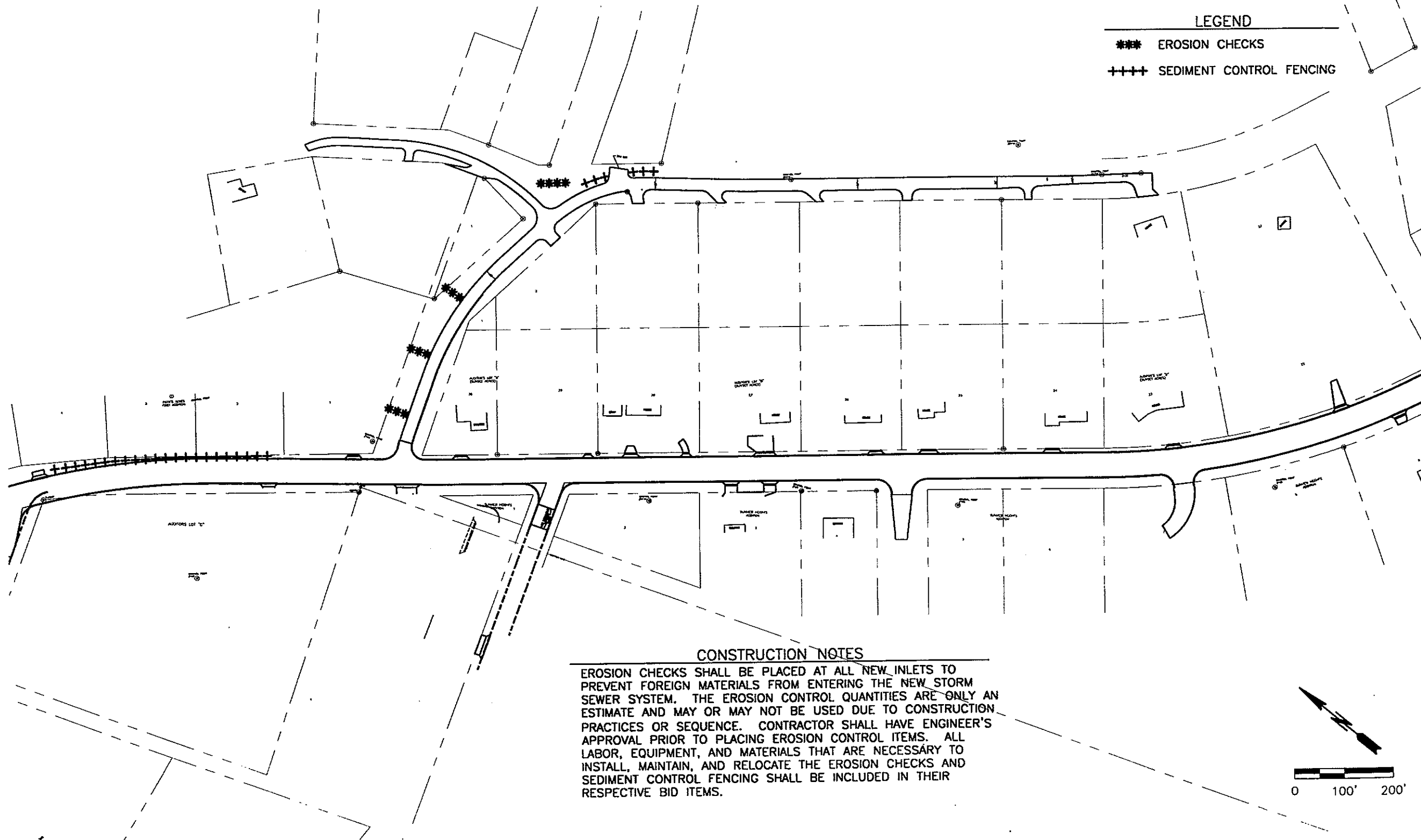


STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	69
OLD RED TRAIL EROSION CONTROL		

EROSION CONTROL

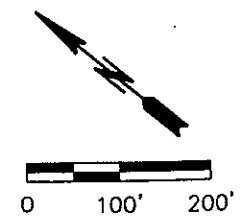
LEGEND

***	EROSION CHECKS
++++	SEDIMENT CONTROL FENCING



CONSTRUCTION NOTES

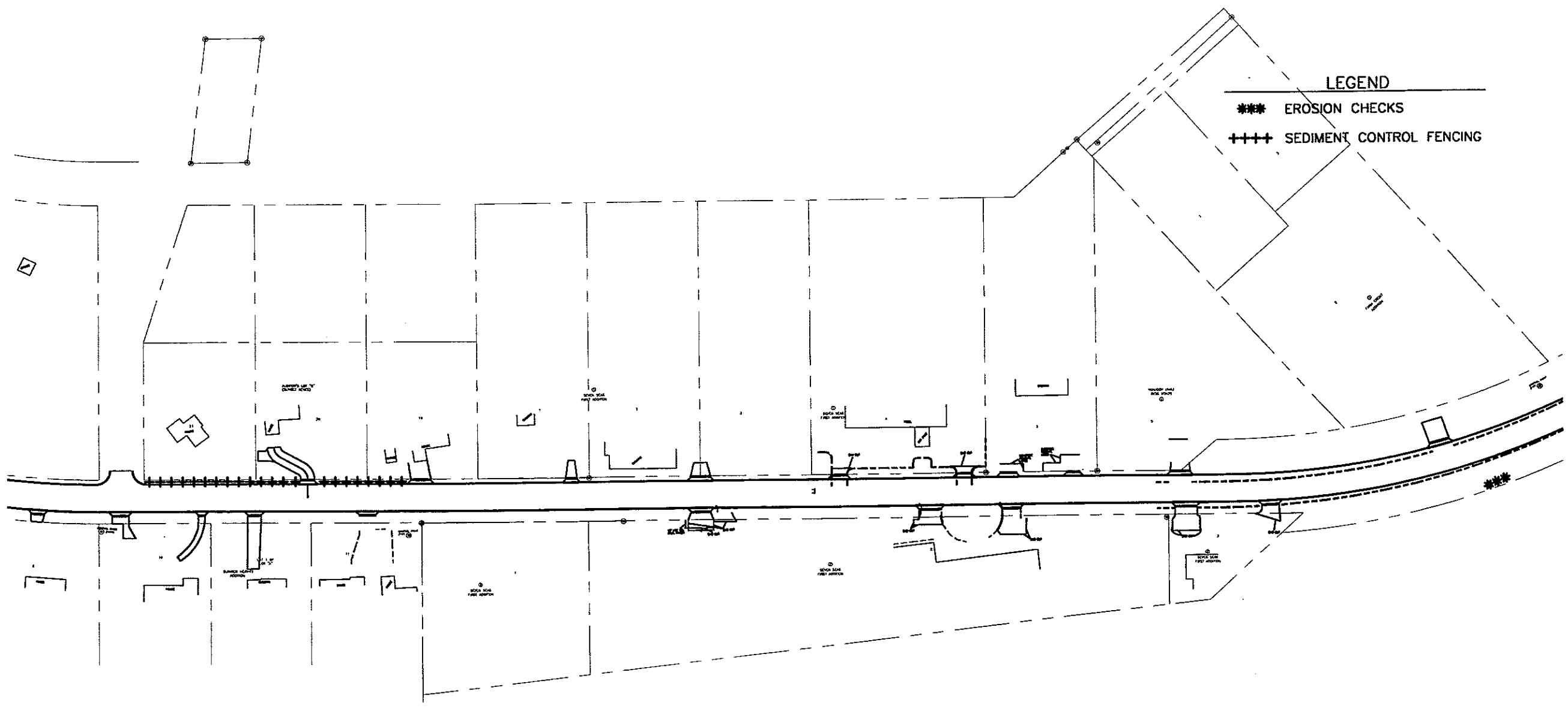
EROSION CHECKS SHALL BE PLACED AT ALL NEW INLETS TO PREVENT FOREIGN MATERIALS FROM ENTERING THE NEW STORM SEWER SYSTEM. THE EROSION CONTROL QUANTITIES ARE ONLY AN ESTIMATE AND MAY OR MAY NOT BE USED DUE TO CONSTRUCTION PRACTICES OR SEQUENCE. CONTRACTOR SHALL HAVE ENGINEER'S APPROVAL PRIOR TO PLACING EROSION CONTROL ITEMS. ALL LABOR, EQUIPMENT, AND MATERIALS THAT ARE NECESSARY TO INSTALL, MAINTAIN, AND RELOCATE THE EROSION CHECKS AND SEDIMENT CONTROL FENCING SHALL BE INCLUDED IN THEIR RESPECTIVE BID ITEMS.



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EROSION CONTROL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	70
OLD RED TRAIL EROSION CONTROL		

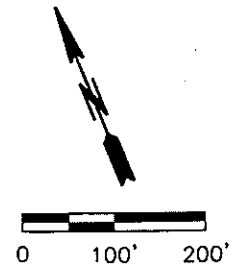


LEGEND

- *** EROSION CHECKS
- ++++ SEDIMENT CONTROL FENCING

CONSTRUCTION NOTES

EROSION CHECKS SHALL BE PLACED AT ALL NEW INLETS TO PREVENT FOREIGN MATERIALS FROM ENTERING THE NEW STORM SEWER SYSTEM. THE EROSION CONTROL QUANTITIES ARE ONLY AN ESTIMATE AND MAY OR MAY NOT BE USED DUE TO CONSTRUCTION PRACTICES OR SEQUENCE. CONTRACTOR SHALL HAVE ENGINEER'S APPROVAL PRIOR TO PLACING EROSION CONTROL ITEMS. ALL LABOR, EQUIPMENT, AND MATERIALS THAT ARE NECESSARY TO INSTALL, MAINTAIN, AND RELOCATE THE EROSION CHECKS AND SEDIMENT CONTROL FENCING SHALL BE INCLUDED IN THEIR RESPECTIVE BID ITEMS.



PROJECT	SHEET NO.
SU-1-988(008)019	71
OLD RED TRAIL EROSION CONTROL	

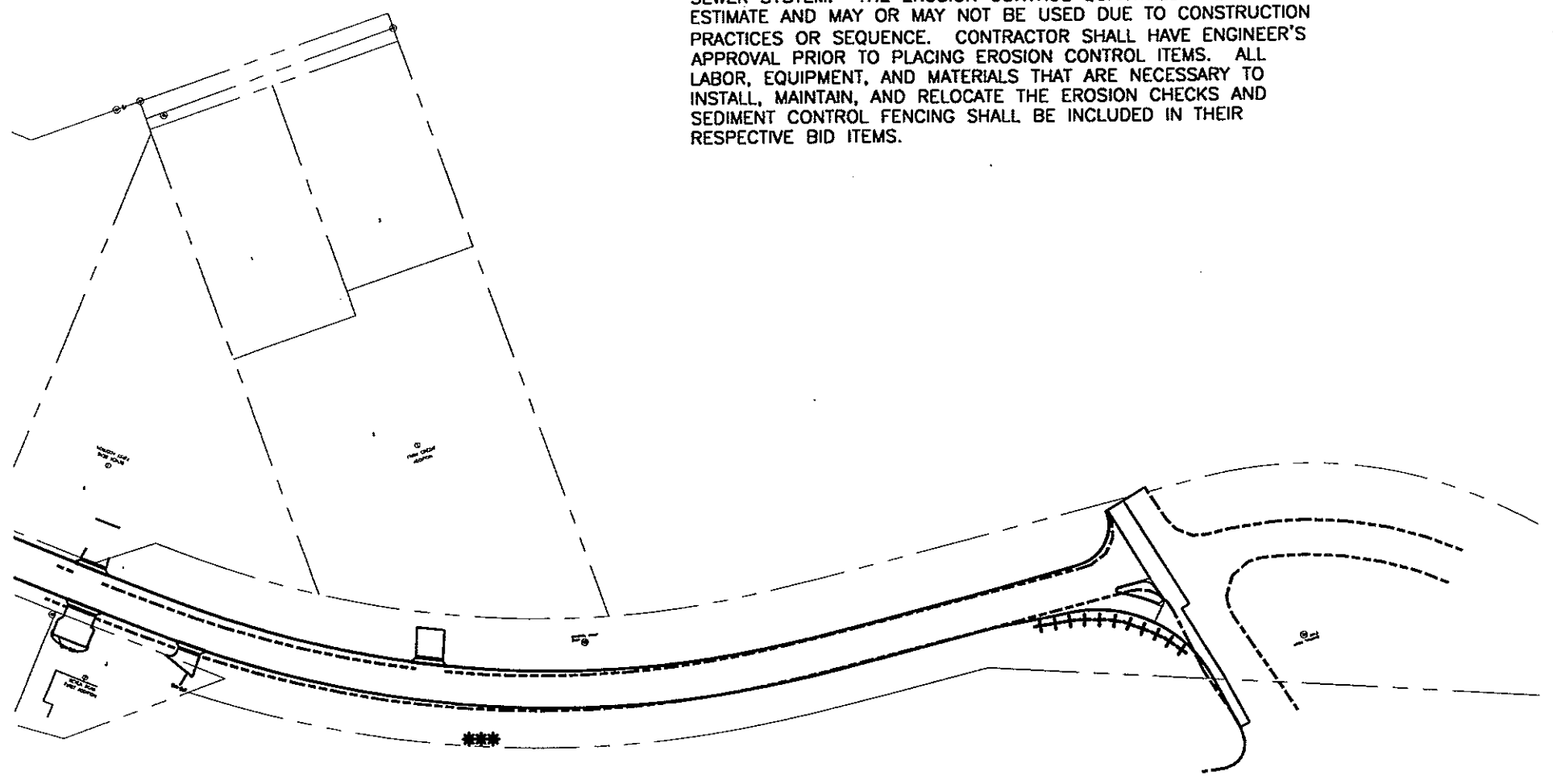
EROSION CONTROL

CONSTRUCTION NOTES

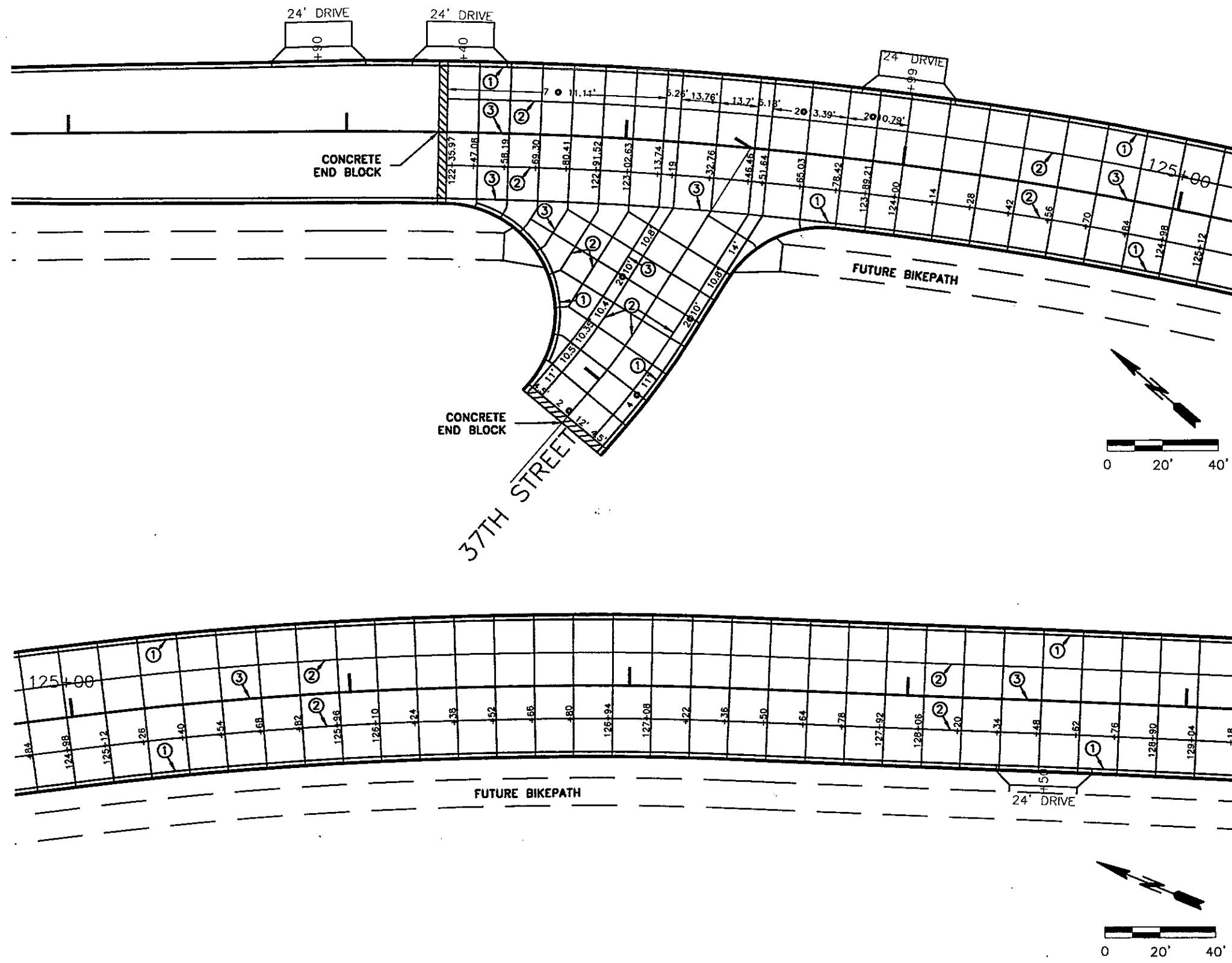
EROSION CHECKS SHALL BE PLACED AT ALL NEW INLETS TO PREVENT FOREIGN MATERIALS FROM ENTERING THE NEW STORM SEWER SYSTEM. THE EROSION CONTROL QUANTITIES ARE ONLY AN ESTIMATE AND MAY OR MAY NOT BE USED DUE TO CONSTRUCTION PRACTICES OR SEQUENCE. CONTRACTOR SHALL HAVE ENGINEER'S APPROVAL PRIOR TO PLACING EROSION CONTROL ITEMS. ALL LABOR, EQUIPMENT, AND MATERIALS THAT ARE NECESSARY TO INSTALL, MAINTAIN, AND RELOCATE THE EROSION CHECKS AND SEDIMENT CONTROL FENCING SHALL BE INCLUDED IN THEIR RESPECTIVE BID ITEMS.

LEGEND

- *** EROSION CHECKS
- ++++ SEDIMENT CONTROL FENCING



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	72
OLD RED TRAIL STA. 121+00 TO STA. 129+00 JOINT LAYOUT		



CONSTRUCTION NOTES

ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

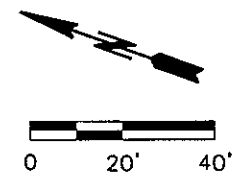
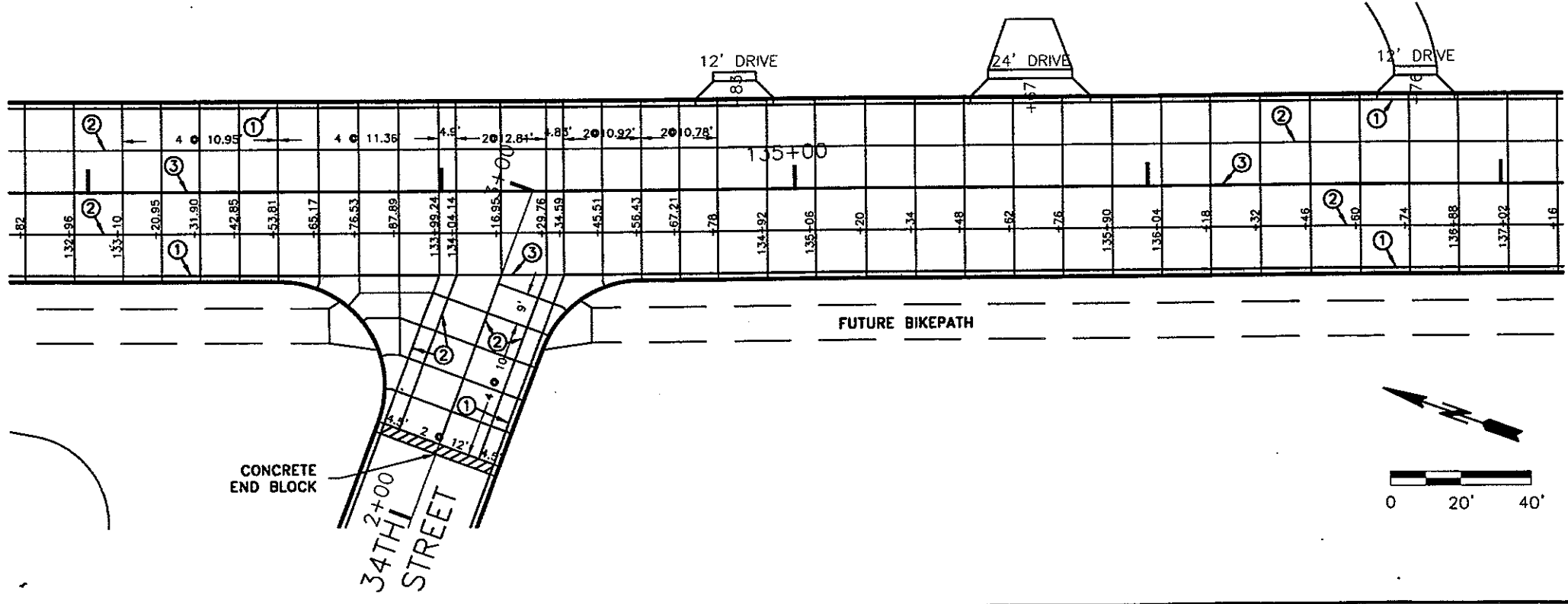
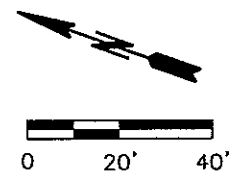
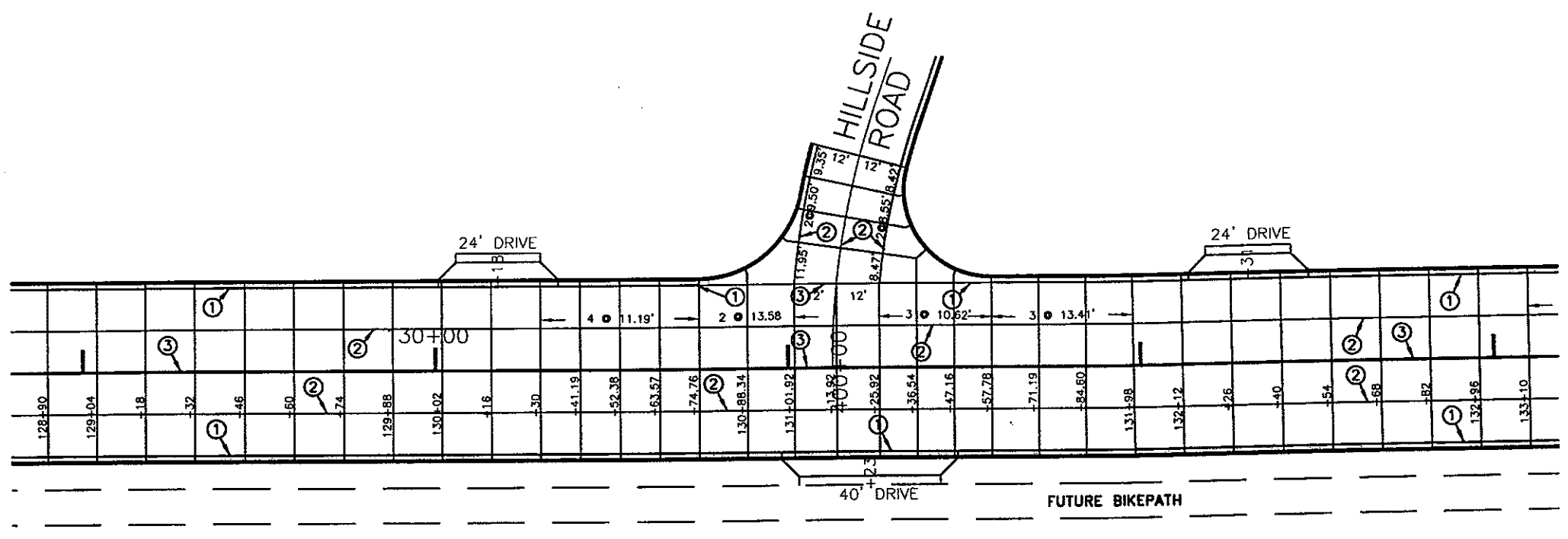
ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

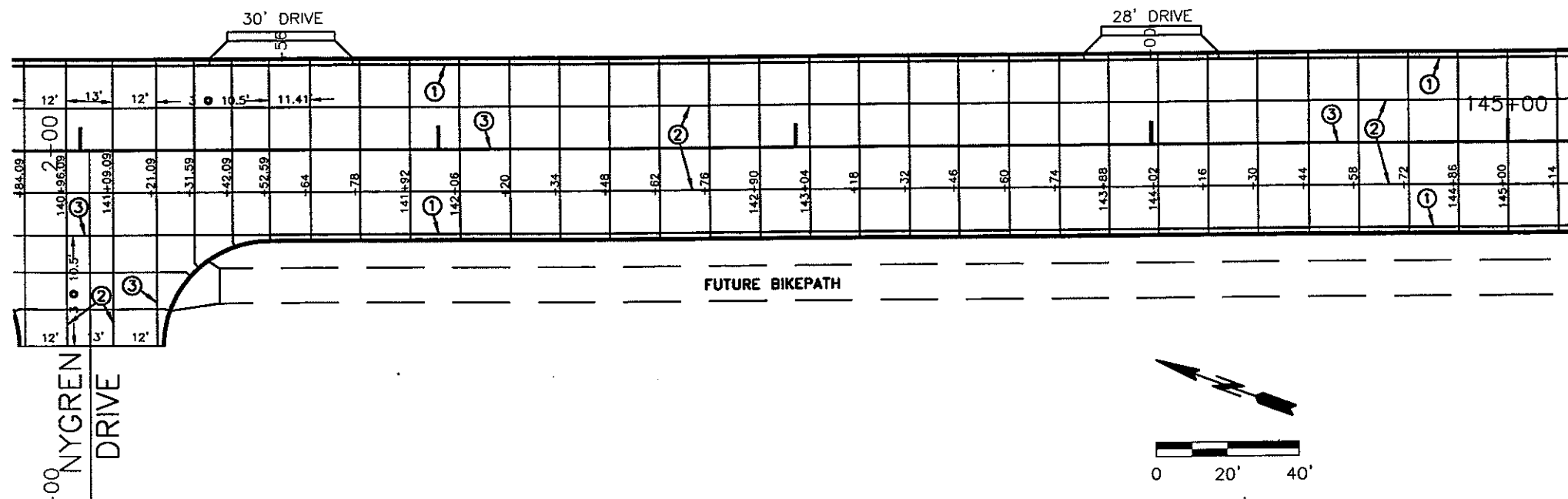
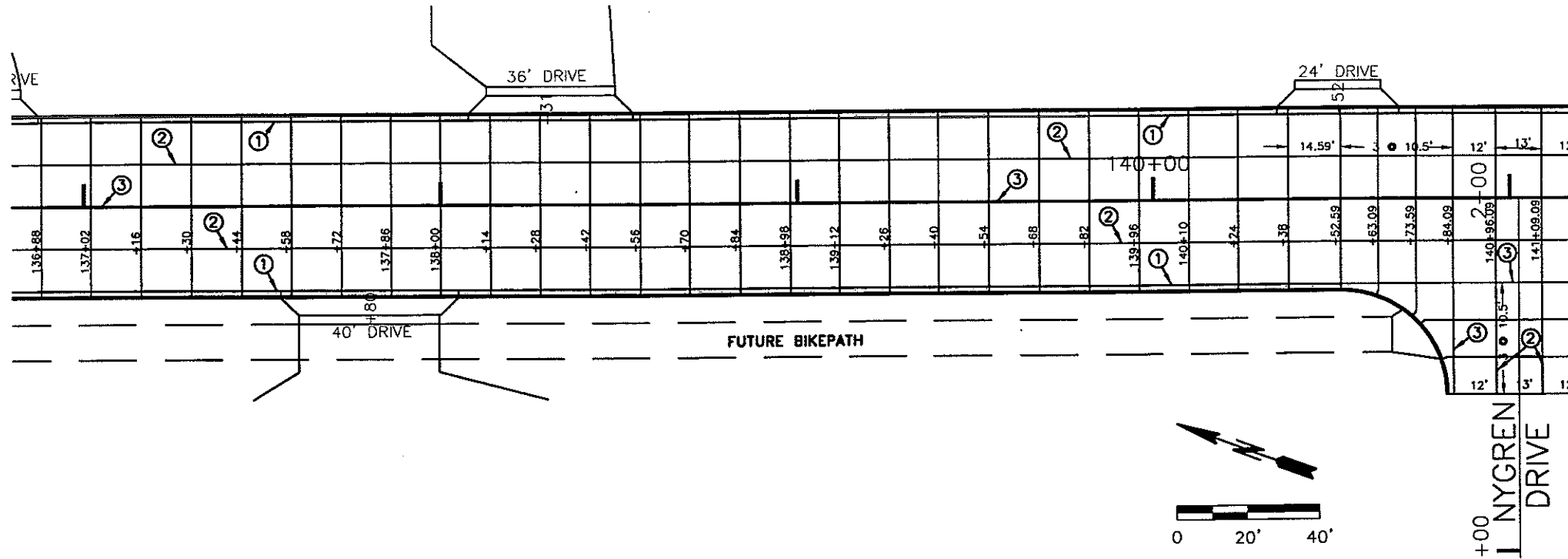
- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	73
OLD RED TRAIL STA. 129+00 TO STA. 137+00 JOINT LAYOUT		



- CONSTRUCTION NOTES**
- ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.
- ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.
- ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.
- ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.
- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
 - ② SEE STANDARD DRAWING D-550-2
 - ③ KEYED JOINT SILICONE SEAL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	74
OLD RED TRAIL STA. 137+00 TO 145+00 JOINT LAYOUT		



CONSTRUCTION NOTES

ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT Poured ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

- ① NO 3 x 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	75
OLD RED TRAIL STA. 145+00 TO 153+00 JOINT LAYOUT		

CONSTRUCTION NOTES

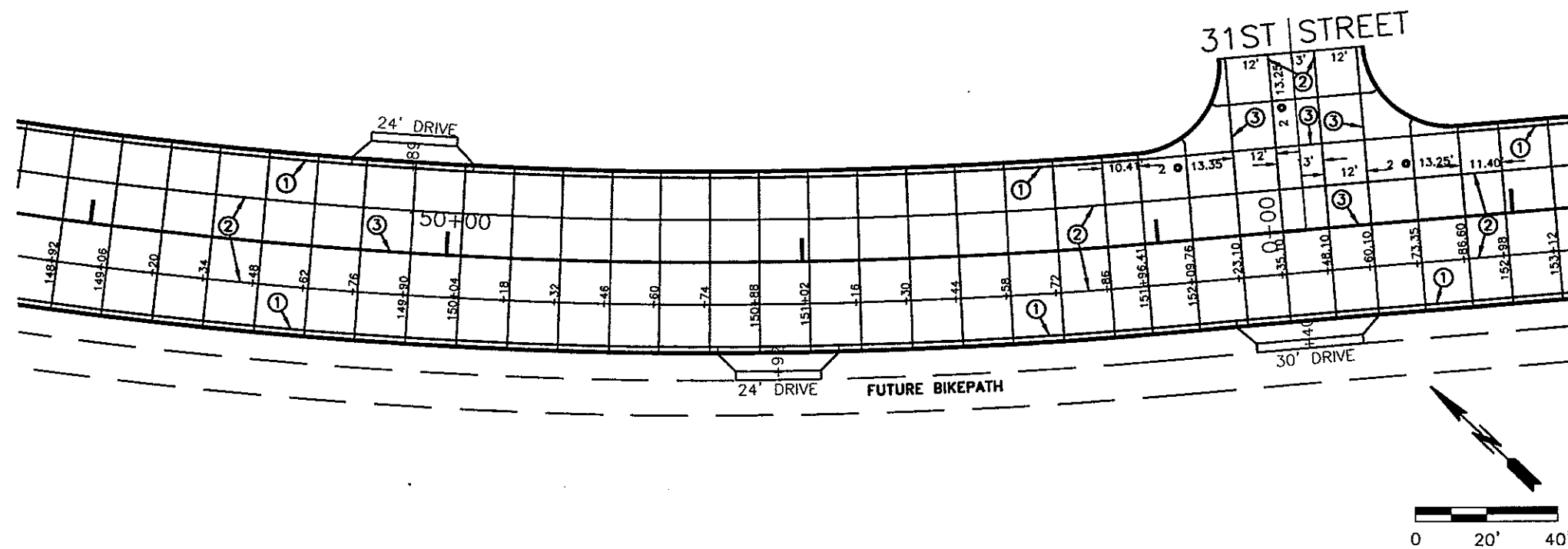
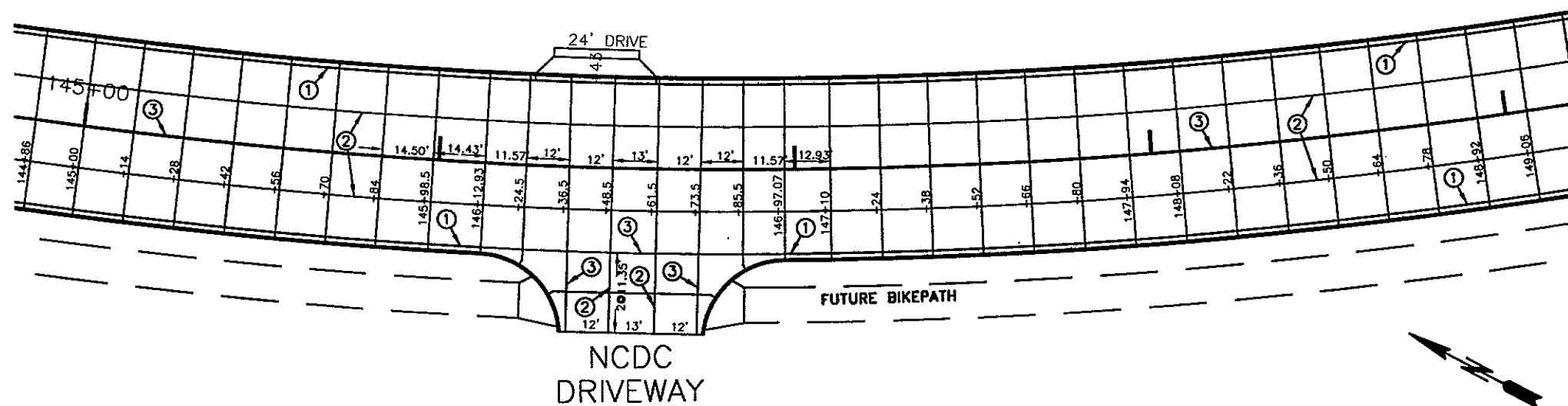
ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

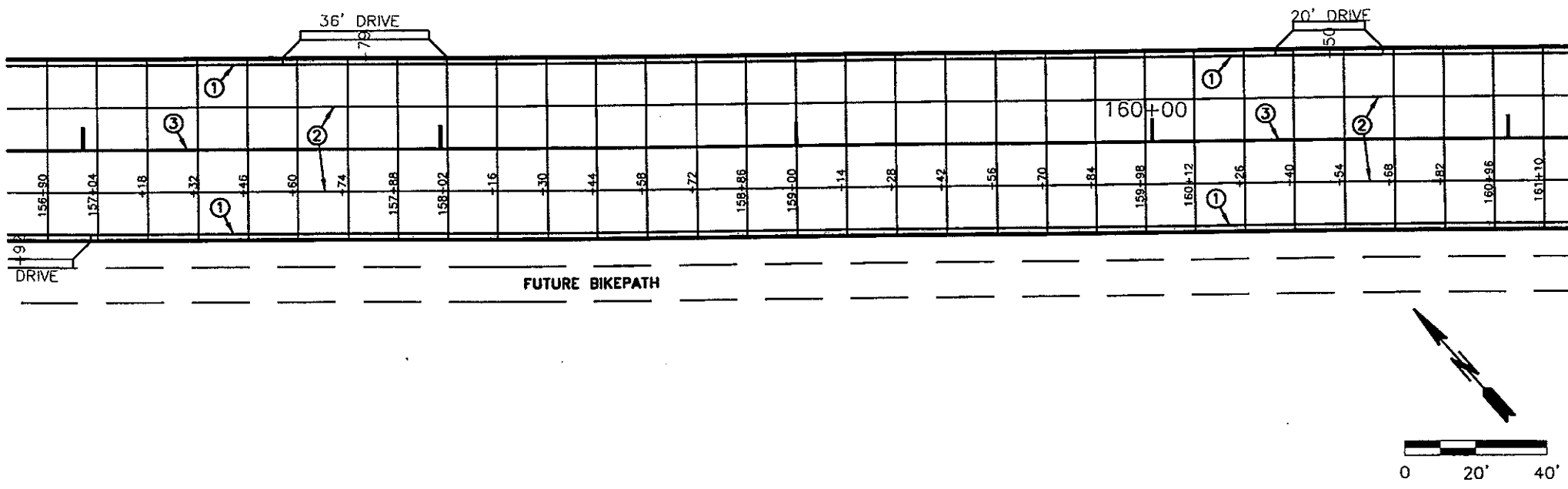
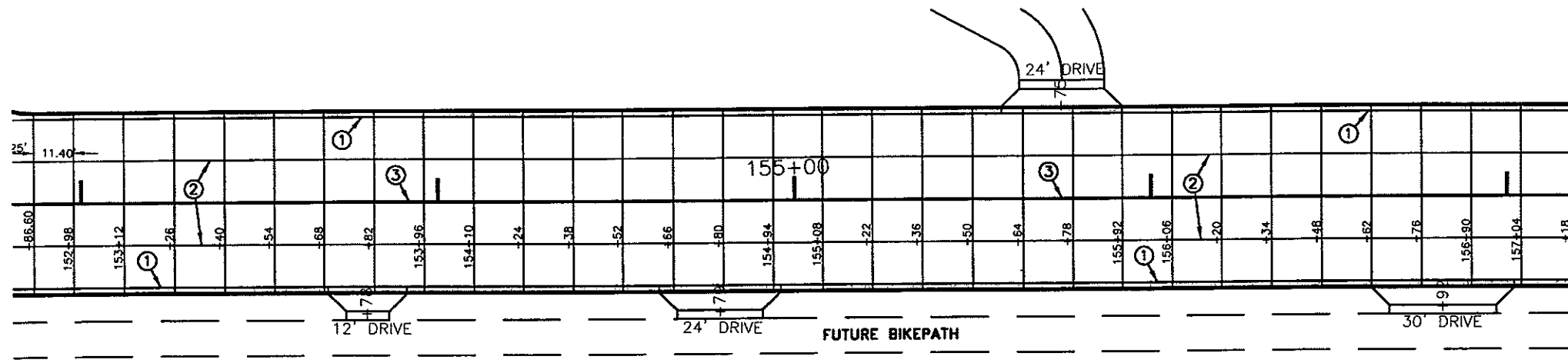
ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	76
OLD RED TRAIL STA. 153+00 TO STA. 161+00 JOINT LAYOUT		



CONSTRUCTION NOTES

ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

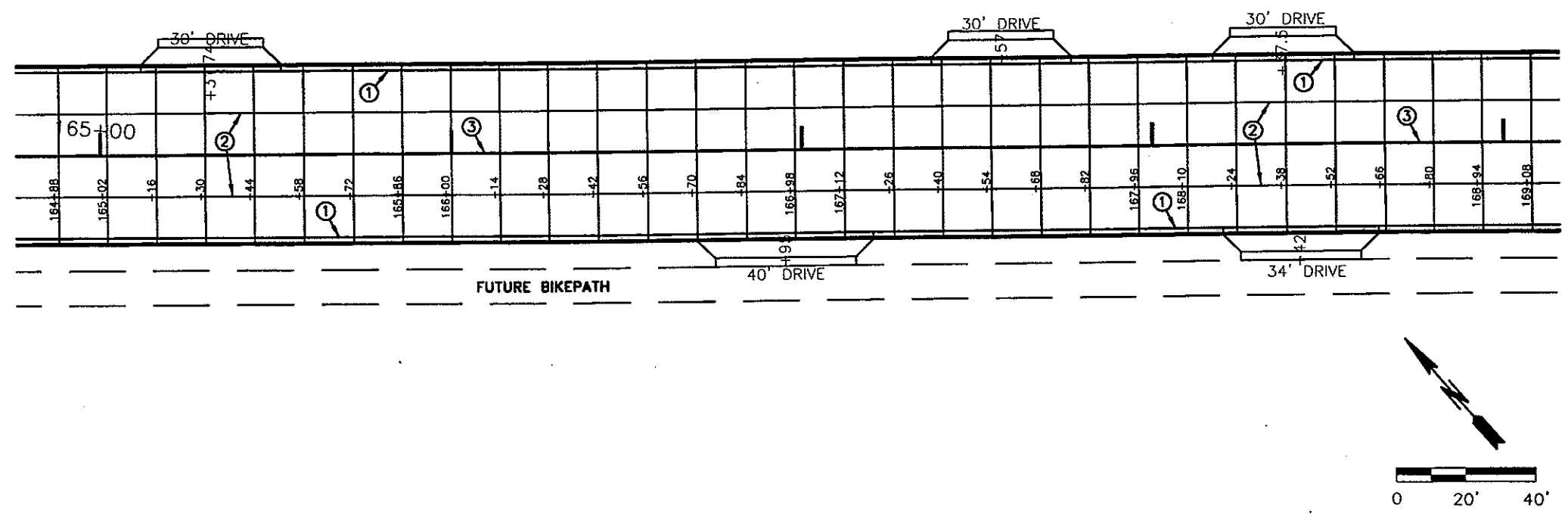
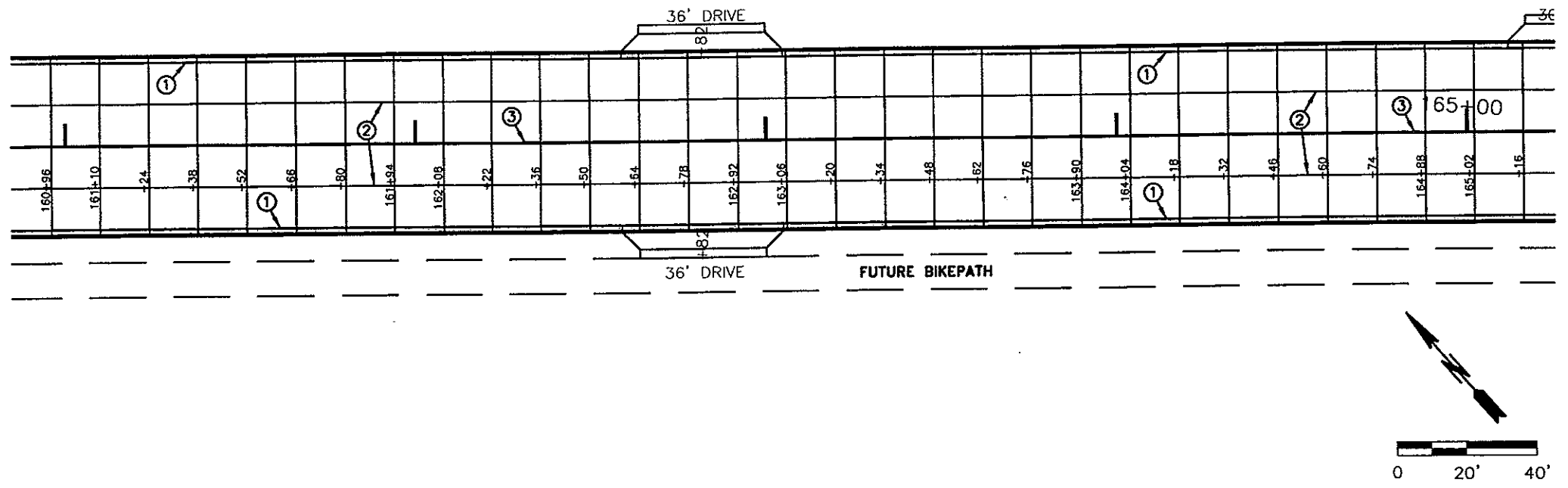
ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	77
OLD RED TRAIL STA. 161+00 TO STA. 169+00 JOINT LAYOUT		

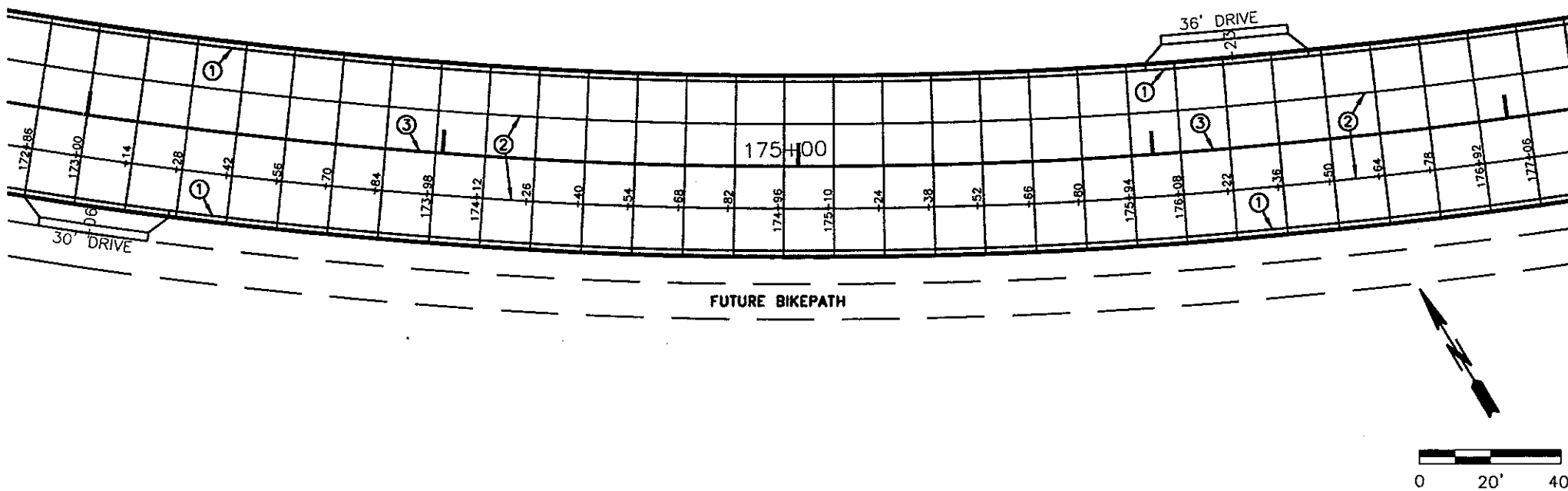
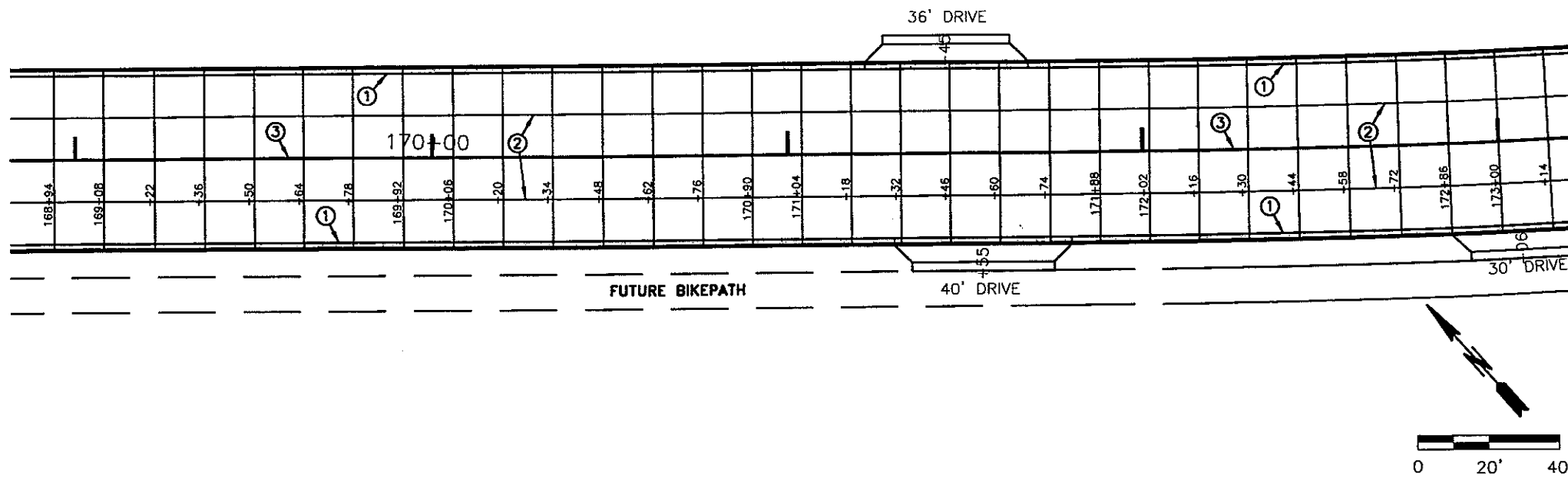
CONSTRUCTION NOTES

- ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.
- ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.
- ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.
- ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.
- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
 - ② SEE STANDARD DRAWING D-550-2
 - ③ KEYED JOINT SILICONE SEAL



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	78
OLD RED TRAIL STA. 169+00 TO STA. 177+00 JOINT LAYOUT		



CONSTRUCTION NOTES

ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWS TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	79
OLD RED TRAIL STA. 177+00 TO STA. 185+00 JOINT LAYOUT		

CONSTRUCTION NOTES

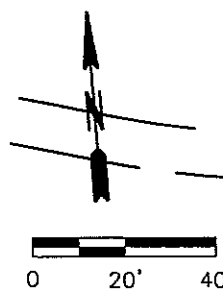
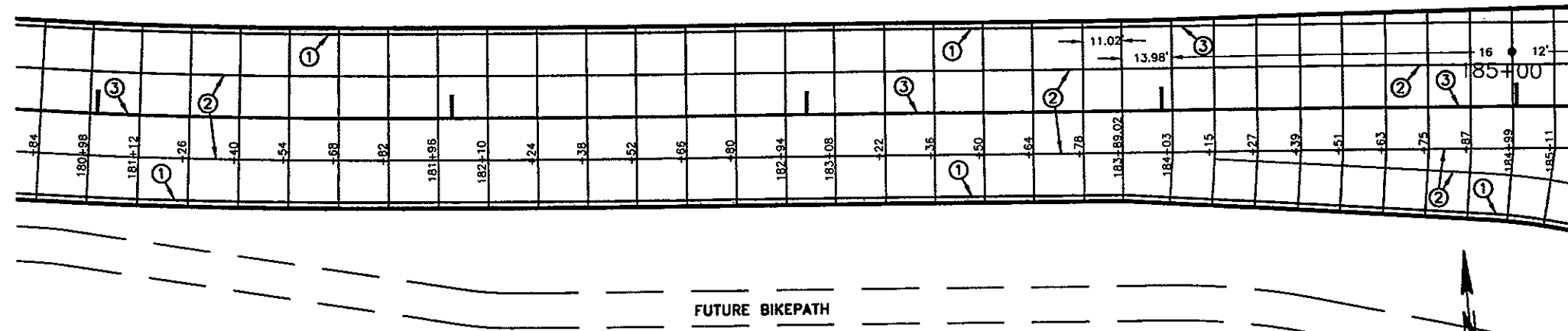
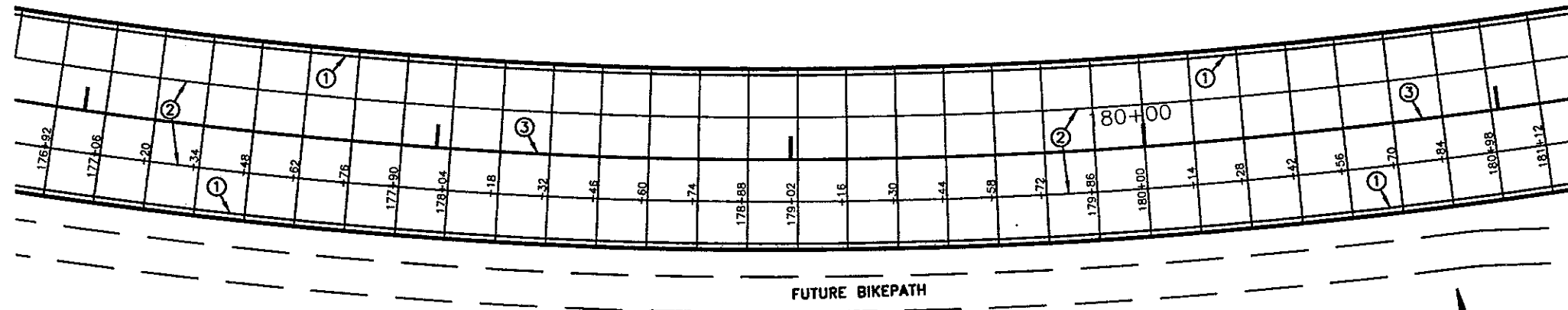
ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWS TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT POURED ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	80
OLD RED TRAIL STA. 185+00 TO STA. 189+00 JOINT LAYOUT		

CONSTRUCTION NOTES

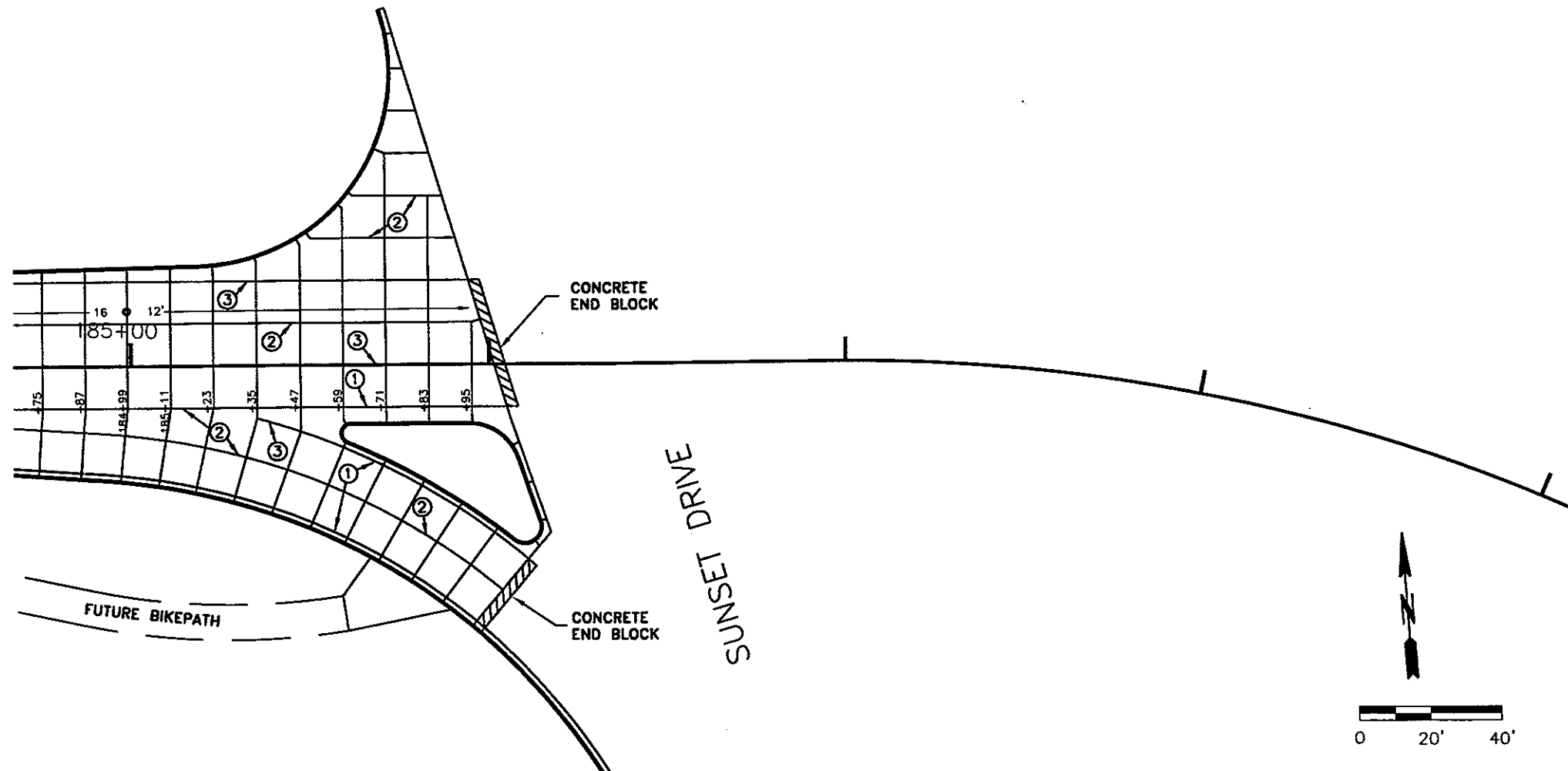
ALL LONGITUDINAL UNTIED JOINTS ON THIS PROJECT SHALL BE SEALED WITH SILICONE SEAL.

ALL TRANSVERSE CONTRACTION JOINTS SHALL BE SAWED TO A DEPTH OF TWO AND ONE-QUARTER (2-1/4) INCHES BY ONE-EIGHTH (1/8) INCH WIDE AND LEFT UNSEALED. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

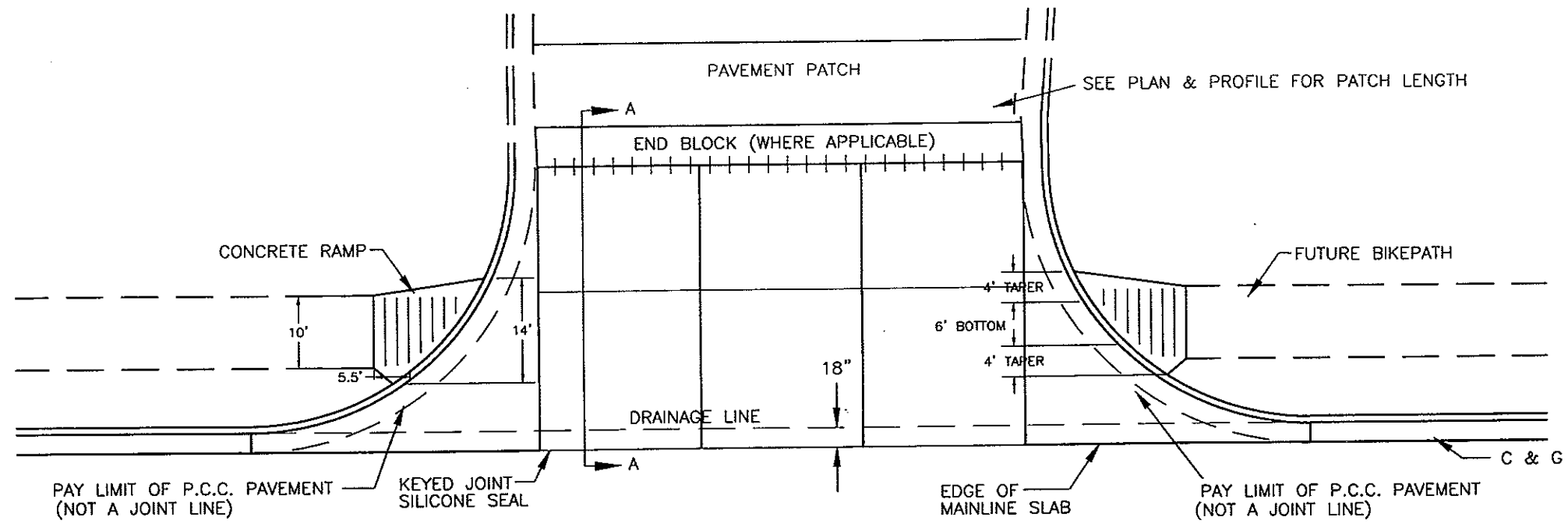
ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 836.02B OF THE STANDARD SPECIFICATIONS.

ALL TIED LONGITUDINAL JOINTS ON THIS PROJECT SHALL BE SEALED WITH HOT Poured ELASTIC SEAL. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE 8" NON-REINFORCED CONCRETE PAVEMENT.

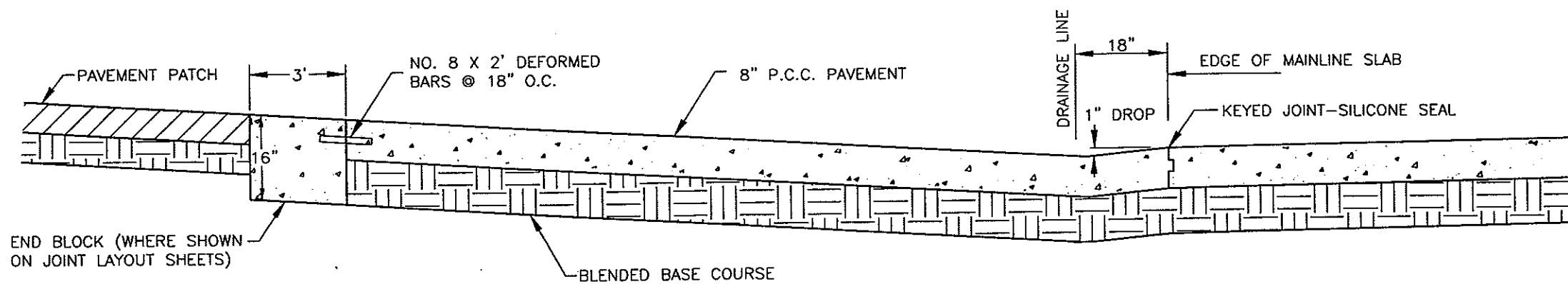
- ① NO 3 X 1'-6" TIE BARS AT 3.5' O.C.
- ② SEE STANDARD DRAWING D-550-2
- ③ KEYED JOINT SILICONE SEAL



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	81
OLD RED TRAIL TYPICAL INTERSECTION PAVEMENT DETAIL		



PLAN



SECTION A-A

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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	82
OLD RED TRAIL CONSTRUCTION SIGNING		

CONSTRUCTION PHASING

ALL PHASES:

SEQUENCING OF WORK MAY BE ADJUSTED TO SUIT THE CONTRACTORS OPERATIONS IF APPROVED BY THE ENGINEER. IF IN THE OPINION OF THE CONTRACTOR, CHANGES IN TRAFFIC CONTROL LAYOUT AND/OR DIFFERENT DEVICES ARE REQUIRED, THE PROPOSED CHANGES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, BEFORE INSTALLATION. CHANGES NOT APPROVED PRIOR TO IMPLEMENTATION MAY OR MAY NOT BE CONSIDERED FOR COMPENSATION.

ALL EXISTING SIGNING ON THE DETOUR ROUTES THAT CONTRADICT, OR DO NOT APPLY TO THE CONSTRUCTION SIGNING SHALL BE COVERED OR REMOVED DURING THE TIME THE CONSTRUCTION SIGNING IS IN EFFECT.

EACH CONSTRUCTION SIGN SHOULD BE ERECTED IN THE ORIENTATION SHOWN ON THE PLANS IF PRACTICAL.

THE W20-7A-48 (FLAGGER SYMBOL) SIGNS SHALL BE USED WHENEVER FLAGGERS ARE BEING USED. ONE SIGN SHALL BE PLACED FOR EACH ONCOMING LANE (ACCORDING TO THE MUTCD) AND SHALL BE REMOVED WHEN FLAGGERS ARE NOT BEING USED.

PHASE 1

PHASE 1 CONSISTS OF CONSTRUCTING THE STORM SEWER OUTFALL PIPING TO A POINT LEFT OF CENTERLINE (STA. 176-177) WITH THE APPROPRIATE SIGNING AND FLAGGING TO MAINTAIN 1 LANE - 2 WAY TRAFFIC FOR SHORT PERIODS OF TIME. ONCE THE OUTFALL PIPING IS INSTALLED, THE EXCAVATION SHALL BE BACKFILLED AND GRAVEL SURFACING SHALL BE PLACED.

THIS PHASE ALSO INCLUDES MAINTAINING TRAFFIC ON THE LEFT OF THE EXISTING ROADWAY WHILE THE CURB AND GUTTER IS REMOVED AND BACKFILLED WITH GRAVEL SURFACING FROM STA. 175+00± RT. TO 186+00± RT. FROM STA 179+00 RT. TO 186+00 RT., AN ADDITIONAL 2 FT. BEHIND THE CURB SHALL BE EXCAVATED AND BACKFILLED WITH GRAVEL SURFACING. THE PAVEMENT WILL ALSO BE WIDENED FROM STA. 145+00± RT. TO STA. 171+00± RT. TO ALLOW FOR PHASE II CONSTRUCTION. THE WIDENED SURFACE WILL CONSIST OF 6" BLENDED BASE AND A PRIME COAT. THE BLENDED BASE AND PRIME COAT WILL BE PAID UNDER THE RESPECTIVE BID ITEMS. ALL OTHER LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE PRICE BID PER MILE FOR "RESHAPE INSLOPE."

PHASE 2

WORK IN THIS PHASE WILL CONSIST OF UNDERGROUND UTILITY AND ROADWAY CONSTRUCTION FROM STA. 126+00 TO 186+00± OF THE NORTHBOUND LANES AND THE HILLSIDE ROAD AND 31st ST. NW TIE-INS. DURING THE UNDERGROUND UTILITY CONSTRUCTION, STORM SEWER LEADS WILL BE STUBBED TO THE RIGHT OF CENTERLINE WITH THE APPROPRIATE SIGNING AND FLAGGING TO MAINTAIN 1 LANE - 2 WAY TRAFFIC FOR SHORT PERIODS OF TIME.

PHASE 2 WILL ALSO INCLUDE GRADING AND BASE WORK TO THE RIGHT OF THE EXISTING ROADWAY AND STARTING THE CURB & GUTTER AND DRIVEWAY INSTALLATION NORTH OF 37th ST. NW.

TO CONSTRUCT THE HILLSIDE ROAD AND THE 31st ST. NW TIE-INS, THE APPROACHES SHALL BE WIDENED TO ONE SIDE FOR TRAFFIC MAINTENENCE WHILE CONSTRUCTING THE OTHER HALF. ONCE THIS HALF IS COMPLETE AND TRAFFIC IS PLACED ON IT, THE OTHER HALF CAN BE CONSTRUCTED.

DURING THIS PHASE, ONE OF THE TWO RIDGE MOTEL DRIVEWAYS SHALL REMAIN OPEN AT ALL TIMES. THE NEW SOUTH DRIVEWAY TO THE JEHOVAH'S WITNESSES SHALL BE CONSTRUCTED PRIOR TO CLOSING THE EXISTING DRIVEWAY FOR CONSTRUCTION.

PHASE 3

PHASE 3 CONSISTS OF TWO PARTS.

-PHASE 3A INCLUDES CONSTRUCTING THE SOUTHBOUND LANES FROM STA. 122+36 TO 128+00± AND THE HIGHLAND ROAD REALIGNMENT.

-PHASE 3B INCLUDES CONSTRUCTING THE NORTHBOUND LANES FROM STA. 122+36 TO 126+00±.

DURING THIS CONSTRUCTION, THE 37th ST. NW TIE IN AND THE REMAINING CURB AND GUTTER AND PAVING NORTH OF 37th ST. NW SHALL BE COMPLETED.

OLD RED TRAIL WILL BE CLOSED TO THRU TRAFFIC FROM 34th ST. NW TO 34th AVE. NW DURING PHASE 3. ONLY LOCAL (RESIDENTIAL) TRAFFIC WILL BE ALLOWED.

WORK ON PHASE 4 MAY START DURING PHASE 3 BUT THE 34th ST. NW INTERSECTION SHALL REMAIN OPEN UNTIL THE 37th ST. NW INTERSECTION IS COMPLETED AND OPENED TO TRAFFIC.

PHASE 4

PHASE 4 CONSISTS OF THE ROADWAY CONSTRUCTION FROM STA. 128+00± TO 186+00± OF THE SOUTHBOUND LANES AND THE 34th ST. NW, NYGREN DRIVE AND NORTH CENTRAL DATA COOPERATIVE(NCDC) ENTRANCE TIE-INS. THE NYGREN DRIVE AND NCDC ENTRANCE TIE-INS SHALL BE CONSTRUCTED IN THE SAME MANNER AS THE HILLSIDE ROAD AND 31st ST. NW TIE-INS.

THIS PHASE WILL ALSO CONSIST OF REMOVING THE OLD ROADWAY, INSTALLING DRIVEWAYS, AND GRADING BEHIND THE CURB ON THE LEFT SIDE NORTH OF 37th ST. NW.

DURING THIS PHASE, ONE OF THE TWO MAIN SEVEN SEAS DRIVEWAYS AND ONE OF THE TWO CONOCO GAS STATION DRIVEWAYS SHALL REMAIN OPEN AT ALL TIMES.

**DURING PAVING OPERATIONS IN ALL PHASES, IT MAY BE NECESSARY TO USE THE APPROPRIATE SIGNING AND FLAGGING TO MAINTAIN 1 LANE - 2 WAY TRAFFIC.

HILLSIDE ROAD

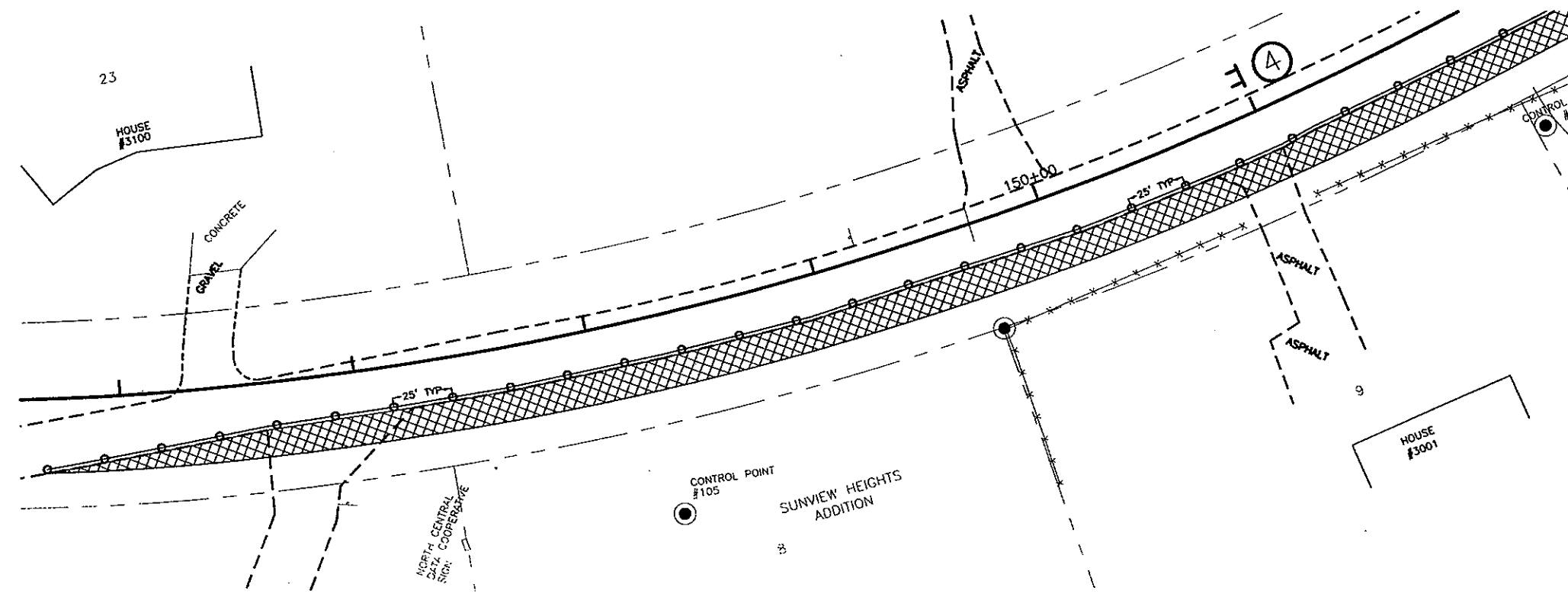
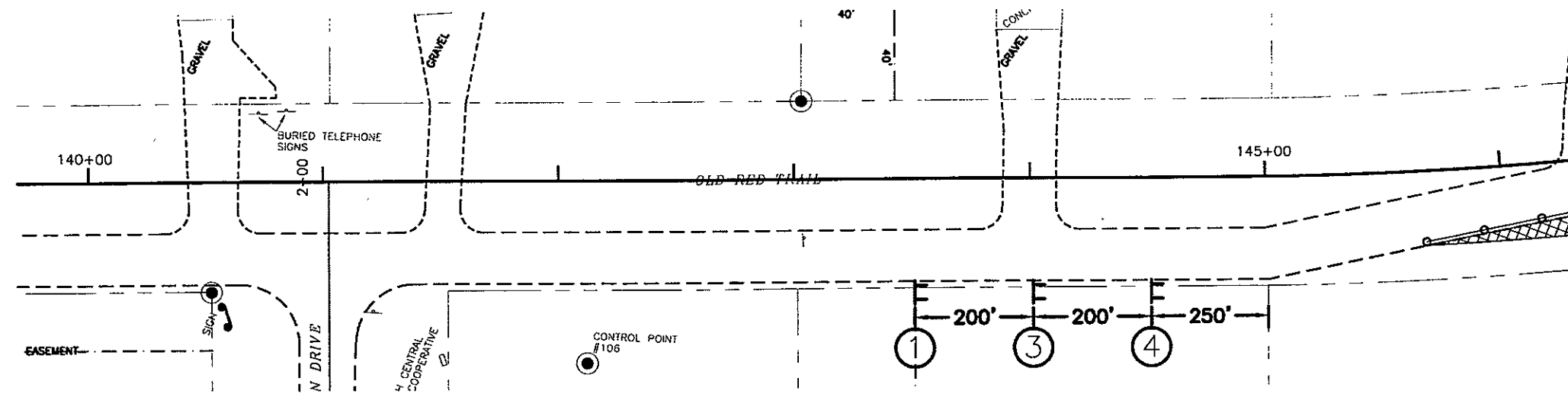
LOCAL TRAFFIC ONLY WILL BE ALLOWED ON HILLSIDE ROAD DURING THE CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST USE ALLOCATED TRAFFIC CONTROL DEVICES, PLUS OTHERS APPROVED BY THE ENGINEER, IF NEEDED, TO PROVIDE SAFETY FOR THE LOCAL DRIVERS.

FWWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	83
OLD RED TRAIL STA. 140+00 TO STA. 151+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 1

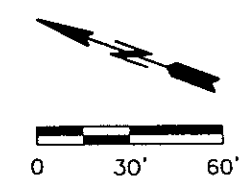
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	22
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



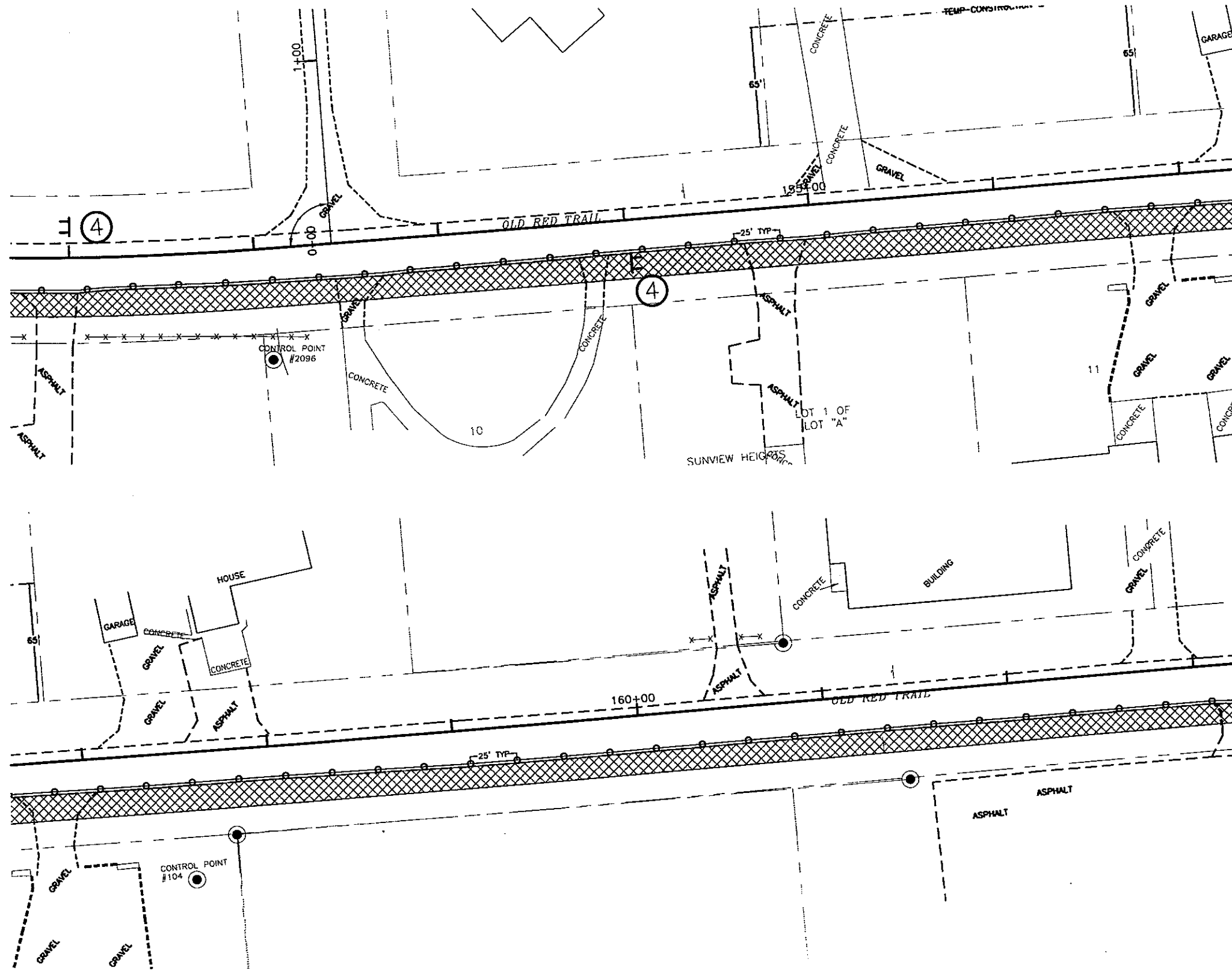
LEGEND

	PHASE 1 WORK ZONE
	TEMPORARY ROADWAY WIDENING
	DELINEATOR DRUM
	TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 1





FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	84
OLD RED TRAIL STA. 151+00 TO STA. 163+00 CONSTRUCTION SIGNING			



QUANTITIES

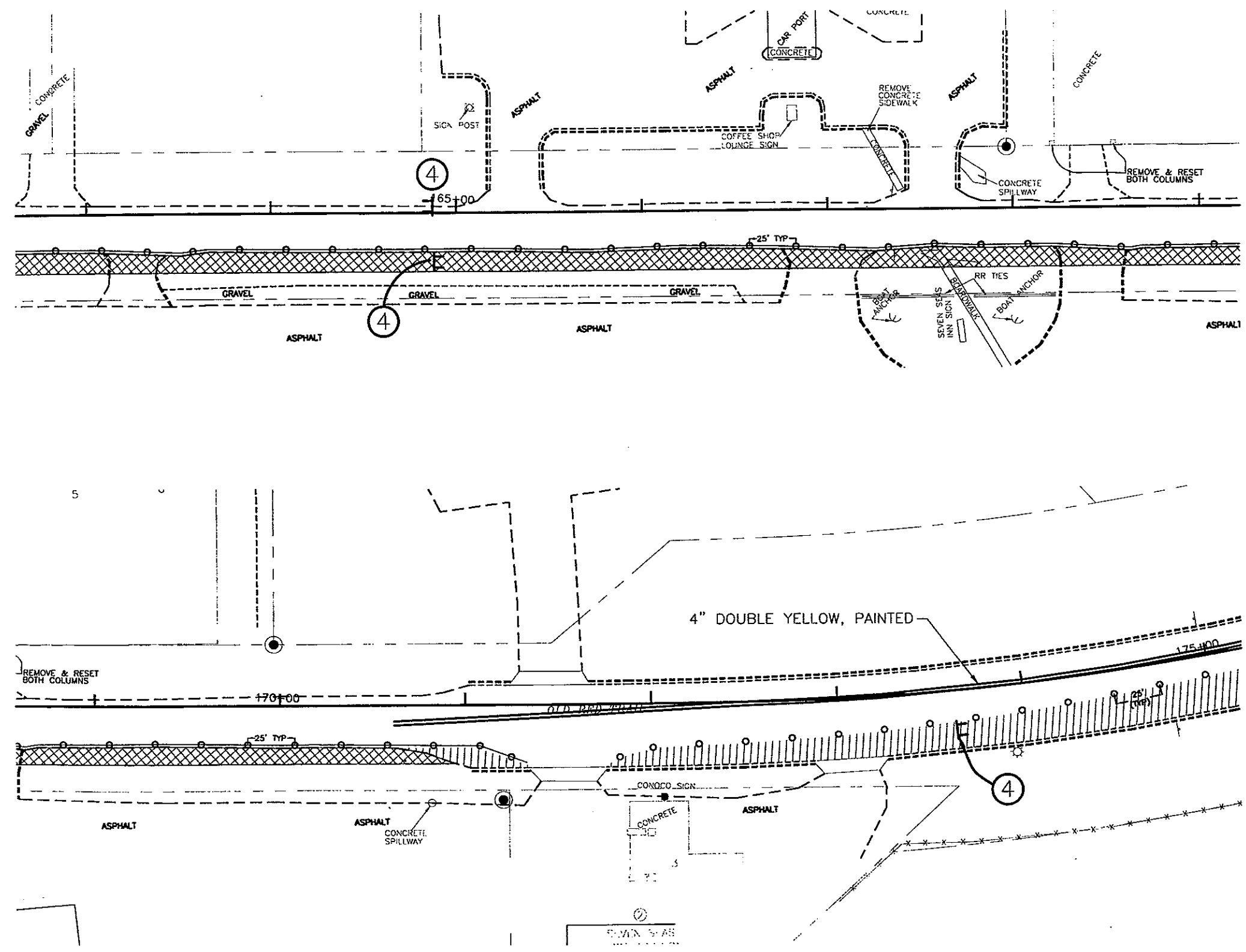
TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	48
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

-  PHASE 1 WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	85
OLD RED TRAIL STA. 163+00 TO STA. 175+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 1

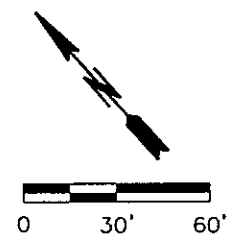


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	48
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	880 LF
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

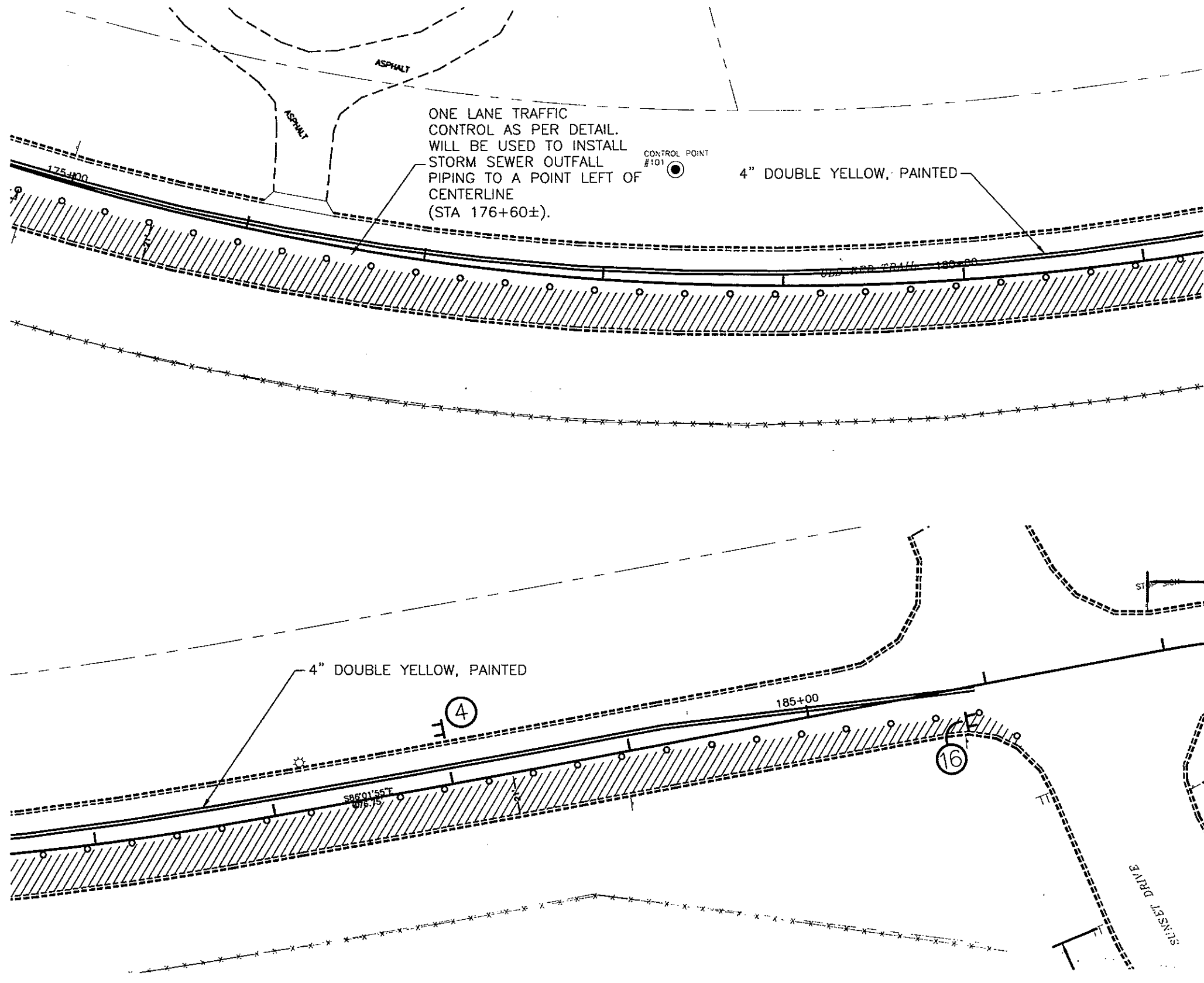
LEGEND

- PHASE 1 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 1





FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	86
OLD RED TRAIL STA. 175+00 TO STA. 187+00 CONSTRUCTION SIGNING			

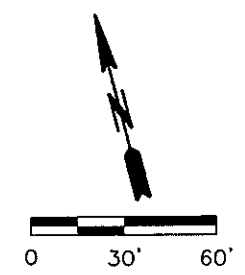


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	45
TUBULAR MARKERS	_____
PVMT MK PAINTED	_____
4 INCH LINE (YELLOW)	2390 LF
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

-  PHASE 2 WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER

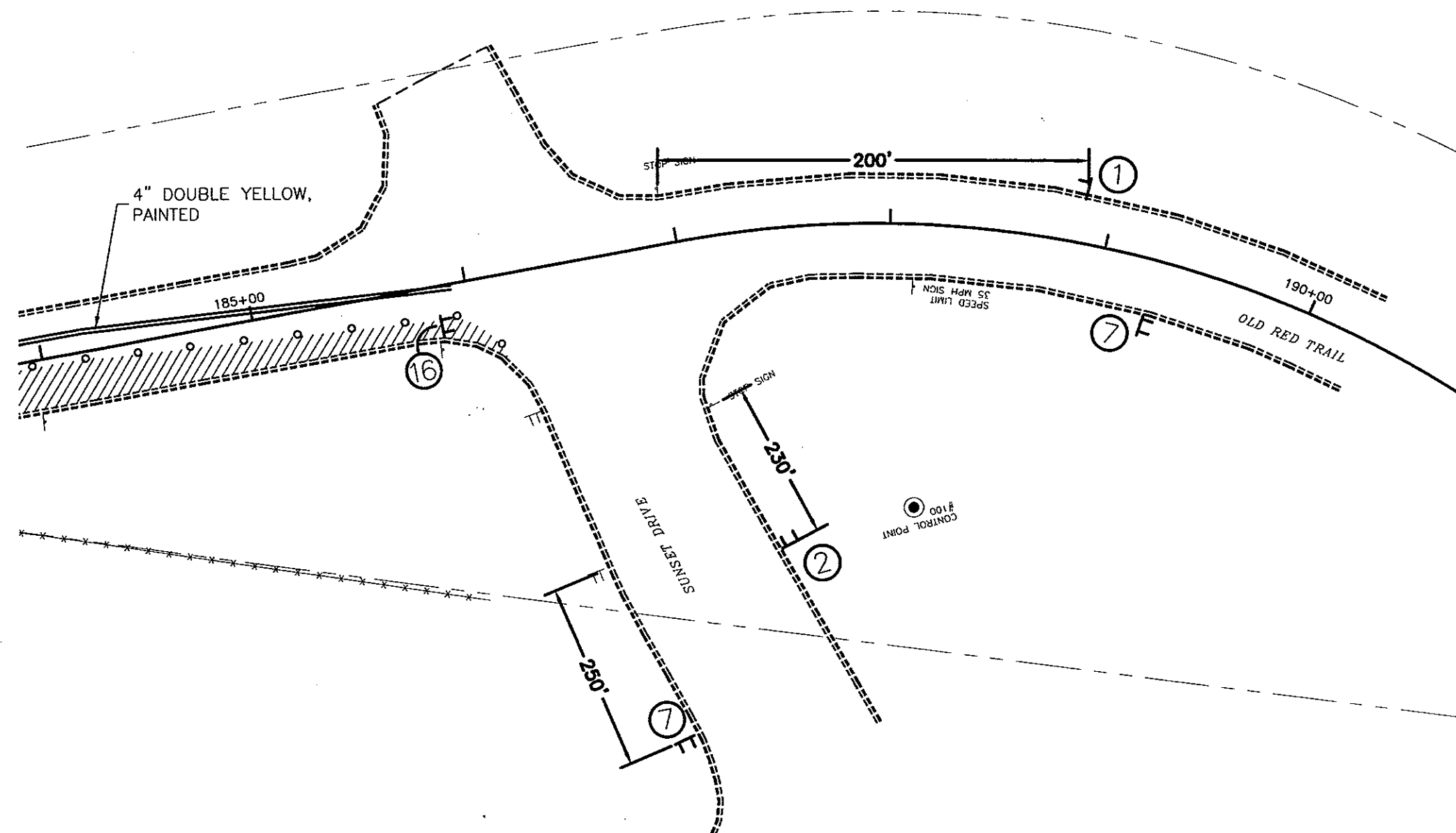


CONSTRUCTION SIGNING - PHASE 1





FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	87
OLD RED TRAIL STA. 187+00 TO STA. 191+00 CONSTRUCTION SIGNING			

QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	_____
TUBULAR MARKERS	_____
PVMT MK PAINTED	_____
4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

-  PHASE 1 WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER

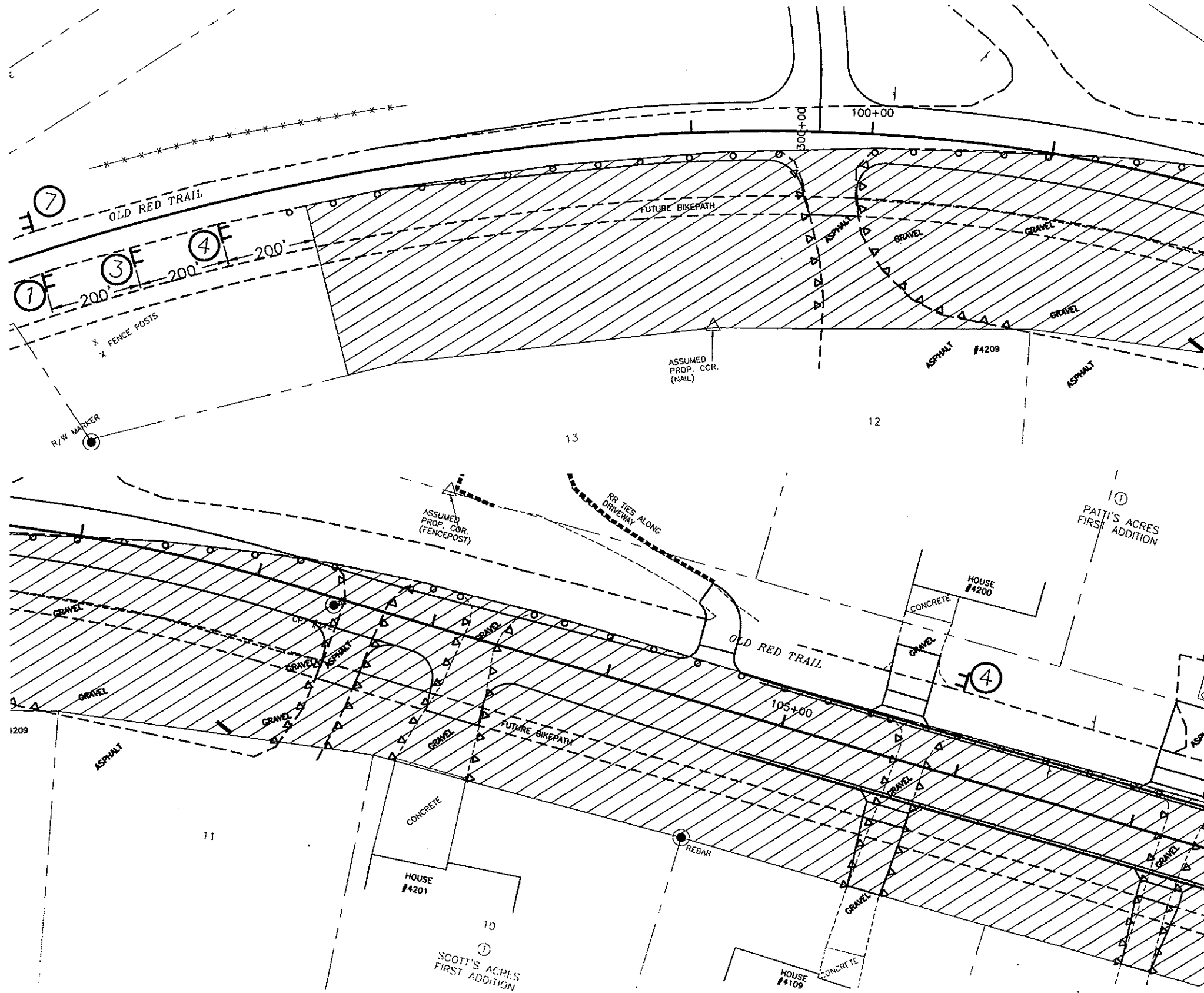


CONSTRUCTION SIGNING - PHASE 2





FIRMA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	88
OLD RED TRAIL STA. 97+00 TO STA. 107+00 CONSTRUCTION SIGNING			

QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	40
TUBULAR MARKERS	69
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

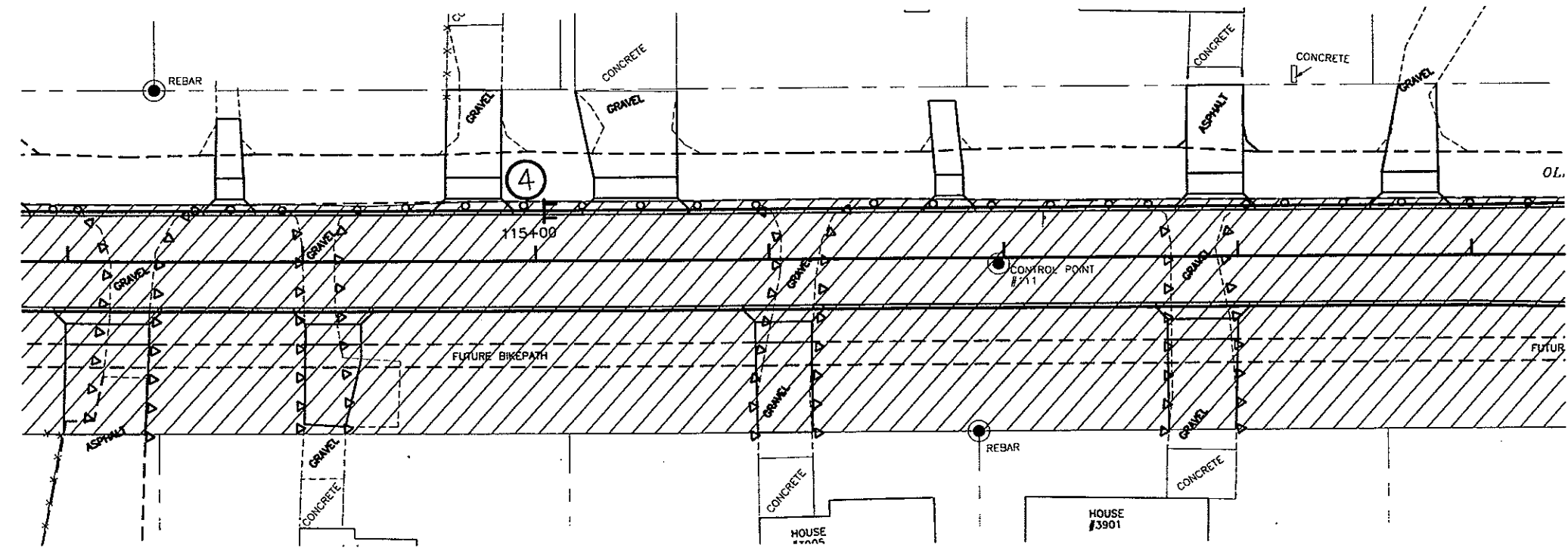
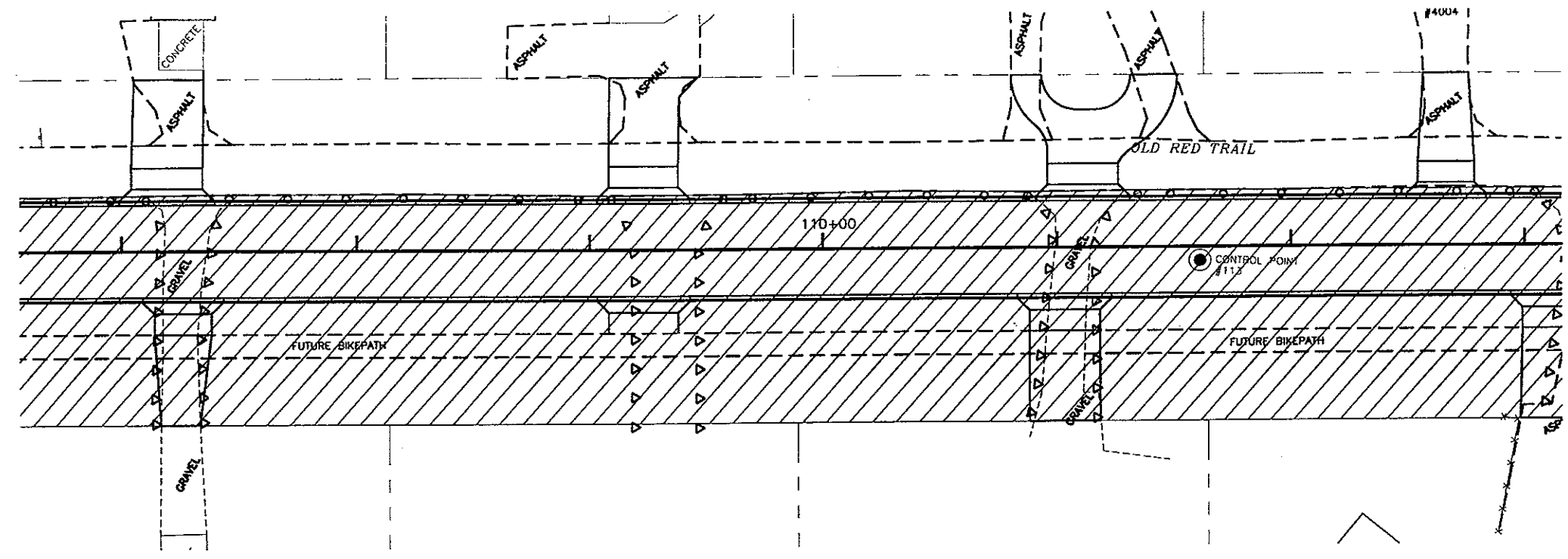


LEGEND

-  PHASE 2 WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	89
OLD RED TRAIL STA. 107+00 TO STA. 119+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 2

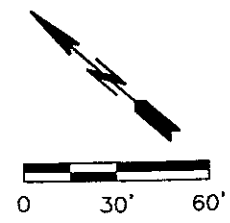


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	47
TUBULAR MARKERS	105
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

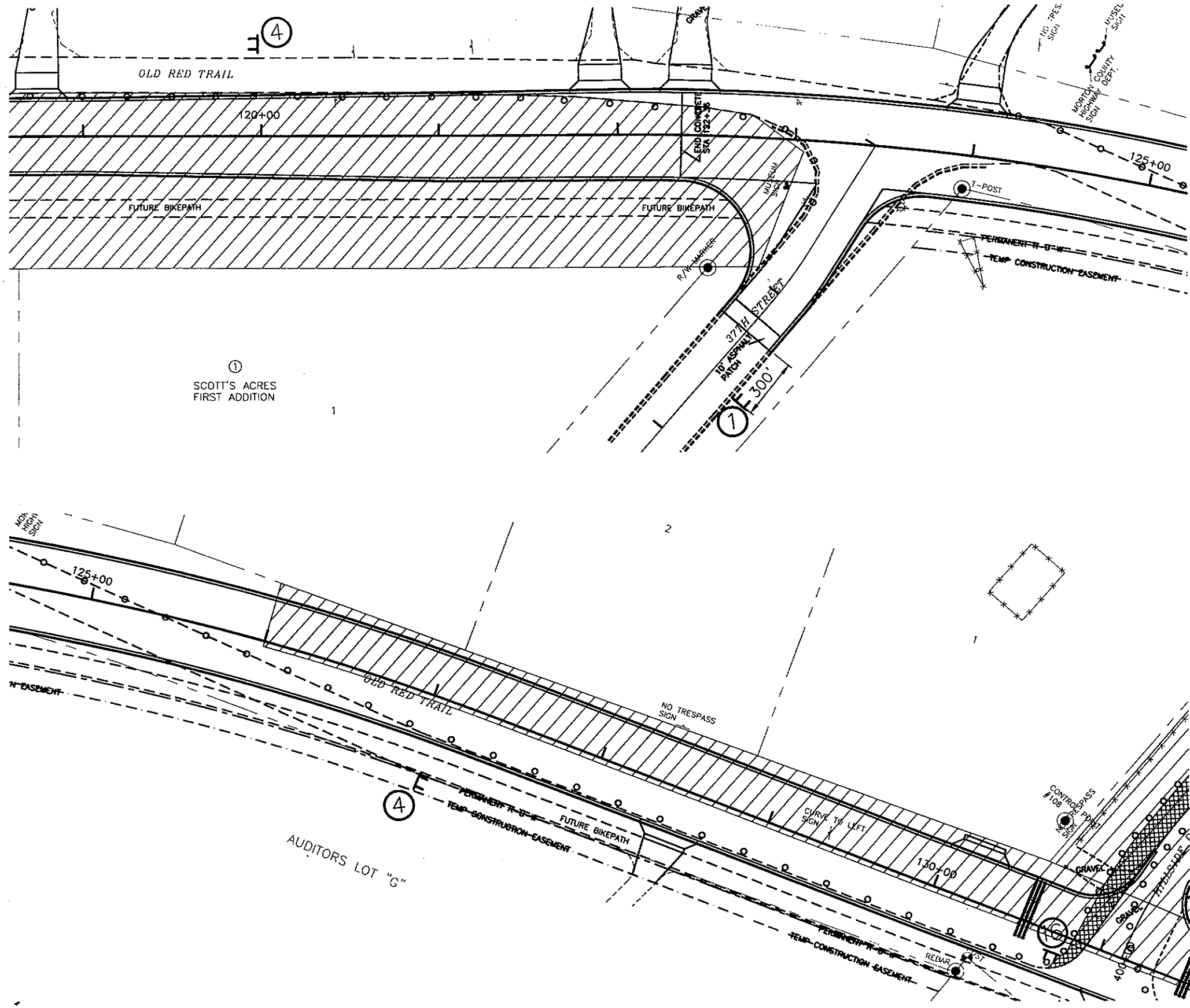
- PHASE 2 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 2

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	90
OLD RED TRAIL STA. 119+00 TO STA. 131+00 CONSTRUCTION SIGNING			

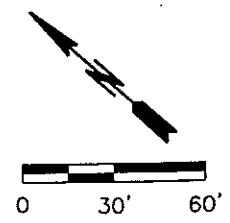


QUANTITIES

TYPE 3 BARRICADE	3
DELINEATOR DRUMS	64
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

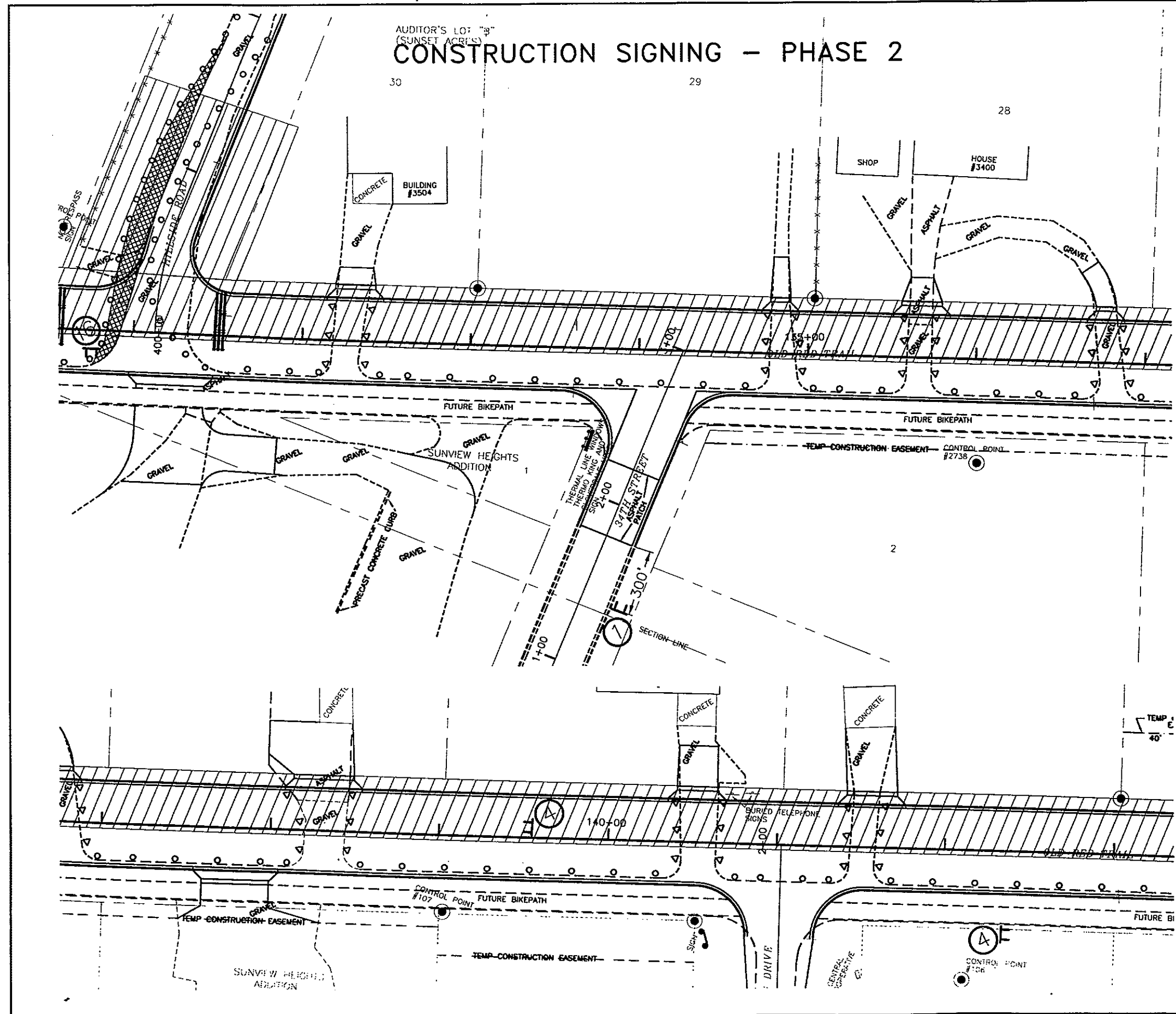
LEGEND

- PHASE 2 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	91
OLD RED TRAIL STA. 131+00 TO STA. 143+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 2

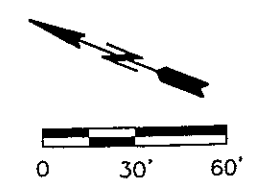


QUANTITIES

TYPE 3 BARRICADE	3
DELINEATOR DRUMS	63
TUBULAR MARKERS	42
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

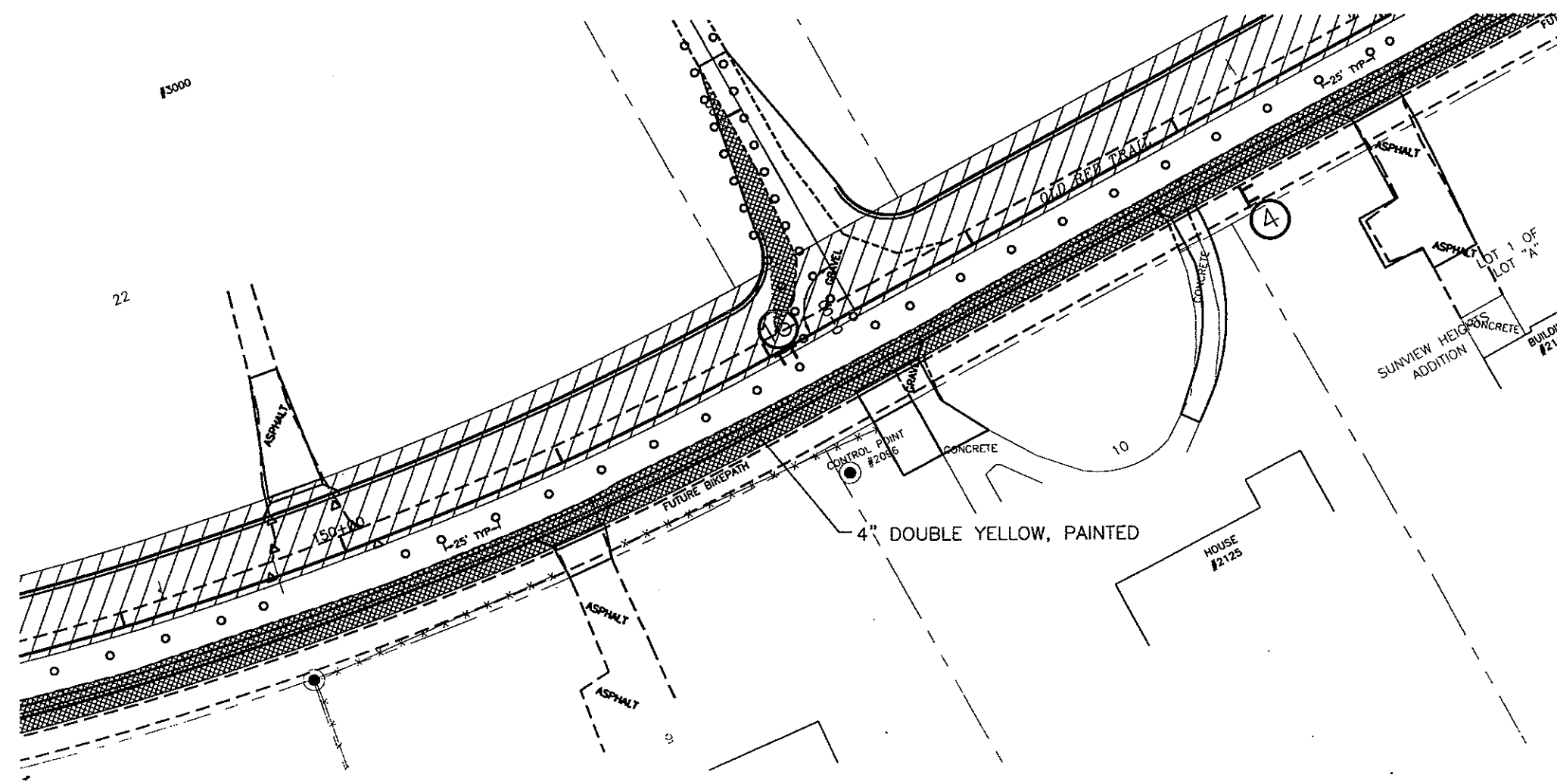
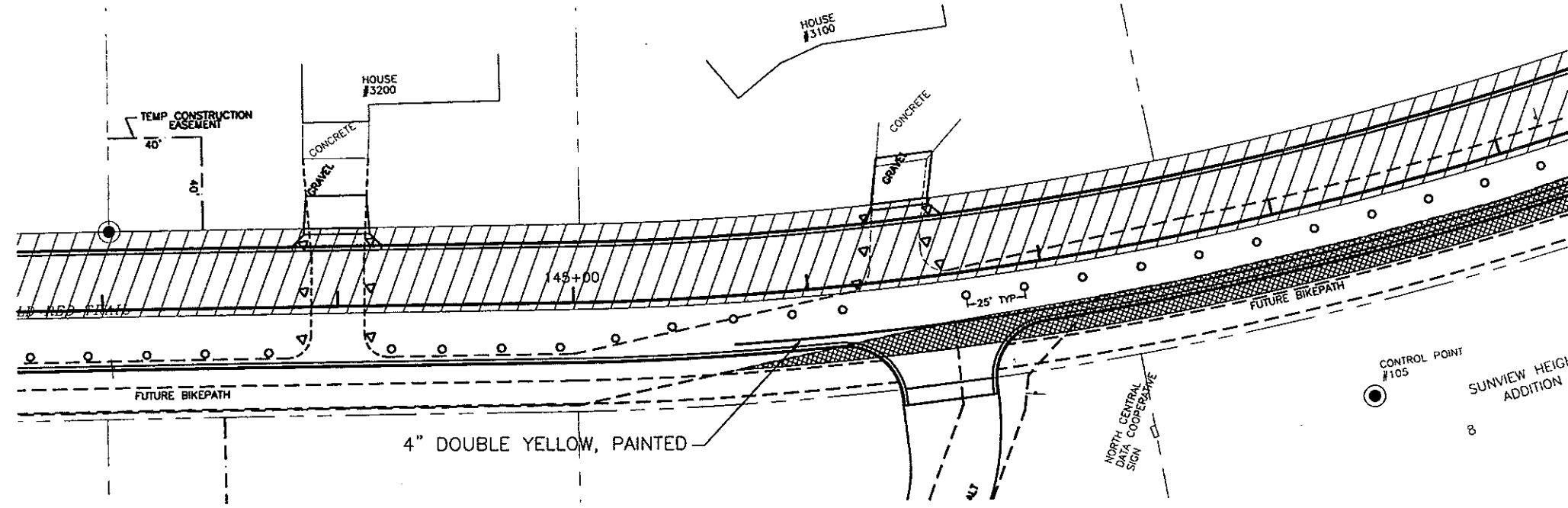
	PHASE 2 WORK ZONE
	TEMPORARY ROADWAY WIDENING
	DELINEATOR DRUM
	TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 2

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	92
OLD RED TRAIL STA. 143+00 TO STA. 154+00 CONSTRUCTION SIGNING			

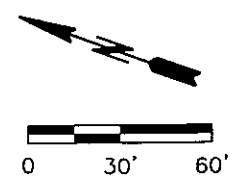


QUANTITIES

TYPE 3 BARRICADE	
DELINEATOR DRUMS	65
TUBULAR MARKERS	18
PVMT MK PAINTED 4 INCH LINE (YELLOW)	1670
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	

LEGEND

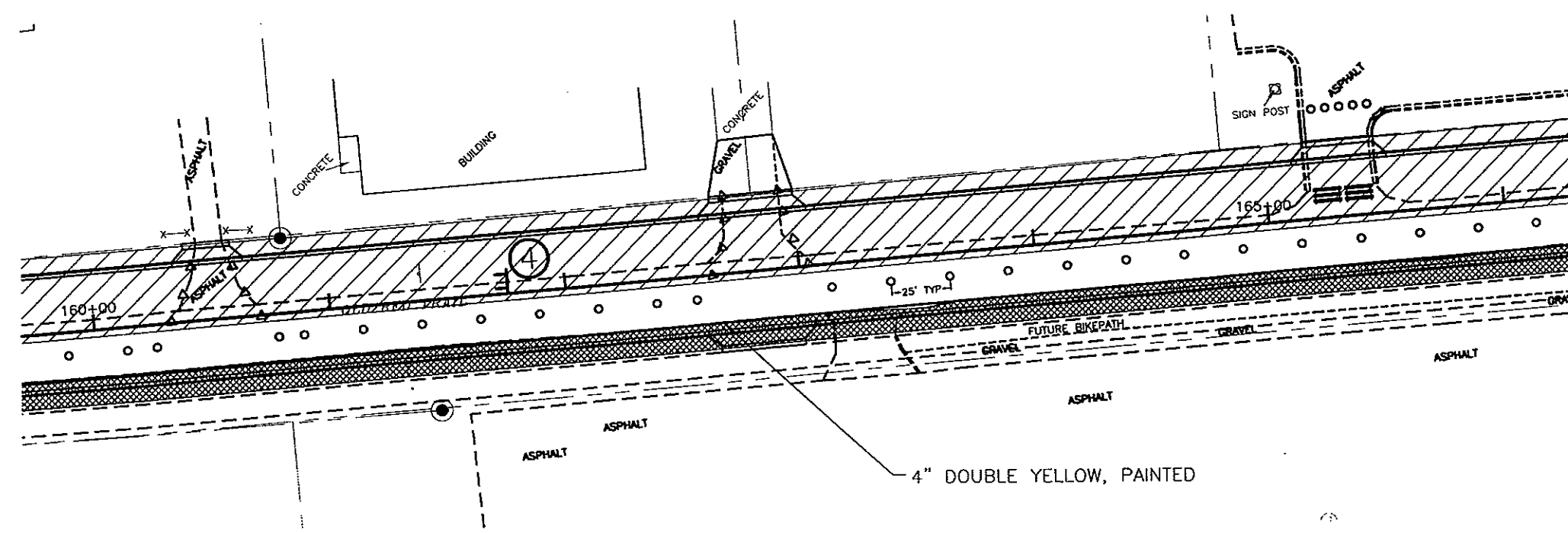
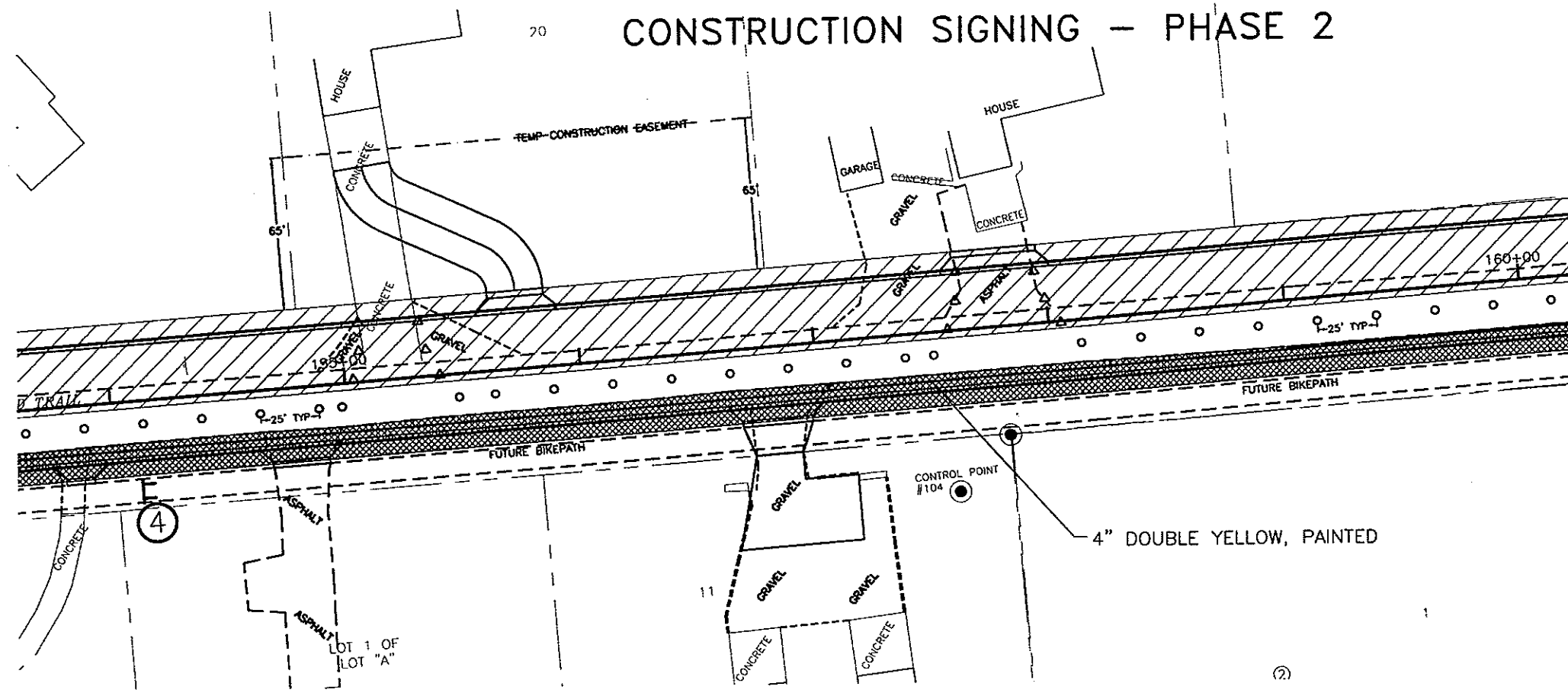
- PHASE 2 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 2

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-98B(008)019	43
OLD RED TRAIL STA. 154+00 TO STA. 166+00 CONSTRUCTION SIGNING			

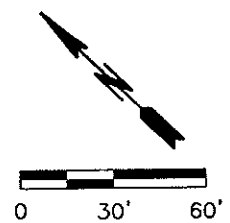


QUANTITIES

TYPE 3 BARRICADE	2
DELINEATOR DRUMS	51
TUBULAR MARKERS	26
PVMT MK PAINTED 4 INCH LINE (YELLOW)	2400 LF
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

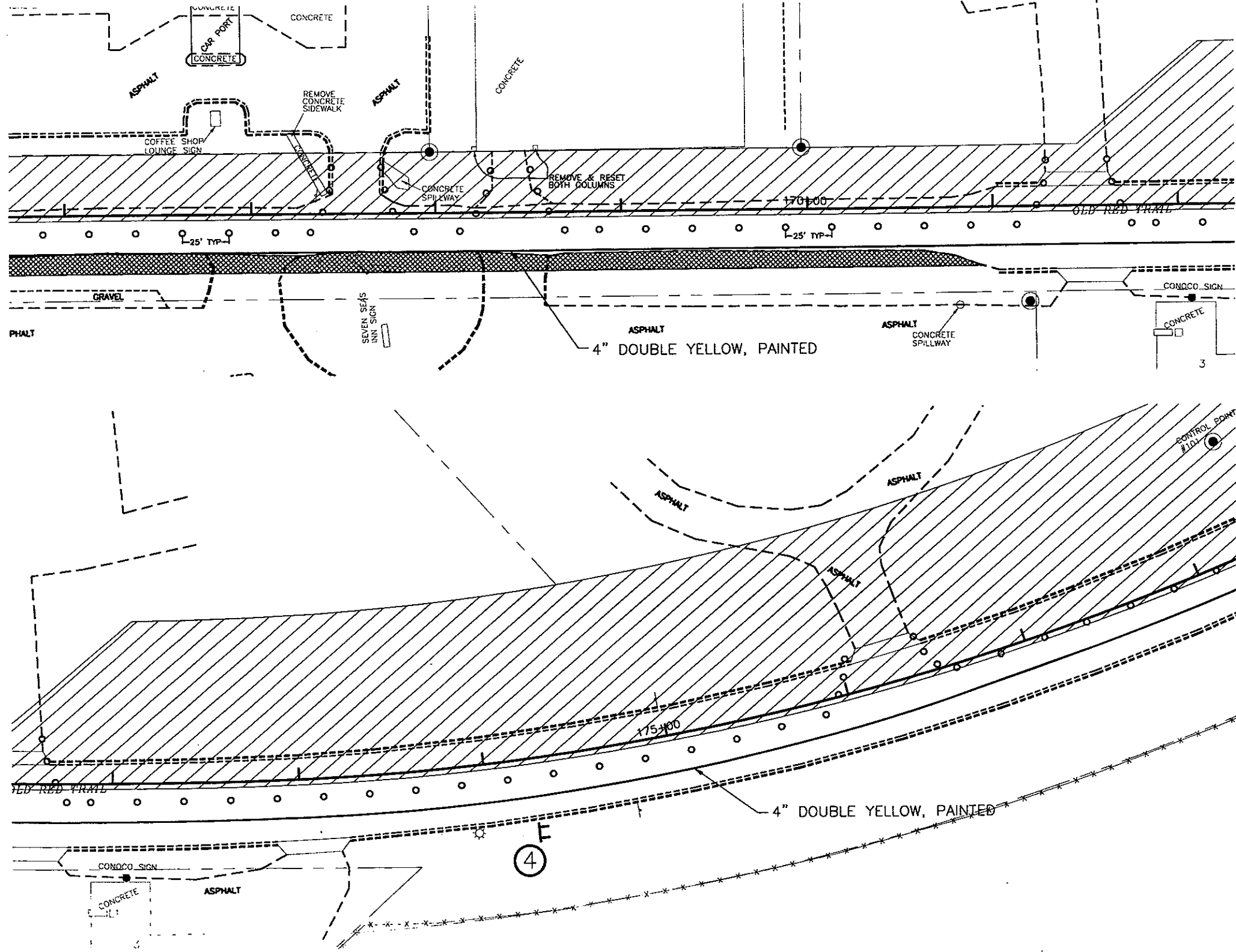
LEGEND

- PHASE 2 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 2

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	94
OLD RED TRAIL STA. 166+00 TO STA. 178+00 CONSTRUCTION SIGNING			

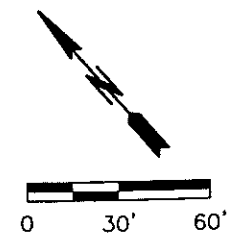


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	67
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	2400 LF
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

- PHASE 2 WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER

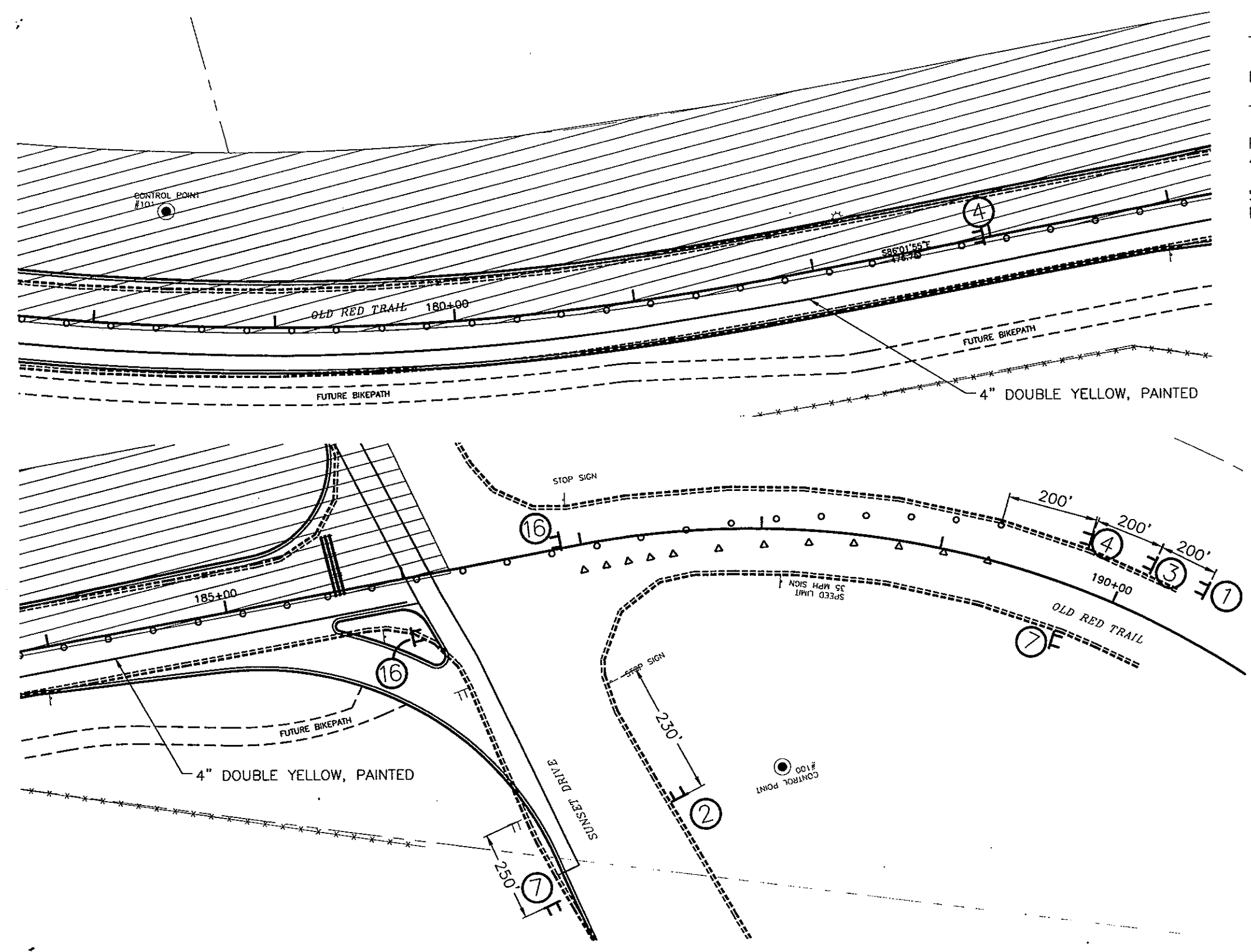


FYWA REGION	STATE	PROJECT	SHEET NO.
B	ND	SU-1-988(008)019	95
OLD RED TRAIL STA. 178+00 TO STA. 190+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 2

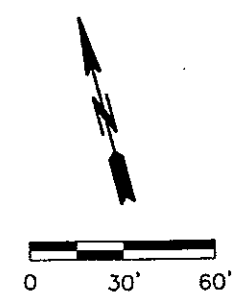
QUANTITIES

TYPE 3 BARRICADE	3
DELINEATOR DRUMS	46
TUBULAR MARKERS	12
PVMT MK PAINTED 4 INCH LINE (YELLOW)	1600 LF
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

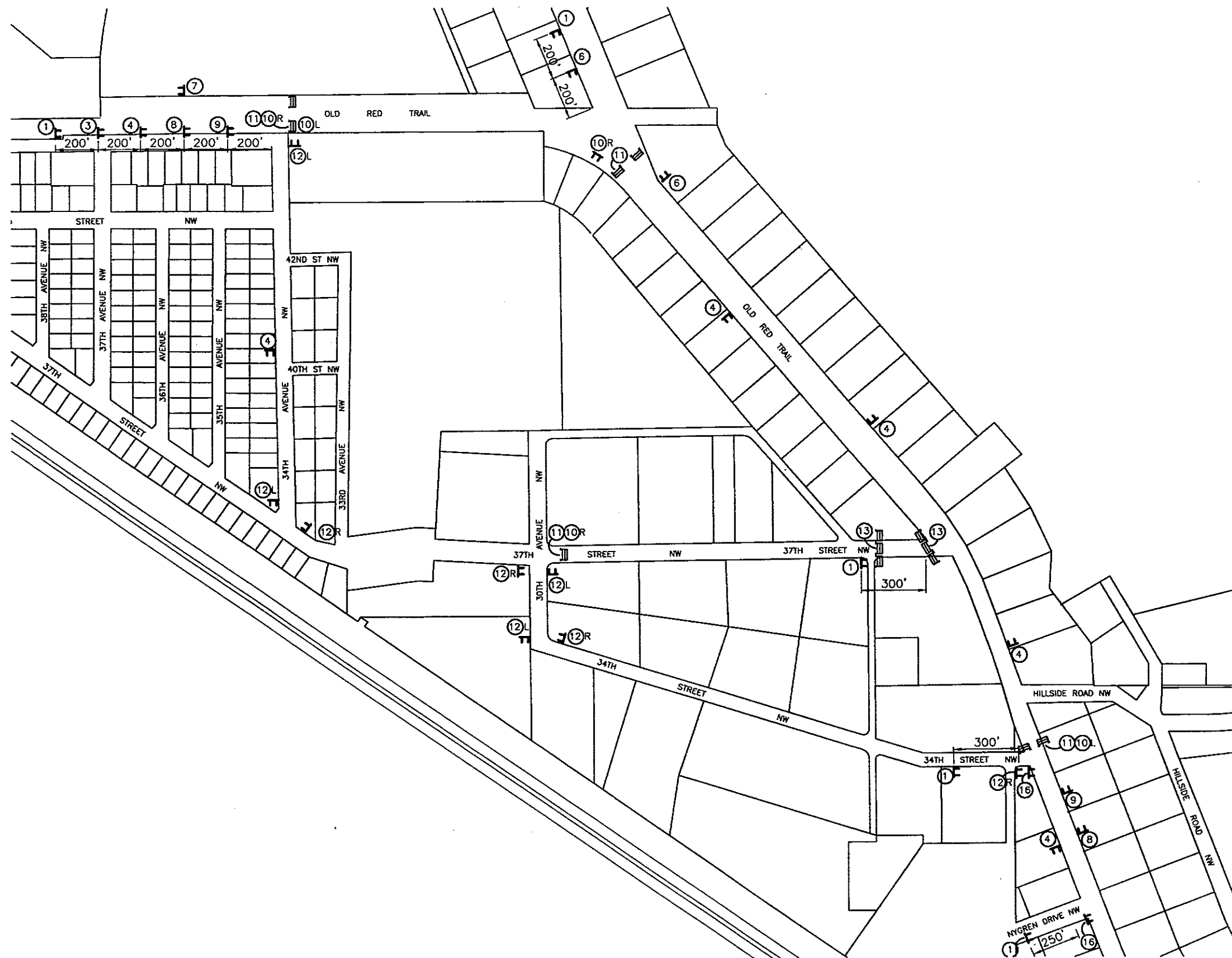
	PHASE 2 WORK ZONE
	TEMPORARY ROADWAY WIDENING
	DELINEATOR DRUM
	TUBULAR MARKER



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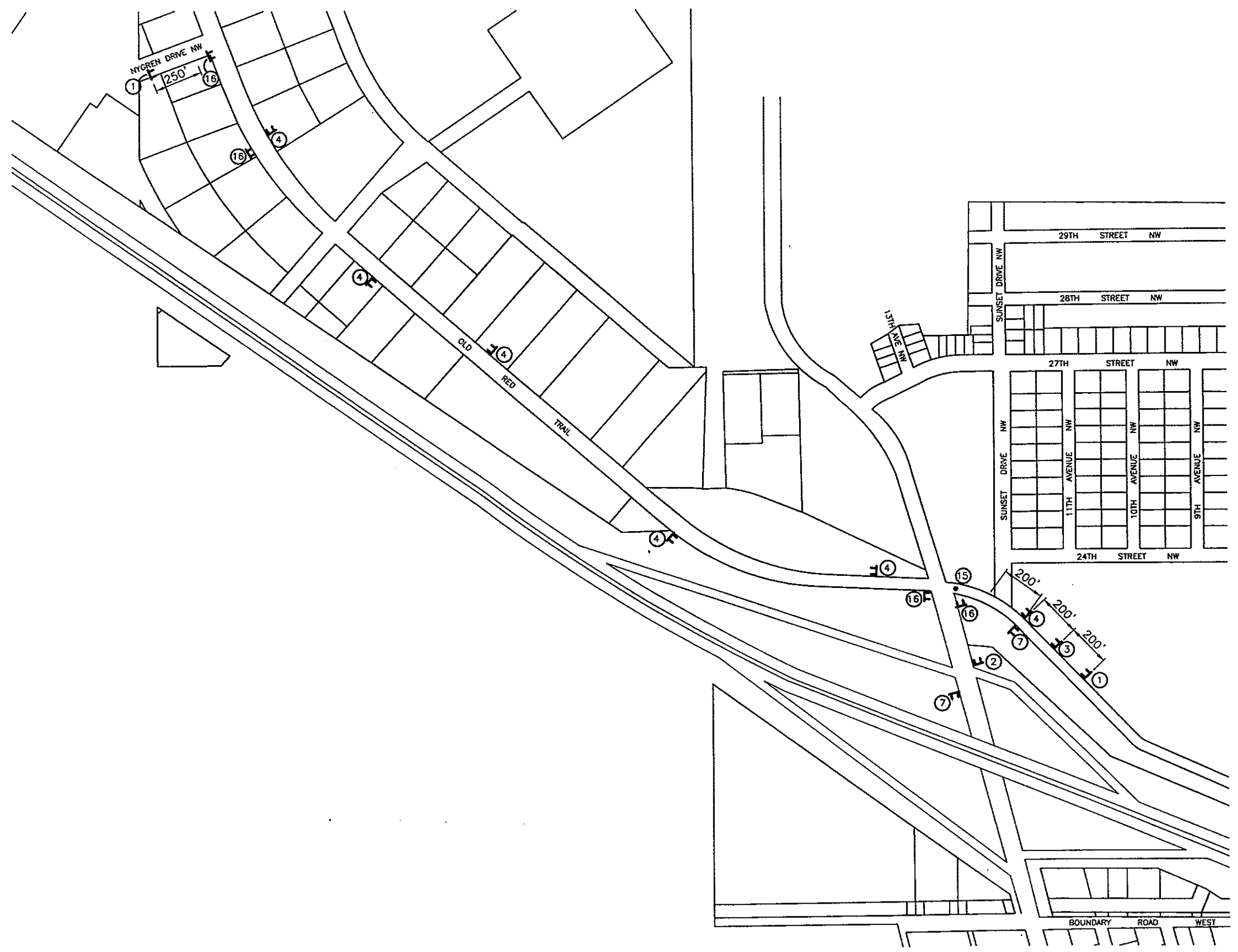
CONSTRUCTION SIGNING – PHASE 3 OVERVIEW

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	96
OLD RED TRAIL PHASE 3 OVERVIEW CONSTRUCTION SIGNING			



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	97
OLD RED TRAIL PHASE 3 OVERVIEW CONSTRUCTION SIGNING			

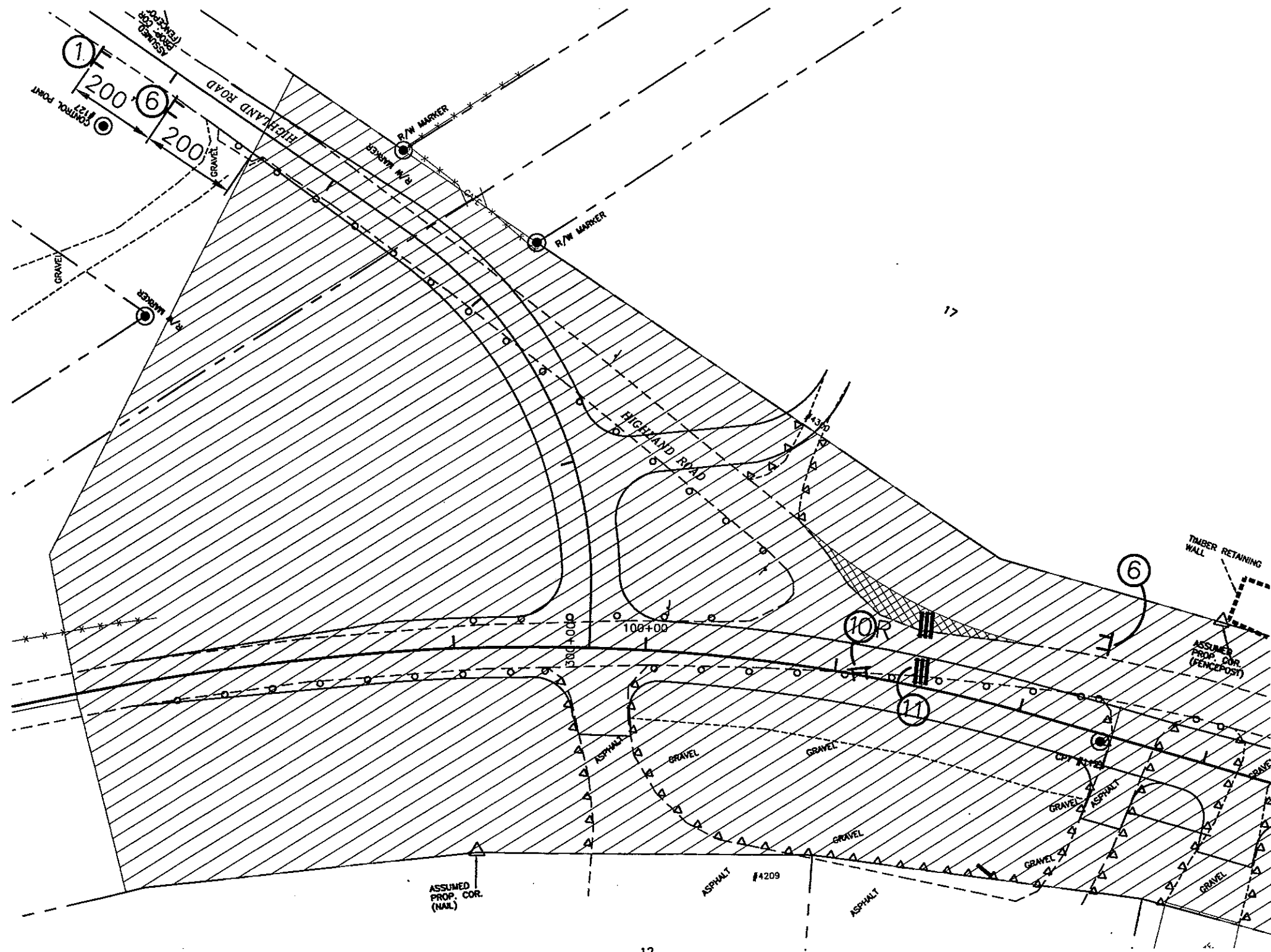
CONSTRUCTION SIGNING – PHASE 3 OVERVIEW



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CONSTRUCTION SIGNING - PHASE 3A

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	98
OLD RED TRAIL STA. 97+00 TO STA. 103+00 CONSTRUCTION SIGNING			

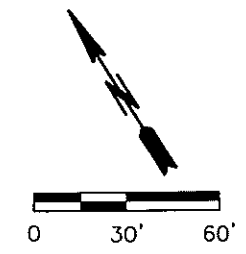


QUANTITIES

TYPE 3 BARRICADE	2
DELINEATOR DRUMS	42
TUBULAR MARKERS	56
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

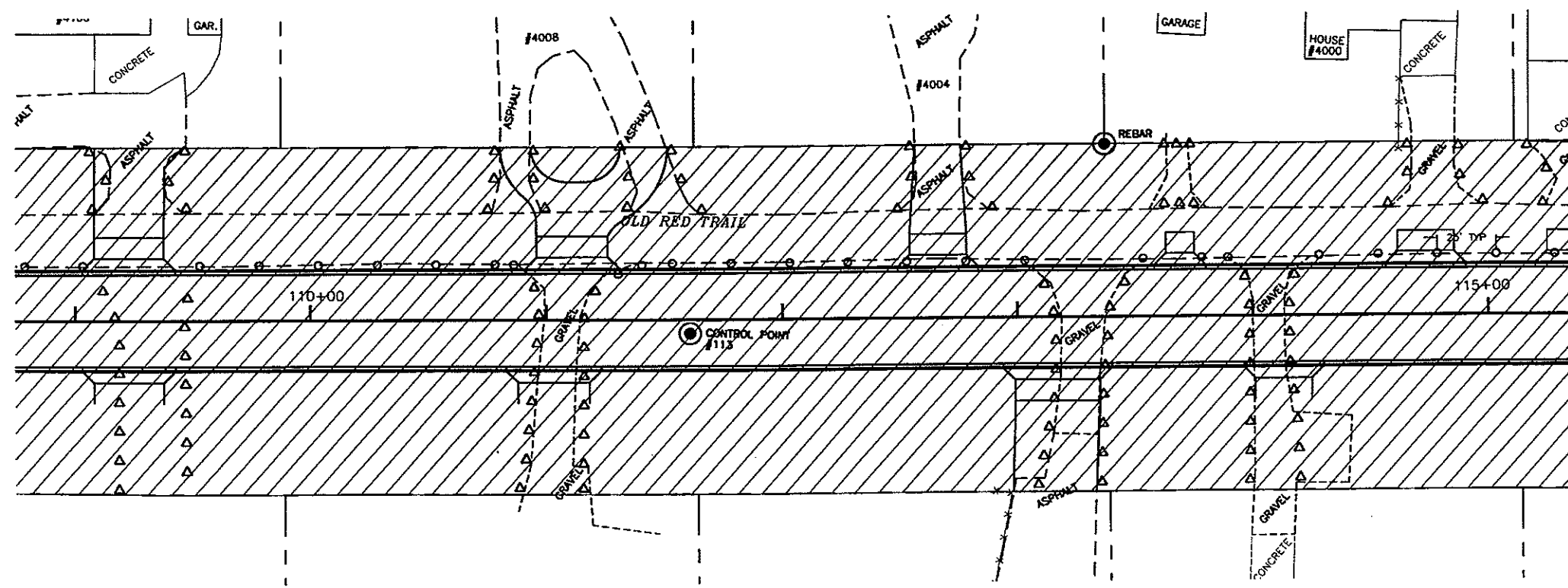
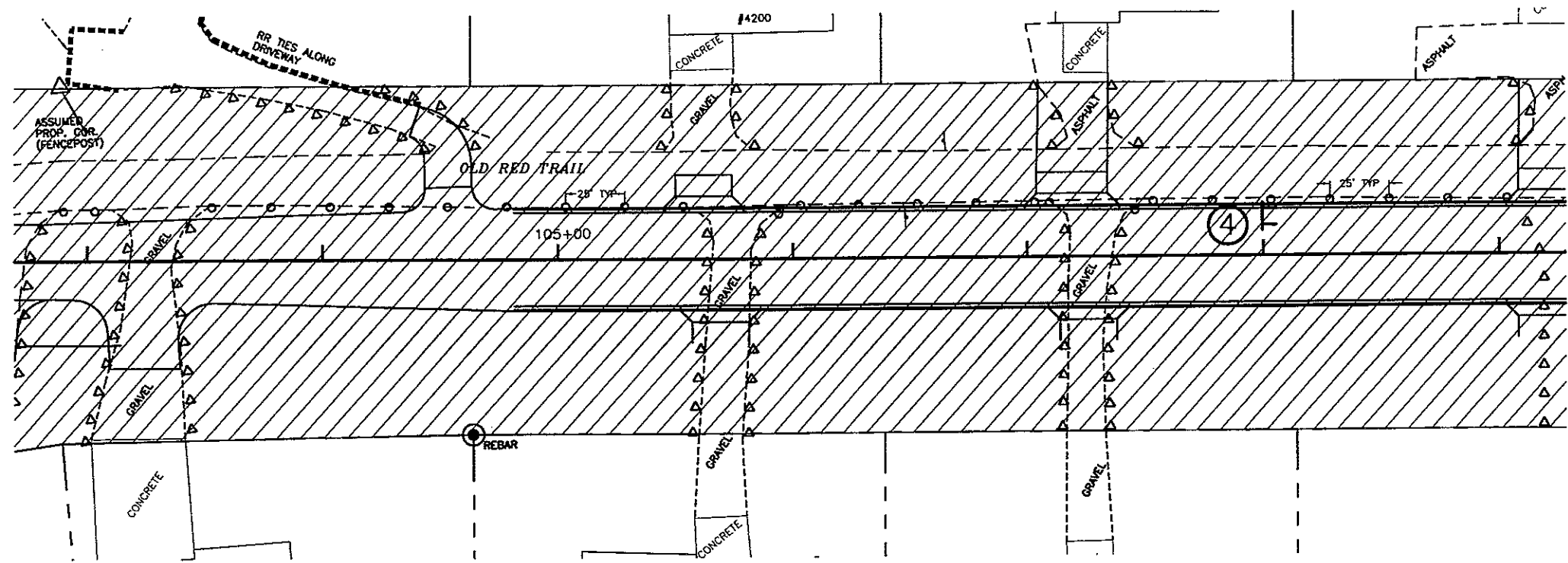
LEGEND

- PHASE 3A WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	99
OLD RED TRAIL STA. 103+00 TO STA. 115+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A

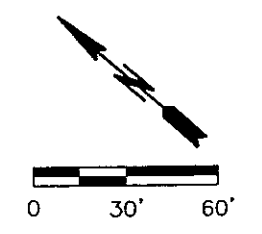


QUANTITIES

TYPE 3 BARRICADE	
DELINEATOR DRUMS	47
TUBULAR MARKERS	175
PVMT MK PAINTED 4 INCH LINE (YELLOW)	
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	

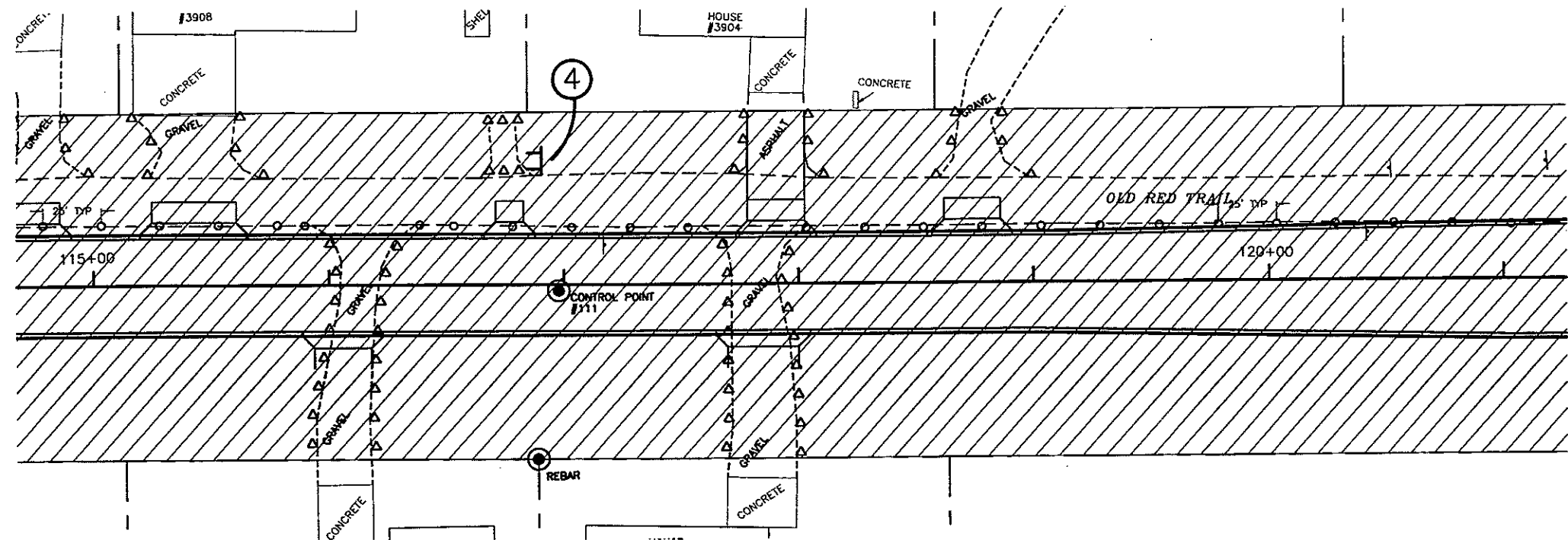
LEGEND

- PHASE 3A WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



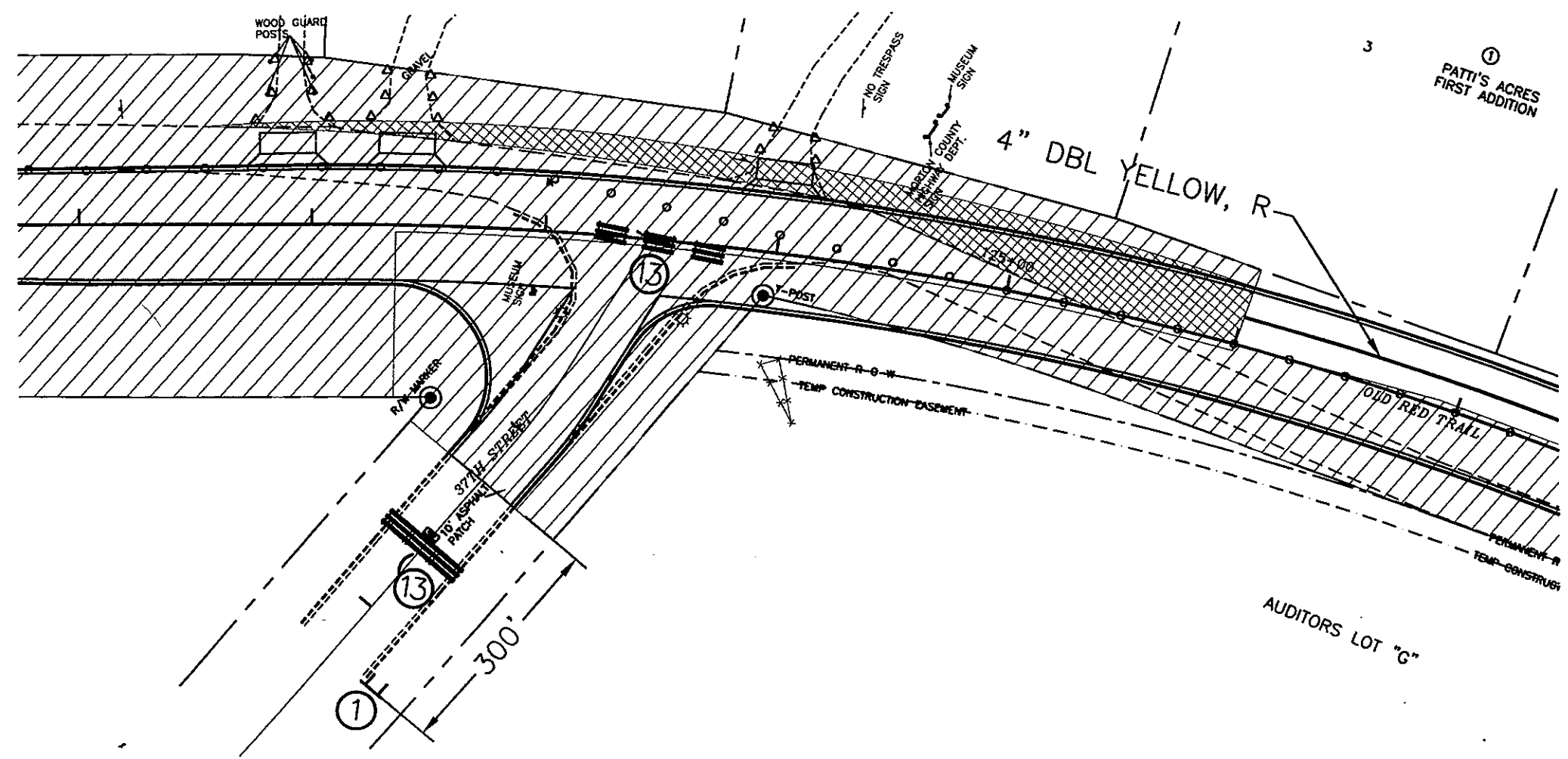
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	100
OLD RED TRAIL STA. 115+00 TO STA. 127+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A



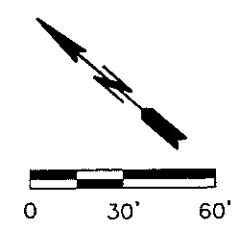
QUANTITIES

TYPE 3 BARRICADE	6
DELINEATOR DRUMS	48
TUBULAR MARKERS	72
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	200 LF



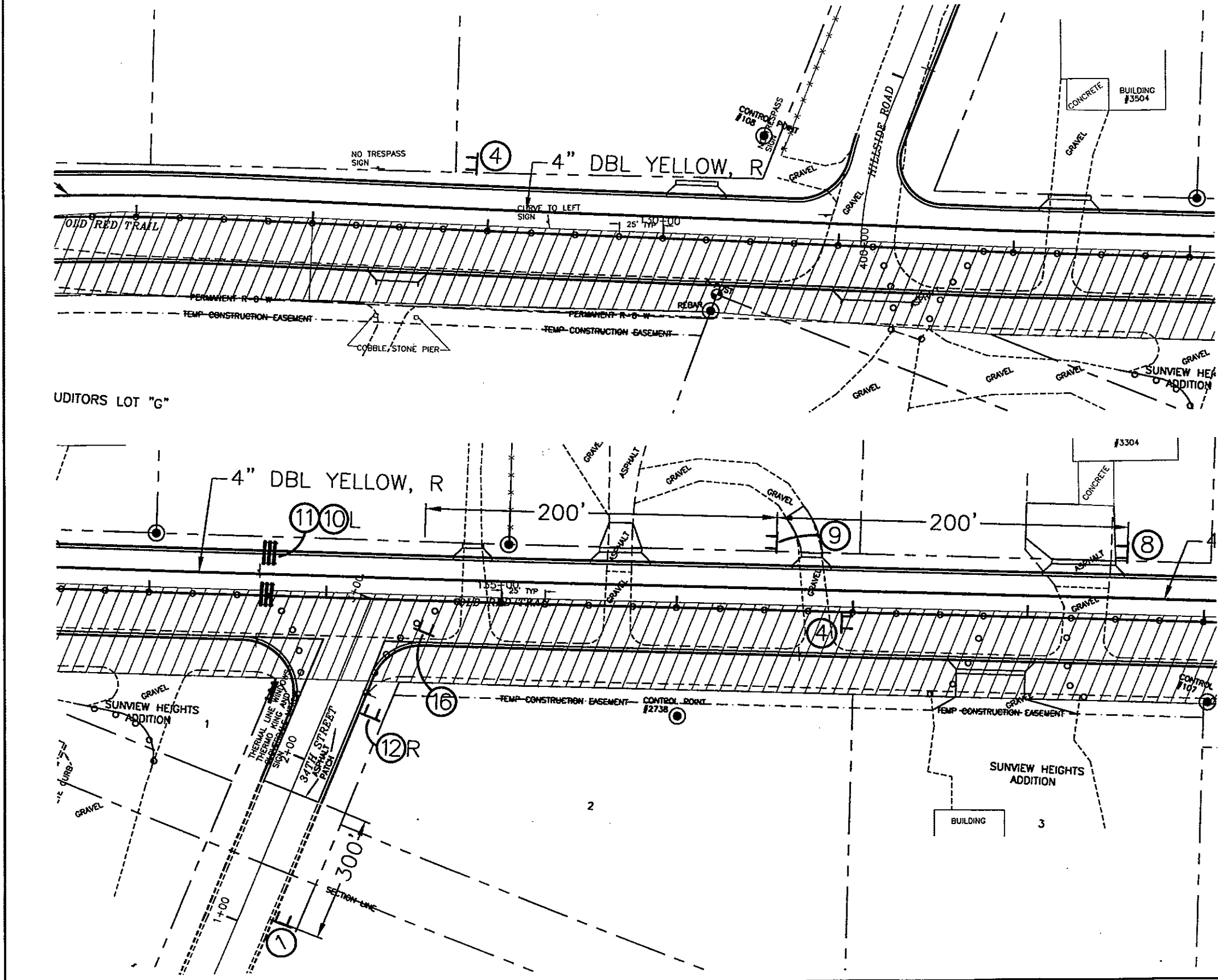
LEGEND

- PHASE 3A WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	101
OLD RED TRAIL STA. 127+00 TO STA. 139+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A

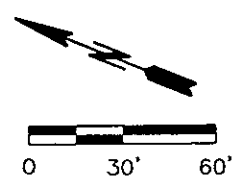


QUANTITIES

TYPE 3 BARRICADE	2
DELINEATOR DRUMS	76
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	2400 LF

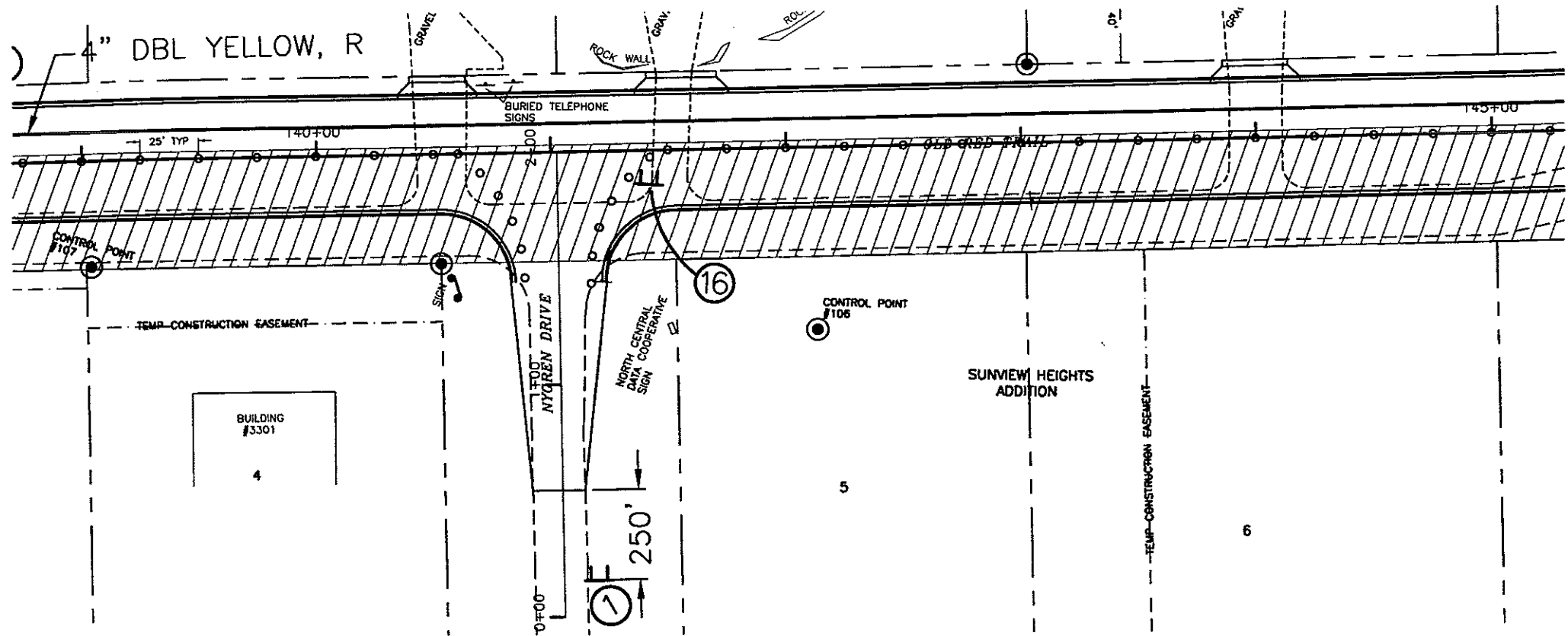
LEGEND

- PHASE 3A WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



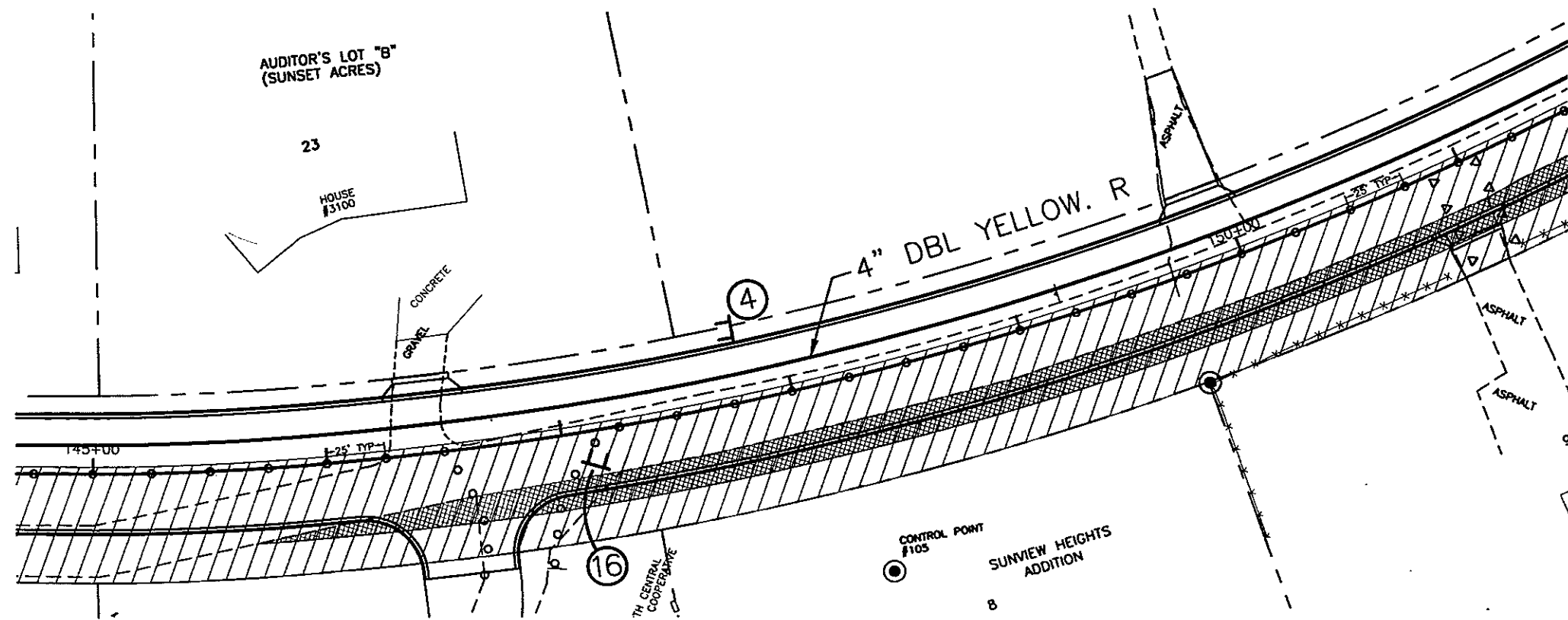
FWWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	102
OLD RED TRAIL STA. 139+00 TO STA. 151+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A



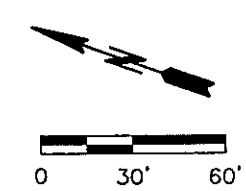
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	65
TUBULAR MARKERS	4
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	2400 LF



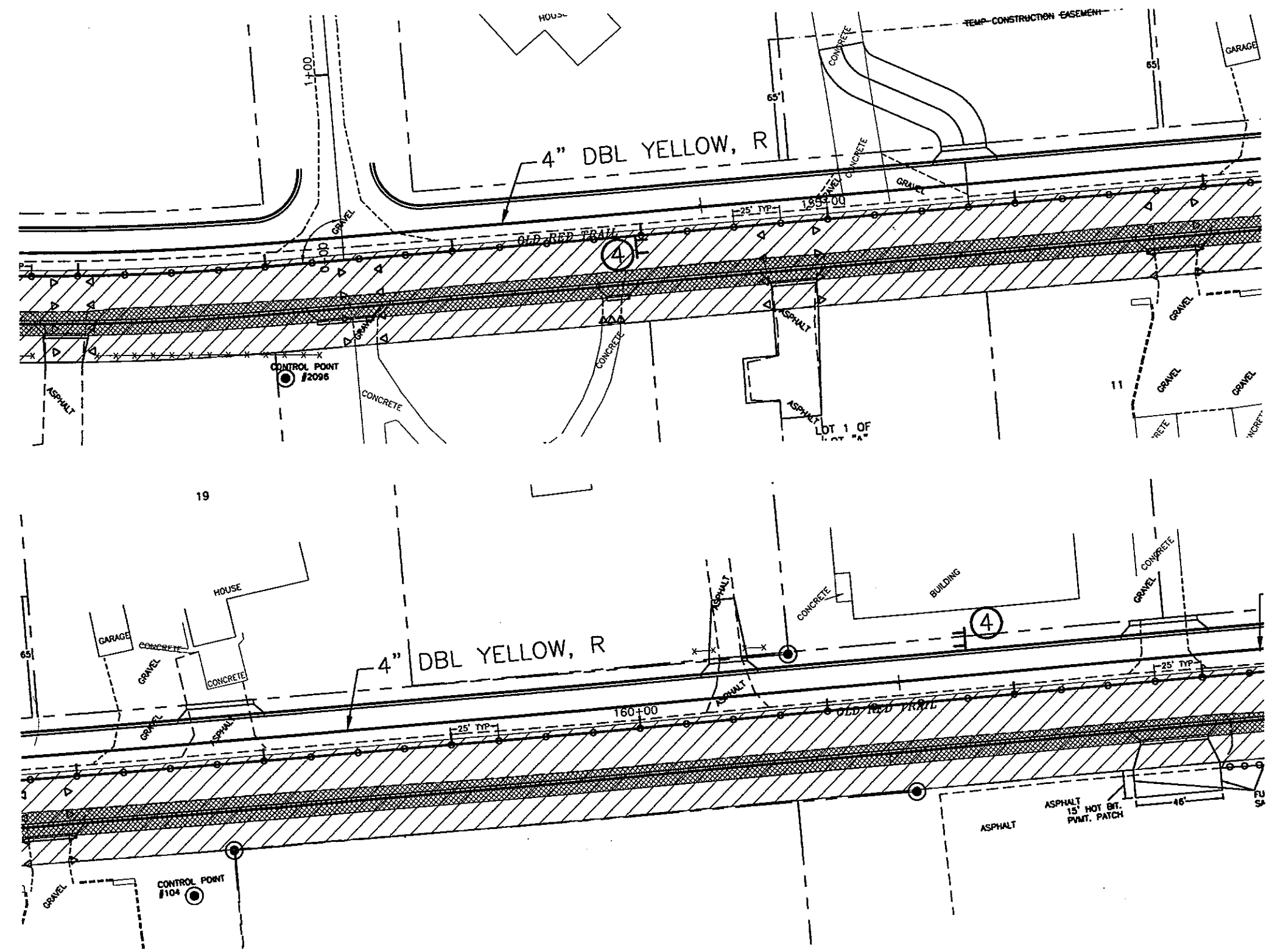
LEGEND

- PHASE 3A WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	103
OLD RED TRAIL STA. 151+00 TO STA. 163+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A

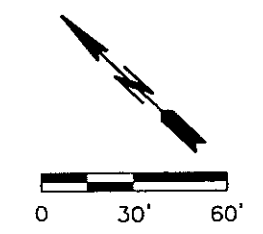


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	48
TUBULAR MARKERS	31
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	2400 LF

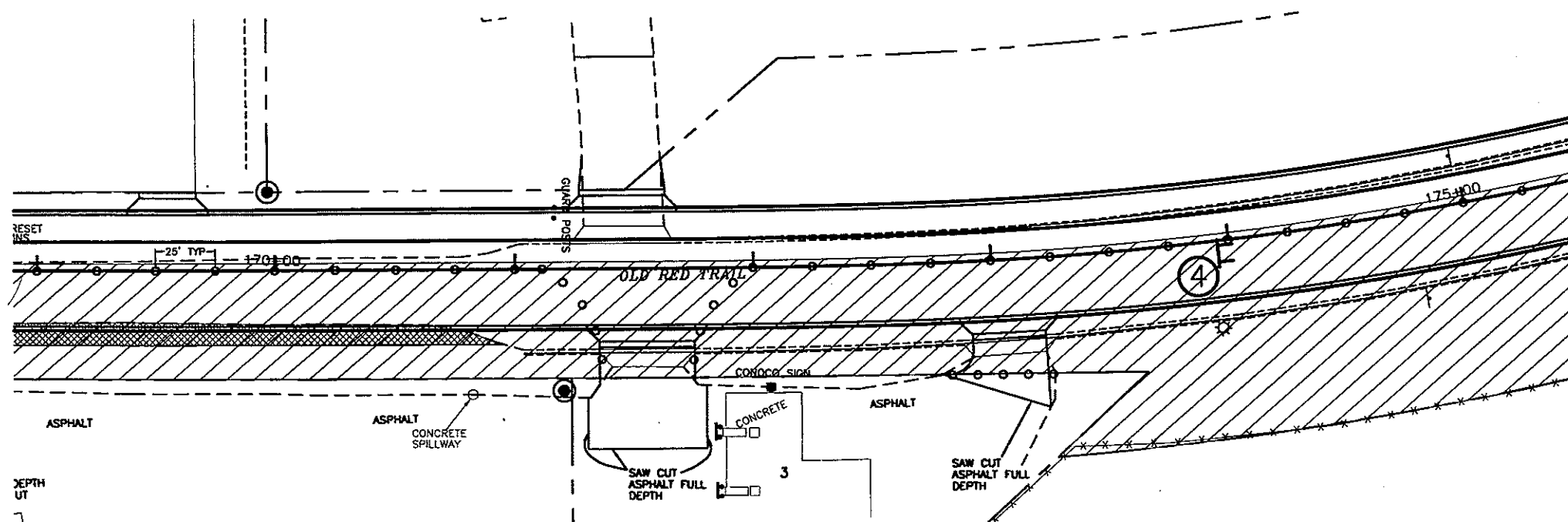
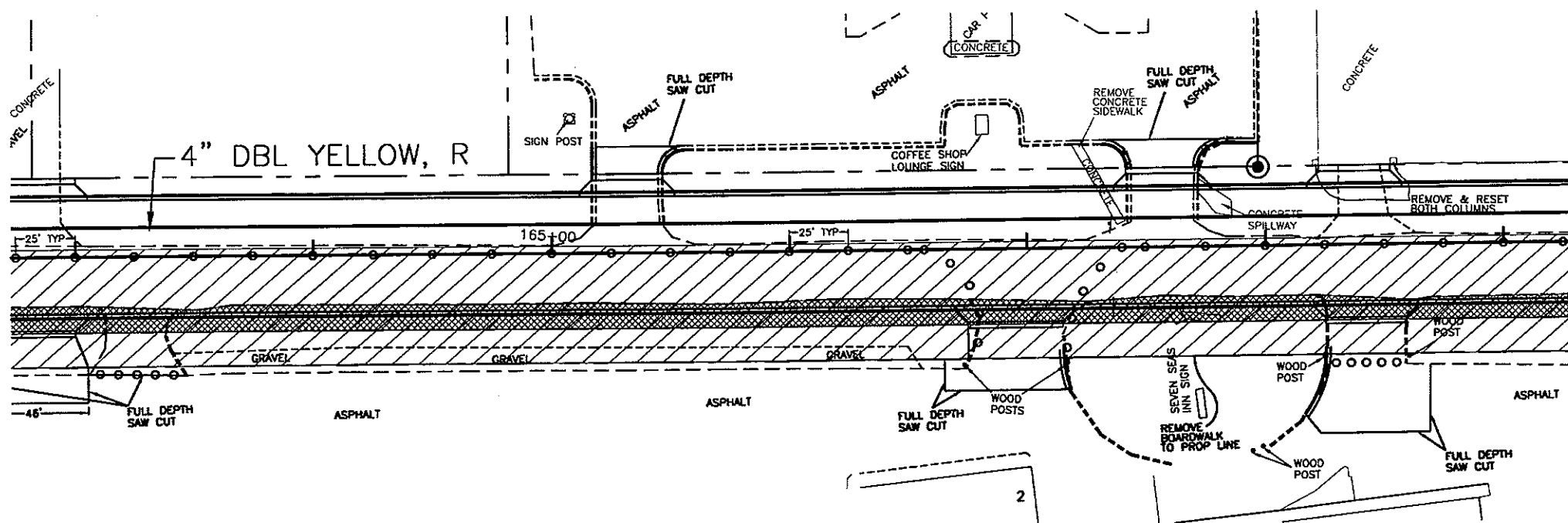
LEGEND

- PHASE 3A WORK ZONE
- DELINEATOR DRUM
- TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 3A




FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	104
OLD RED TRAIL STA. 163+00 TO STA. 175+00 CONSTRUCTION SIGNING			

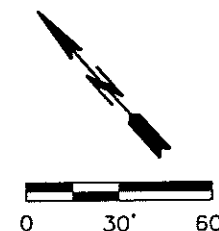


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	76
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	2400 LF

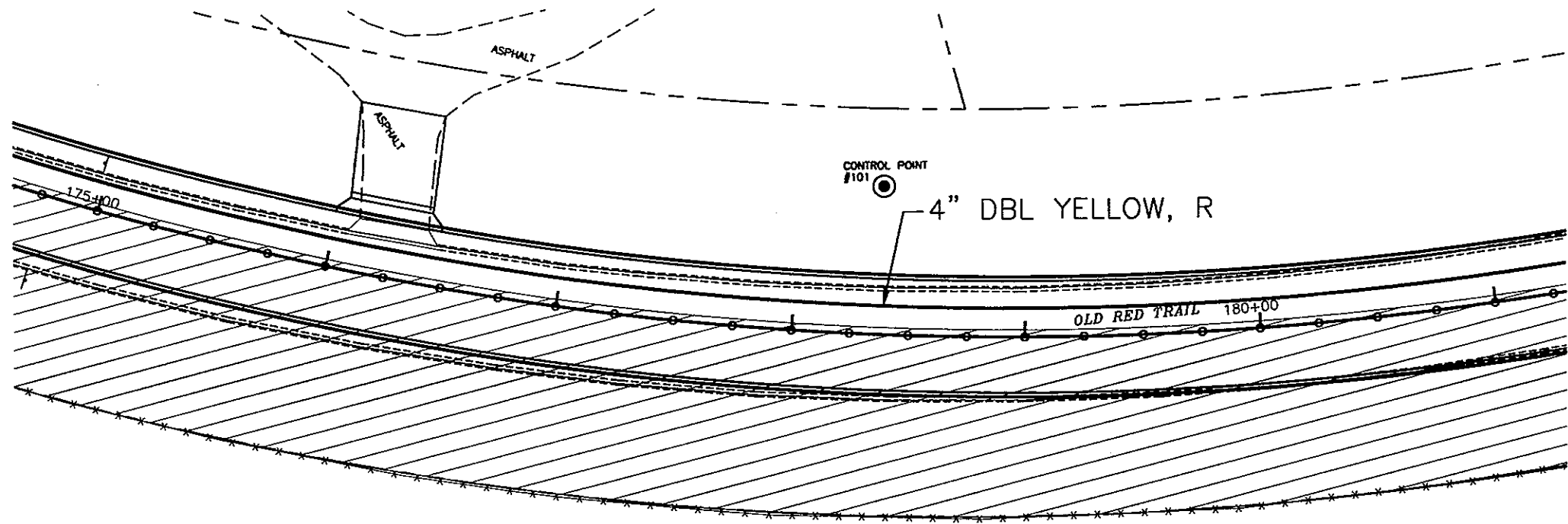
LEGEND

-  PHASE 3A WORK ZONE
-  DELINEATOR DRUM
-  TUBULAR MARKER



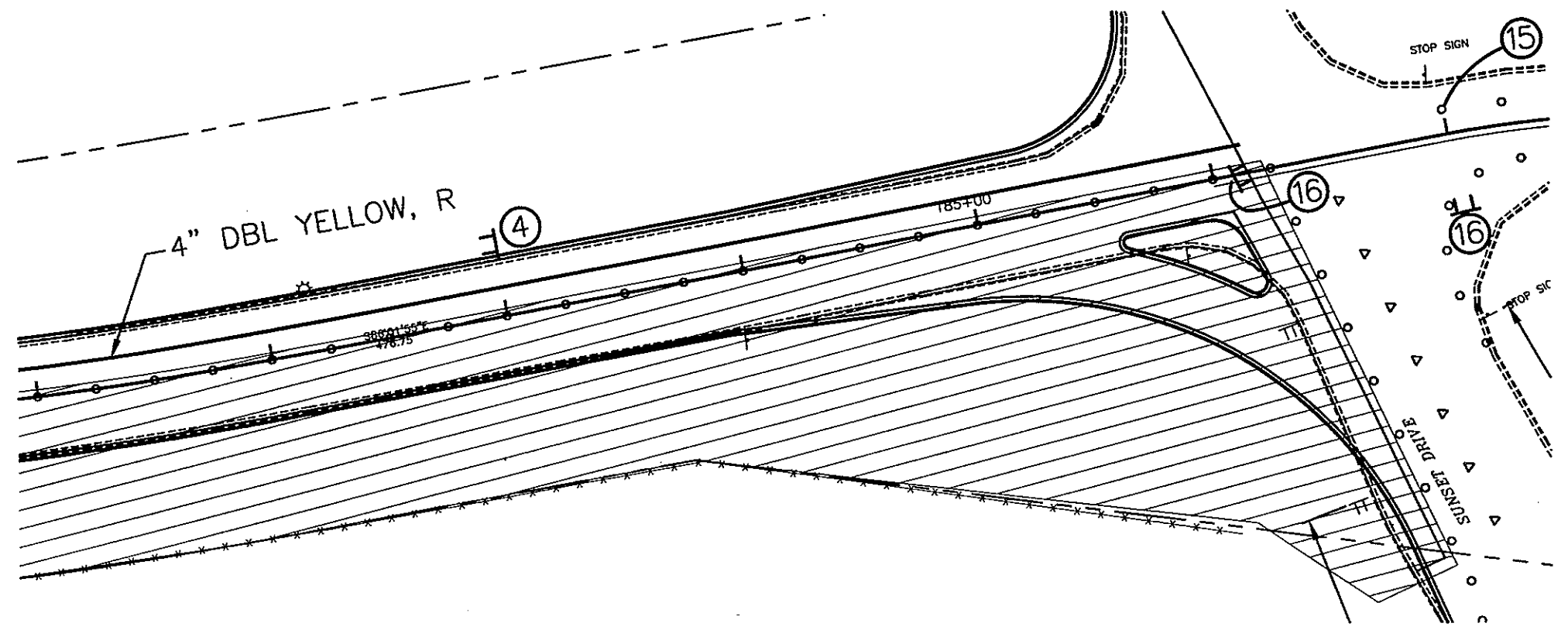
FIRMA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	105
OLD RED TRAIL STA. 175+00 TO STA. 187+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3A



QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	56
TUBULAR MARKERS	7
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	2230 LF



LEGEND

	PHASE 3A WORK ZONE
	DELINEATOR DRUM
	TUBULAR MARKER

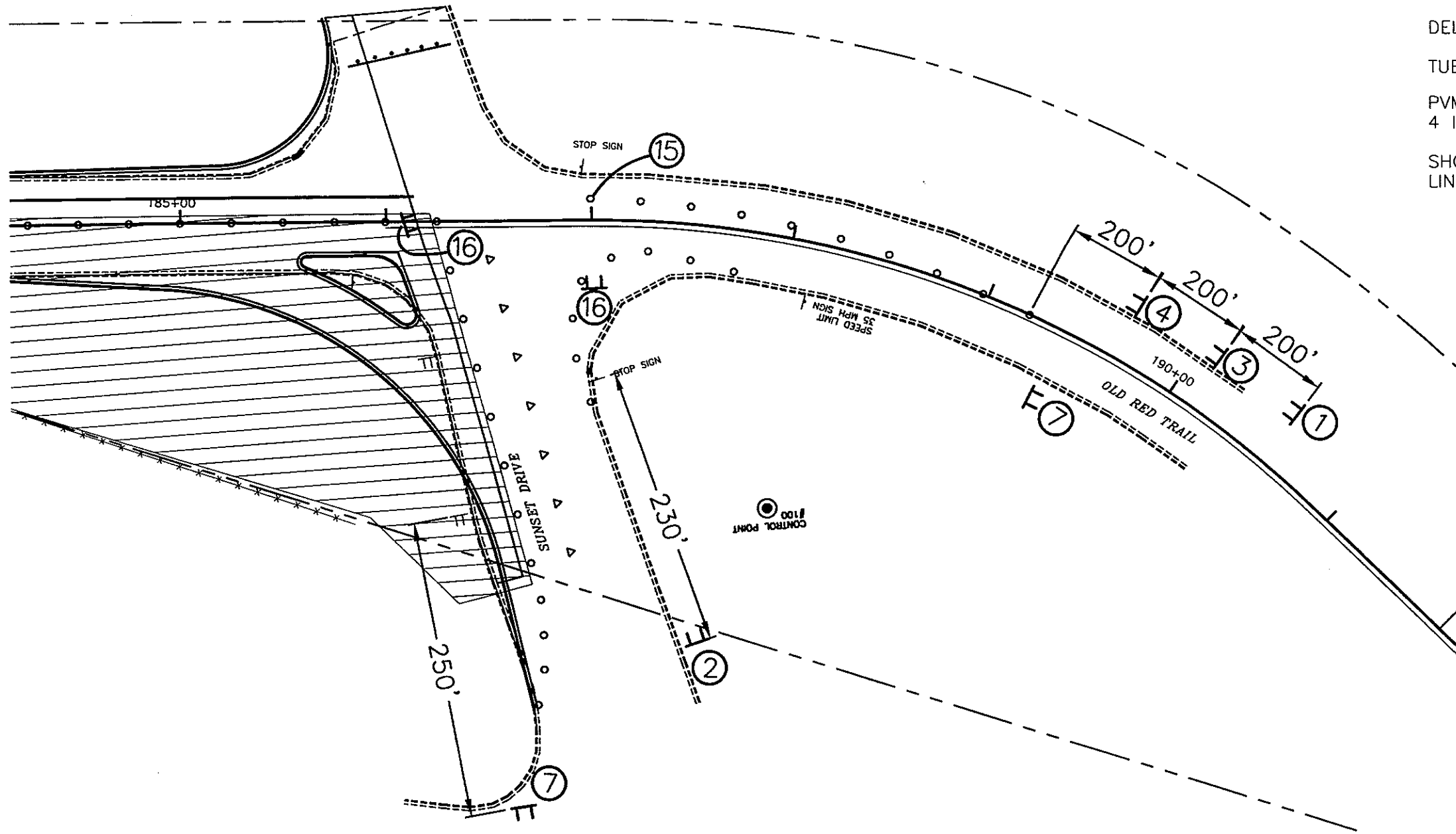


CONSTRUCTION SIGNING – PHASE 3A




FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	106
OLD RED TRAIL STA. 187+00 TO STA. 192+00 CONSTRUCTION SIGNING			

QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	18
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE – TYPE R (YELLOW)	_____



LEGEND

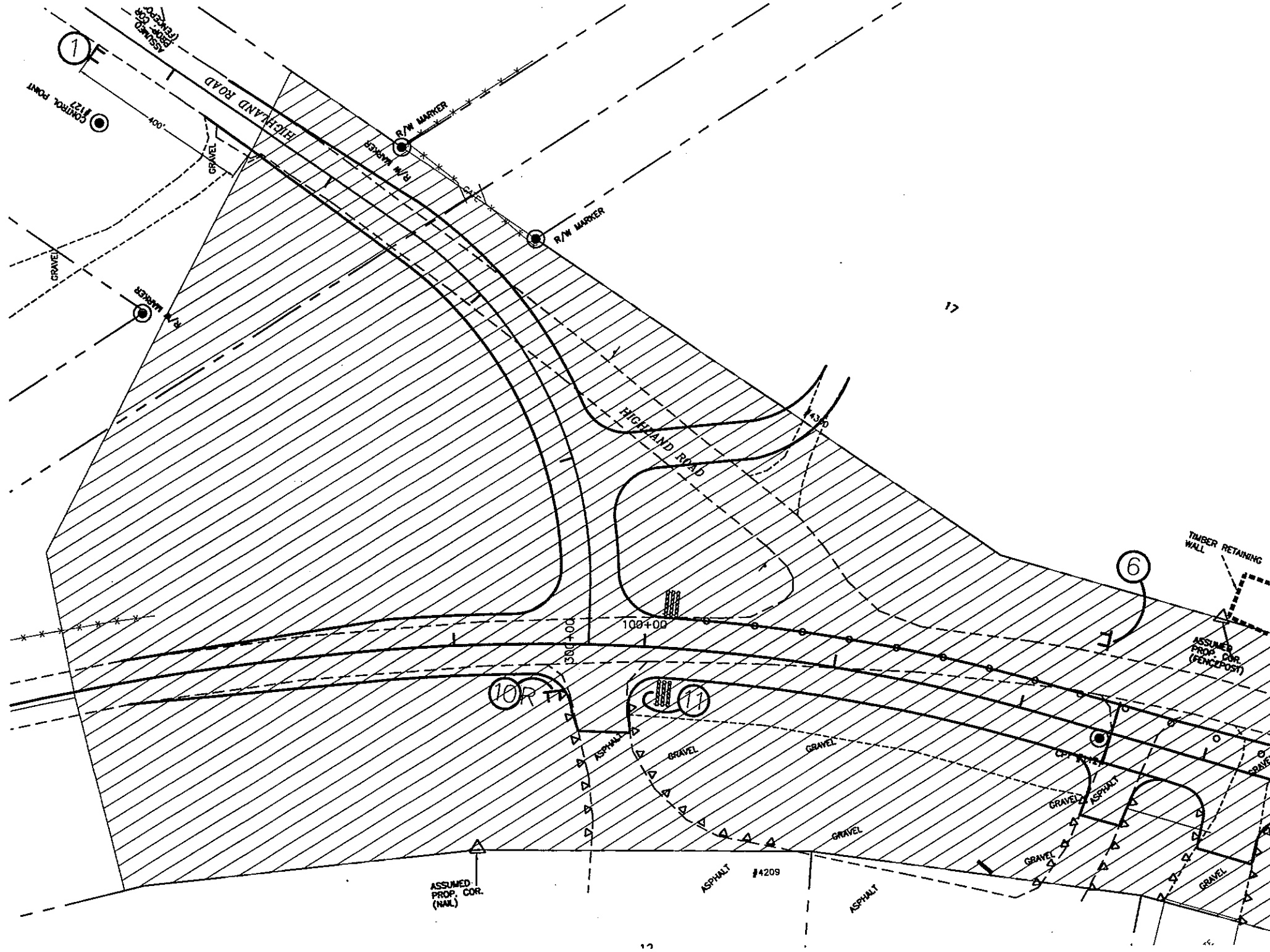
-  PHASE 3A WORK ZONE
-  DELINEATOR DRUM
-  TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 3B

FWWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	107
OLD RED TRAIL STA. 97+00 TO STA. 103+00 CONSTRUCTION SIGNING			

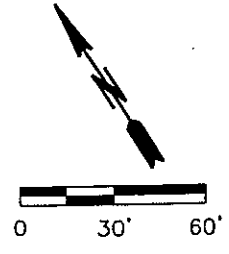


QUANTITIES

TYPE 3 BARRICADE	2
DELINEATOR DRUMS	11
TUBULAR MARKERS	30
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

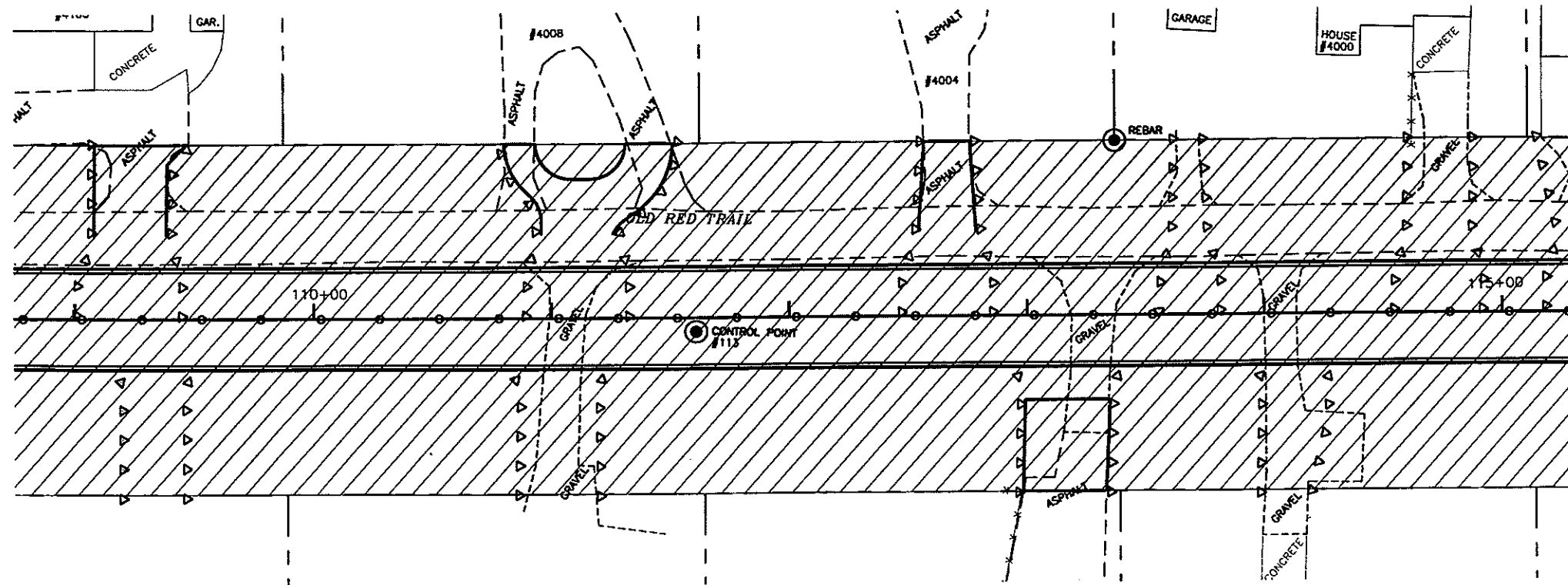
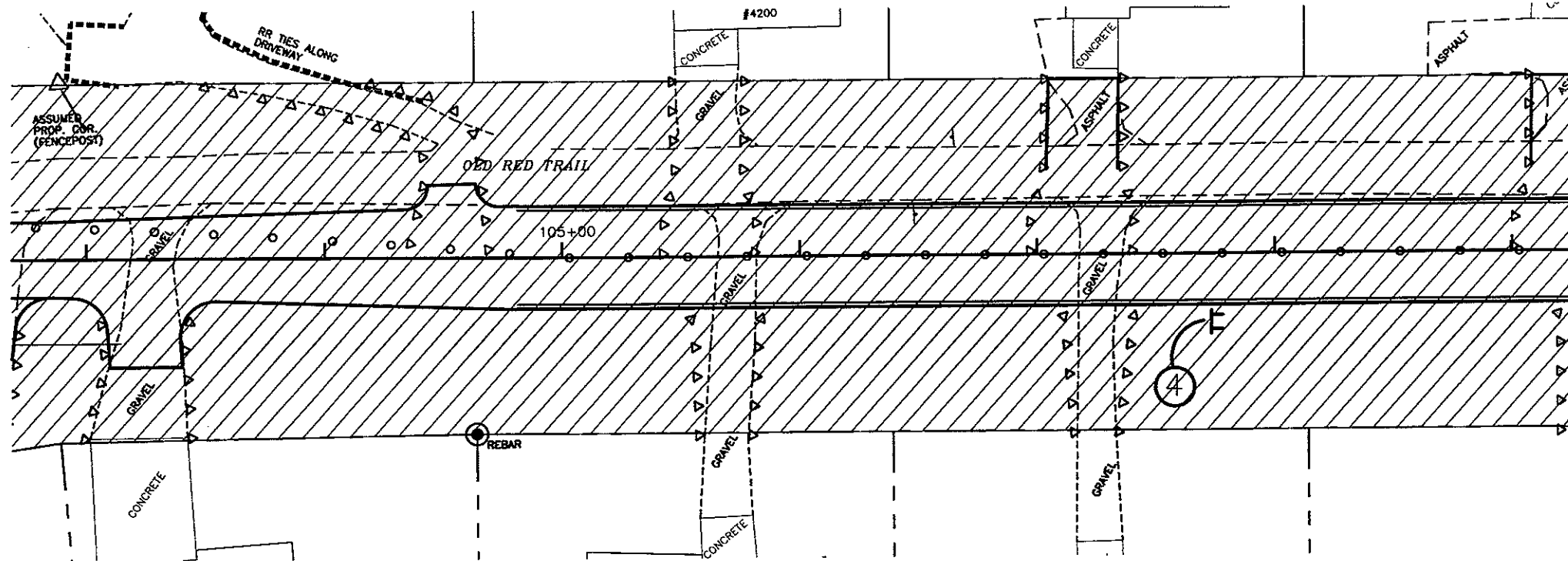
LEGEND

	PHASE 3B WORK ZONE
	TEMPORARY ROADWAY WIDENING
	DELINEATOR DRUM
	TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 3B





FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	108
OLD RED TRAIL STA. 103+00 TO STA. 115+00 CONSTRUCTION SIGNING			

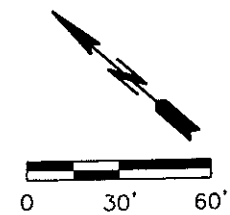


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	48
TUBULAR MARKERS	192
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

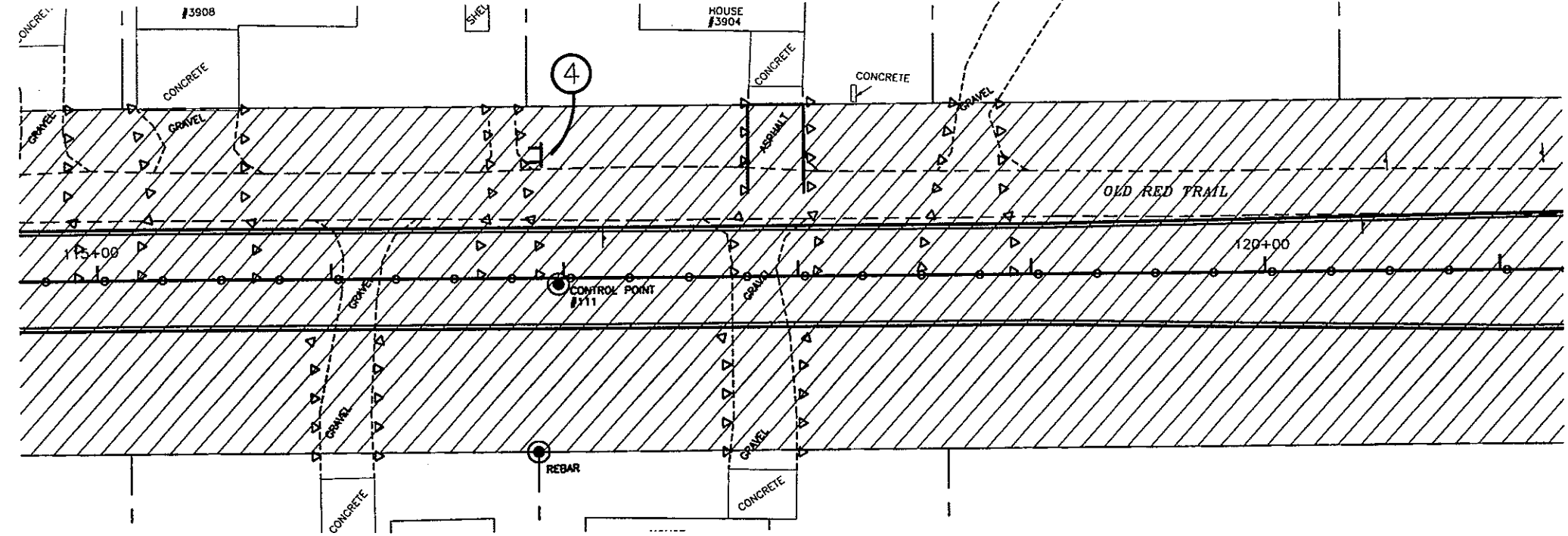
LEGEND

-  PHASE 3B WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER



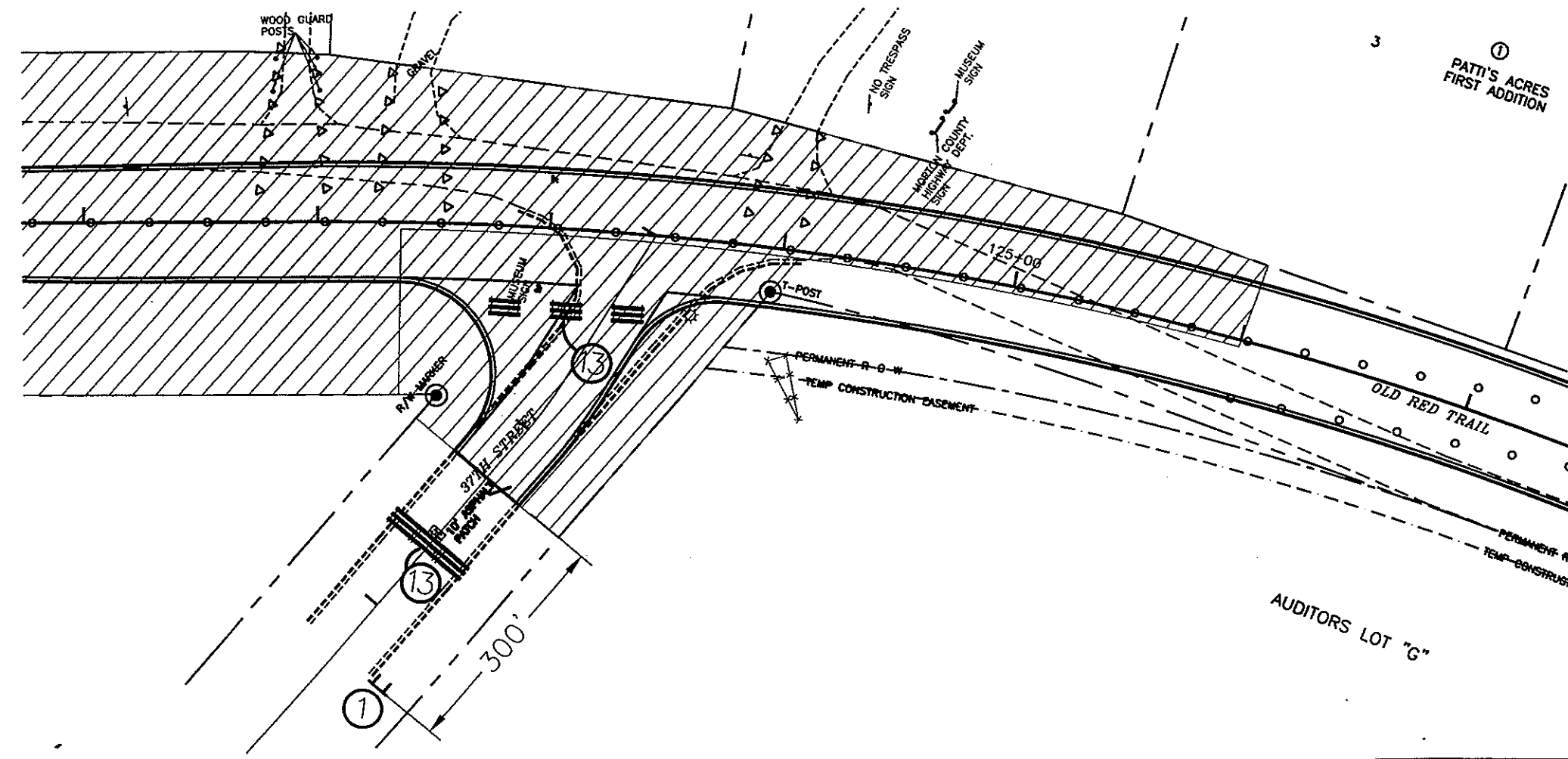
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	109
OLD RED TRAIL STA. 115+00 TO STA. 127+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 3B



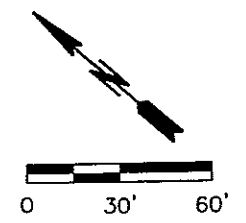
QUANTITIES

TYPE 3 BARRICADE	6
DELINEATOR DRUMS	52
TUBULAR MARKERS	110
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

- PHASE 3B WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



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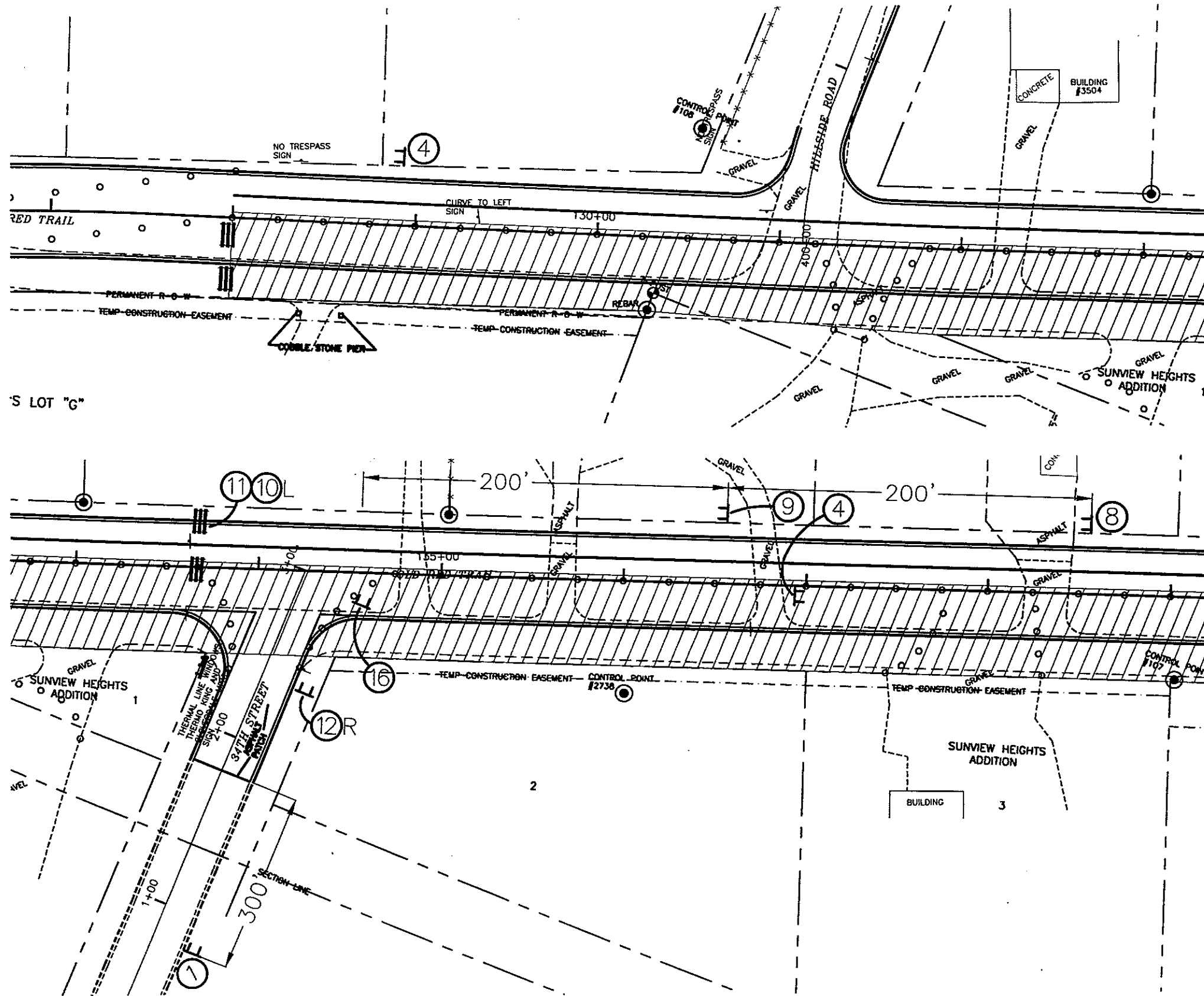
CONSTRUCTION SIGNING - PHASE 3B

FHWA REGION	STATE	PROJECT	SHEET NO.
B	ND	SU-1-988(008)019	110





OLD RED TRAIL
STA. 127+00 TO STA. 139+00
CONSTRUCTION SIGNING

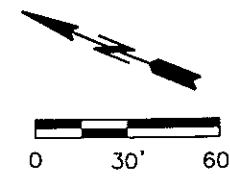
QUANTITIES

TYPE 3 BARRICADE	4
DELINEATOR DRUMS	82
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



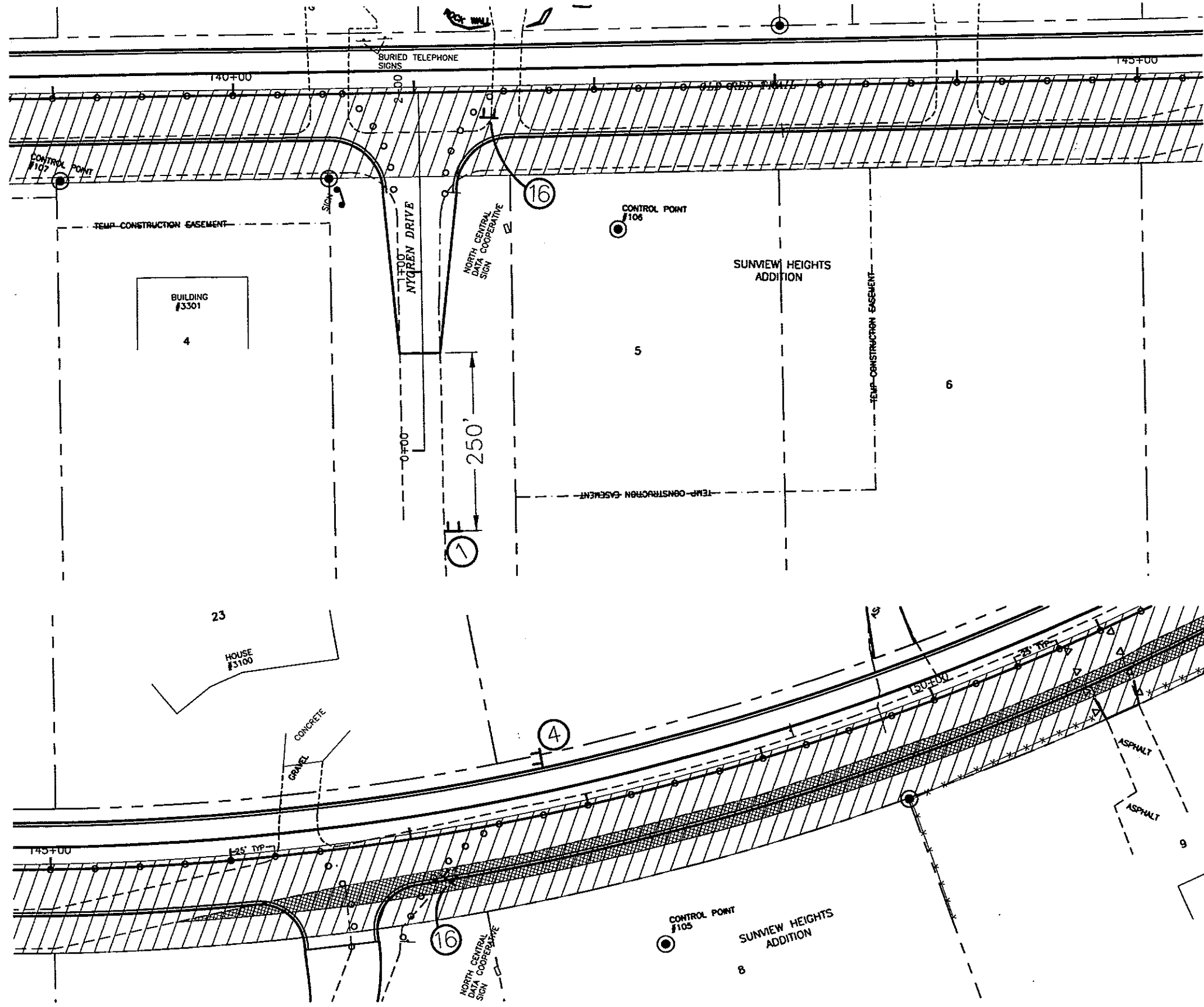
LEGEND

-  PHASE 3B WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 3B





FIRMA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	///
OLD RED TRAIL STA. 139+00 TO STA. 151+00 CONSTRUCTION SIGNING			



QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	66
TUBULAR MARKERS	8
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

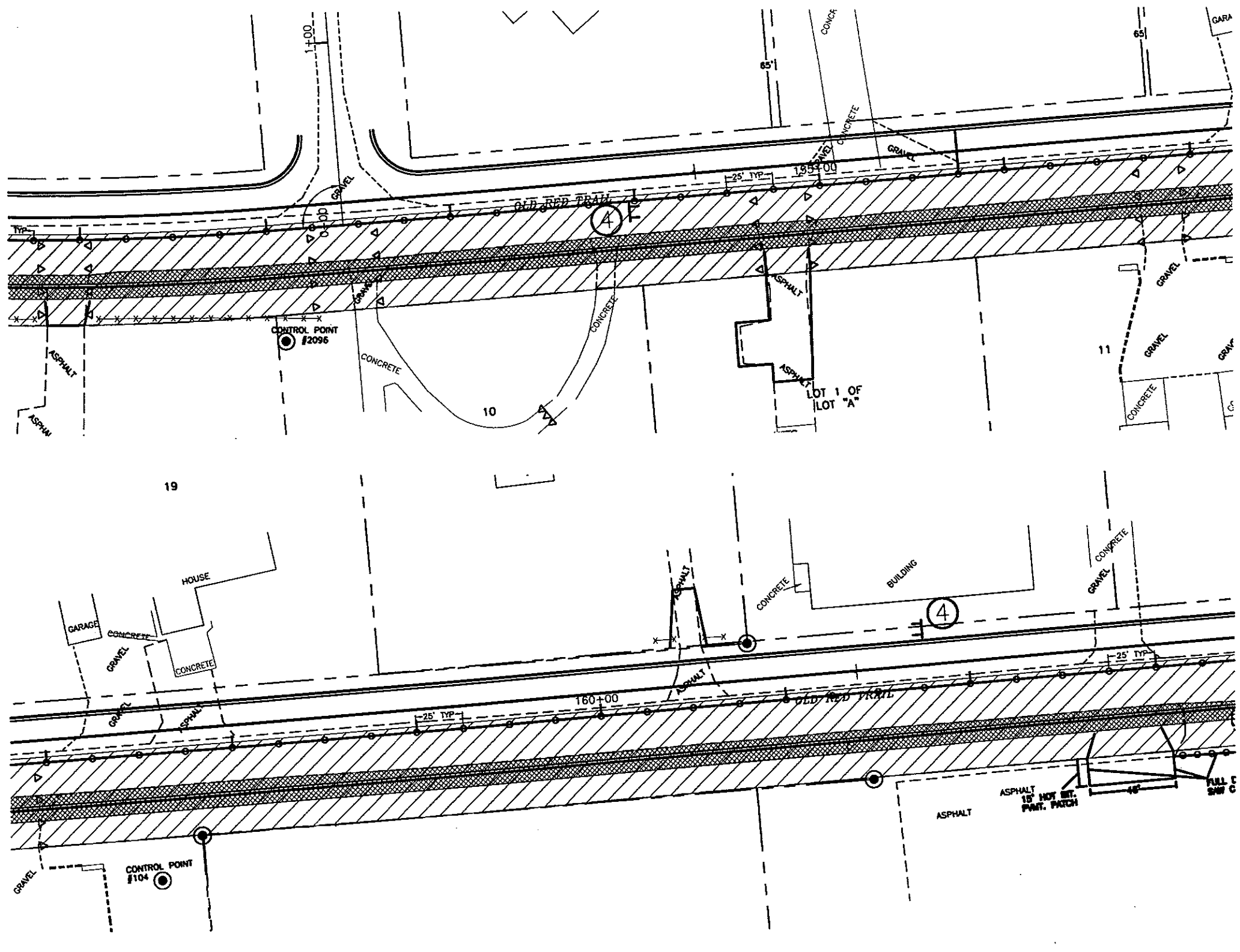
LEGEND

-  PHASE 3B WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER

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CONSTRUCTION SIGNING – PHASE 3B

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	112
OLD RED TRAIL STA. 151+00 TO STA. 163+00 CONSTRUCTION SIGNING			

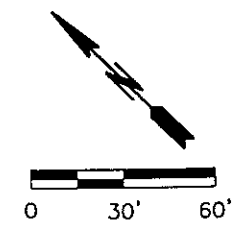


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	48
TUBULAR MARKERS	27
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE – TYPE R (YELLOW)	_____

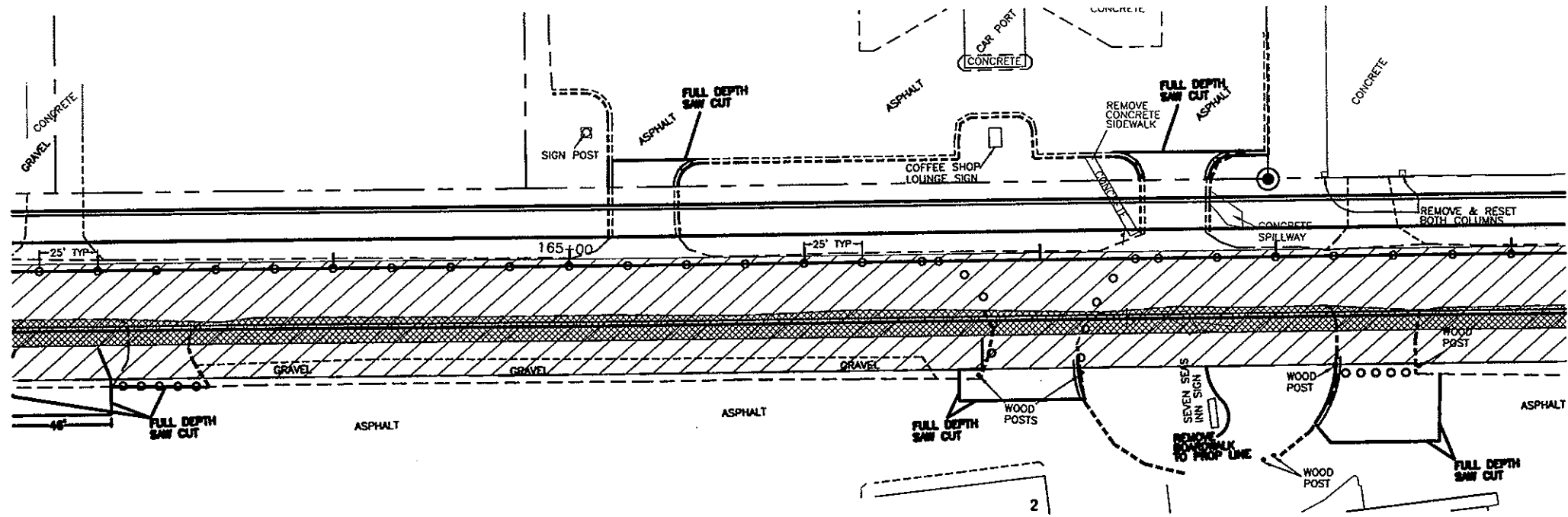
LEGEND

- PHASE 3B WORK ZONE
- DELINEATOR DRUM
- TUBULAR MARKER



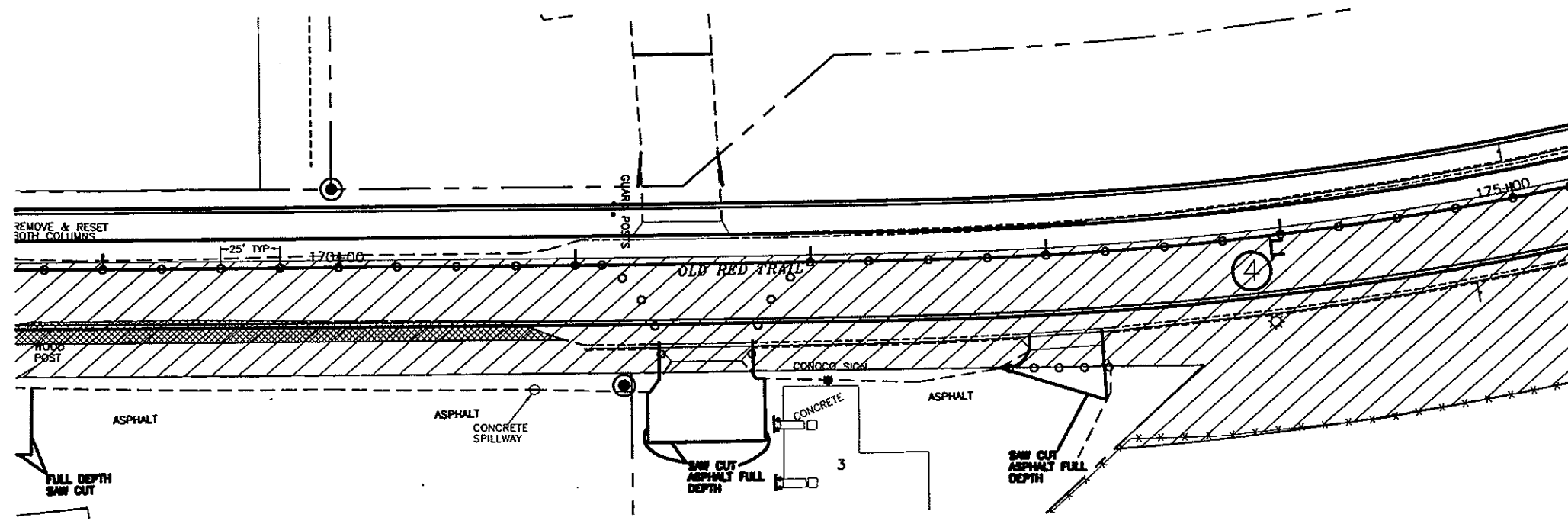
CONSTRUCTION SIGNING - PHASE 3B

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	113
OLD RED TRAIL STA. 163+00 TO STA. 175+00 CONSTRUCTION SIGNING			



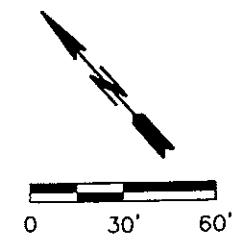
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	76
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

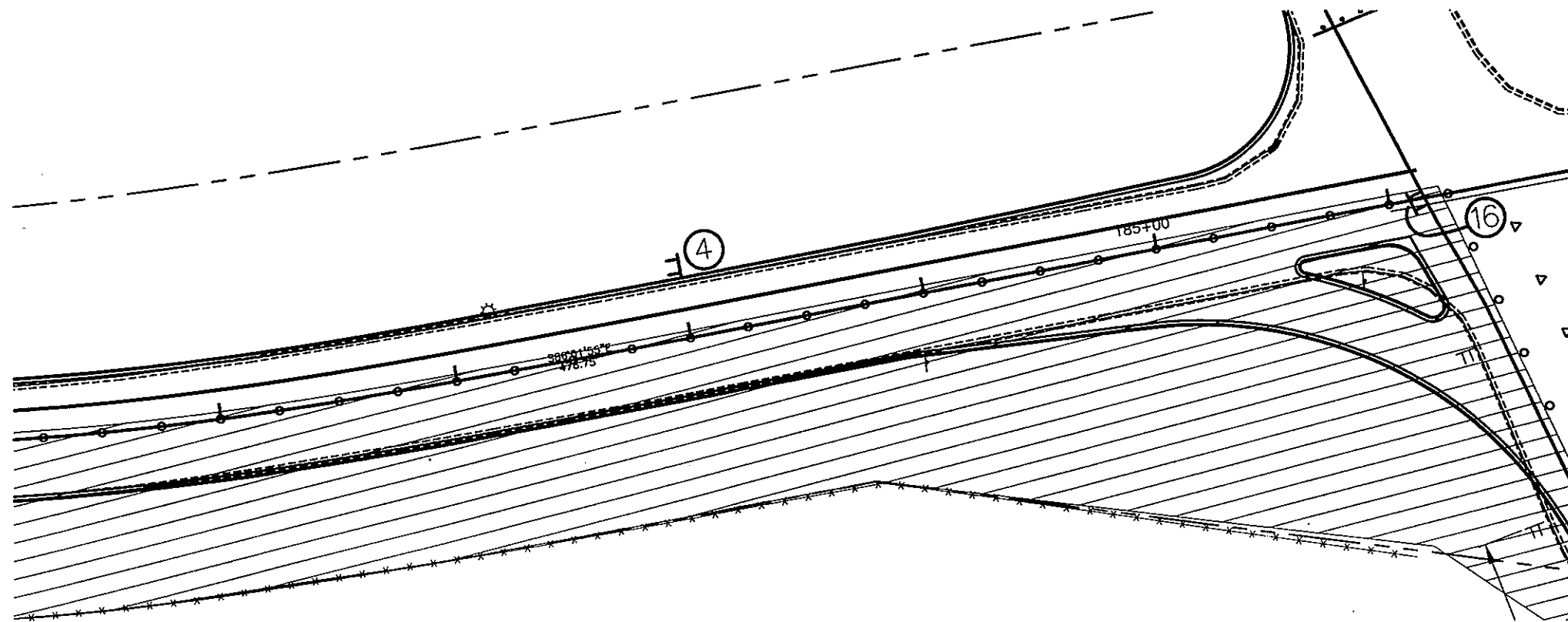
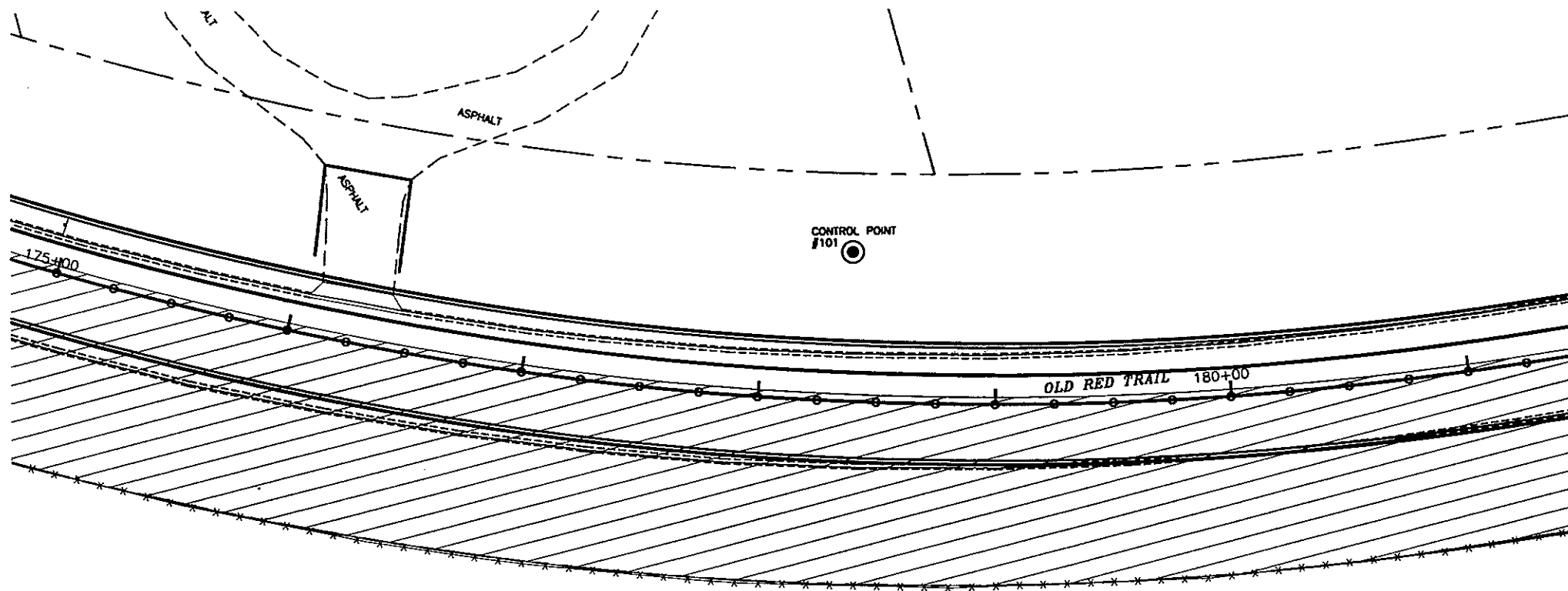
- PHASE 3B WORK ZONE
- DELINEATOR DRUM
- TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 3B




FIRMA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	114
OLD RED TRAIL STA. 175+00 TO STA. 186+00 CONSTRUCTION SIGNING			



QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	44
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

-  PHASE 3B WORK ZONE
-  DELINEATOR DRUM
-  TUBULAR MARKER

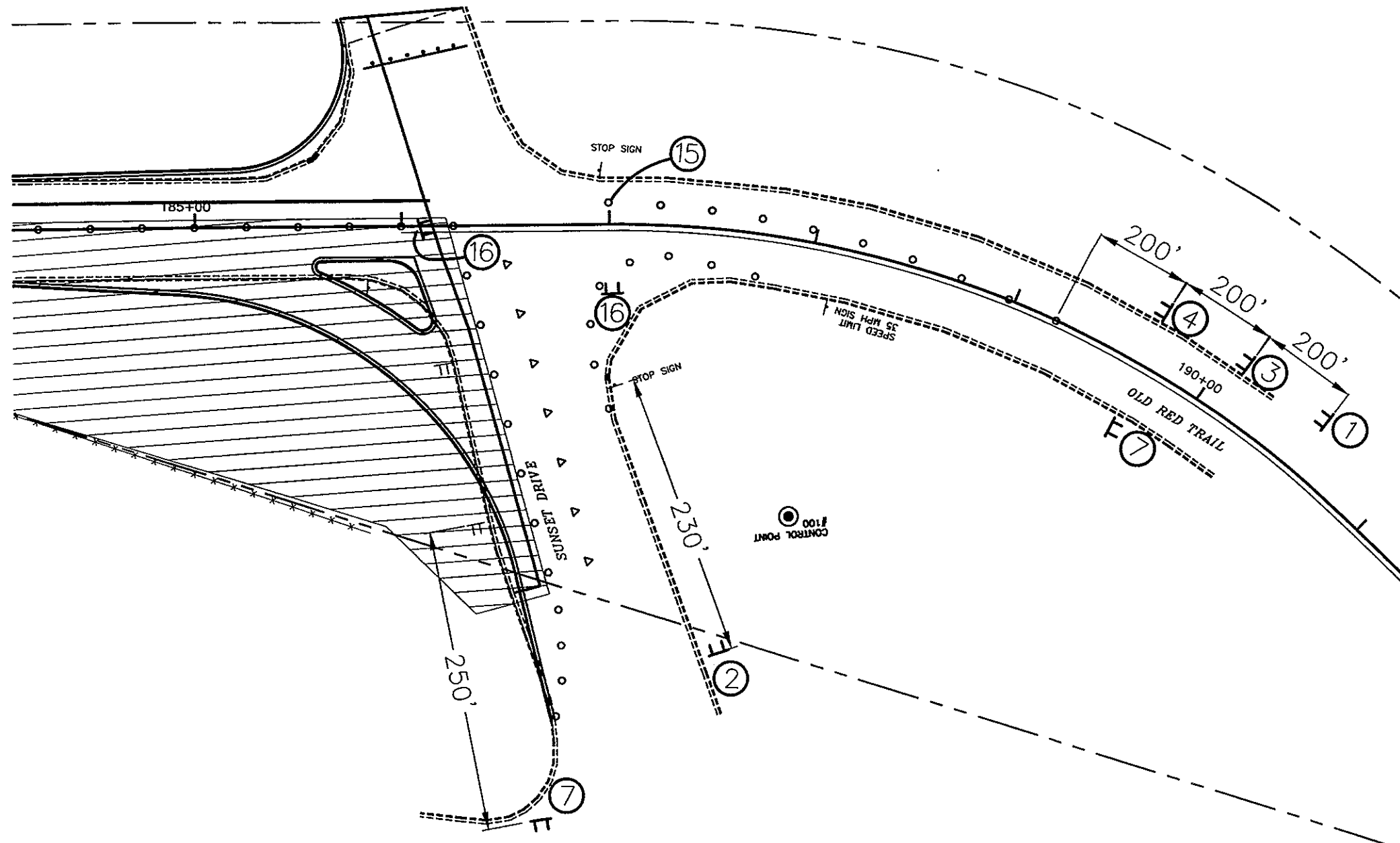


CONSTRUCTION SIGNING – PHASE 3B




FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	115
OLD RED TRAIL STA. 186+00 TO STA. 191+00 CONSTRUCTION SIGNING			

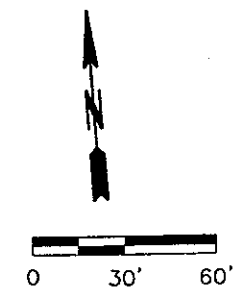
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	30
TUBULAR MARKERS	7
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE – TYPE R (YELLOW)	_____



LEGEND

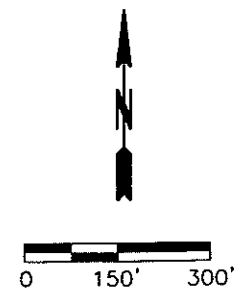
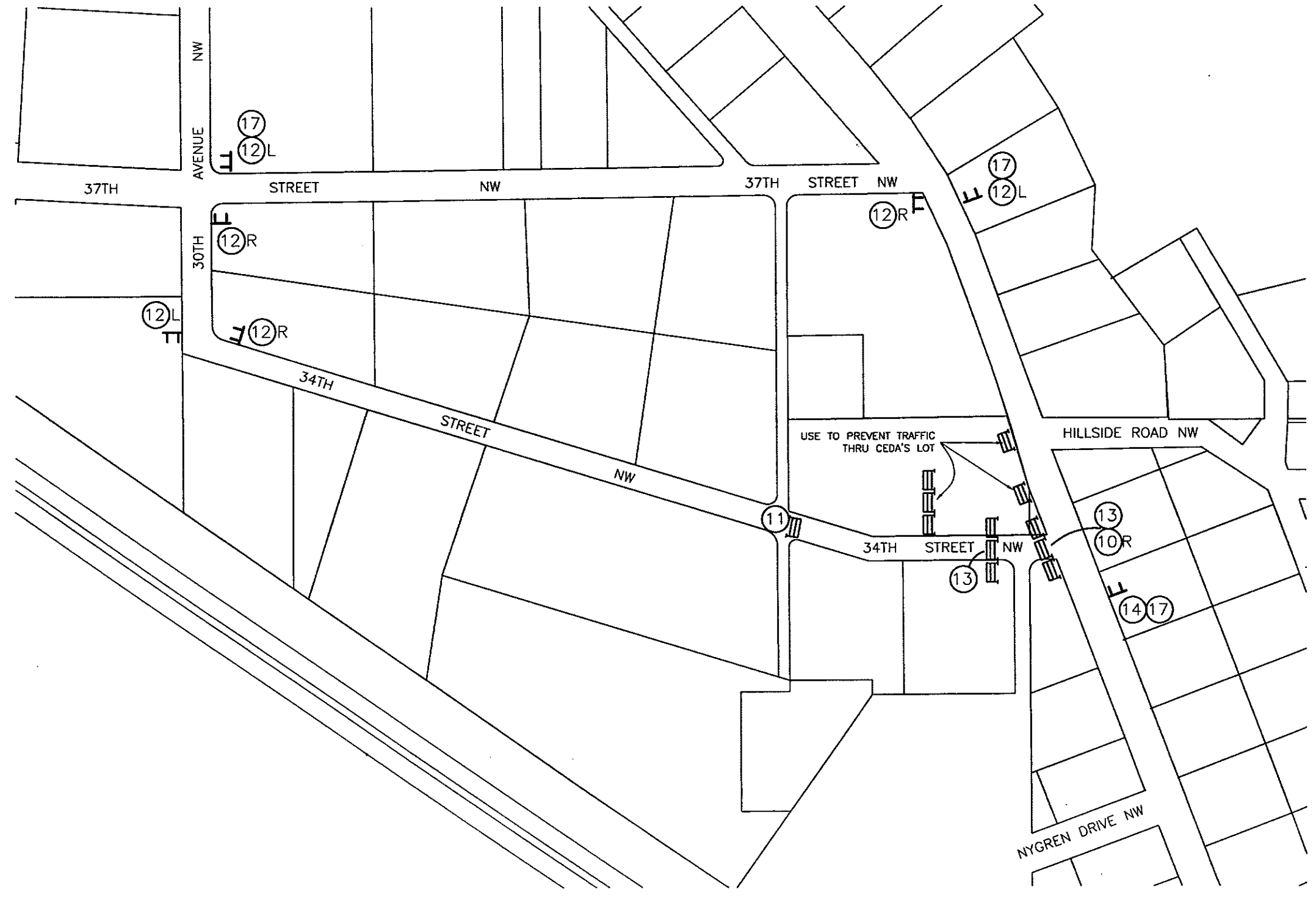
-  PHASE 3B WORK ZONE
-  DELINEATOR DRUM
-  TUBULAR MARKER



CONSTRUCTION SIGNING – PHASE 4 OVERVIEW

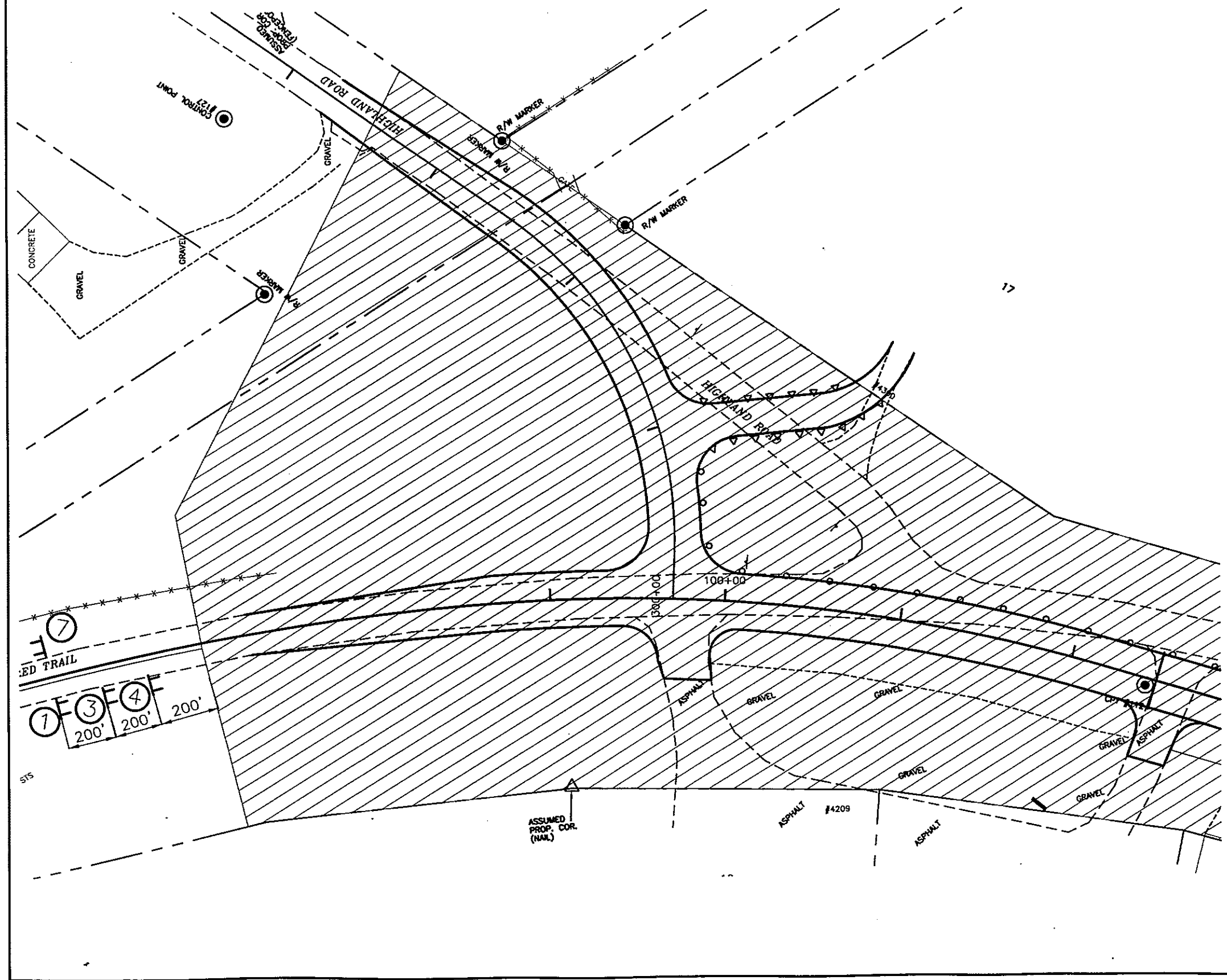
34th ST. NW DETOUR OVERVIEW

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	116
OLD RED TRAIL PHASE 4 OVERVIEW CONSTRUCTION SIGNING			



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	117
OLD RED TRAIL STA. 97+00 TO STA. 102+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 4



QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	11
TUBULAR MARKERS	16
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

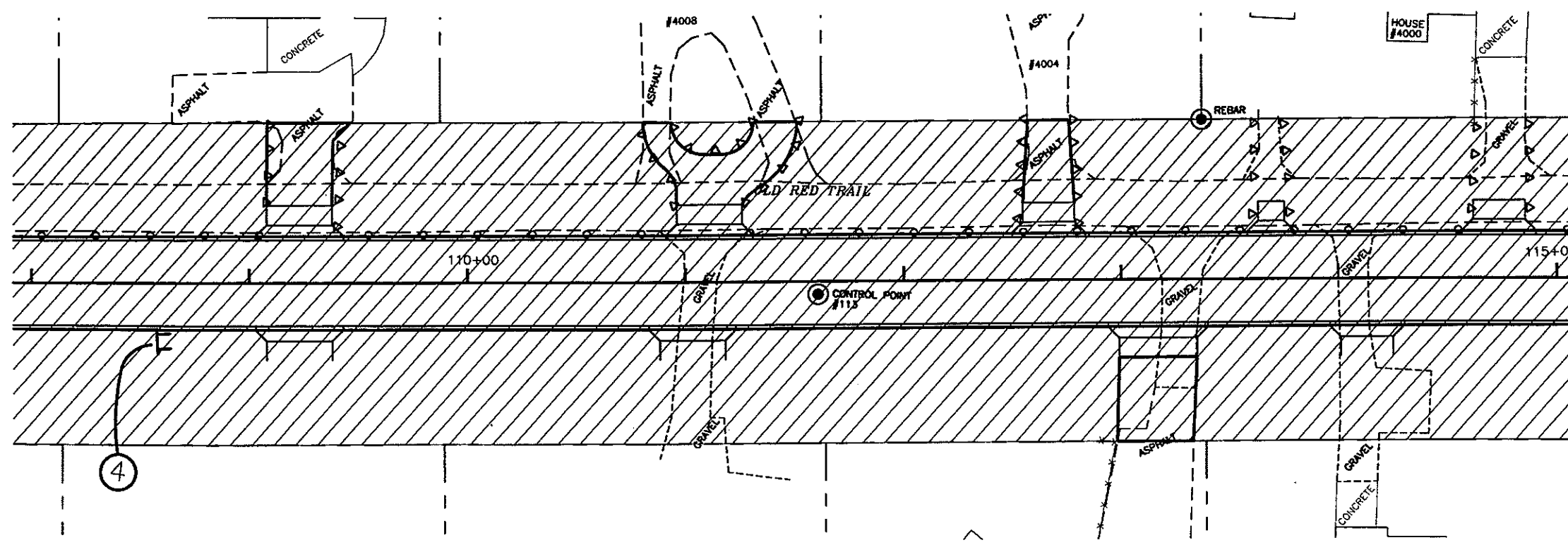
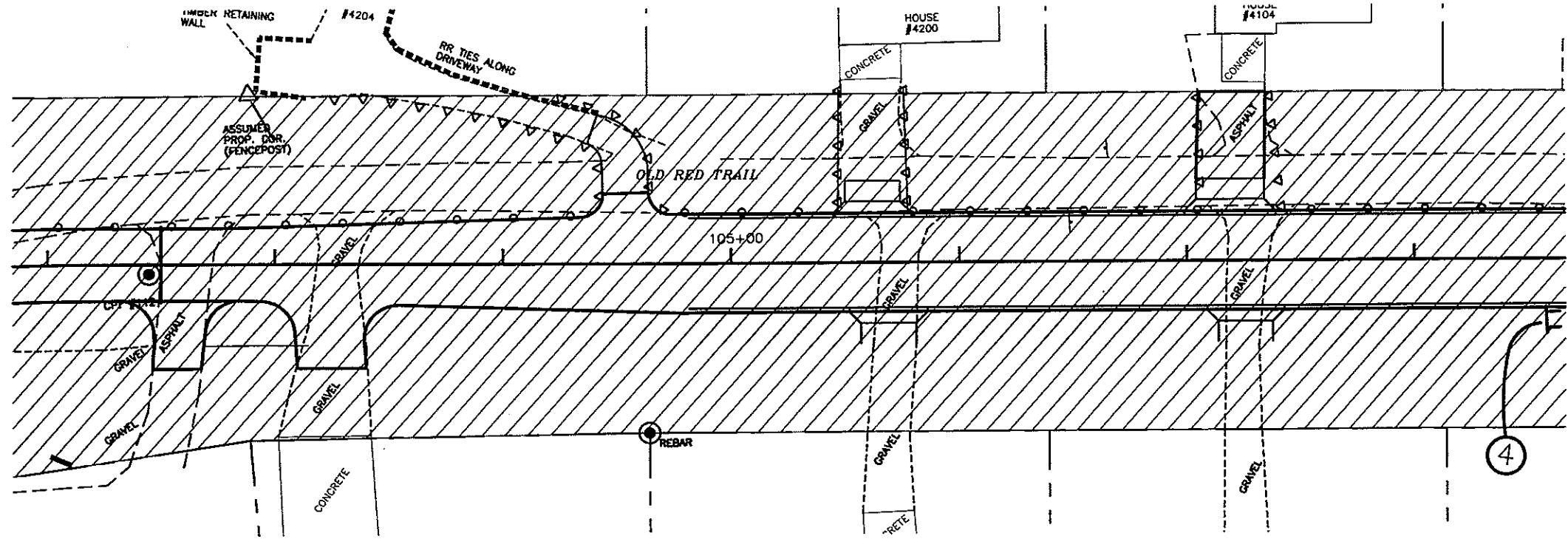
LEGEND

- PHASE 3B WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER

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CONSTRUCTION SIGNING - PHASE 4

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	118
OLD RED TRAIL STA. 102+00 TO STA. 115+00 CONSTRUCTION SIGNING			

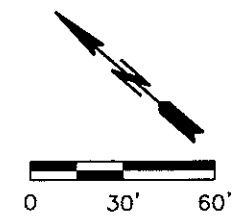


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	46
TUBULAR MARKERS	86
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

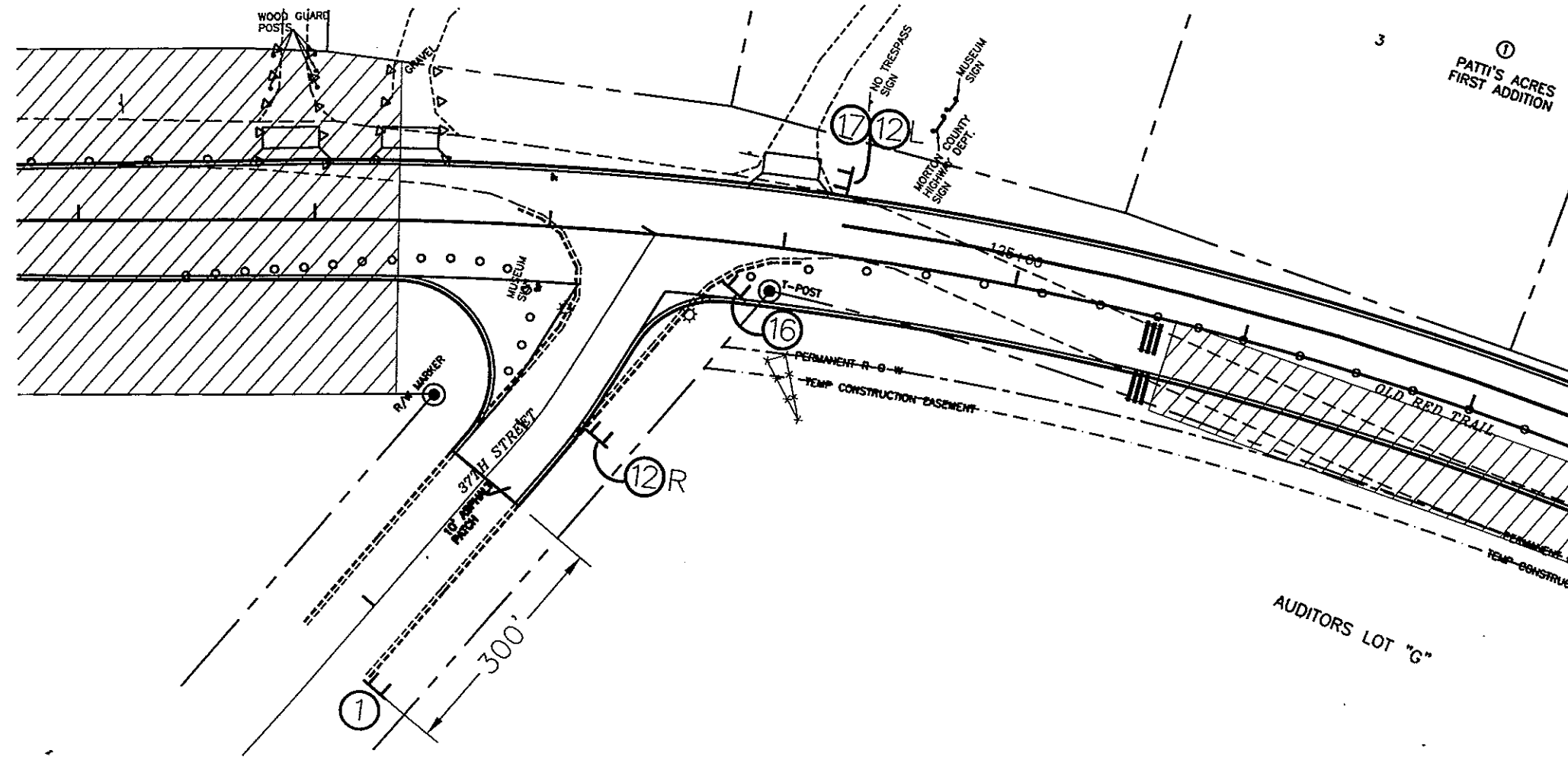
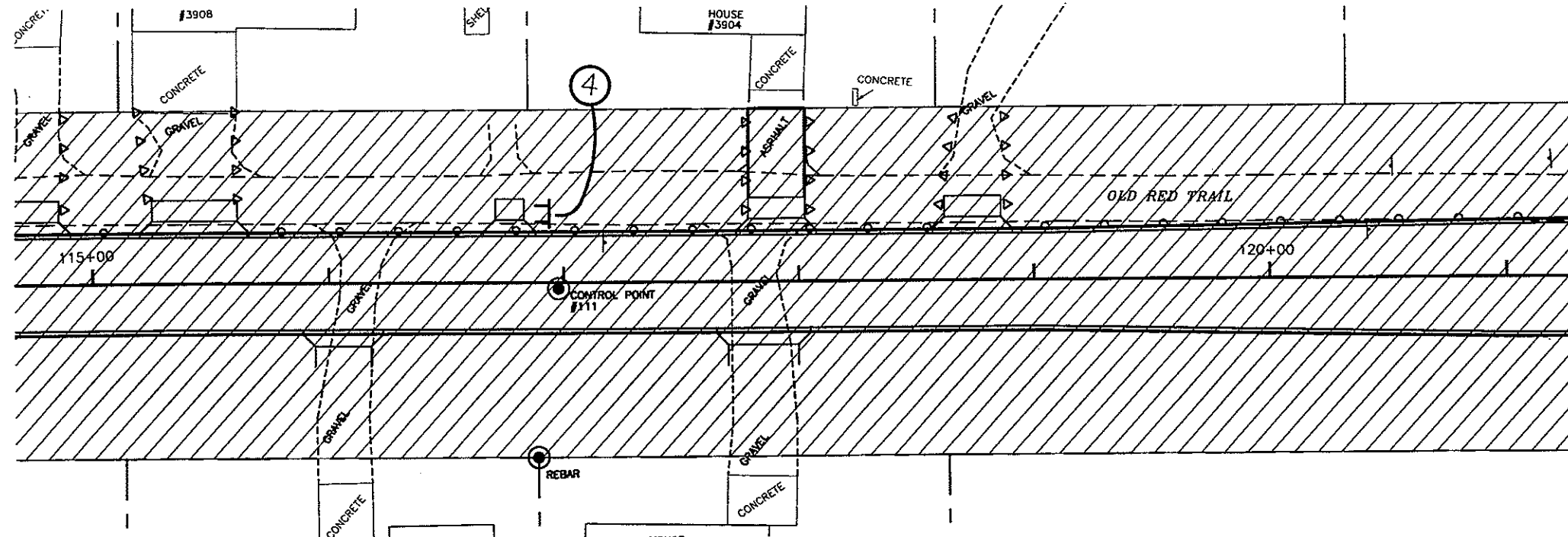
LEGEND

	PHASE 3B WORK ZONE
	TEMPORARY ROADWAY WIDENING
	DELINEATOR DRUM
	TUBULAR MARKER



FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	119
OLD RED TRAIL STA. 115+00 TO STA. 127+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 4

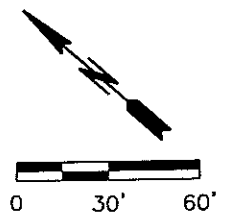


QUANTITIES

TYPE 3 BARRICADE	2
DELINEATOR DRUMS	59
TUBULAR MARKERS	42
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

- PHASE 3B WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



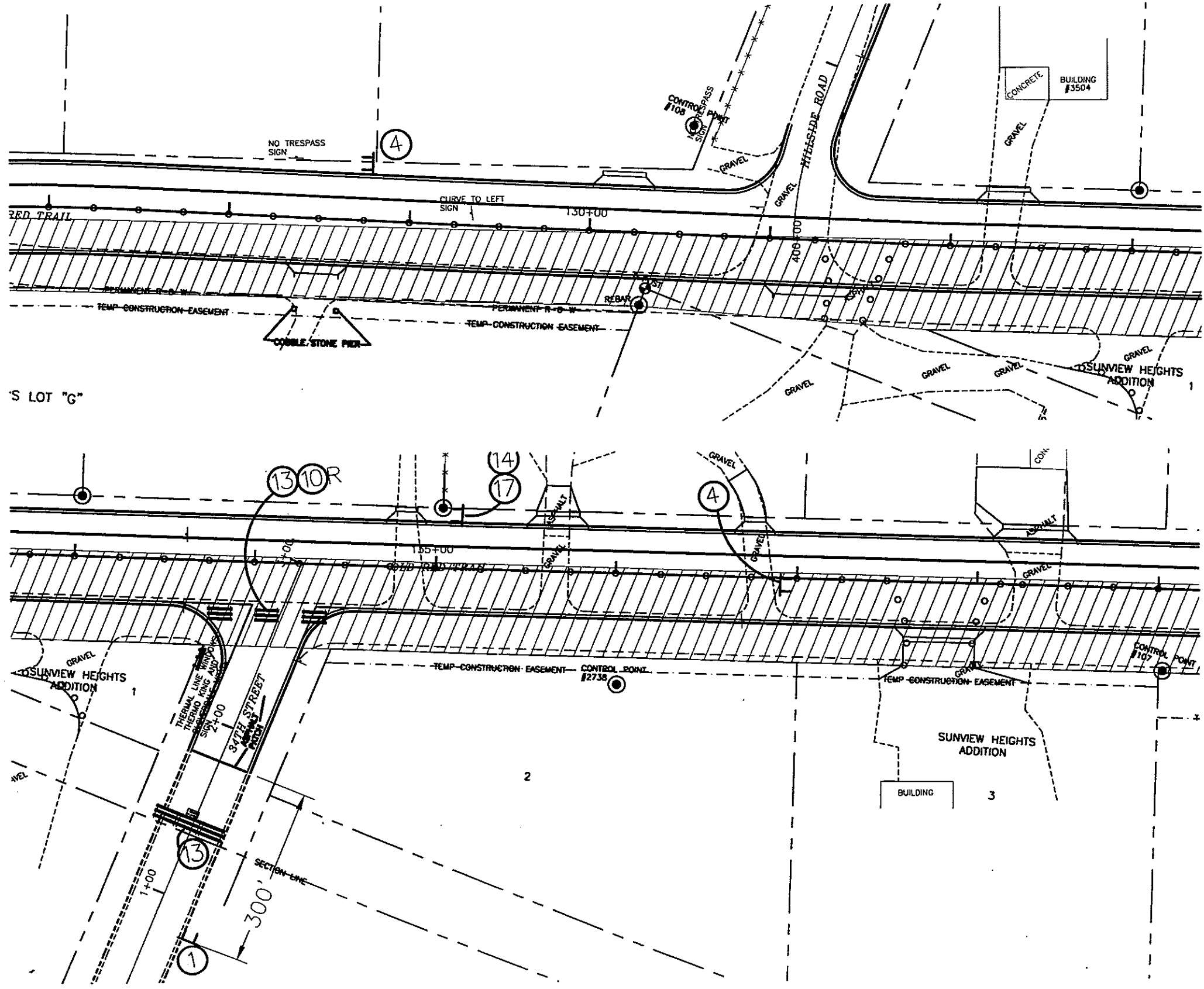
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CONSTRUCTION SIGNING - PHASE 4

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	120
OLD RED TRAIL STA. 127+00 TO STA. 139+00 CONSTRUCTION SIGNING			

QUANTITIES

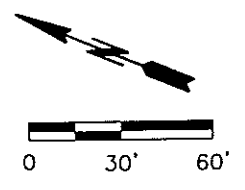
TYPE 3 BARRICADE	6
DELINEATOR DRUMS	67
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



S LOT "G"

LEGEND

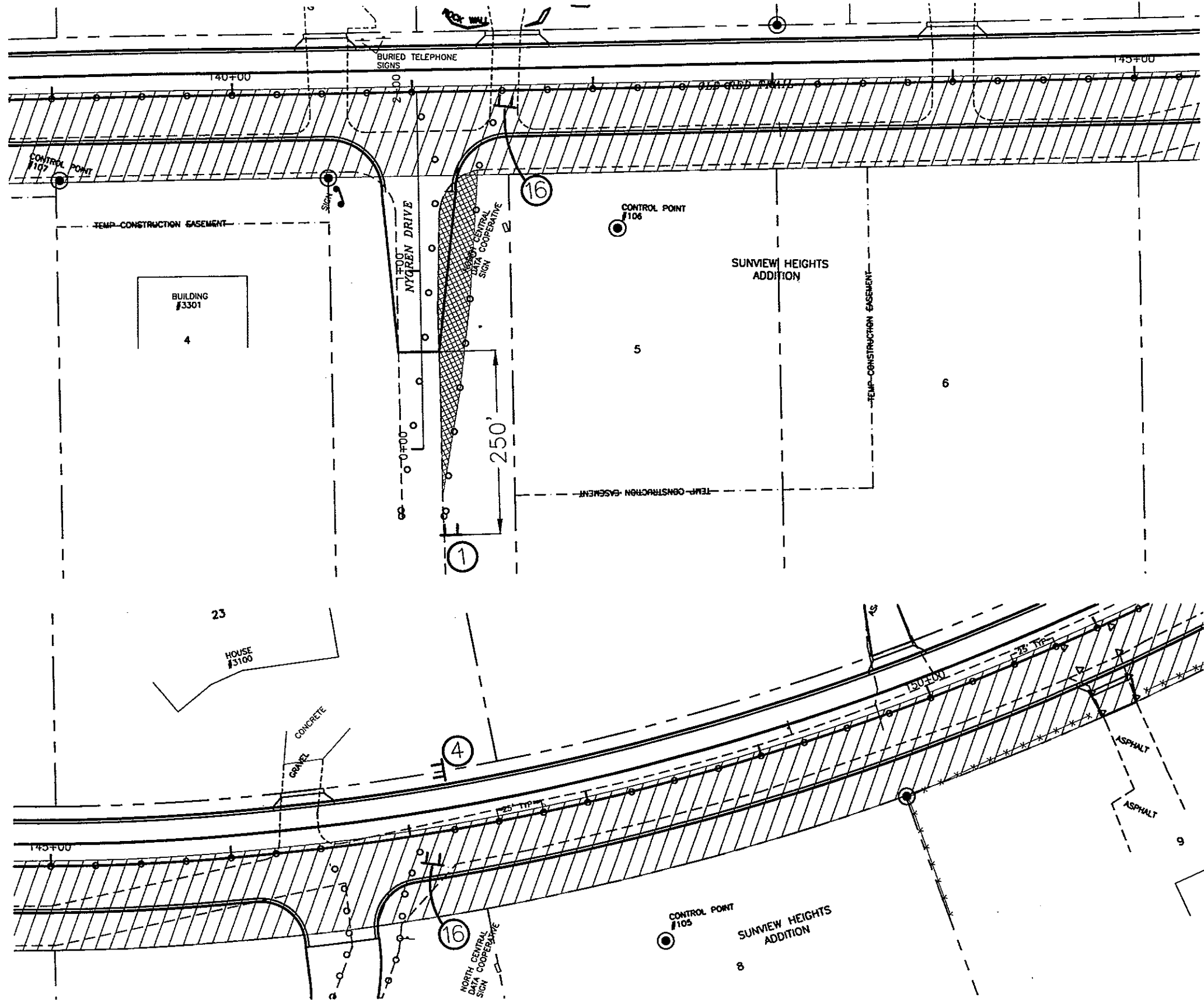
- PHASE 3B WORK ZONE
- TEMPORARY ROADWAY WIDENING
- DELINEATOR DRUM
- TUBULAR MARKER



CONSTRUCTION SIGNING - PHASE 4

FWHA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	121





OLD RED TRAIL
STA. 139+00 TO STA. 151+00
CONSTRUCTION SIGNING

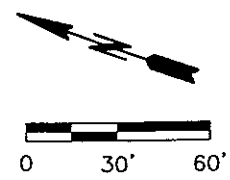


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	84
TUBULAR MARKERS	8
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

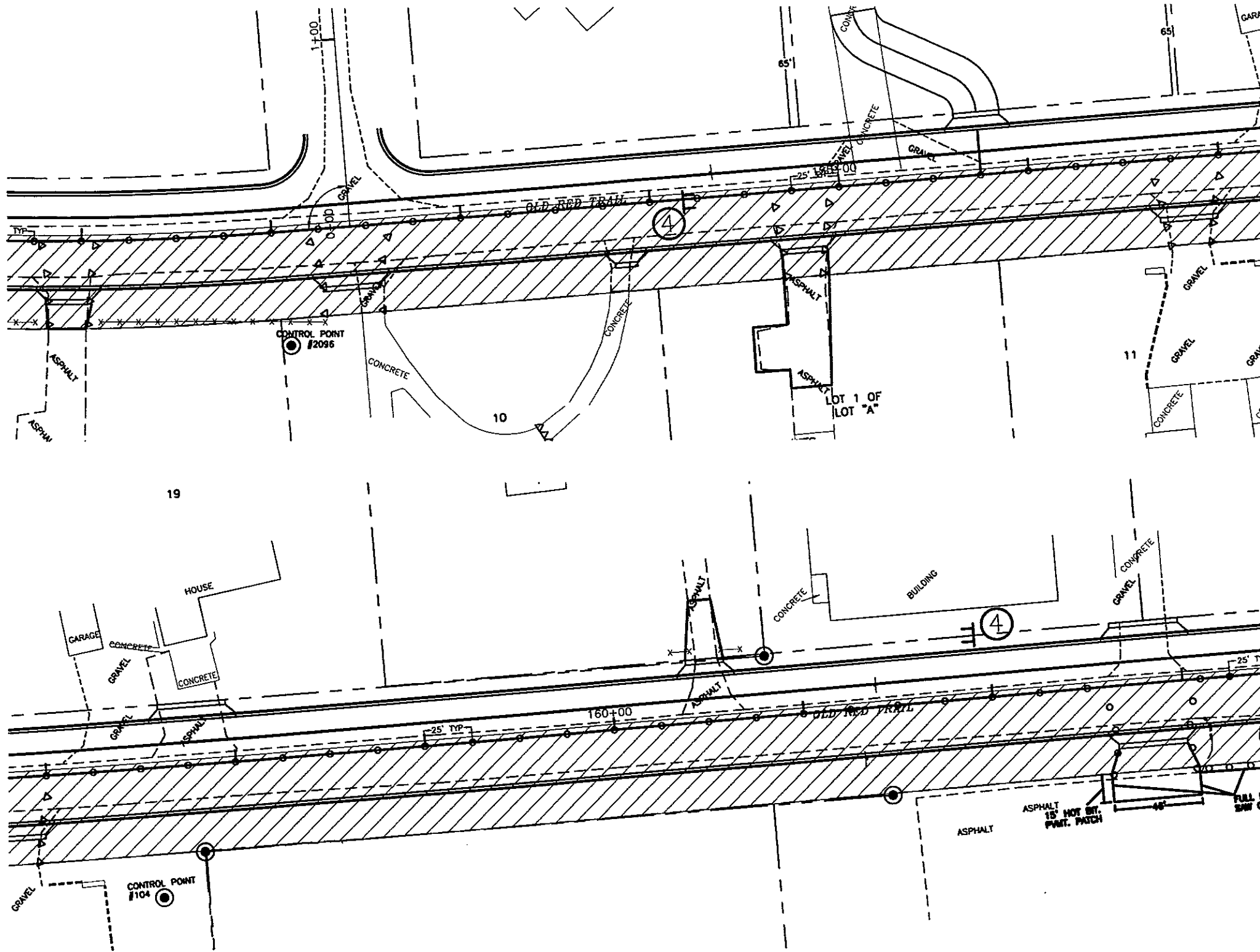
-  PHASE 3B WORK ZONE
-  TEMPORARY ROADWAY WIDENING
-  DELINEATOR DRUM
-  TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 4

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	22
OLD RED TRAIL STA. 151+00 TO STA. 163+00 CONSTRUCTION SIGNING			

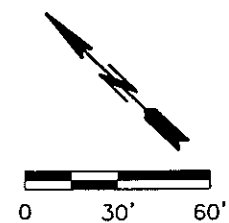


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	50
TUBULAR MARKERS	27
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

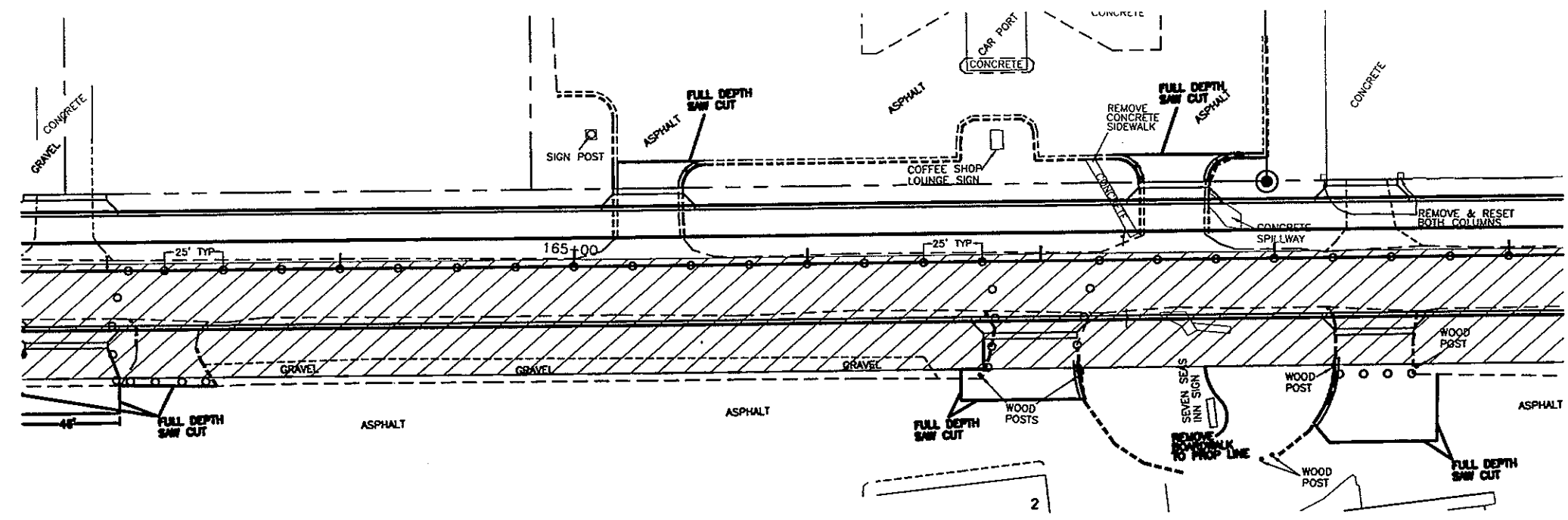
LEGEND

- PHASE 3B WORK ZONE
- DELINEATOR DRUM
- TUBULAR MARKER



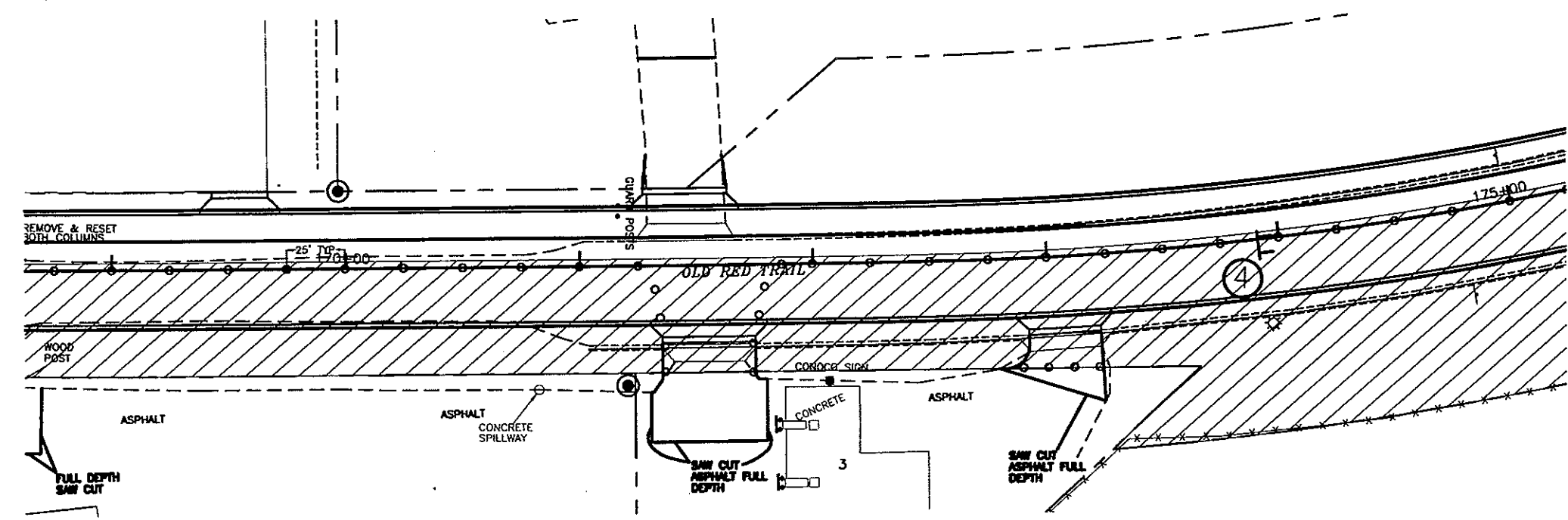
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	123
OLD RED TRAIL STA. 163+00 TO STA. 175+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 4



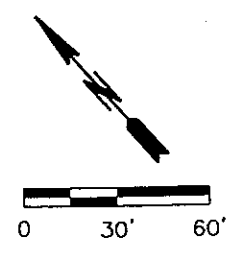
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	79
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

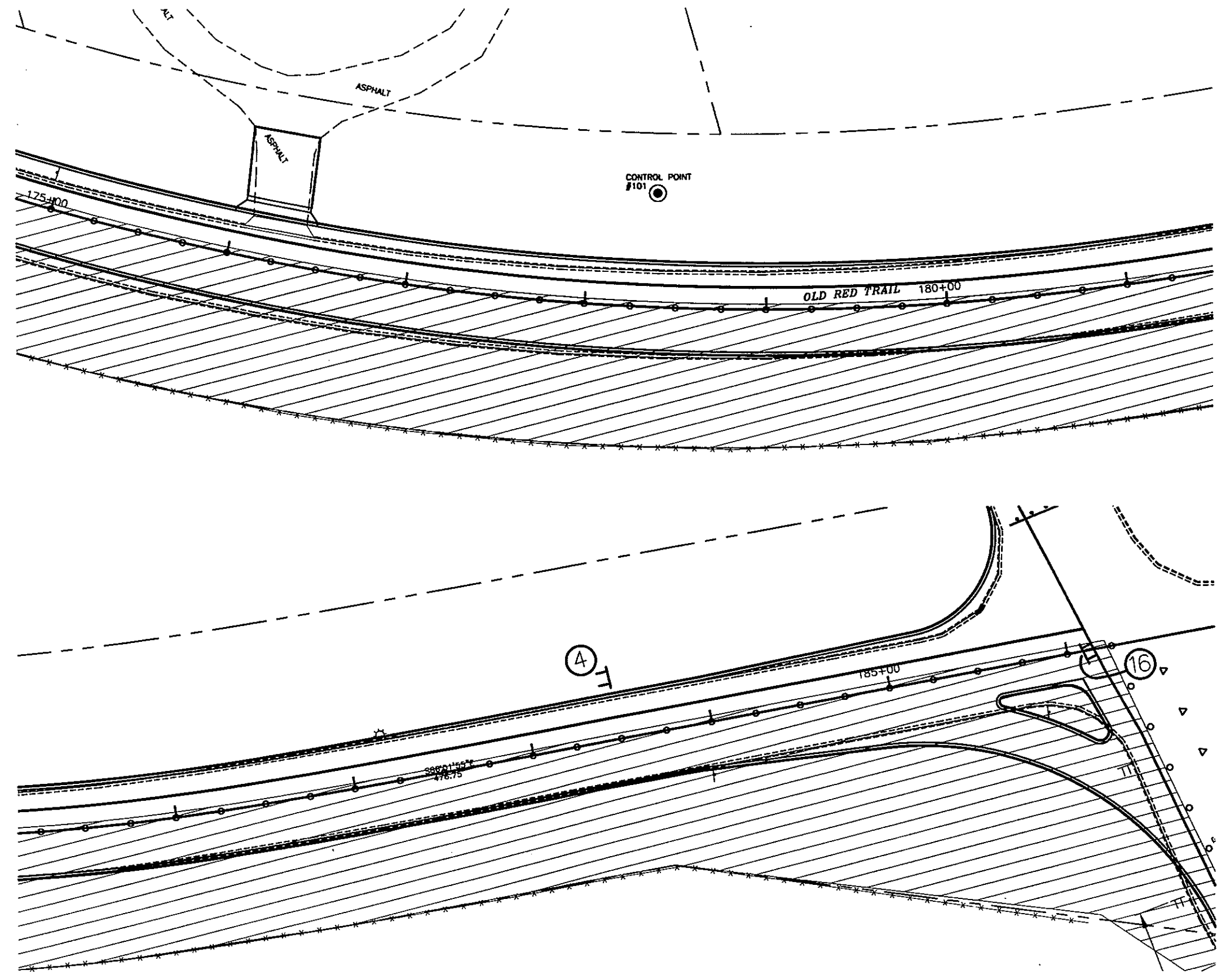
- PHASE 3B WORK ZONE
- DELINEATOR DRUM
- TUBULAR MARKER



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CONSTRUCTION SIGNING - PHASE 4




FYWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	124
OLD RED TRAIL STA. 175+00 TO STA. 186+00 CONSTRUCTION SIGNING			

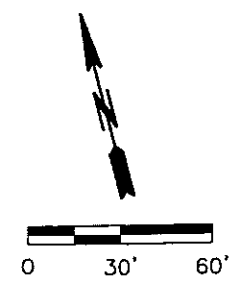


QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	44
TUBULAR MARKERS	_____
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____

LEGEND

-  PHASE 3B WORK ZONE
-  DELINEATOR DRUM
-  TUBULAR MARKER

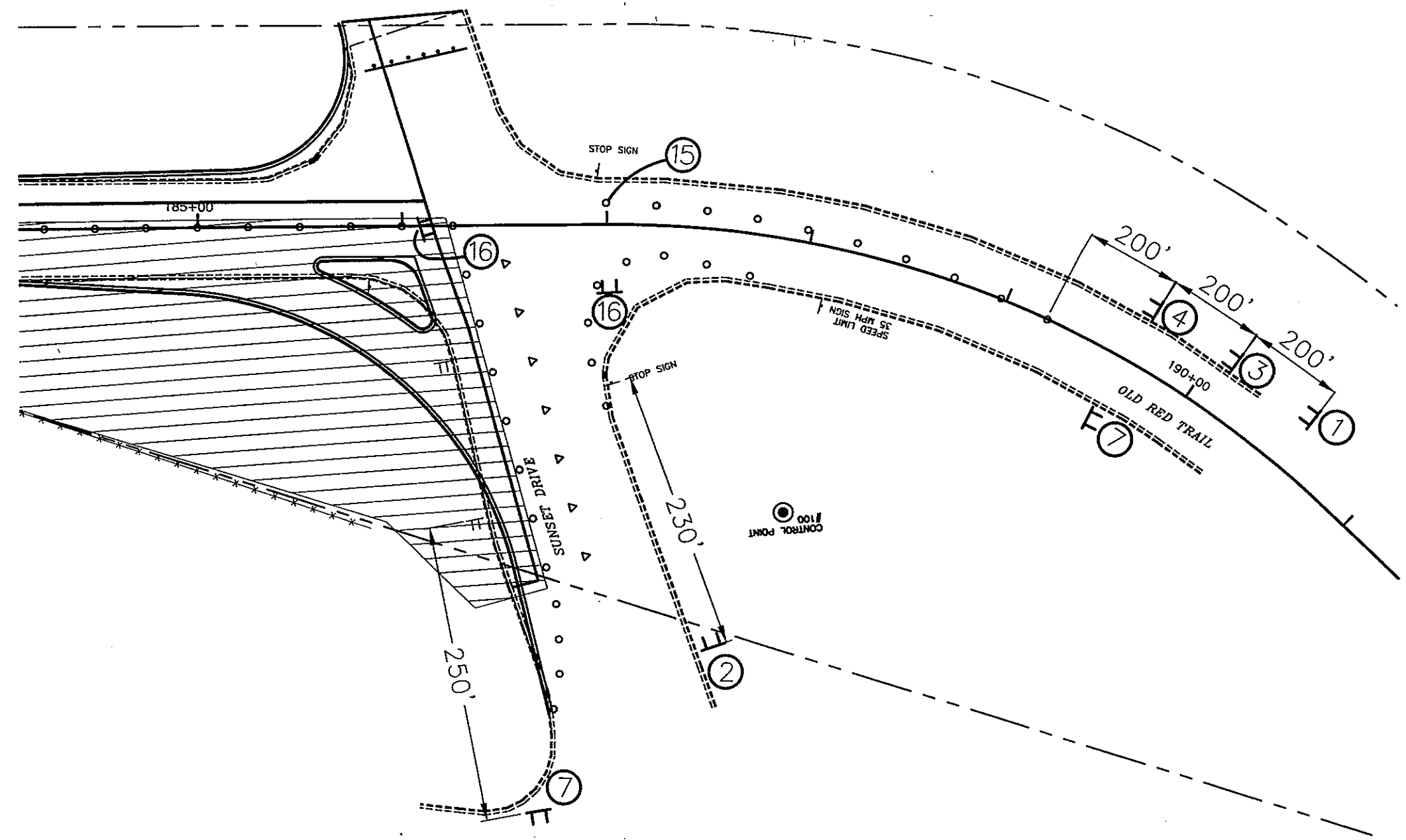


FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	125
OLD RED TRAIL STA. 186+00 TO STA. 191+00 CONSTRUCTION SIGNING			

CONSTRUCTION SIGNING - PHASE 4

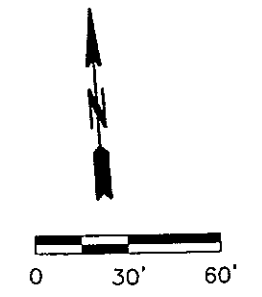
QUANTITIES

TYPE 3 BARRICADE	_____
DELINEATOR DRUMS	30
TUBULAR MARKERS	7
PVMT MK PAINTED 4 INCH LINE (YELLOW)	_____
SHORT TERM 4 INCH LINE - TYPE R (YELLOW)	_____



LEGEND

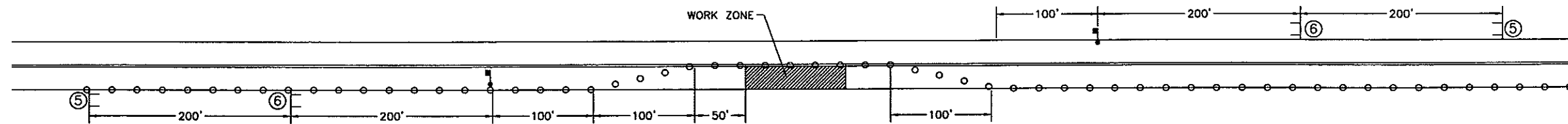
PHASE 3B WORK ZONE
DELINEATOR DRUM
TUBULAR MARKER



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FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	126
OLD RED TRAIL ONE LANE TRAFFIC CONTROL			

ONE LANE TRAFFIC CONTROL



ONE LANE TRAFFIC CONTROL WILL BE NEEDED TO INSTALL THE STORM SEWER OUTFALL PIPING TO A POINT LEFT OF CENTERLINE, INSTALL STORM SEWER INLET STUBS TO A POINT BEYOND THE CENTERLINE, AND POSSIBLY DURING SOME PAVING OPERATIONS.

- ⌋ FLAGGER LOCATION
- DELINEATOR DRUM

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	127
OLD RED TRAIL CONSTRUCTION SIGNING			

SUMMARY OF CONSTRUCTION SIGNING

SIGN NO.	DESCRIPTION	UNITS EACH	Phase 1		Phase 2		Phase 3A		Phase 3B		Phase 4		Hillside Road*		Max. Need	
			NO REQD	UNITS	NO REQD	UNITS	NO REQD	UNITS	NO REQD	UNITS	NO REQD	UNITS	NO REQD	UNITS	NO REQD	UNITS
1	Road Work Ahead	34	2	68	5	170	⑥	204	6	204	5	170	-	-	6	204
2	Road Construction Next 2 miles	30	①	30	1	30	1	30	1	30	1	30	-	-	1	30
3	Reduced Speed Ahead	40	1	40	②	80	2	80	2	80	2	80	-	-	2	80
4	Speed Limit 25—Minimum Fee \$40	48	8	384	⑫	576	12	576	12	576	11	528	-	-	12	576
5	One Lane Road Ahead	34	②	68	2	68	2	68	2	68	2	68	1	34	2	68
6	Flagger	34	2	68	2	68	④	136	2	68	2	68	-	-	4	136
7	End Road Work	25	2	50	③	75	3	75	3	75	3	75	-	-	3	75
8	Road Closed Ahead	34	-	-	-	-	②	68	2	68	-	-	-	-	2	68
9	Detour Ahead	34	-	-	-	-	②	68	2	68	-	-	-	-	2	68
10	Detour (In Arrow)	23	-	-	-	-	⑤	115	5	115	1	23	-	-	5	115
11	Road Closed to Thru Traffic	30	-	-	-	-	④	120	4	120	1	30	-	-	4	120
12	Detour with Arrow Left or Right	15	-	-	-	-	⑧	120	8	120	6	90	-	-	8	120
13	Road Closed	27	-	-	-	-	②	54	2	54	2	54	-	-	2	54
14	Detour -- Directional Arrow ↑	23	-	-	-	-	-	-	-	-	①	23	-	-	1	23
15	Bullnose -- R (Drum Mounted)	15	-	-	-	-	①	15	1	15	1	15	-	-	1	15
16	Stop	15	1	15	4	60	⑤	75	5	75	5	75	-	-	5	75
17	34th ST NW	10	-	-	-	-	-	-	-	-	③	30	-	-	3	30
18	Equipment Working	34	-	-	-	-	-	-	-	-	-	-	1	34	-	-
	Type 3 Barricades	EA	-	-	11	-	13	-	⑮	-	12	-	2	-	15	-
	Delineator Drums	EA	163	-	443	-	④76	-	457	-	470	-	75	-	476	-
	Tubular Markers	EA	-	-	272	-	345	-	③74	-	186	-	-	-	374	-
TOTAL UNITS															1857	

① No. CIRCLED NUMBER INDICATES ITEMS COUNTED IN MAX NEED THAT MAY HAPPEN SIMULTANEOUSLY

* CITY FUNDS ONLY (NOT INCLUDED IN MAX. NEED)

CONSTRUCTION SIGNING

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	128
OLD RED TRAIL CONSTRUCTION SIGNING			



W21-4-48

①



G20-52L-72

②



R2-5a-48

③



R2-1-48
R2-1a-24

④



W20-4-48

⑤



W20-7A-48
BLACK & ORANGE

⑥



G20-2A-48

⑦



W20-3-48

⑧



W20-2-48
BLACK & ORANGE

⑨



M4-10(L OR R)-48

⑩



R11-4-60
BLACK & WHITE

⑪



M4-9(L OR R)-30

⑫



R11-2-48
BLACK & WHITE

⑬



M4-8-24
M6-3-21

⑭



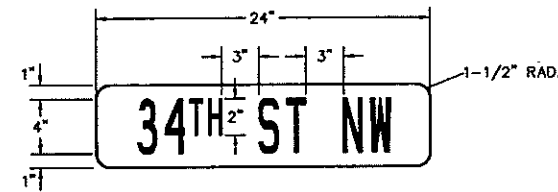
R4-7-24
DRUM MOUNTED

⑮



R1-1-30

⑯



4" LETTERS, SERIES B
BLACK & ORANGE

⑰



W20-51-48

⑱



Type III Barricade



Delineator Drum



Tubular Marker

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	130
OLD RED TRAIL STA. 101+00 TO STA. 105+00 PERMANENT SIGNING AND MARKING		

PLASTIC PAVEMENT MARKING FILM

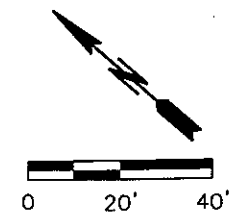
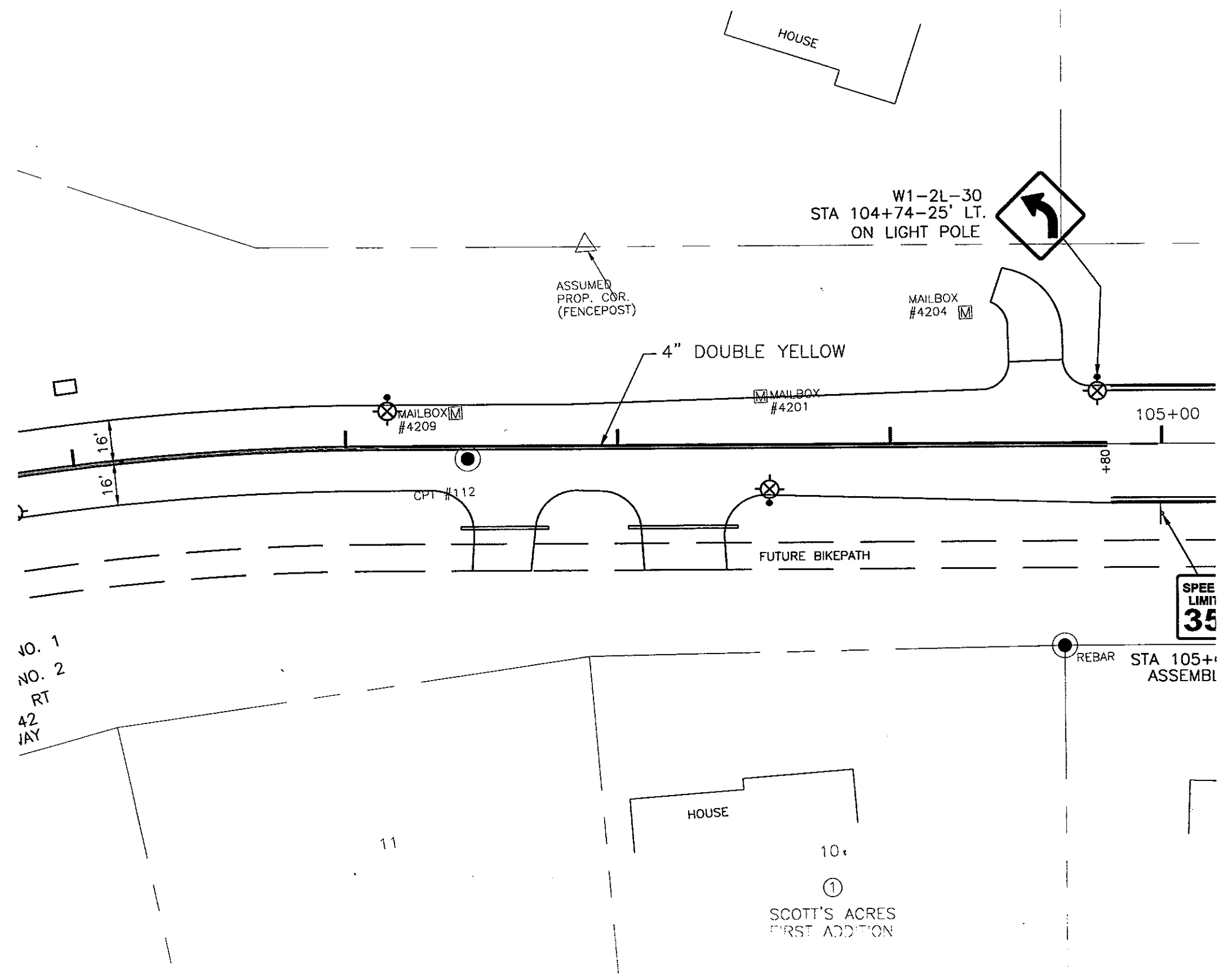
4" WHITE LINE	_____
4" YELLOW LINE	10 LF _____
24" WHITE LINE	_____

PAVEMENT MARKING-MASKING

4" WHITE LINE	_____
4" YELLOW LINE	10 LF _____
24" WHITE LINE	_____

PAVEMENT MARKING-PAINTED

4" WHITE LINE	_____
4" YELLOW LINE	760 LF _____
24" WHITE LINE	_____



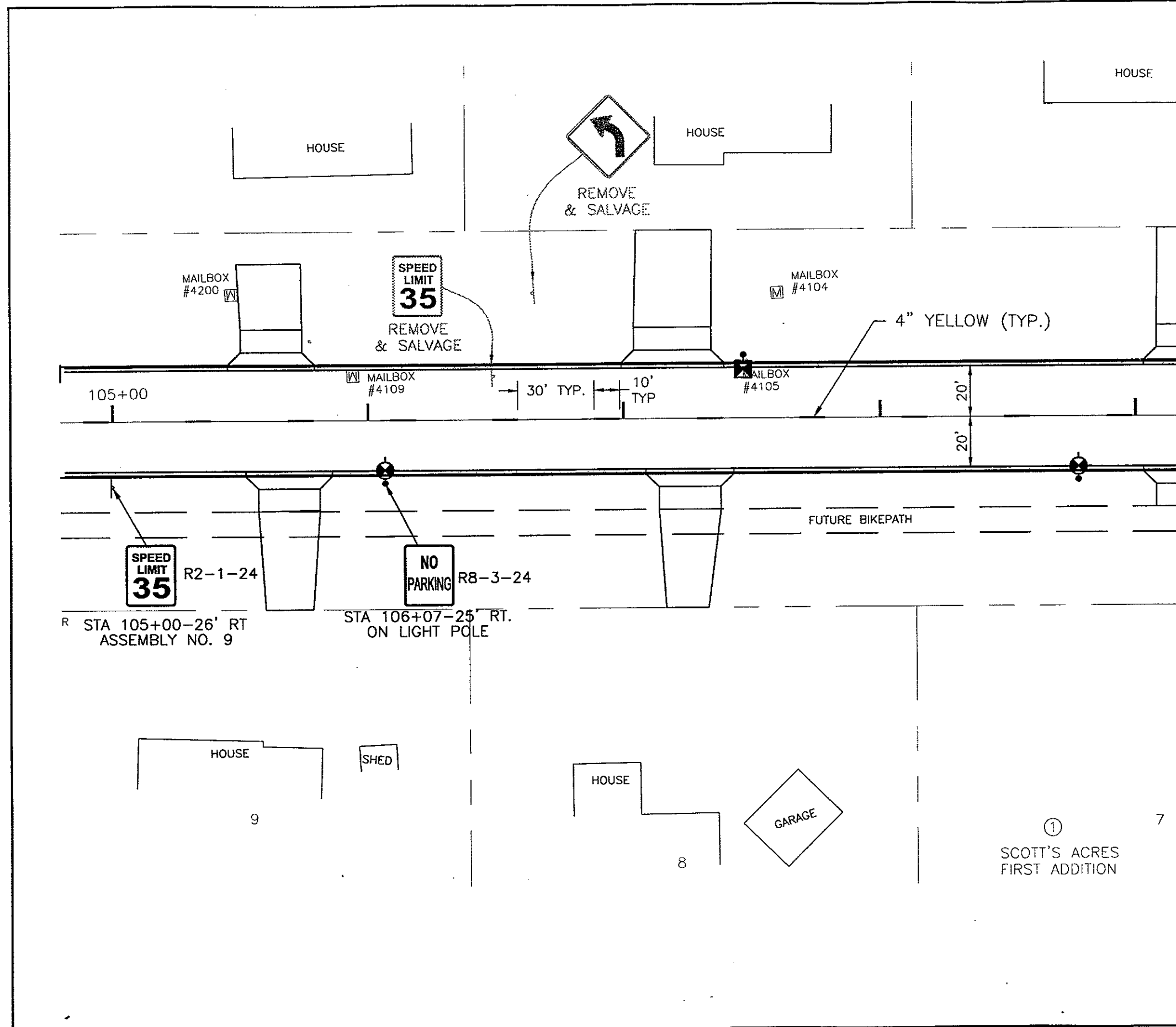
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	131
OLD RED TRAIL STA. 105+00 TO STA. 109+00 PERMANENT SIGNING AND MARKING		

PLASTIC PAVEMENT MARKING FILM

4" WHITE LINE	_____
4" YELLOW LINE	100 LF
24" WHITE LINE	_____

PAVEMENT MARKING-MASKING

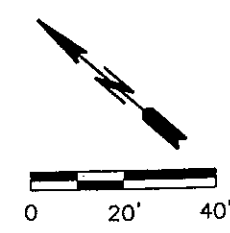
4" WHITE LINE	_____
4" YELLOW LINE	100 LF
24" WHITE LINE	_____



R STA 105+00-26' RT
ASSEMBLY NO. 9

STA 106+07-25' RT.
ON LIGHT POLE

①
SCOTT'S ACRES
FIRST ADDITION



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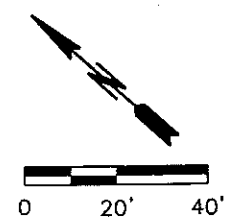
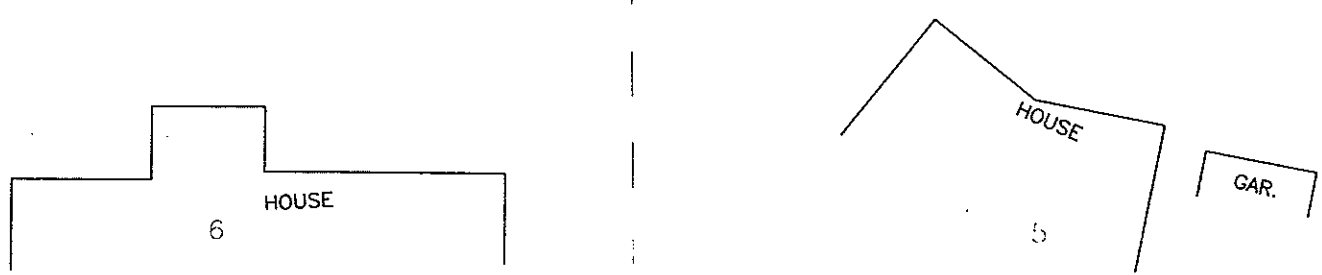
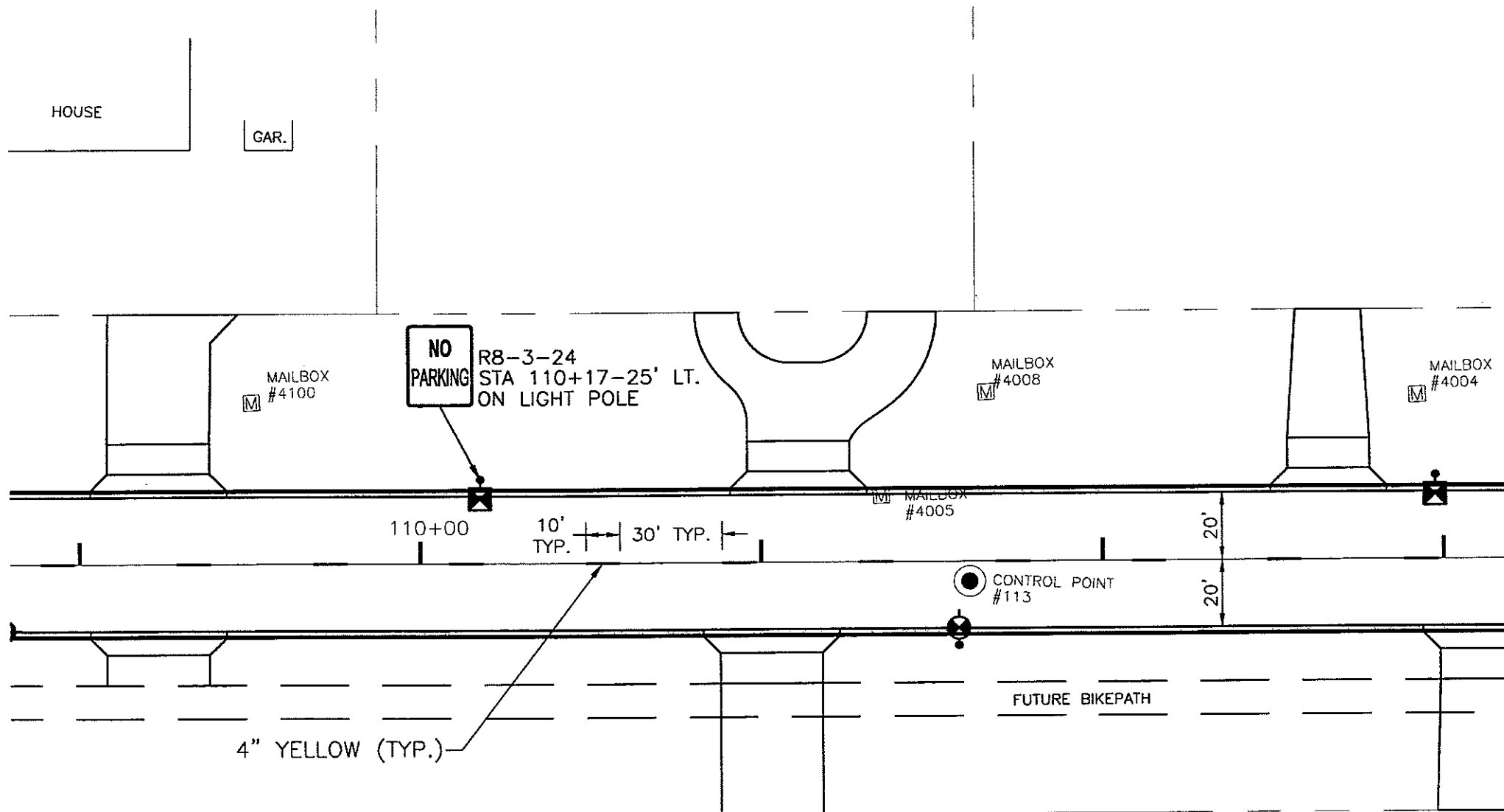
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	132
OLD RED TRAIL STA. 109+00 TO STA. 113+00 PERMANENT SIGNING AND MARKING		

PLASTIC PAVEMENT MARKING FILM

4" WHITE LINE _____
 4" YELLOW LINE 100 LF
 24" WHITE LINE _____

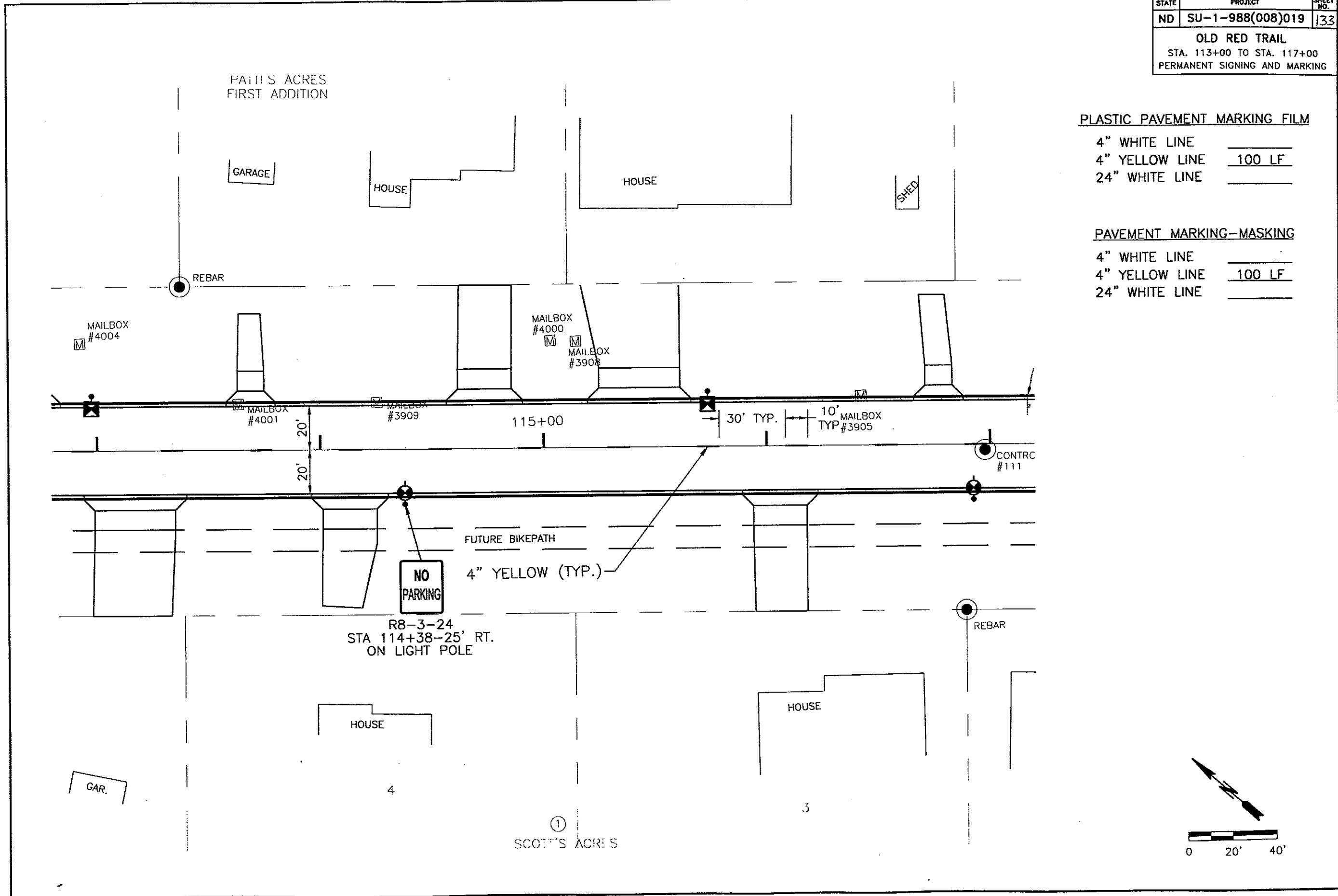
PAVEMENT MARKING-MASKING

4" WHITE LINE _____
 4" YELLOW LINE 100 LF
 24" WHITE LINE _____



7
 12:5

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	133
OLD RED TRAIL STA. 113+00 TO STA. 117+00 PERMANENT SIGNING AND MARKING		



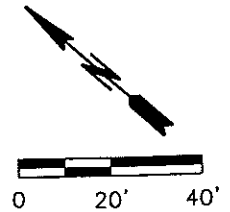
PLASTIC PAVEMENT MARKING FILM

4" WHITE LINE	_____
4" YELLOW LINE	100 LF
24" WHITE LINE	_____

PAVEMENT MARKING-MASKING

4" WHITE LINE	_____
4" YELLOW LINE	100 LF
24" WHITE LINE	_____

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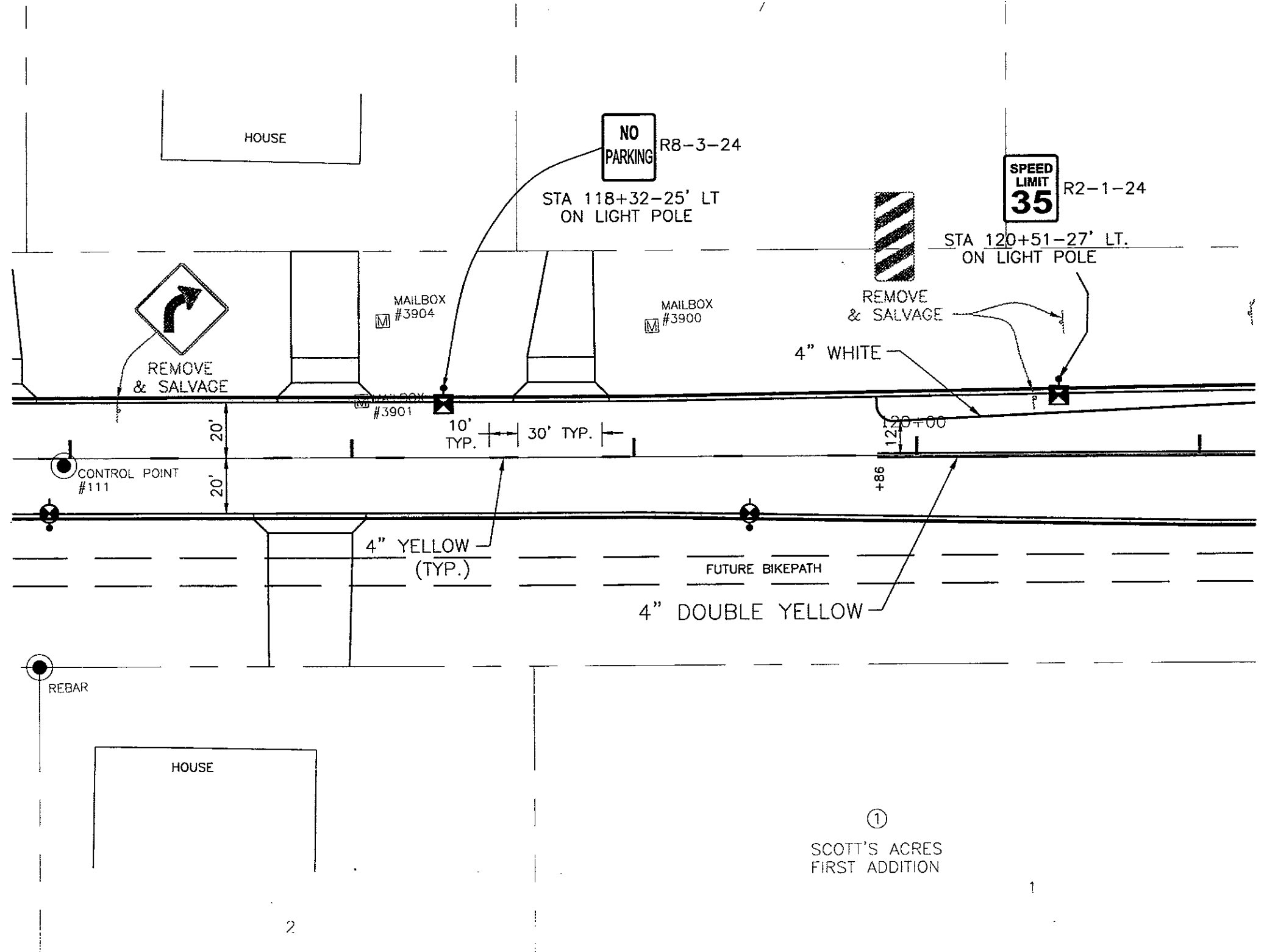
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	134
OLD RED TRAIL STA. 117+00 TO STA. 121+00 PERMANENT SIGNING AND MARKING		

PLASTIC PAVEMENT MARKING FILM

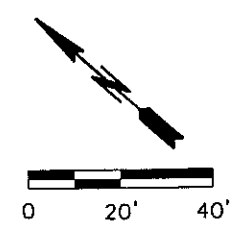
4" WHITE LINE	122 LF
4" YELLOW LINE	298 LF
24" WHITE LINE	_____

PAVEMENT MARKING-MASKING

4" WHITE LINE	122 LF
4" YELLOW LINE	298 LF
24" WHITE LINE	_____



①
SCOTT'S ACRES
FIRST ADDITION



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	135
OLD RED TRAIL STA. 121+00 TO STA. 125+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

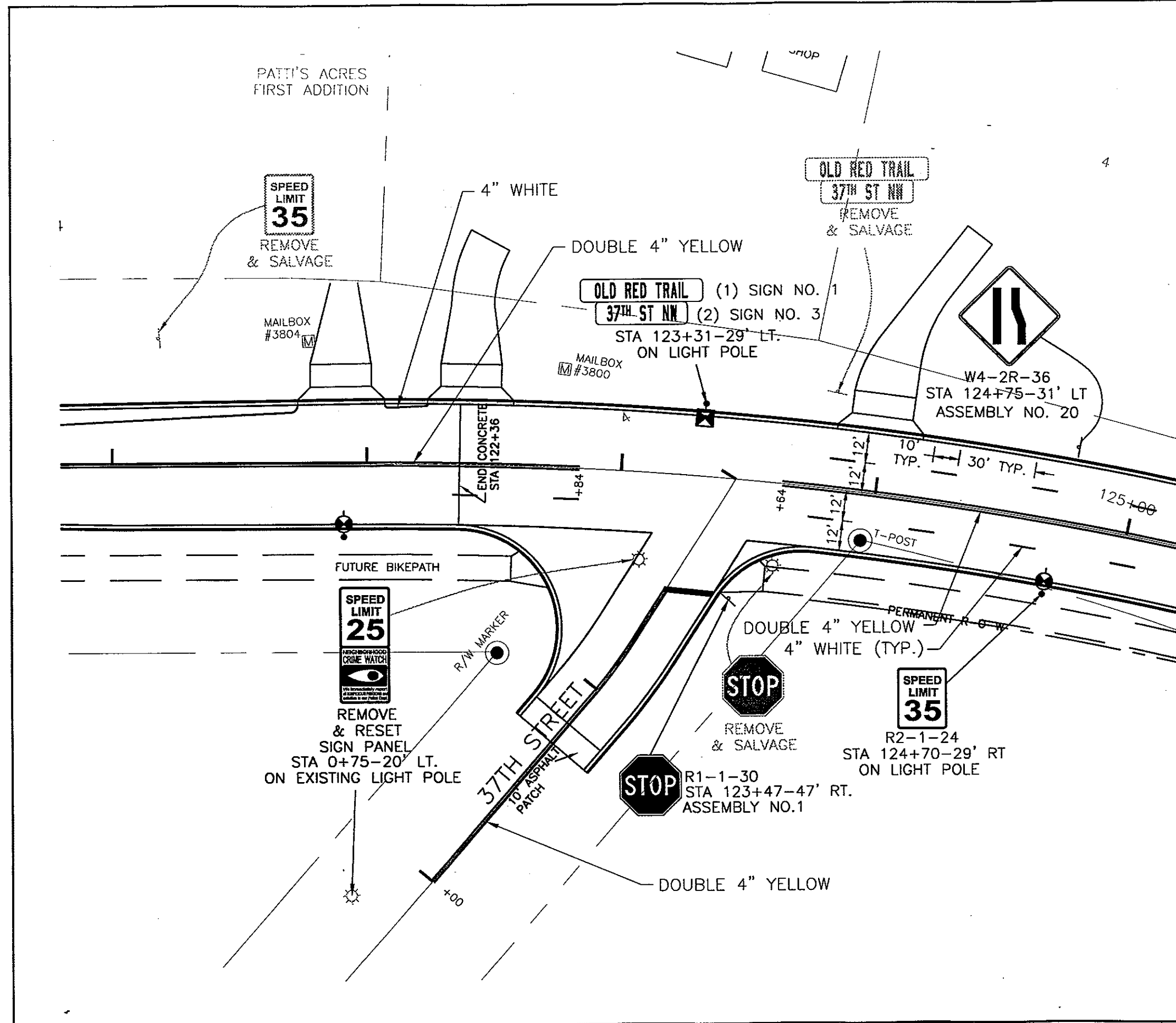
4" WHITE LINE	80 LF
4" YELLOW LINE	368 LF
24" WHITE LINE	20 LF

PLASTIC PAVEMENT MARKING FILM

4" WHITE LINE	95 LF
4" YELLOW LINE	572 LF
24" WHITE LINE	

PAVEMENT MARKING-MASKING

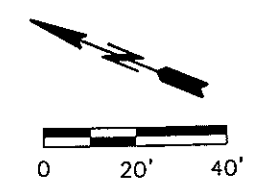
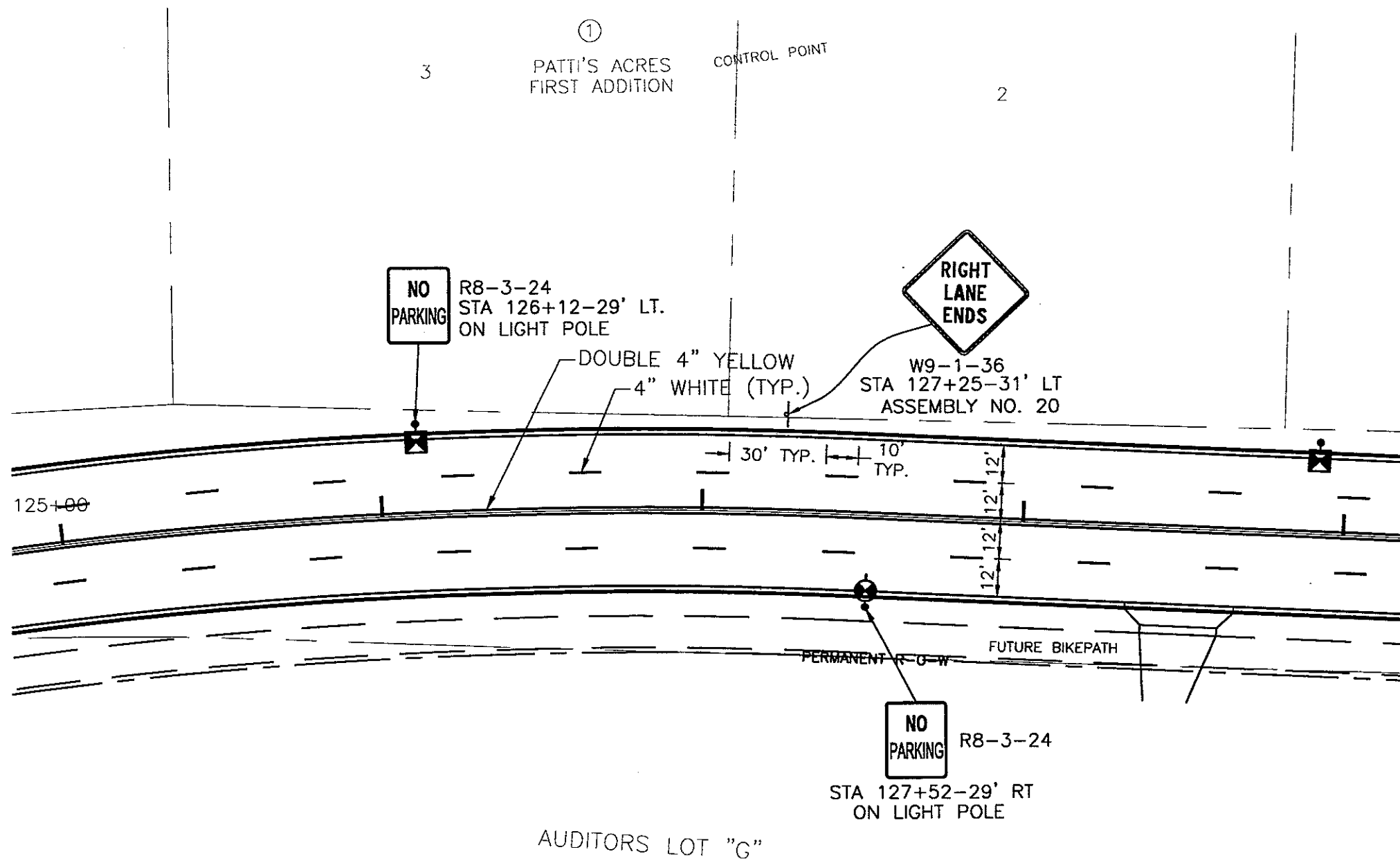
4" WHITE LINE	95 LF
4" YELLOW LINE	438 LF
24" WHITE LINE	



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	136
OLD RED TRAIL STA. 125+00 TO STA. 129+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	137
OLD RED TRAIL		
STA. 129+00 TO STA. 133+00		
PERMANENT SIGNING AND MARKING		

**PERFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

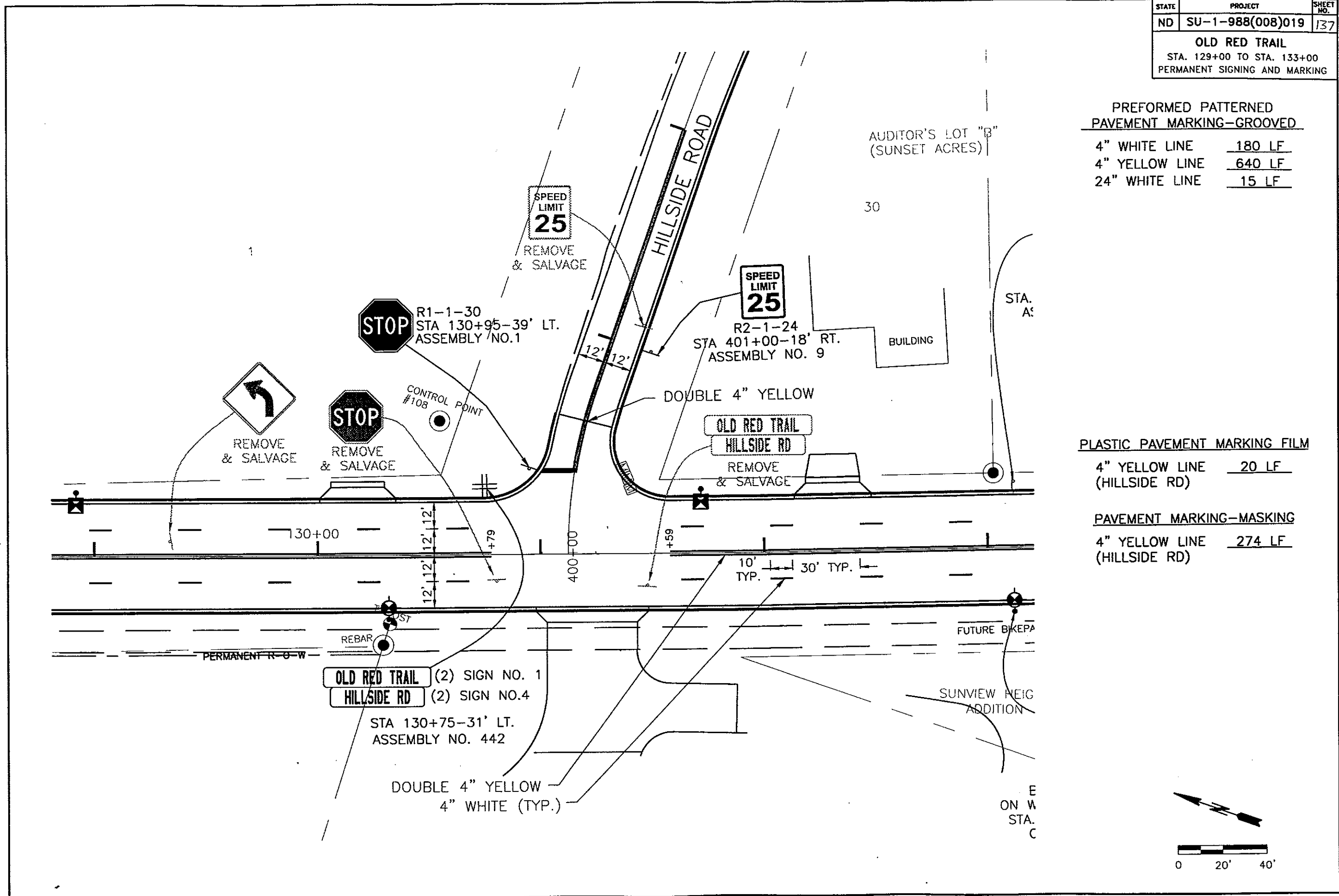
4" WHITE LINE	180 LF
4" YELLOW LINE	640 LF
24" WHITE LINE	15 LF

PLASTIC PAVEMENT MARKING FILM

4" YELLOW LINE (HILLSIDE RD)	20 LF
---------------------------------	-------

PAVEMENT MARKING-MASKING

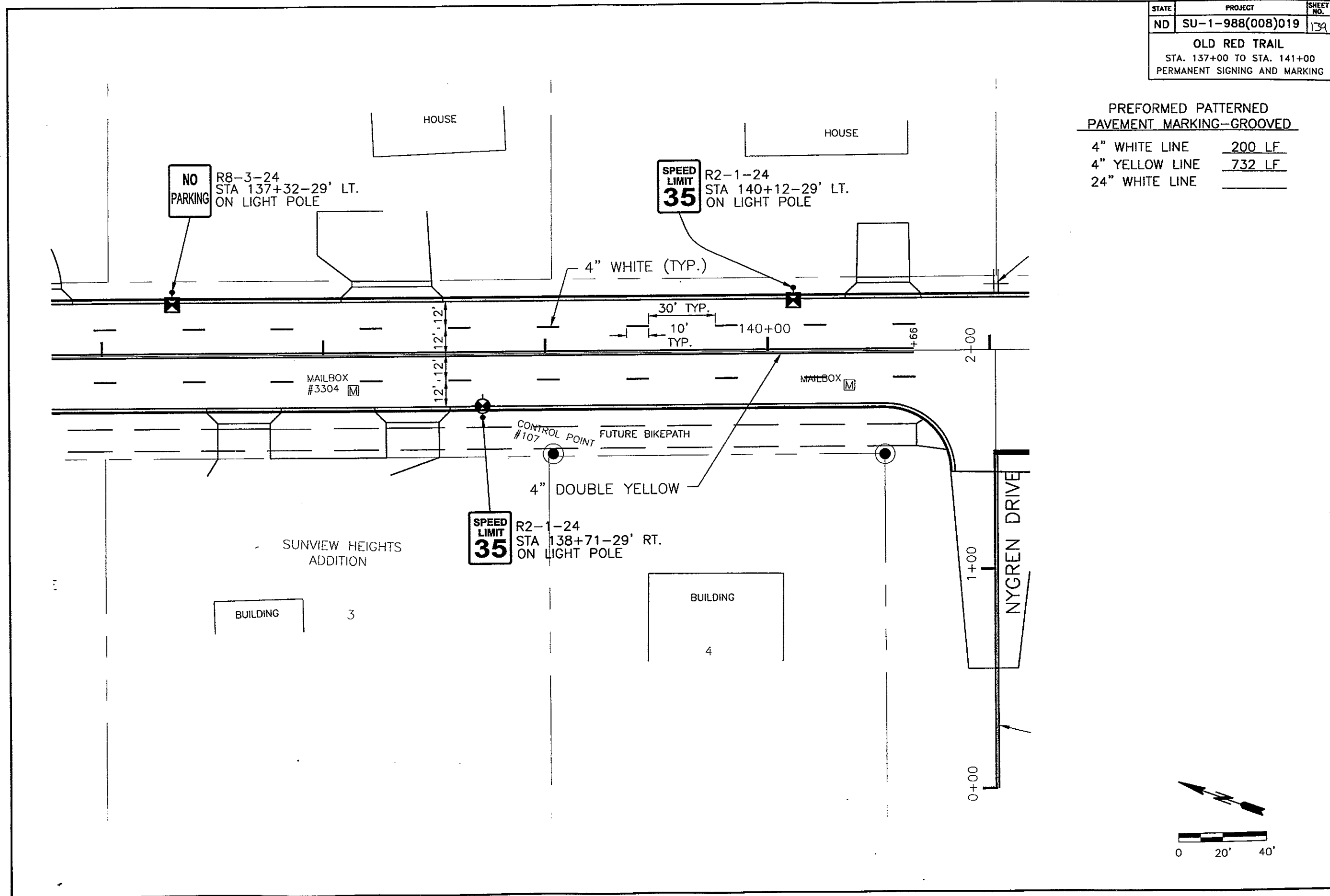
4" YELLOW LINE (HILLSIDE RD)	274 LF
---------------------------------	--------



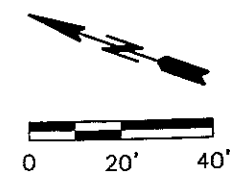
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	139
OLD RED TRAIL STA. 137+00 TO STA. 141+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	732 LF
24" WHITE LINE	



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	140
OLD RED TRAIL		
STA. 141+00 TO STA. 145+00		
PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

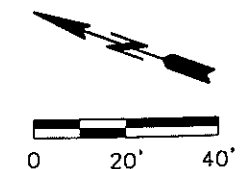
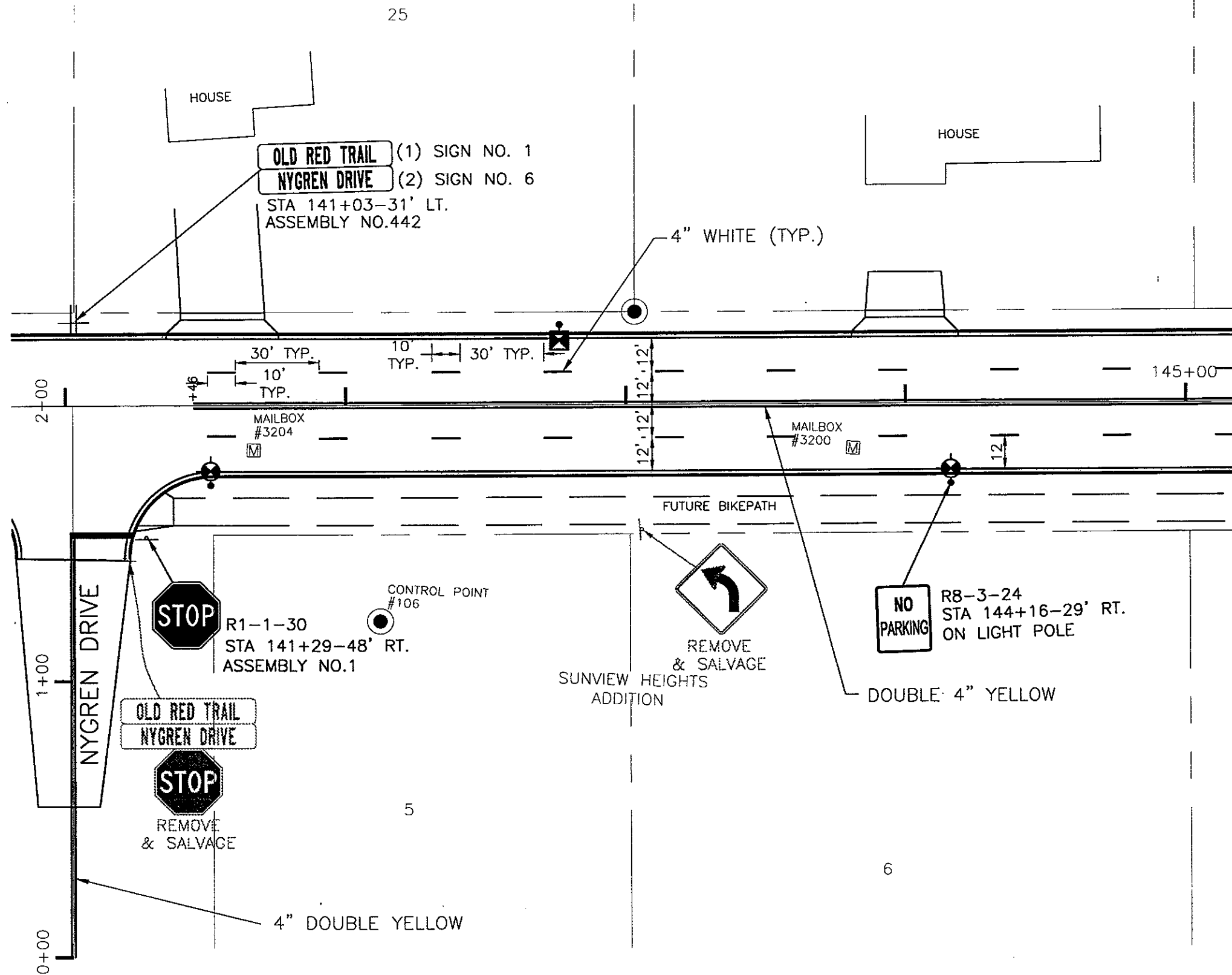
4" WHITE LINE	180 LF
4" YELLOW LINE	708 LF
24" WHITE LINE	19 LF

PLASTIC PAVEMENT MARKING FILM

4" YELLOW LINE (34TH ST)	300 LF
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PAVEMENT MARKING-MASKING

4" YELLOW LINE (34TH ST)	285 LF
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	141
OLD RED TRAIL STA. 145+00 TO STA. 149+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

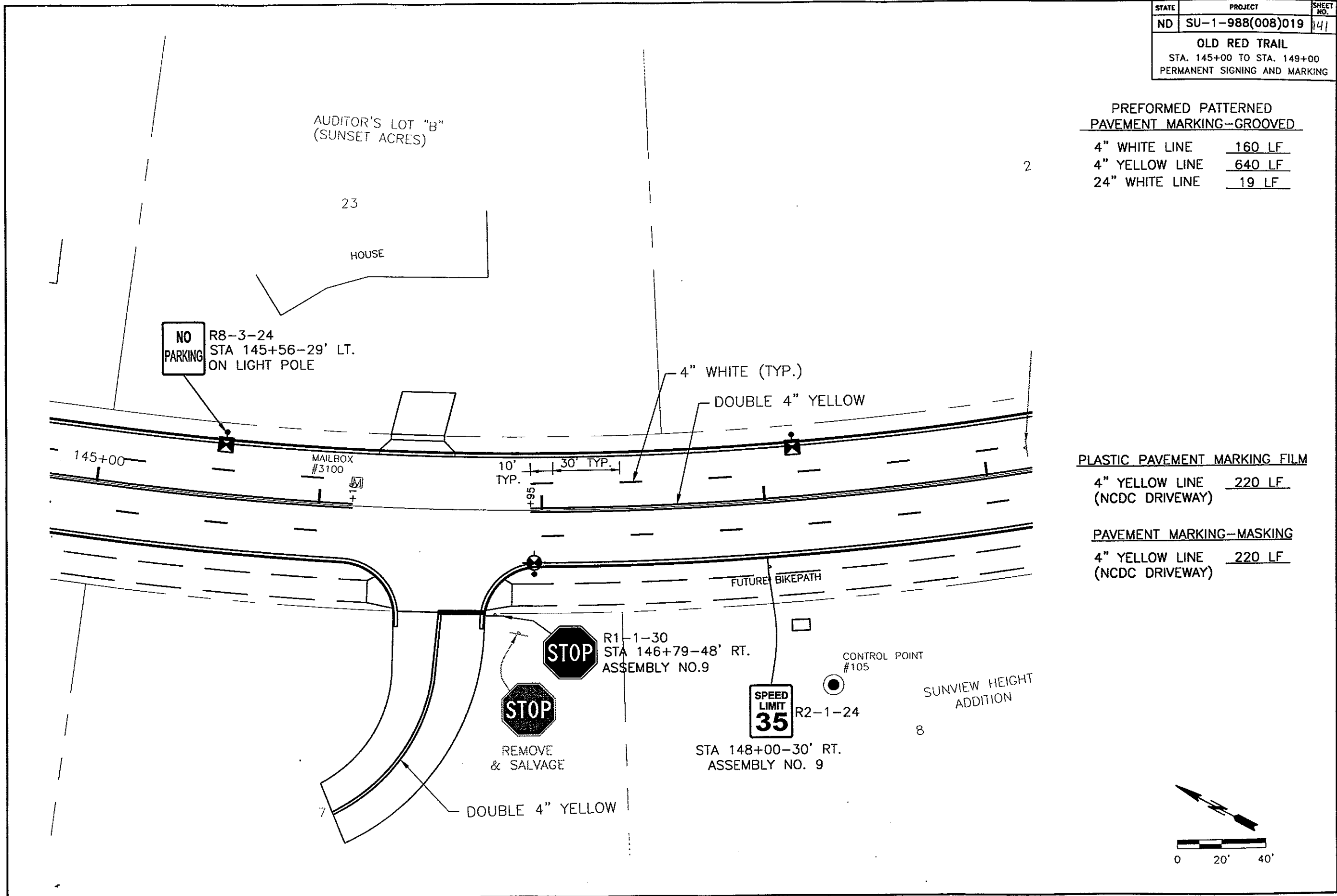
4" WHITE LINE	160 LF
4" YELLOW LINE	640 LF
24" WHITE LINE	19 LF

PLASTIC PAVEMENT MARKING FILM

4" YELLOW LINE (NCDC DRIVEWAY)	220 LF
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PAVEMENT MARKING-MASKING

4" YELLOW LINE (NCDC DRIVEWAY)	220 LF
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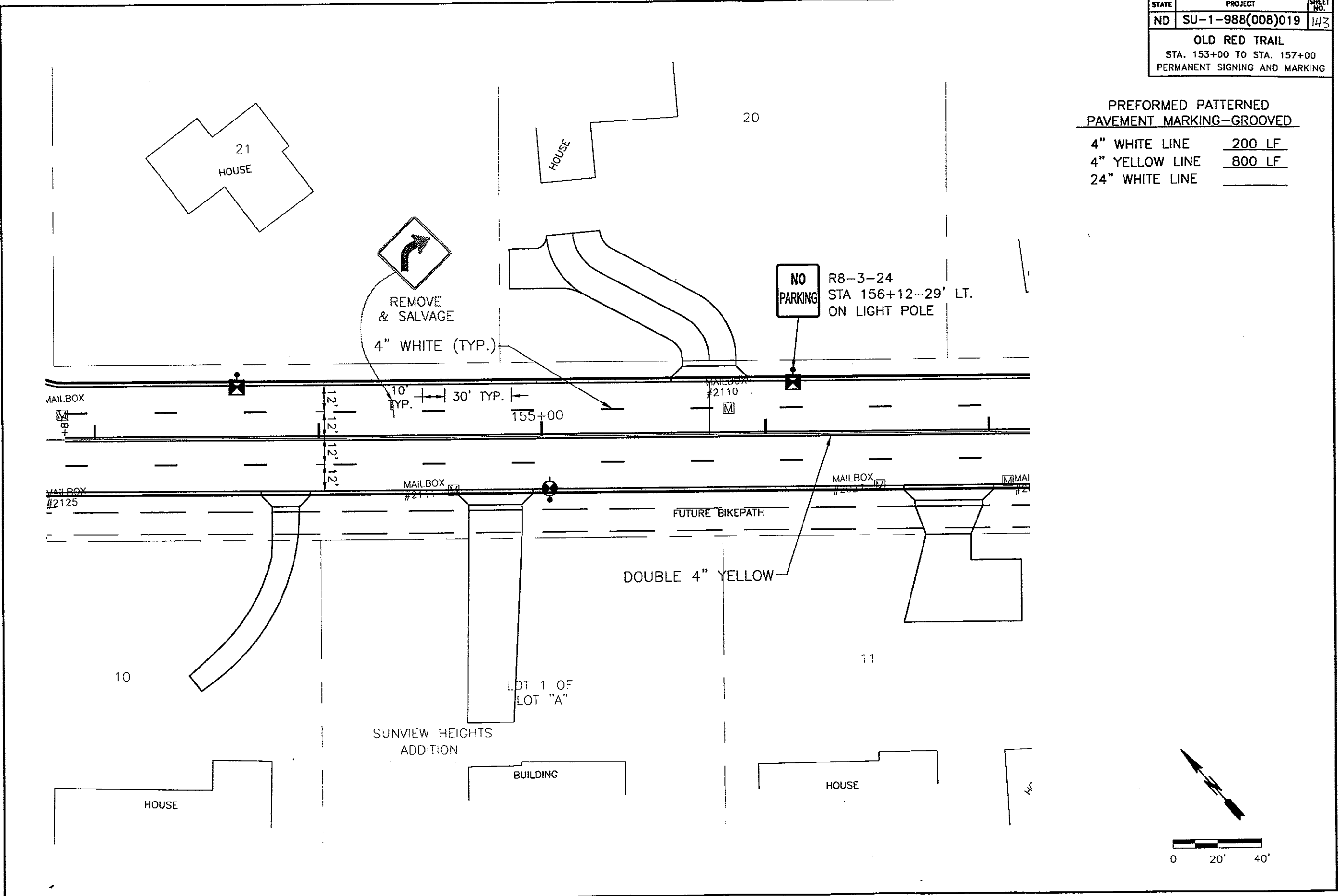


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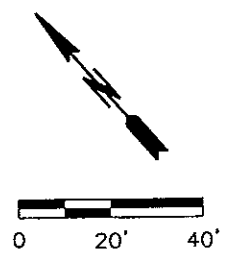
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	143
OLD RED TRAIL STA. 153+00 TO STA. 157+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	



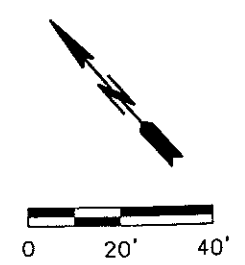
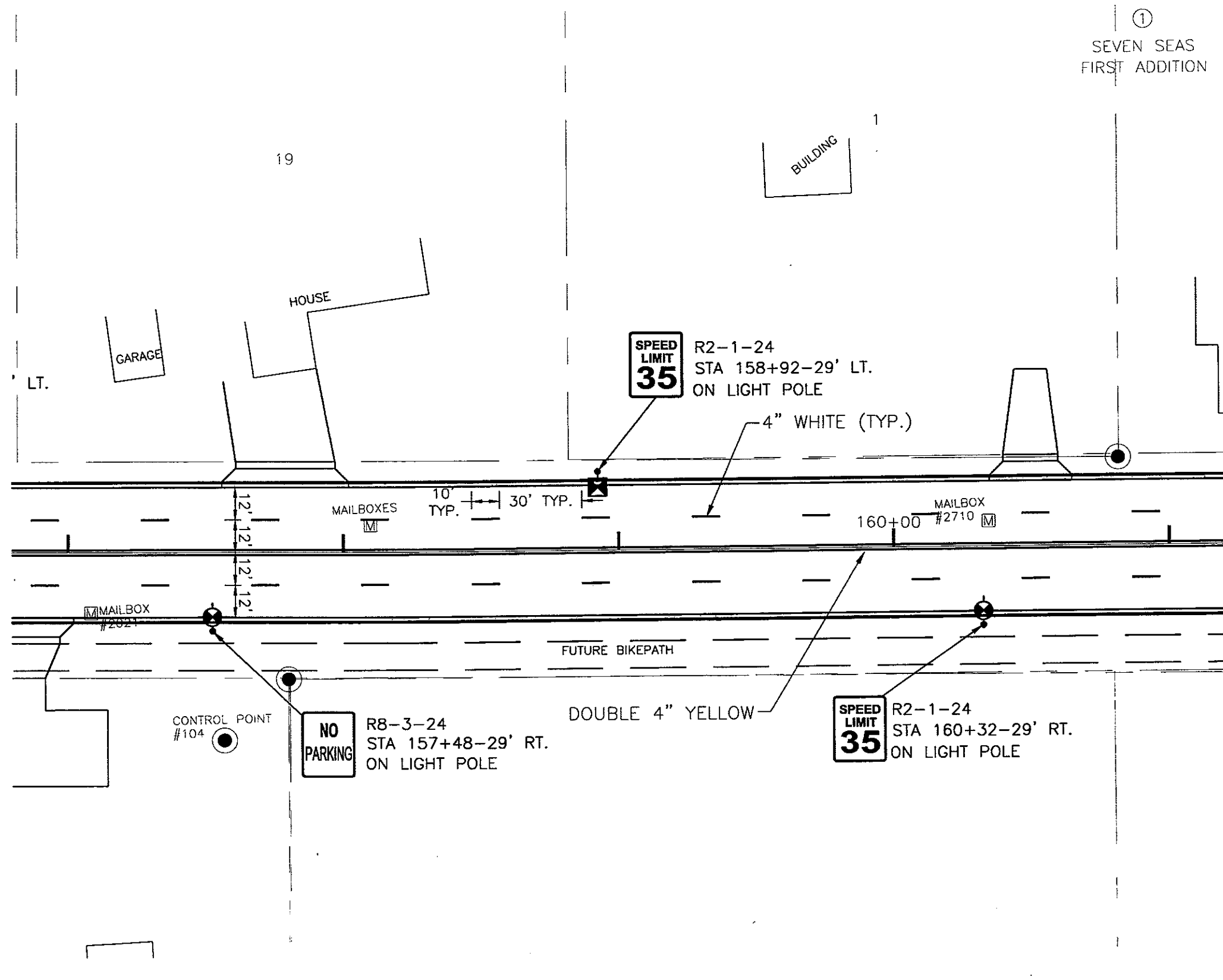
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	144
OLD RED TRAIL STA. 157+00 TO STA. 161+00 PERMANENT SIGNING AND MARKING		

PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	145
OLD RED TRAIL STA. 161+00 TO STA. 165+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	

①
VEN SEAS
ST ADDITION

2

3

SEVEN
FIRST

SPEED
LIMIT
35
REMOVE
& SALVAGE

**NO
PARKING**

R8-3-24
STA 164+50-29' LT.
ON LIGHT POLE

4" WHITE (TYP.)

10' TYP. 30' TYP.

165+00

FUTURE BIKEPATH



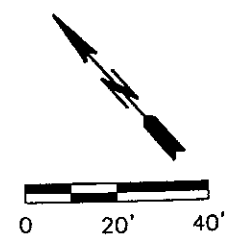
SPEED
LIMIT
25
REMOVE
& SALVAGE

15' HOT BIT.
PVMT. PATCH 46' SAW CUT SAW CUT

DOUBLE 4" YELLOW

②

SEVEN
FIRST AD

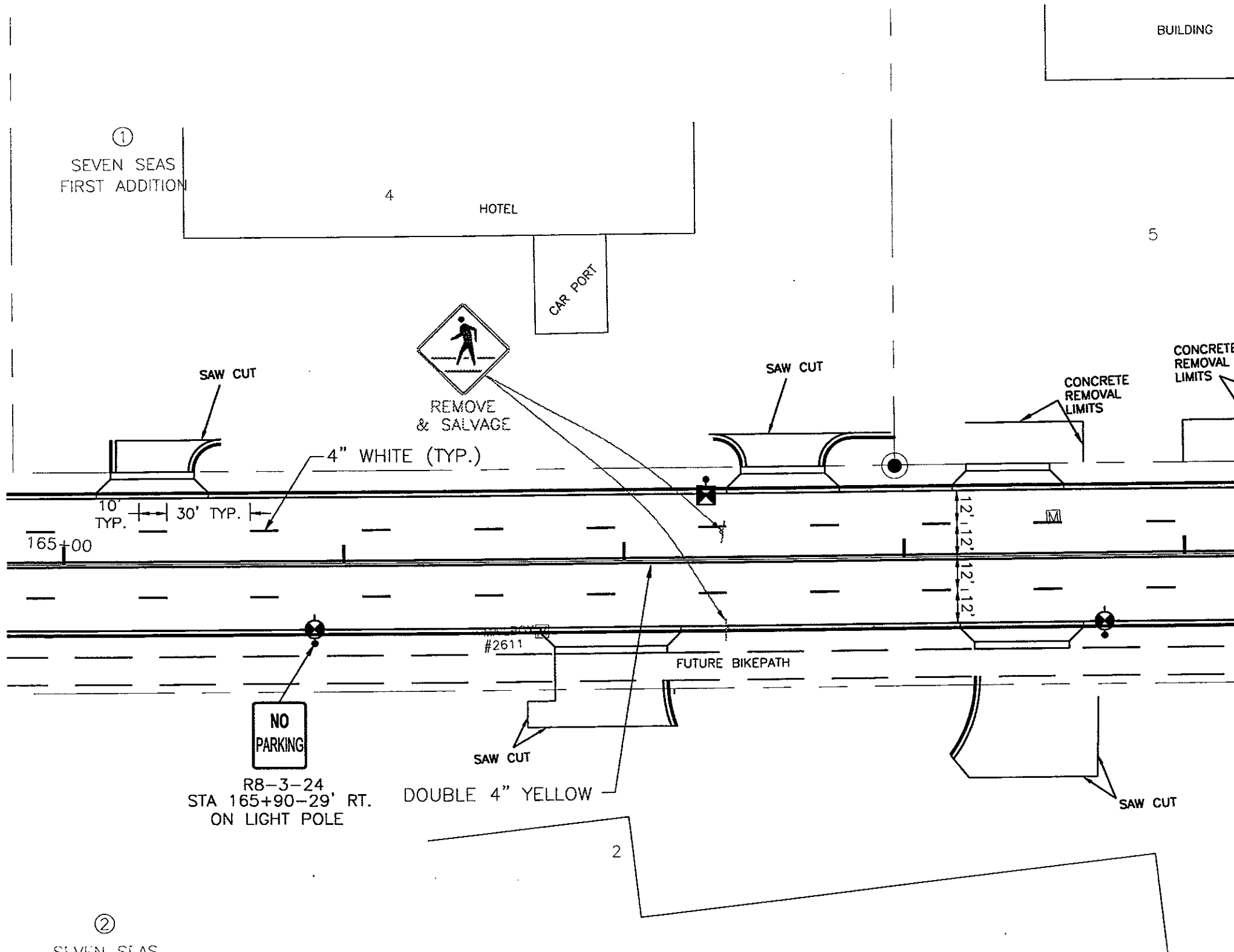


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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	146
OLD RED TRAIL STA. 165+00 TO STA. 169+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	



①
SEVEN SEAS
FIRST ADDITION

4 HOTEL

BUILDING

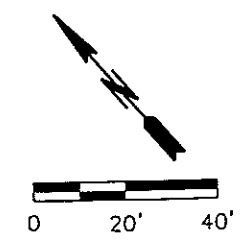
5

NO
PARKING
RB-3-24
STA 165+90-29' RT.
ON LIGHT POLE

DOUBLE 4" YELLOW

2

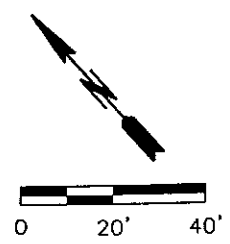
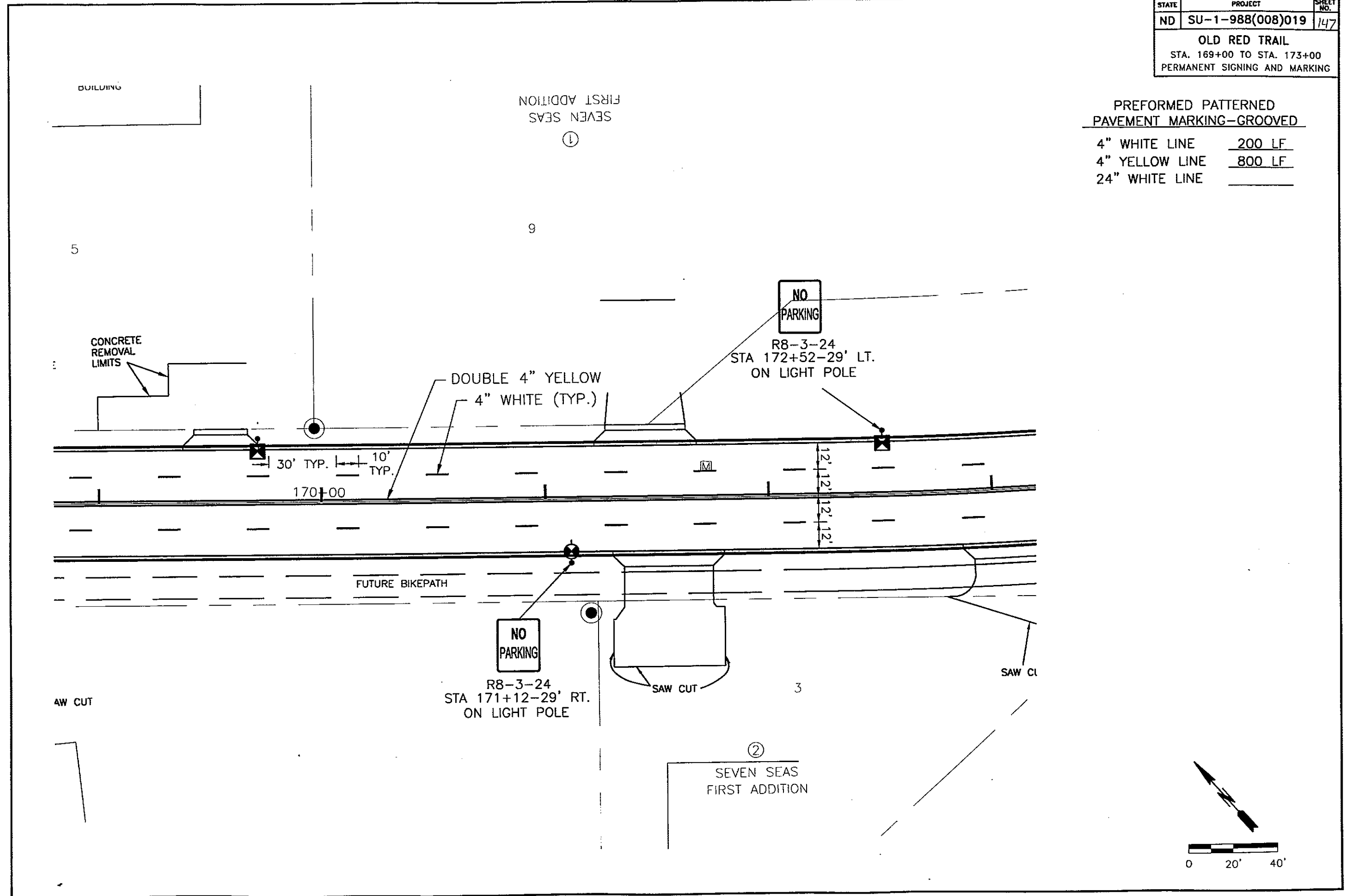
②
SEVEN SEAS
FIRST ADDITION



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	147
OLD RED TRAIL STA. 169+00 TO STA. 173+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	_____

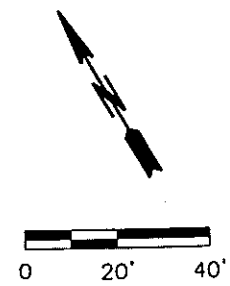
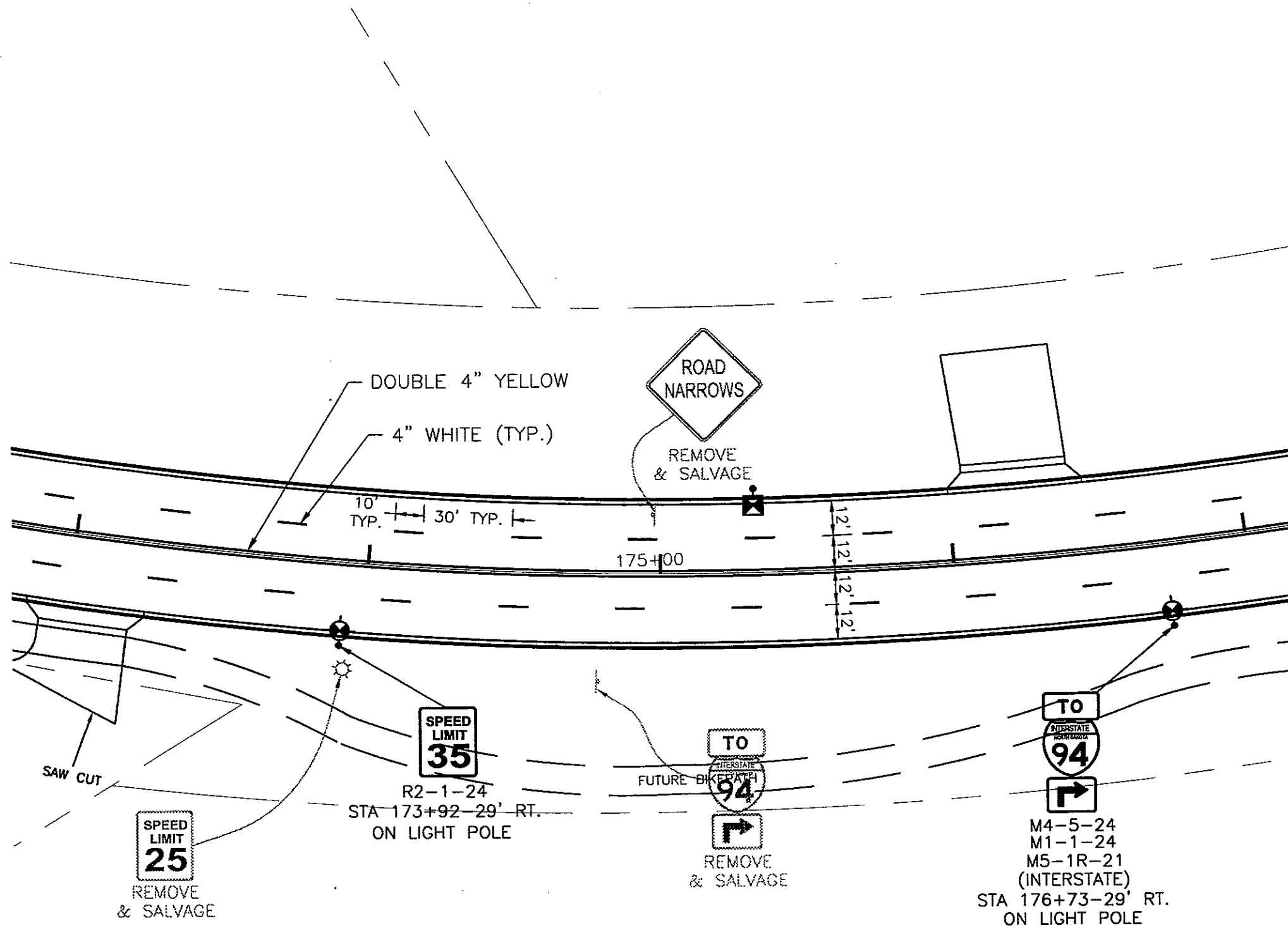


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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	14A
OLD RED TRAIL STA. 173+00 TO STA. 177+00 PERMANENT SIGNING AND MARKING		

PERFORMED PATTERNED
PAVEMENT MARKING-GROOVED

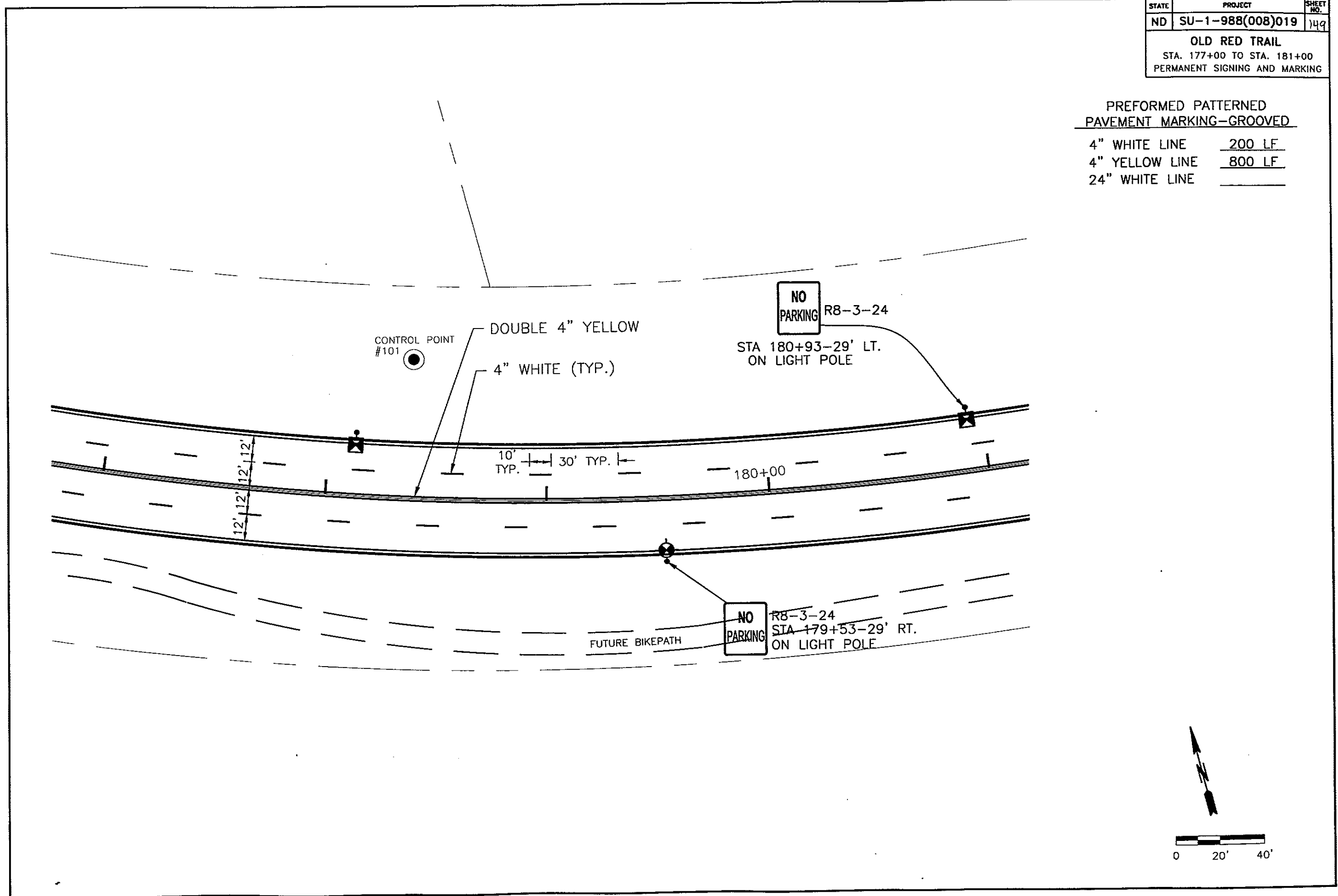
4" WHITE LINE	<u>200 LF</u>
4" YELLOW LINE	<u>800 LF</u>
24" WHITE LINE	<u> </u>



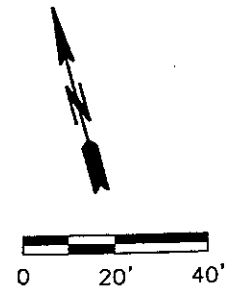
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	149
OLD RED TRAIL STA. 177+00 TO STA. 181+00 PERMANENT SIGNING AND MARKING		

**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	200 LF
4" YELLOW LINE	800 LF
24" WHITE LINE	



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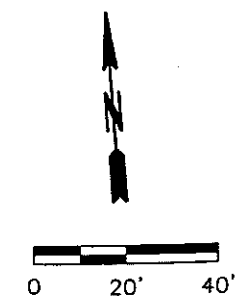
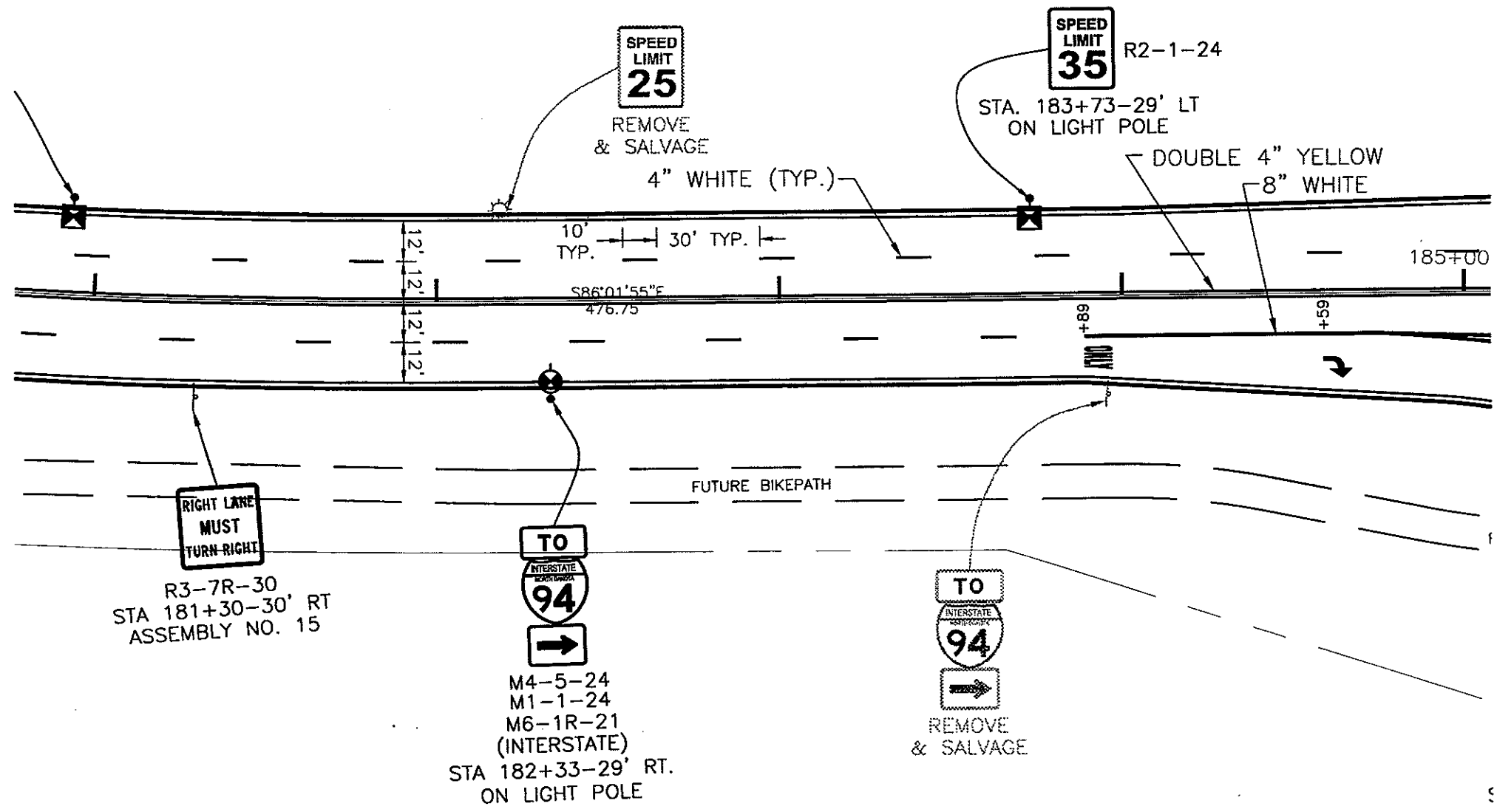
STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	150
OLD RED TRAIL STA. 181+00 TO STA. 185+00 PERMANENT SIGNING AND MARKING		

PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED

4" WHITE LINE	<u>170 LF</u>
4" YELLOW LINE	<u>800 LF</u>
8" WHITE LINE	<u>136 LF</u>
24" WHITE LINE	<u> </u>

PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED

ONLY (1)	<u>22 SF</u>
RIGHT ARROW (1)	<u>15 SF</u>



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	151
OLD RED TRAIL STA. 185+00 TO STA. 189+00 PERMANENT SIGNING AND MARKING		

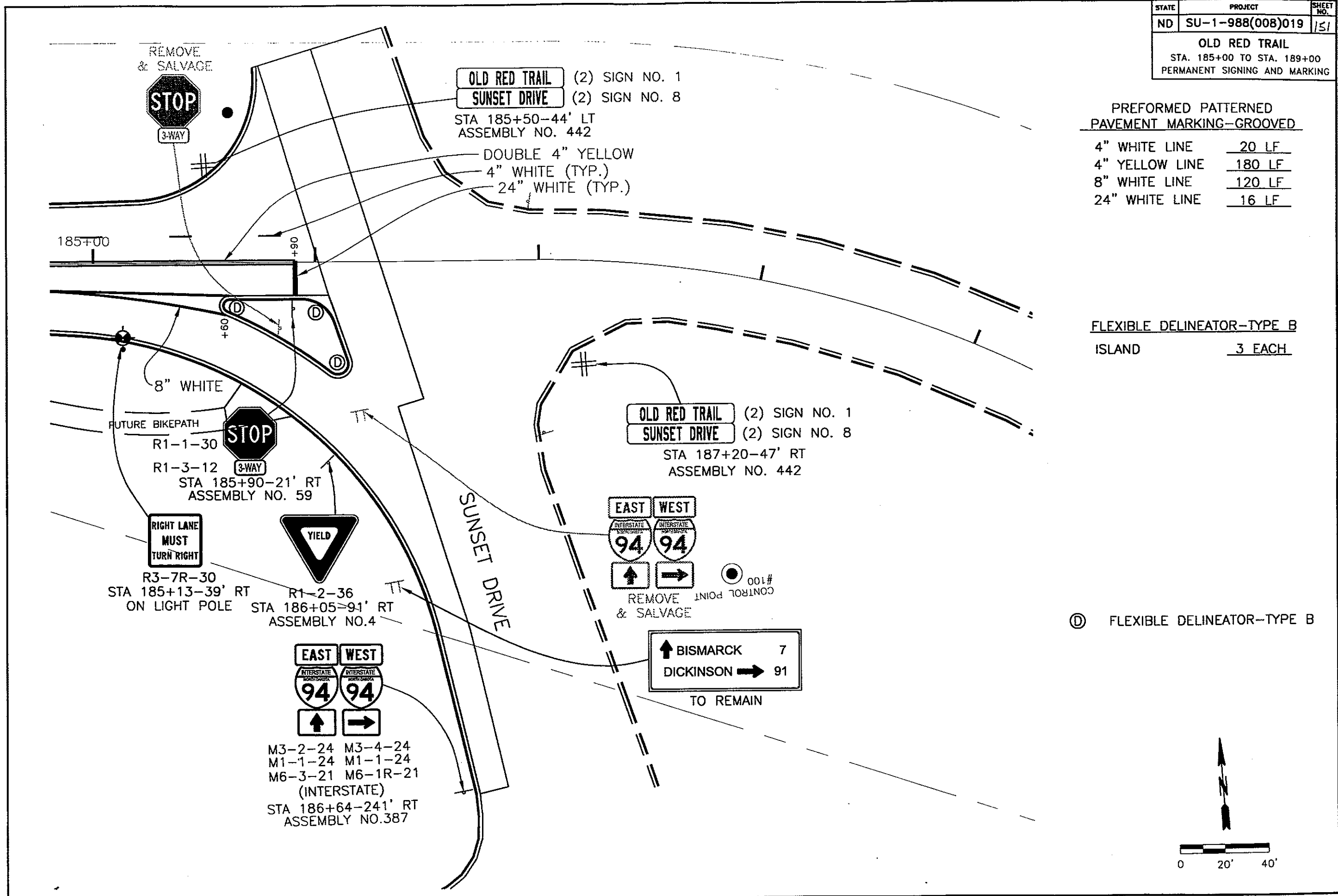
**PREFORMED PATTERNED
PAVEMENT MARKING-GROOVED**

4" WHITE LINE	20 LF
4" YELLOW LINE	180 LF
8" WHITE LINE	120 LF
24" WHITE LINE	16 LF

FLEXIBLE DELINEATOR-TYPE B

ISLAND	3 EACH
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Ⓞ FLEXIBLE DELINEATOR-TYPE B



OLD RED TRAIL (2) SIGN NO. 1
SUNSET DRIVE (2) SIGN NO. 8
 STA 185+50-44' LT
 ASSEMBLY NO. 442

DOUBLE 4" YELLOW
 4" WHITE (TYP.)
 24" WHITE (TYP.)

OLD RED TRAIL (2) SIGN NO. 1
SUNSET DRIVE (2) SIGN NO. 8
 STA 187+20-47' RT
 ASSEMBLY NO. 442

8" WHITE
 FUTURE BIKEPATH
 R1-1-30
 R1-3-12
STOP
 3-WAY
 STA 185+90-21' RT
 ASSEMBLY NO. 59

**RIGHT LANE
MUST
TURN RIGHT**
 R3-7R-30
 STA 185+13-39' RT
 ON LIGHT POLE

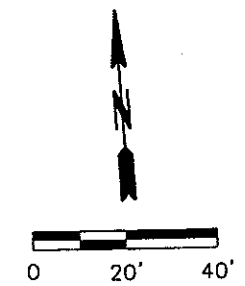
YIELD
 R1-2-36
 STA 186+05-91' RT
 ASSEMBLY NO. 4

EAST WEST
94 94
 ↑ →
 M3-2-24 M3-4-24
 M1-1-24 M1-1-24
 M6-3-21 M6-1R-21
 (INTERSTATE)
 STA 186+64-241' RT
 ASSEMBLY NO. 387

EAST WEST
94 94
 ↑ →
 REMOVE CONTROL POINT
 & SALVAGE

↑ BISMARCK 7
→ DICKINSON 91
 TO REMAIN

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OLD RED TRAIL

OLD STATION	NEW STATION	ASSEMBLY NUMBER	SIGN DISCRPTION	NEW SIGN NUMBER	FLAT SHEET SIGN AREA		SUPPORT POST LENGTH			SUPPORT SLEEVE LENGTH			ANCHOR UNIT		TOTAL SUPPORT LENGTH(LF)	RESET SIGN PANEL	
					TYPE 2(SF)	TYPE 3A(SF)	1ST(FT)	2ND(FT)	SIZE(IN)	1ST(FT)	2ND(FT)	SIZE(IN)	LNG(FT)	SIZE(IN)			NO.
NEW	98+00-18' LT	NO. 9	35 MPH	R2-1-24	5	-	9.50	-	2.00	-	-	-	4.00	2.25	1	13.00	-
NEW	100+09-21.5' RT	NO. 442	ST SIGNS	NO.1&NO.2	-	11.25	9.25	-	2.00	-	-	-	4.00	2.25	1	12.75	-
NEW	99+47-27' LT	NO. 1	STOP	R1-1-30	-	6.25	9.50	-	2.25	-	-	-	4.00	2.50	1	13.00	-
NEW	301+50-20' RT(HLND)	NO. 9	25 MPH	R2-1-24	5	-	9.50	-	2.00	-	-	-	4.00	2.25	1	13.00	-
NEW	104+74-25' RT	L.P.	CURVE	W1-2L-30	-	6.25	-	-	-	-	-	-	-	-	-	-	-
NEW	105+00-26' RT	NO. 9	35 MPH	R2-1-24	5	-	9.75	-	2.00	-	-	-	4.00	2.25	1	13.25	-
NEW	106+07-25' RT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	110+17-25' LT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	114+38-25' RT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	118+32-25' LT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	120+51-27' LT	L.P.	35 MPH	R2-1-24	5	-	-	-	-	-	-	-	-	-	-	-	-
2+53 LT	0+75-20' LT(37TH)	L.P.	25 MPH	-	-	-	-	-	-	-	-	-	-	-	-	-	1
2+53 LT	0+75-20' LT(37TH)	L.P.	CRIME WATCH	-	-	-	-	-	-	-	-	-	-	-	-	-	1
NEW	123+31-29' LT	L.P.	ST SIGNS	NO.1&NO.3	-	7.50	-	-	-	-	-	-	-	-	-	-	-
NEW	123+47-47 RT	NO. 1	SIGN	R1-1-30	-	6.25	10.00	-	2.25	-	-	-	4.00	2.50	1	13.50	-
NEW	124+70-29' RT	L.P.	35MPH	R2-1-24	-	-	-	-	-	-	-	-	-	-	-	-	-
NEW	124+75-31' LT	NO. 20	MERGE	W4-2R-36	-	9	11.00	-	2.51	-	-	-	4.00	2.50	1	14.50*	-
NEW	126+12-29' LT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	127+25-31' LT	NO. 20	RT LN ENDS	W9-1R-36	-	9	11.00	-	2.51	-	-	-	4.00	2.50	1	14.50*	-
NEW	127+52-29' RT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	130+75-31' LT	NO. 442	ST SIGNS	NO.1&NO.4	-	11.25	8.75	-	2.00	-	-	-	4.00	2.25	1	12.25	-
NEW	130+95-39' LT	NO. 1	STOP	R1-1-30	-	6.25	10.00	-	2.25	-	-	-	4.00	2.50	1	13.50	-
NEW	401+00-18' RT(HLSD)	NO. 9	25 MPH	R2-1-24	5	-	9.75	-	2.00	-	-	-	4.00	2.25	1	13.25	-
NEW	133+12-29' RT	L.P.	BUCKLE UP	R16-1-15	3	-	-	-	-	-	-	-	-	-	-	-	-
NEW	133+12-30' LT	NO. 7	BUCKLE UP	R16-1-15	3	-	9.75	-	2.00	-	-	-	4.00	2.25	1	13.25	-
NEW	133+85-31' LT	NO. 442	ST SIGNS	NO. 1&NO. 5	-	7.5	8.75	-	2.00	-	-	-	4.00	2.25	1	12.25	-
NEW	134+33-48' RT	NO. 1	STOP	R1-1-30	-	6.25	10.00	-	2.25	-	-	-	4.00	2.50	1	13.50	-
NEW	135+92-29' RT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
136+70 RT	135+92-29' RT	L.P.	LTR. CONTROL	-	-	-	-	-	-	-	-	-	-	-	-	-	2
NEW	137+32-29' LT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	138+71-29' RT	L.P.	35 MPH	R2-1-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	140+12-29' LT	L.P.	35 MPH	R2-1-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	141+03-31' LT	NO. 442	ST SIGNS	NO.1&NO.6	-	9	8.75	-	2.00	-	-	-	4.00	2.25	1	12.25	-
NEW	141+29-48' RT	NO. 1	STOP	R1-1-30	-	6.25	10.00	-	2.25	-	-	-	4.00	2.50	1	13.50	-
NEW	144+16-29' RT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	145+56-29' LT	L.P.	NO PARK.	R8-3-24	5	-	-	-	-	-	-	-	-	-	-	-	-
NEW	146+79-48' RT	NO. 1	STOP	R1-1-30	-	6.25	10.00	-	2.25	-	-	-	4.00	2.50	1	13.50	-

L.P. = INSTALL ON LIGHT POLE
 * BREAKAWAY BASE

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	153
OLD RED TRAIL SIGN QUANTITIES		

OLD RED TRAIL

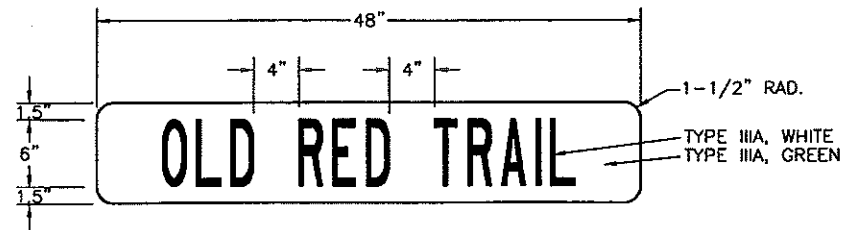
OLD STATION	NEW STATION	ASSEMBLY NUMBER	SIGN DIScription	NEW SIGN NUMBER	FLAT SHEET SIGN AREA		SUPPORT POST LENGTH			SUPPORT SLEEVE LENGTH			ANCHOR UNIT		TOTAL SUPPORT LENGTH(LF)	RESET SIGN PANEL	
					TYPE 2(SF)	TYPE 3A(SF)	1ST(FT)	2ND(FT)	SIZE(IN)	1ST(FT)	2ND(FT)	SIZE(IN)	LNG(FT)	SIZE(IN)			NO.
NEW	148+00-30'	RT	NO. 9	35 MPH	R2-1-24	5	--	9.75	--	2.00	--	--	4.00	2.25	1	13.25	--
NEW	149+39-29'	RT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
149+20	LT	150+72-29'	LT	L.P.	LTR. CONTROL	--	--	--	--	--	--	--	--	--	--	--	2
NEW	152+14-39'	LT	NO. 1	STOP	R1-1-30	--	6.25	10.00	--	2.25	--	--	4.00	2.50	1	13.50	--
NEW	152+77-31'	RT	NO. 442	ST SIGNS	NO.1&NO.7	--	7.5	8.75	--	2.00	--	--	4.00	2.25	1	12.25	--
NEW	156+12-29'	LT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	157+48-29'	RT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	158+92-29'	LT	L.P.	35 MPH	R2-1-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	160+32-29'	RT	L.P.	35 MPH	R2-1-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	164+50-29'	LT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	165+90-29'	RT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	171+12-29'	RT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	172+52-29'	LT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	173+92-29'	RT	L.P.	35 MPH	R2-1-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	176+73-29'	RT	L.P.	TO	M4-5-24	2	--	--	--	--	--	--	--	--	--	--	--
NEW	176+73-29'	RT	L.P.	I-94	M1-1-24	4	--	--	--	--	--	--	--	--	--	--	--
NEW	176+73-29'	RT	L.P.	ARROW	M5-1R-21	2.2	--	--	--	--	--	--	--	--	--	--	--
NEW	179+53-29'	RT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	180+93-29'	LT	L.P.	NO PARK.	R8-3-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	181+30-30'	RT	NO. 15	R.L.M.T.R.	R3-7R-30	6.25	--	9.75	--	2.25	--	--	4.00	2.50	1	13.25	--
NEW	182+33-29'	RT	L.P.	TO	M4-5-24	2	--	--	--	--	--	--	--	--	--	--	--
NEW	182+33-29'	RT	L.P.	I-94	M1-1-24	4	--	--	--	--	--	--	--	--	--	--	--
NEW	182+33-29'	RT	L.P.	ARROW	M6-1R-21	2.2	--	--	--	--	--	--	--	--	--	--	--
NEW	183+73-29'	LT	L.P.	35 MPH	R2-1-24	5	--	--	--	--	--	--	--	--	--	--	--
NEW	185+13-39'	RT	L.P.	R.L.M.T.R.	R3-7R-30	6.25	--	--	--	--	--	--	--	--	--	--	--
NEW	185+50-44'	LT	NO. 442	ST SIGNS	NO.1&NO.8	--	12.0	8.75	--	2.00	--	--	4.00	2.25	1	12.25	--
NEW	185+90-21'	RT	NO. 59	COMBO	R1-1-30&R1-3-12	--	6.75	10.00	--	2.25	--	--	4.00	2.50	1	13.50	--
NEW	186+05-91'	RT	NO. 4	YIELD	R1-2-36	--	4	9.90	--	2.25	--	--	4.00	2.50	1	13.40	--
NEW	186+64-241'	RT	NO. 387	COMBO	M3-2,M1-1,M6-3& M3-4,M1-1,M6-1R	16.4	--	11.5	11.5	2.50	--	--	4.00	2.50	2	30.00*	--
NEW	187+20-47'	RT	NO. 442	ST SIGNS	NO.1&NO.8	--	12.0	8.75	--	2.00	--	--	4.00	2.25	1	12.25	--
					TOTALS	206.3	156.8							358.4	6		

L.P. = INSTALL ON LIGHT POLE

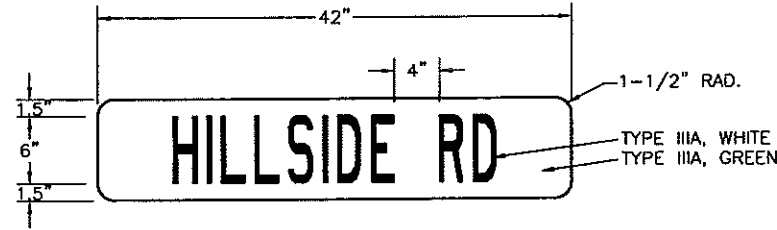
* BREAKAWAY BASES

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	154
OLD RED TRAIL PERMANENT SIGNING AND PAVEMENT MARKING		

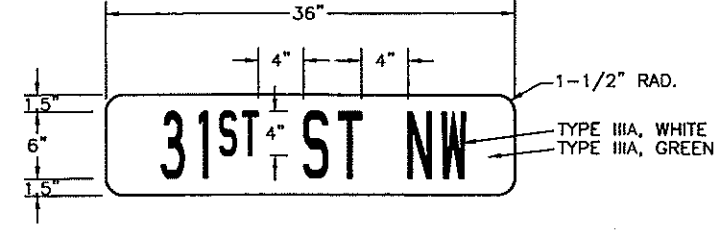
STREET SIGNS



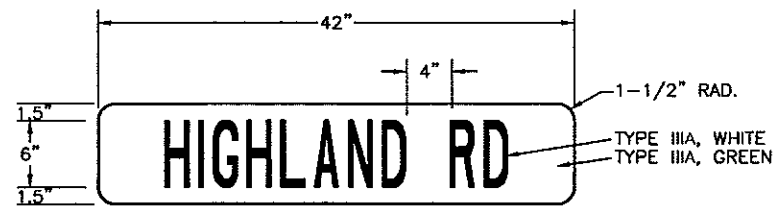
SIGN NO.1
6" LETTERS, SERIES B



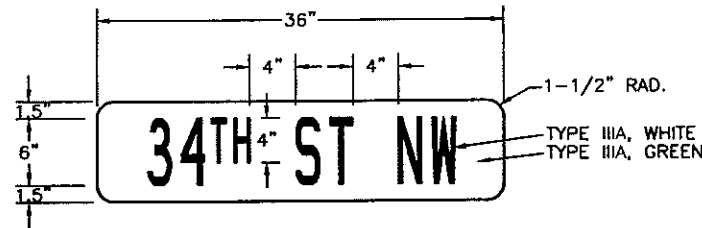
SIGN NO.4
6" LETTERS, SERIES B



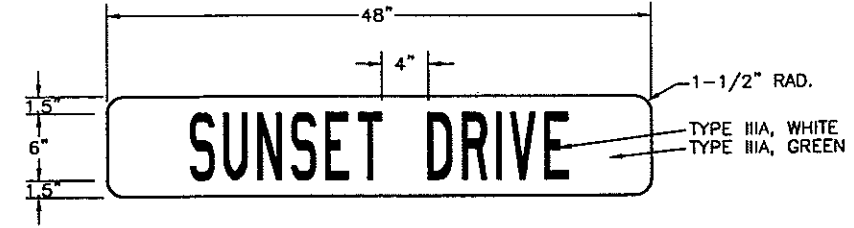
SIGN NO.7
6" LETTERS, SERIES B



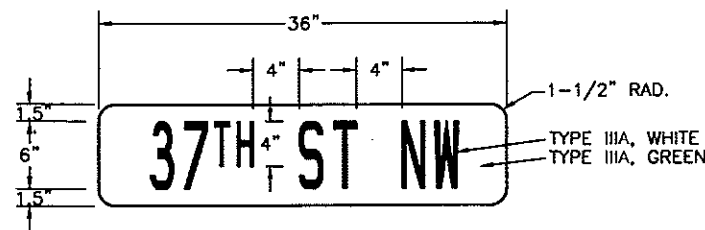
SIGN NO.2
6" LETTERS, SERIES B



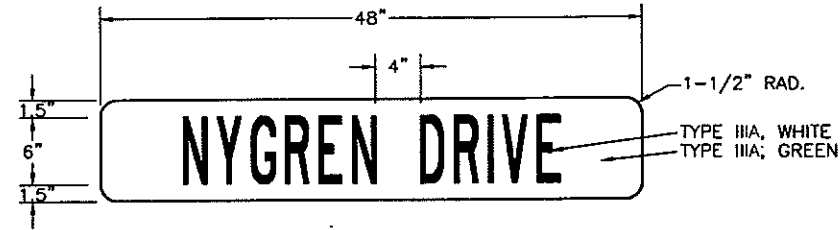
SIGN NO.5
6" LETTERS, SERIES B



SIGN NO.8
6" LETTERS, SERIES B

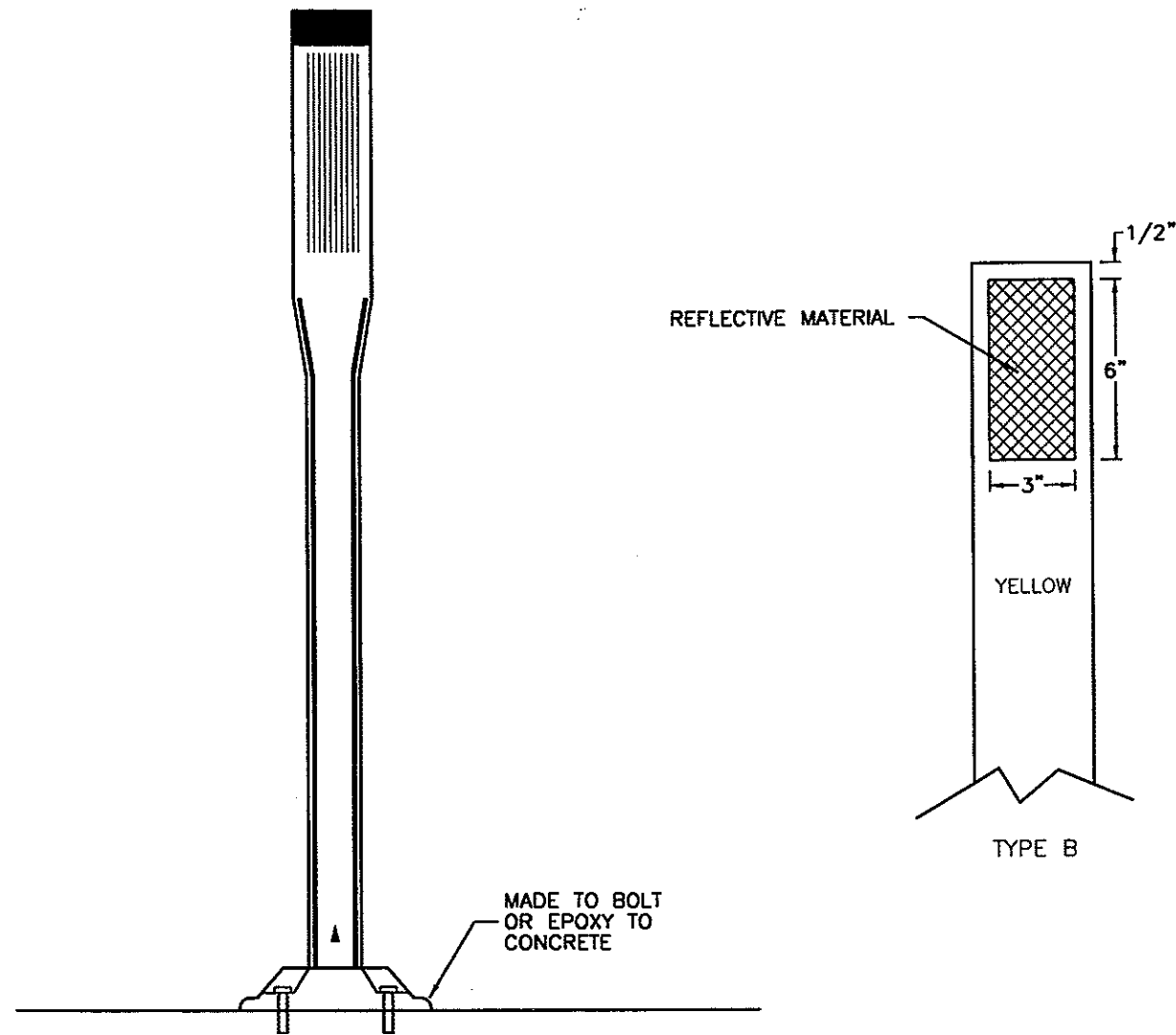


SIGN NO.3
6" LETTERS, SERIES B



SIGN NO.6
6" LETTERS, SERIES B

STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	155
OLD RED TRAIL FLEXIBLE DELINEATORS TYPE B		



NOT TO SCALE

DELINEATOR SPECIFICATIONS:

DESCRIPTION:

THE DELINEATOR POST SHALL CONSIST OF A FLEXIBLE, DURABLE, NON-DISCOLORING MATERIAL CAPABLE OF RECOVERING FROM REPEATED VEHICLE IMPACTS, AND TO WHICH REFLECTORS CAN BE ATTACHED. THE POST SHALL BE INSERTED INTO AN ANCHOR WHICH WILL HOLD THE POST IN PLACE BY A LOCKING MECHANISM. IT IS INTENDED THAT WHEN THE POST IS NO LONGER SERVICEABLE IT CAN BE REMOVED AND A NEW POST INSERTED IN THE SAME ANCHOR AND LOCKED INTO PLACE.

DETAILED REQUIREMENTS:

THE POST SHALL BE TUBULAR IN SHAPE AND ABOUT TWO (2) TO TWO AND ONE-HALF (2 1/2) INCHES IN DIAMETER EXCEPT THAT THE UPPER 11 TO 14 INCHES SHALL BE FLATTENED TO AN OVAL SHAPE AT LEAST THREE (3) INCHES IN WIDTH ABOUT ONE (1) INCH AT THE MINOR AXIS. THE TOP OF THE POST SHALL BE CAPPED SO AS TO BE WATER RESISTANT. THE REFLECTOR SHALL BE ATTACHED TO THE FLATTENED AREA. THE REFLECTOR SHALL BE WHITE OR YELLOW IN COLOR. THE POST SHALL BE USED WITH EITHER A BOLT DOWN OR AN EPOXIED TYPE OF ANCHOR AND SHALL HAVE A SELF-LOCKING MECHANISM COMPATIBLE WITH EITHER TYPE OF ANCHOR. IT SHALL FURTHER HAVE AN INTERIOR REINFORCEMENT ABOUT 24 INCHES IN LENGTH AND LOCATED IN THE BOTTOM PORTION OF THE POST. THE 3" X 3" REFLECTIVE MATERIAL SHALL BE 3-M DIAMOND GRADE OR EQUAL.

FLEXIBILITY - THE POST SHALL PASS THE FLEXIBILITY TEST AT 110 DEGREES F.

METHODS OF TEST:

FLEXIBILITY TEST - FOLLOWING AT LEAST TWO HOURS OF CONDITIONING AT 100 DEGREES F. OR AT 0 DEGREES F. THE POST SHALL STRAIGHTEN WITHIN 60 SECONDS AFTER BEING BENT AT A 90 DEGREE ANGLE. THE TEST SHALL BE REPEATED FOR A TOTAL OF FIVE (5) BENDS. THE POST SHALL BE RETURNED TO THE TEST CHAMBER FOR 30 MINUTES BETWEEN TESTS, AND THE TIME OUTSIDE THE CHAMBER SHALL NOT EXCEED 90 SECONDS.

METHOD OF MEASUREMENT:

THE QUANTITY WILL BE MEASURED BY THE NUMBER OF DELINEATORS INSTALLED, COMPLETE WITH REFLECTORS, AND ACCEPTED BY THE ENGINEER.

REFLECTIVE MATERIAL:

THE REFLECTIVE MATERIAL TO BE USED SHALL BE TYPE 3-M DIAMOND GRADE OR EQUAL, AND SHALL BE DIRECTLY APPLIED TO THE FLEXIBLE DELINEATOR AS RECOMMENDED BY THE MANUFACTURER.

OLD RED TRAIL

THERE IS APPROXIMATELY 90 TYPE D DELINEATORS THAT SHALL BE REMOVED FROM EXISTING ROADWAY EDGES FROM STATION 125+00 TO 147+00. SOME OF THESE DELINEATORS SHALL BE RESET AT THE LOCATIONS SHOWN BELOW. ALL DELINEATORS NOT RESET SHALL BECOME THE PROPERTY OF THE CITY OF MANDAN AND BE DELIVERED TO AN OWNER APPROVED LOCATION. ONLY THESE DELINEATORS THAT ARE REMOVED AND RESET WILL BE PAID FOR WITH THE BID ITEM "REMOVE & RESET DELINEATORS." ALL COSTS FOR REMOVAL AND DELIVERY OF THE REMAINING DELINEATORS SHALL BE INCIDENTAL TO OTHER ITEMS.

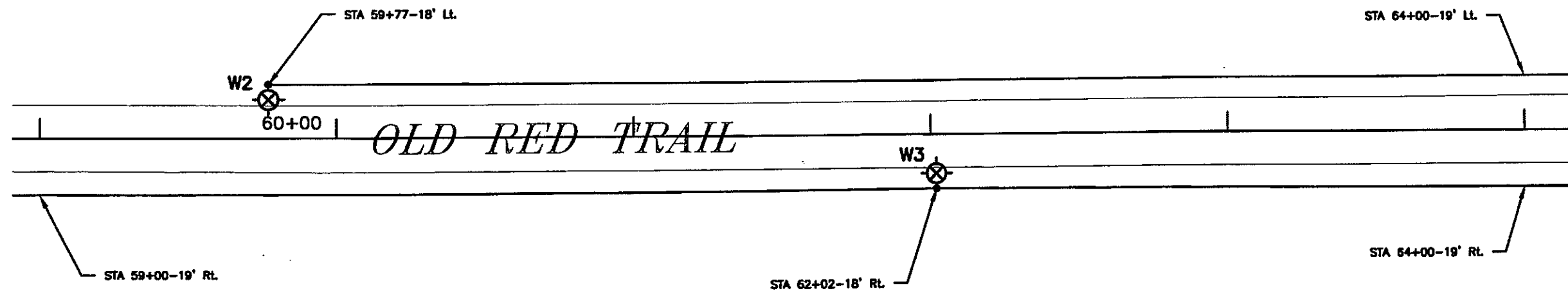
OLD RED TRAIL	
LEFT	RIGHT
97+00	97+00
98+00	98+00
99+00	99+00
100+15	100+15
101+00	101+00
102+00	102+00
103+00	-
104+00	-

HIGHLAND ROAD	
LEFT	RIGHT
300+70	300+70
301+40	301+40
302+10	302+10
302+80	302+80

HILLSIDE ROAD*	
LEFT	RIGHT
401+00	-
402+00	-
403+00	-
404+00	404+00
405+00	405+00
405+50	405+50
406+50	406+50
407+20	407+20
408+20	408+20

*CITY FUNDS ONLY

STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	158
OLD RED TRAIL LIGHTING LAYOUT STA 59+00 TO STA 64+00		



LIGHT STANDARD TABULATION

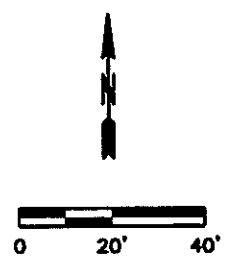
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W2	59+77	18' LL	(1) 150W	A-1	MSC II	50'	8'
W3	62+02	18' RL	(1) 150W	A-1	MSC II	50'	8'

CONDUIT/CONDUCTOR RUN TABULATION

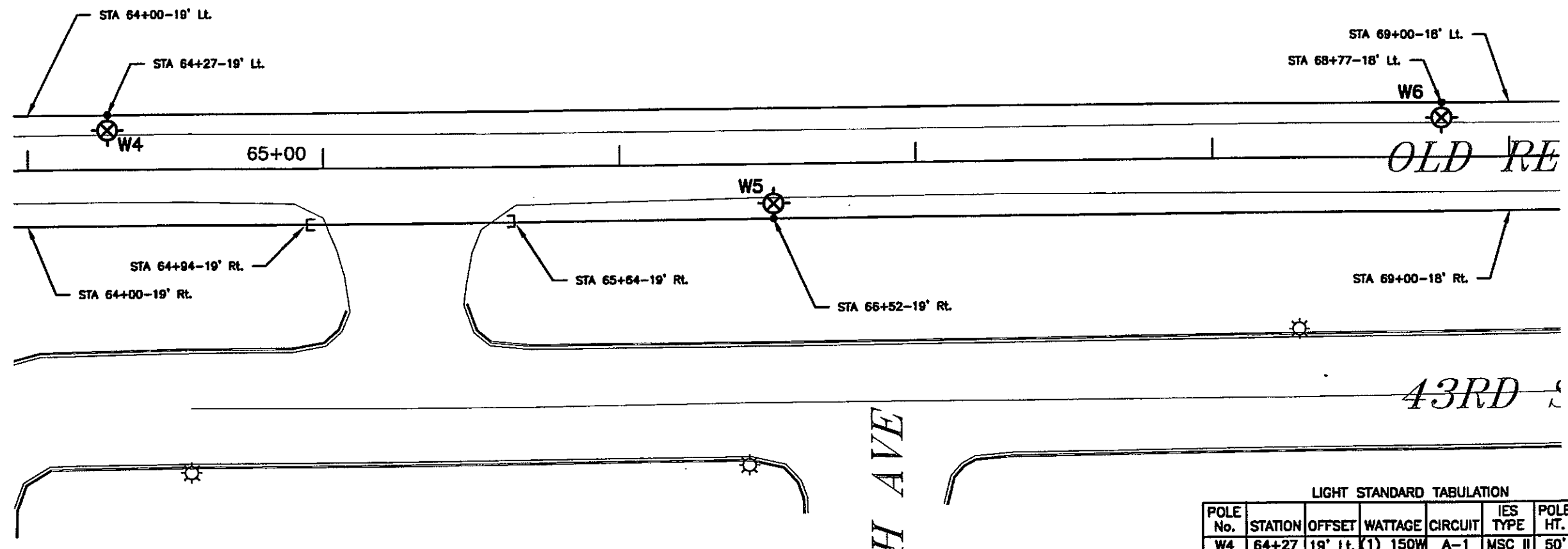
STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
59+77-18' Lt.	64+00-19' Lt.	--	--	423'	852'	(2) #4 RHW	426'	(1) #6 THW
59+00-19' Rt.	62+02-18' Rt.	--	--	302'	610'	(2) #4 RHW	305'	(1) #6 THW
62+02-18' Rt.	64+00-19' Rt.	--	--	198'	402'	(2) #4 RHW	201'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	LF	LF	EA	EA	CITY FUNDS
CABLE TRENCH - TYPE I	LF	923	1864'	2	2	
UNDERGROUND CONDUCTOR No. 4 RHW	LF		932'			
UNDERGROUND CONDUCTOR No. 6 THW	EA					
H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA					
50 FT WOOD SERVICE POLE	EA					



STATE	PROJECT	DRAWING NO.
ND	SU-1-988(008)019	159
OLD RED TRAIL LIGHTING LAYOUT STA 64+00 TO STA 69+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W4	64+27	19' Lt.	(1) 150W	A-1	MSC II	50'	8'
W5	66+52	19' Rt.	(1) 150W	A-1	MSC II	50'	8'
W6	68+77	18' Lt.	(1) 150W	A-1	MSC II	50'	8'

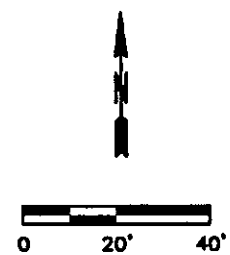
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
64+00-19' Lt.		64+27-19' Lt.	--	--	27'	60'	(2) #4 RHW	30'	(1) #6 THW
64+27-19' Lt.		68+77-18' Lt.	--	--	450'	912'	(2) #4 RHW	456'	(1) #6 THW
68+77-18' Lt.		69+00-18' Lt.	--	--	23'	52'	(2) #4 RHW	26'	(1) #6 THW
64+00-19' Rt.		64+94-19' Rt.	--	--	94'	188'	(2) #4 RHW	94'	(1) #6 THW
64+94-19' Rt.		65+64-19' Rt.	70'	2"	--	140'	(2) #4 RHW	70'	(1) #6 THW
65+64-19' Rt.		66+52-19' Rt.	--	--	88'	182'	(2) #4 RHW	91'	(1) #6 THW
66+52-19' Rt.		69+00-18' Rt.	--	--	248'	502'	(2) #4 RHW	251'	(1) #6 THW

QUANTITY TABULATION

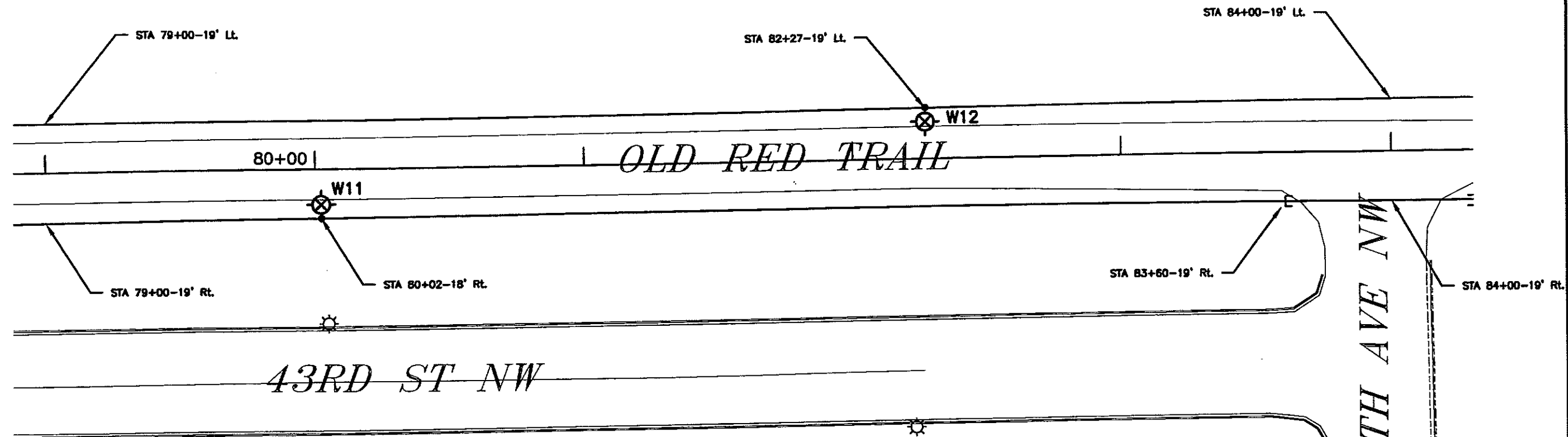
DESCRIPTION	UNIT	QUANTITY
CABLE TRENCH - TYPE 1	LF	930'
2" DIA. RIGID CONDUIT	LF	70'
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2036'
UNDERGROUND CONDUCTOR No. 6 THW	LF	1018'
H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA	3
50 FOOT WOOD SERVICE POLE	EA	3

CITY FUNDS



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STATE	PROJECT	SHEET
ND	SU-1-988(008)019	162
OLD RED TRAIL LIGHTING LAYOUT STA 79+00 TO STA 84+00		



LIGHT STANDARD TABULATION

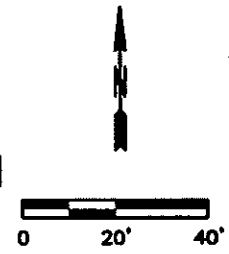
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W11	80+02	18' Rt.	(1) 150W	A-1	MSC II	50'	8'
W12	82+27	19' Lt.	(1) 150W	A-1	MSC II	50'	8'

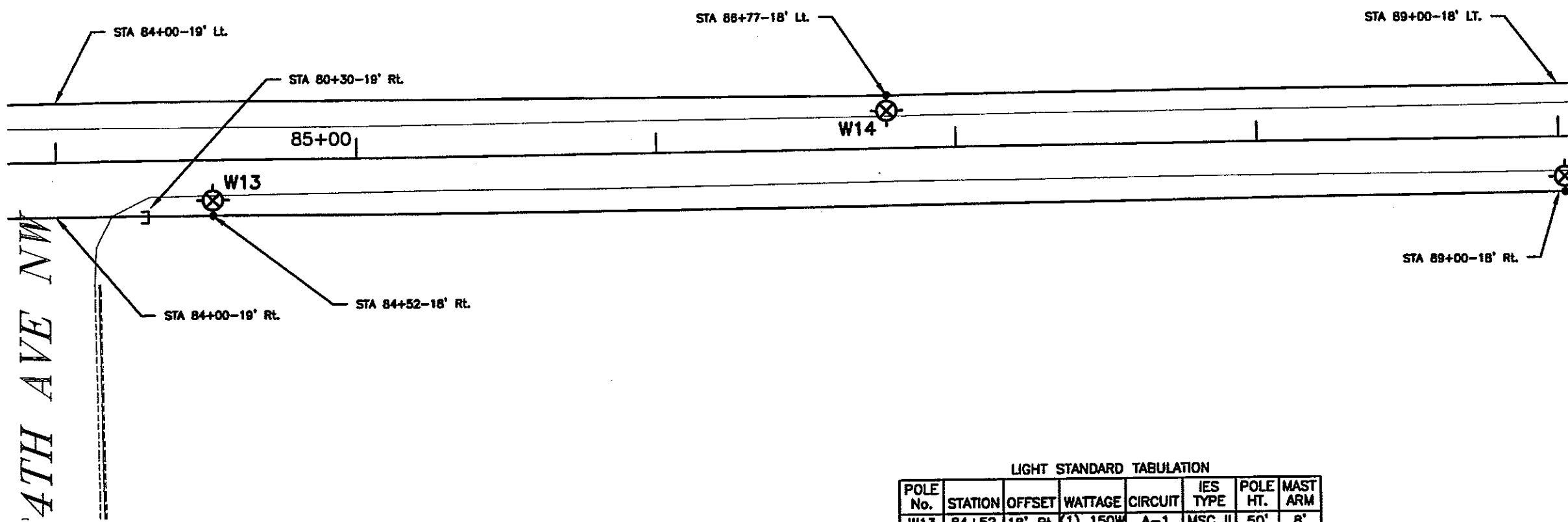
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
79+00-19' Lt.	82+27-19' Lt.	---	---	327'	660'	(2) #4 RHW	330'	(1) #6 THW
82+27-19' Lt.	84+00-19' Lt.	---	---	173'	352'	(2) #4 RHW	176'	(1) #6 THW
79+00-19' Rt.	80+02-18' Rt.	---	---	102'	210'	(2) #4 RHW	105'	(1) #6 THW
80+02-18' Rt.	83+60-19' Rt.	---	---	358'	722'	(2) #4 RHW	361'	(1) #6 THW
83+60-19' Rt.	84+00-19' Rt.	40'	2"	---	80'	(2) #4 RHW	40'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	LF	LF	LF	EA	EA	CITY FUNDS
CABLE TRENCH - TYPE I	LF	960'					
2" DIA. RIGID CONDUIT	LF	40'					
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2024'					
UNDERGROUND CONDUCTOR No. 6 THW	LF	1012'					
H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA				2		
50 FOOT WOOD SERVICE POLE	EA					2	





LIGHT STANDARD TABULATION

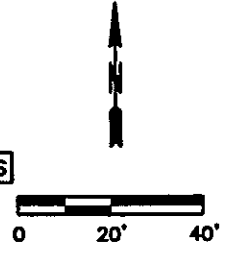
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W13	84+52	18' Rt.	(1) 150W	A-1	MSC II	50'	8'
W14	86+77	18' Lt.	(1) 150W	A-1	MSC II	50'	8'

CONDUIT/CONDUCTOR RUN TABULATION

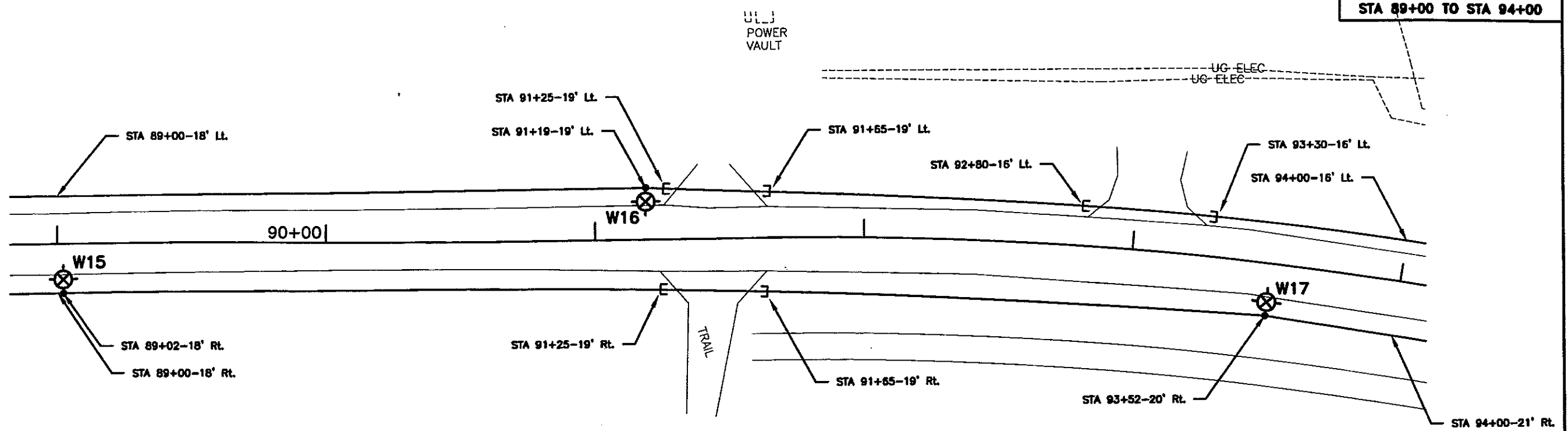
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
84+00-19' Lt.		86+77-18' Lt.	--	--	277'	560'	(2) #4 RHW	280'	(1) #6 THW
86+77-18' Lt.		89+00-18' Lt.	--	--	223'	452'	(2) #4 RHW	226'	(1) #6 THW
84+00-19' Rt.		84+30-19' Rt.	30'	2"	--	60'	(2) #4 RHW	30'	(1) #6 THW
84+30-19' Rt.		84+52-18' Rt.	--	--	22'	50'	(2) #4 RHW	25'	(1) #6 THW
84+52-18' Rt.		89+00-18' Rt.	--	--	448'	902'	(2) #4 RHW	451'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	QUANTITY	UNIT	QUANTITY	UNIT	QUANTITY	UNIT	QUANTITY	UNIT	QUANTITY									
CABLE TRENCH - TYPE I	LF	970'	2" DIA. RIGID CONDUIT	LF	30'	UNDERGROUND CONDUCTOR No. 4 RHW	LF	2024'	UNDERGROUND CONDUCTOR No. 6 THW	LF	1012'	H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA	2	50 FOOT WOOD SERVICE POLE	EA	2	CITY FUNDS	



STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	164
OLD RED TRAIL LIGHTING LAYOUT STA 89+00 TO STA 94+00		



LIGHT STANDARD TABULATION

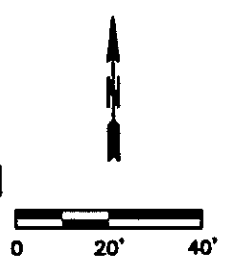
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W15	89+02	18' Rt.	(1) 150W	A-1	MSC II	50'	8'
W16	91+19	19' Lt.	(1) 150W	A-1	MSC II	50'	8'
W17	93+52	20' Rt.	(1) 150W	A-1	MSC II	50'	8'

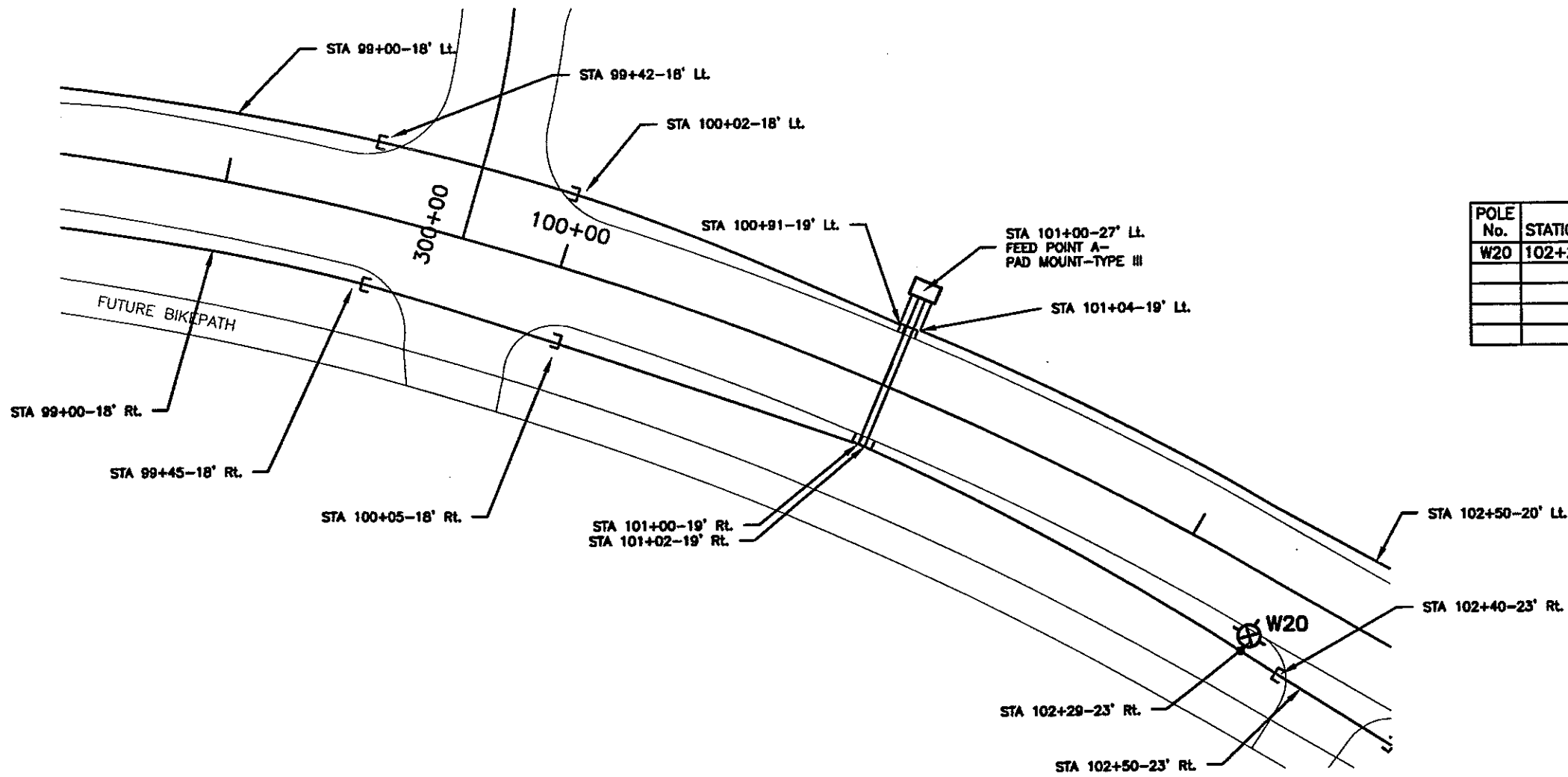
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
89+00-18' Lt.		91+19-19' Lt.	--	--	219'	444'	(2) #4 RHW	222'	(1) #6 THW
91+19-19' Lt.		91+25-19' Lt.	--	--	6'	18'	(2) #4 RHW	9'	(1) #6 THW
91+25-19' Lt.		91+65-19' Lt.	40'	2"	--	80'	(2) #4 RHW	40'	(1) #6 THW
91+65-19' Lt.		92+80-16' Lt.	--	--	115'	230'	(2) #4 RHW	115'	(1) #6 THW
92+80-16' Lt.		93+30-16' Lt.	50'	2"	--	100'	(2) #4 RHW	50'	(1) #6 THW
93+30-16' Lt.		94+00-16' Lt.	--	--	70'	140'	(2) #4 RHW	70'	(1) #6 THW
89+00-18' Rt.		89+02-18' Rt.	--	--	2'	10'	(2) #4 RHW	5'	(1) #6 THW
89+02-18' Rt.		91+25-19' Rt.	--	--	223'	452'	(2) #4 RHW	226'	(1) #6 THW
91+25-19' Rt.		91+65-19' Rt.	40'	2"	--	80'	(2) #4 RHW	40'	(1) #6 THW
91+65-19' Rt.		93+52-20' Rt.	--	--	187'	380'	(2) #4 RHW	190'	(1) #6 THW
93-52+20' Rt.		94+00-21' Rt.	--	--	48'	102'	(2) #4 RHW	51'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	EA	LF	LF	LF	EA	EA		
CABLE TRENCH - TYPE I	870'							
2" DIA. RIGID CONDUIT		130'						
UNDERGROUND CONDUCTOR No. 4 RHW			2036'					
UNDERGROUND CONDUCTOR No. 6 THW			1018'					
H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	3							
50 FOOT WOOD SERVICE POLE	3							
UNIT	EA	LF	LF	LF	EA	EA		
QUAN.	870'	130'	2036'	1018'	3	3		CITY FUNDS





LIGHT STANDARD TABULATION

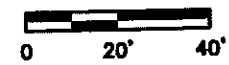
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W20	102+29	23' Rt.	(1) 150W	A-1	MSC II	50'	8'

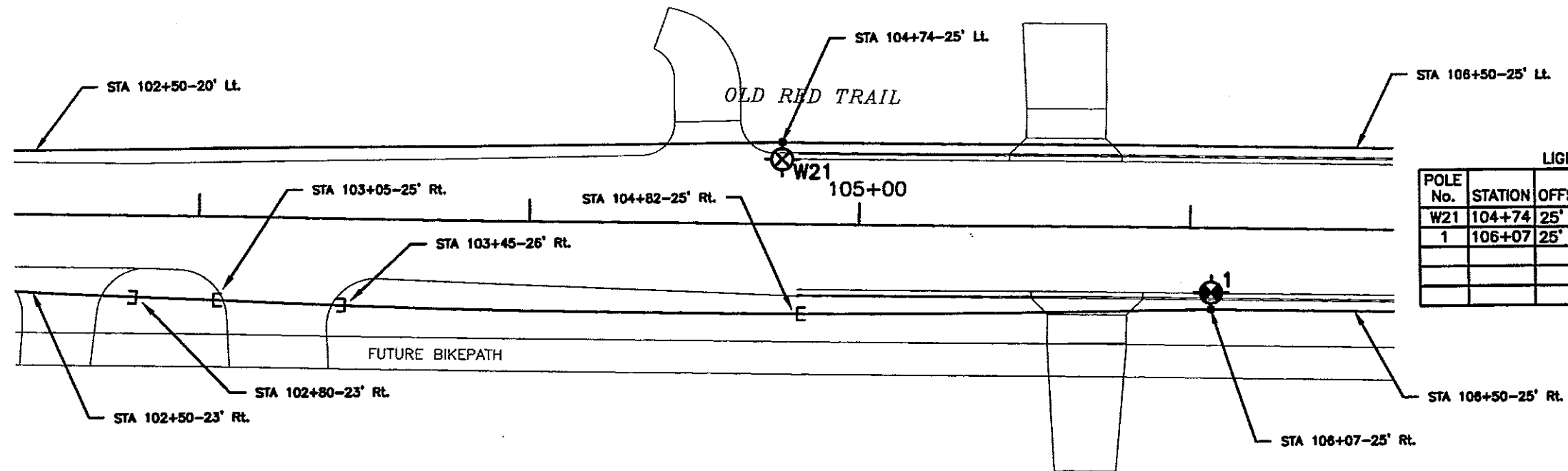
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
99+00-18' Lt.		99+42-18' Lt.	--	--	42'	84'	(2) #4 RHW	42'	(1) #6 THW
99+42-18' Lt.		100+02-18' Lt.	60'	2"	--	120'	(2) #4 RHW	60'	(1) #6 THW
100+02-18' Lt.		100+91-19' Lt.	--	--	89'	178'	(2) #4 RHW	89'	(1) #6 THW
100+91-19' Lt.		101+00-27' Lt.	--	--	12'	44'	(2) #4 RHW	22'	(1) #6 THW
101+00-27' Lt.		101+04-19' Lt.	--	--	9'	38'	(2) #4 RHW	19'	(1) #6 THW
101+04-19' Lt.		102+50-20' Lt.	--	--	146'	292'	(2) #4 RHW	146'	(1) #6 THW
99+00-18' Rt.		99+45-18' Rt.	--	--	45'	90'	(2) #4 RHW	45'	(1) #6 THW
99+45-18' Rt.		100+05-18' Rt.	60'	2"	--	120'	(2) #4 RHW	60'	(1) #6 THW
100+05-18' Rt.		101+00-19' Rt.	--	--	95'	190'	(2) #4 RHW	95'	(1) #6 THW
101+00-19' Rt.		101+00-27' Lt.	46'	2"	--	112'	(2) #4 RHW	56'	(1) #6 THW
101+00-27' Lt.		101+02-19' Rt.	46'	2"	--	112'	(2) #4 RHW	56'	(1) #6 THW
101+02-19' Rt.		102+29-23' Rt.	--	--	127'	260'	(2) #4 RHW	130'	(1) #6 THW
102+29-23' Rt.		102+40-23' Rt.	--	--	11'	28'	(2) #4 RHW	14'	(1) #6 THW
102+40-23' Rt.		102+50-23' Rt.	10'	2"	--	20'	(2) #4 RHW	10'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	QUANTITY	DESCRIPTION	UNIT	QUANTITY	DESCRIPTION	UNIT	QUANTITY	DESCRIPTION	UNIT	QUANTITY
CABLE TRENCH - TYPE I	LF	576'	2" DIA. RIGID CONDUIT	LF	222'	UNDERGROUND CONDUCTOR No. 4 RHW	LF	1688'	UNDERGROUND CONDUCTOR No. 6 THW	LF	844'
			FEED POINT TYPE III PAD MOUNT	EA	1	CONCRETE FOUNDATION FEED POINT-TYPE A	EA	1	H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA	1
									50 FOOT WOOD SERVICE POLE	EA	1
											CITY FUNDS





LIGHT STANDARD TABULATION

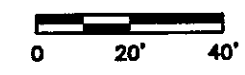
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
W21	104+74	25' Lt.	(1) 150W	A-2	MSC II	50'	8'
1	106+07	25' Rt.	(1) 250W	A-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

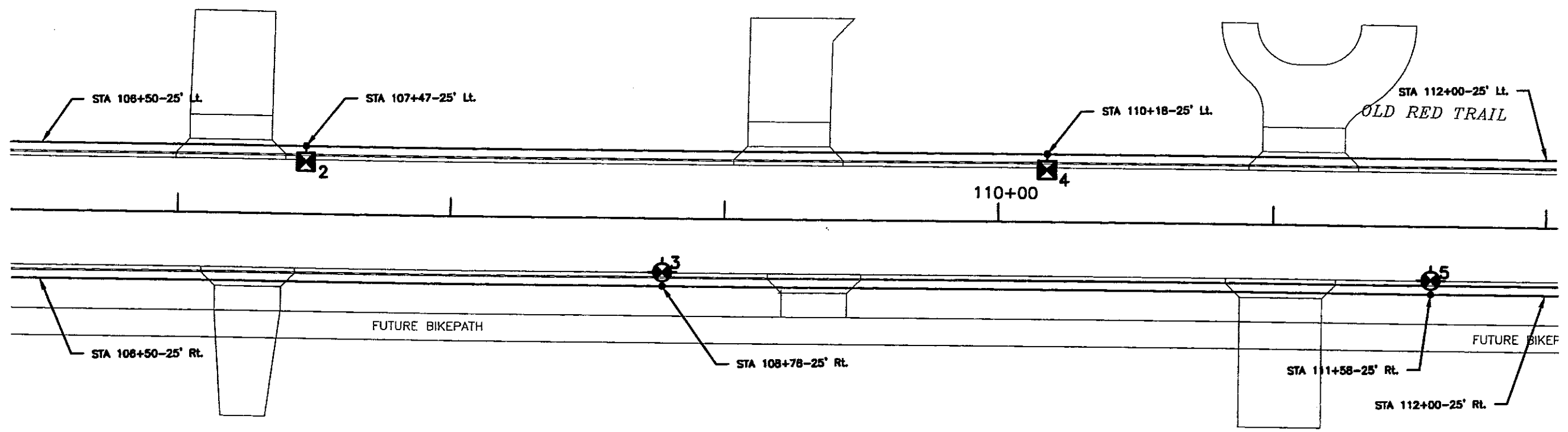
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
102+50-20' Lt.		104+74-25' Lt.	--	--	224'	454'	(2) #4 RHW	227'	(1) #6 THW
104+74-25' Lt.		106+50-25' Lt.	176'	2"	--	352'	(2) #4 RHW	176'	(1) #6 THW
102+50-23' Rt.		102+80-23' Rt.	30'	2"	--	60'	(2) #4 RHW	30'	(1) #6 THW
102+80-23' Rt.		103+05-25' Rt.	--	--	25'	50'	(2) #4 RHW	25'	(1) #6 THW
103+05-25' Rt.		103+45-26' Rt.	40'	2"	--	80'	(2) #4 RHW	40'	(1) #6 THW
103+45-26' Rt.		104+82-25' Rt.	--	--	137'	274'	(2) #4 RHW	137'	(1) #6 THW
104+82-25' Rt.		106+07-25' Rt.	125'	2"	--	250'	(2) #4 RHW	125'	(1) #6 THW
106+07-25' Rt.		106+50-25' Rt.	43'	2"	--	86'	(2) #4 RHW	43'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	EA	EA	
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	1	0	344'	688'	344'	1	1	0	SU FUNDS
CABLE TRENCH - TYPE I	EA	0	386'	70'	918'	459'	0	0	1	CITY FUNDS
2" DIA. RIGID CONDUIT	LF									
UNDERGROUND CONDUCTOR No. 4 RHW	LF									
UNDERGROUND CONDUCTOR No. 6 THW	LF									
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA									
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA									
H.P. SODIUM VAPOR LUMINAIRE, 150 WATT	EA									
50 FOOT WOOD SERVICE POLE	EA									



STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	168
OLD RED TRAIL LIGHTING LAYOUT STA 106+50 TO STA 112+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
2	107+47	25' Lt.	(1) 250W	A-2	MSC III	40'	6'
3	108+78	25' Rt.	(1) 250W	A-2	MSC III	40'	6'
4	110+18	25' Lt.	(1) 250W	A-2	MSC III	40'	6'
5	111+58	25' Rt.	(1) 250W	A-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

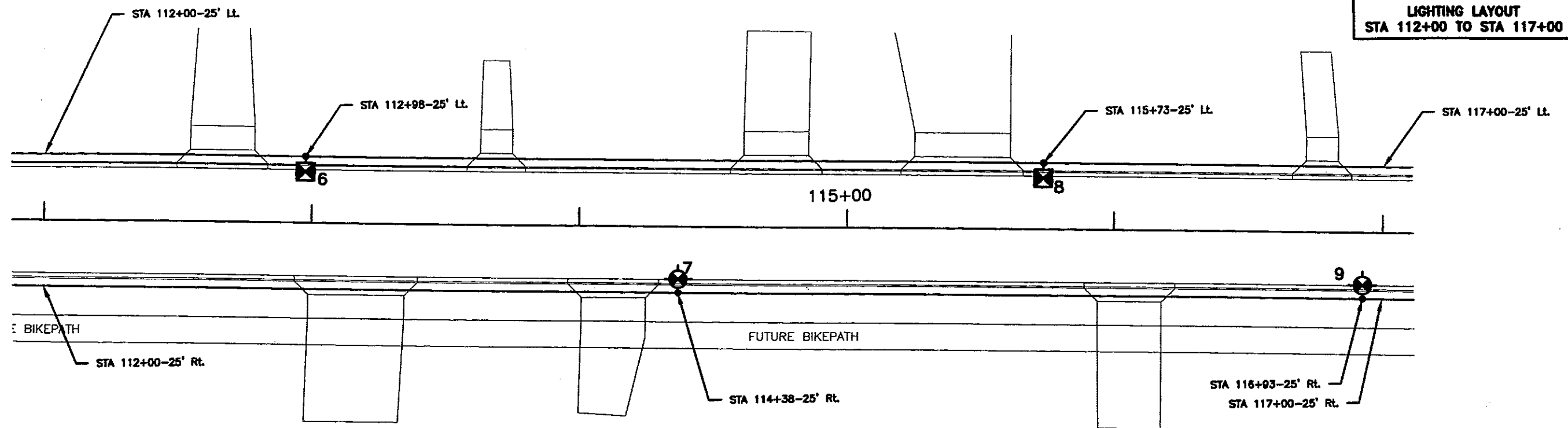
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
106+50-25' Lt.		107+47-25' Lt.	97'	2'	--	202'	(2) #4 RHW	101'	(1) #6 THW
107+47-25' Lt.		110+18-25' Lt.	271'	2'	--	558'	(2) #4 RHW	279'	(1) #6 THW
110+18-25' Lt.		112+00-25' Lt.	182'	2'	--	372'	(2) #4 RHW	186'	(1) #6 THW
106+50-25' Rt.		108+78-25' Rt.	228'	2'	--	464'	(2) #4 RHW	232'	(1) #6 THW
108+78-25' Rt.		111+58-25' Rt.	280'	2'	--	576'	(2) #4 RHW	288'	(1) #6 THW
111+58-25' Rt.		112+00-25' Rt.	42'	2'	--	92'	(2) #4 RHW	46'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4	1100'	2264'	1132'	4	4
2" DIA. RIGID CONDUIT	LF						
UNDERGROUND CONDUCTOR No. 4 RHW	LF						
UNDERGROUND CONDUCTOR No. 6 THW	LF						
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4					
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4					



STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	1169
OLD RED TRAIL LIGHTING LAYOUT STA 112+00 TO STA 117+00		



LIGHT STANDARD TABULATION

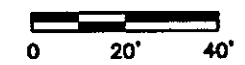
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
6	112+98	25' Lt.	(1) 250W	A-2	MSC III	40'	6'
7	114+38	25' Rt.	(1) 250W	A-2	MSC III	40'	6'
8	115+73	25' Lt.	(1) 250W	A-2	MSC III	40'	6'
9	116+93	25' Rt.	(1) 250W	A-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
112+00-25' Lt.	112+98-25' Lt.	98'	2"	--	204'	(2) #4 RHW	102'	(1) #6 THW
112+98-25' Lt.	115+73-25' Lt.	275'	2"	--	566'	(2) #4 RHW	283'	(1) #6 THW
115+73-25' Lt.	117+00-25' Lt.	127'	2"	--	262'	(2) #4 RHW	131'	(1) #6 THW
112+00-25' Rt.	114+38-25' Rt.	238'	2"	--	484'	(2) #4 RHW	242'	(1) #6 THW
114+38-25' Rt.	116+93-25' Rt.	255'	2"	--	526'	(2) #4 RHW	263'	(1) #6 THW
116+93-25' Rt.	117+00-25' Rt.	7'	2"	--	22'	(2) #4 RHW	11'	(1) #6 THW

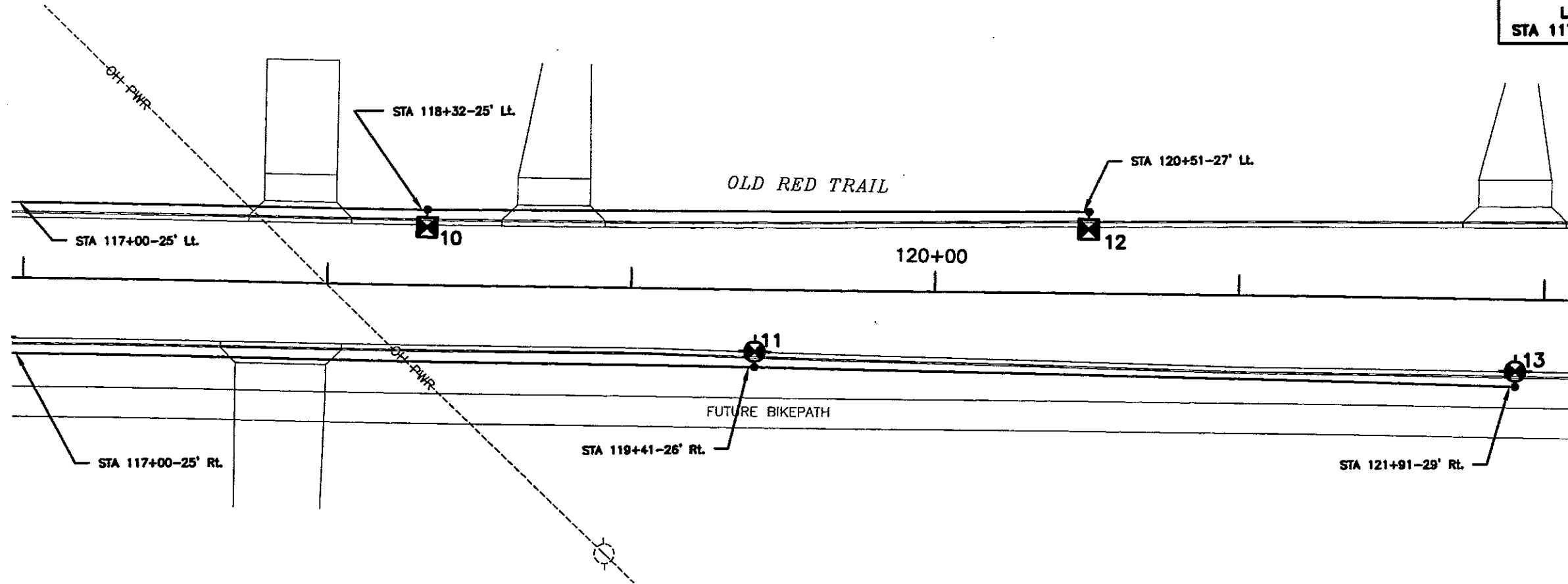
QUANTITY TABULATION

DESCRIPTION	UNIT	QUANTITY
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4
2" DIA. RIGID CONDUIT	LF	1000'
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2064'
UNDERGROUND CONDUCTOR No. 6 THW	LF	1032'
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4
	SU FUNDS	



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STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	170
OLD RED TRAIL LIGHTING LAYOUT STA 117+00 TO STA 122+00		



LIGHT STANDARD TABULATION

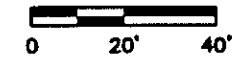
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
10	118+32	25' Lt.	(1) 250W	A-2	MSC III	40'	6'
11	119+41	26' Rt.	(1) 250W	A-2	MSC III	40'	6'
12	120+51	27' Lt.	(1) 250W	A-2	MSC III	40'	6'
13	121+91	29' Rt.	(1) 250W	A-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

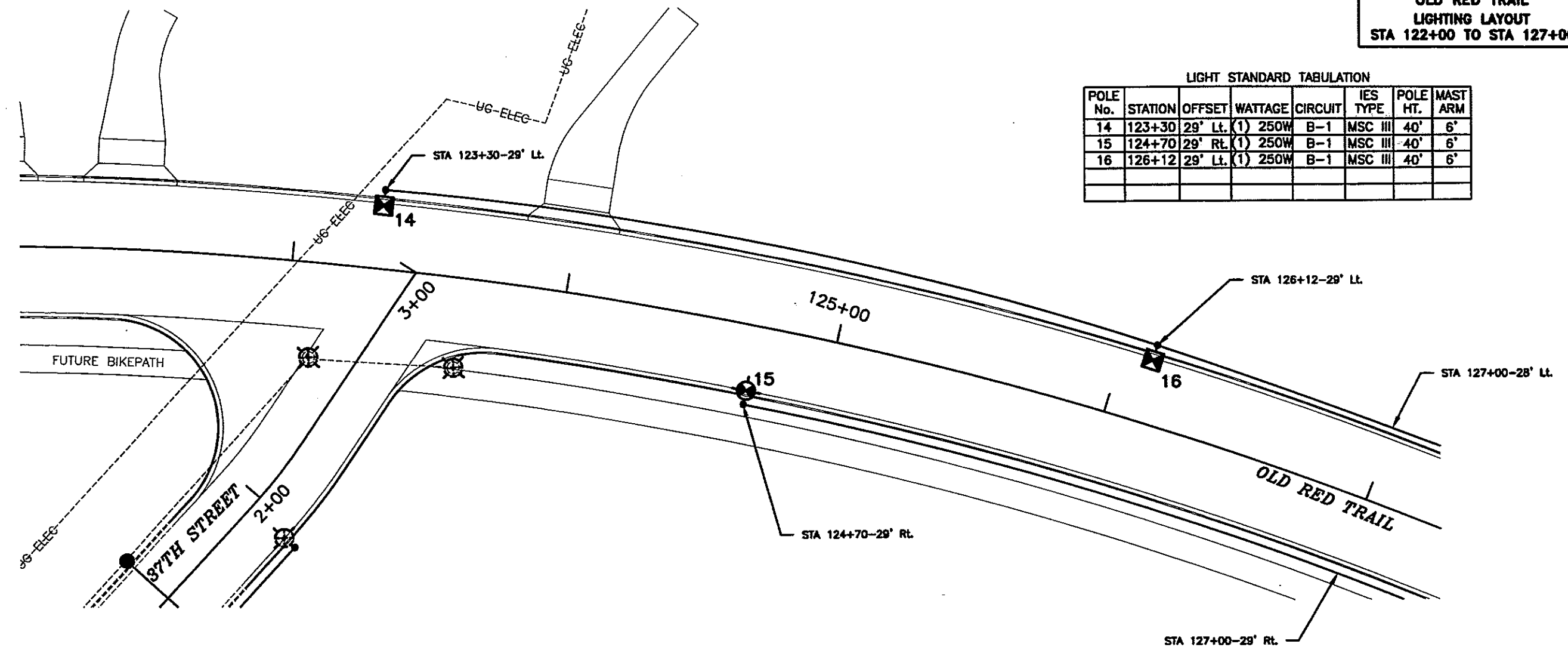
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
117+00-25' Lt.		118+32-25' Lt.	132'	2"	--	272'	(2) #4 RHW	136'	(1) #6 THW
118+32-25' Lt.		120+51-27' Lt.	219'	2"	--	454'	(2) #4 RHW	227'	(1) #6 THW
117+00-25' Rt.		119+41-26' Rt.	241'	2"	--	490'	(2) #4 RHW	245'	(1) #6 THW
119+41-26' Rt.		121+91-29' Rt.	250'	2"	--	516'	(2) #4 RHW	258'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	SU FUNDS
CONCRETE FOUNDATION	EA	4						
HIGHWAY LIGHTING	EA							
2" DIA. RIGID CONDUIT	LF	842'	1732'	866'	4	4		
UNDERGROUND CONDUCTOR No. 4 RHW	LF							
UNDERGROUND CONDUCTOR No. 6 THW	LF							
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4						



STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	171
OLD RED TRAIL LIGHTING LAYOUT STA 122+00 TO STA 127+00		



LIGHT STANDARD TABULATION

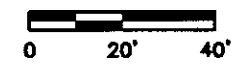
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
14	123+30	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
15	124+70	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
16	126+12	29' Lt.	(1) 250W	B-1	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
123+30-29' Lt.		126+12-29' Lt.	282'	2"	--	580'	(2) #4 RHW	290'	(1) #6 THW
126+12-29' Lt.		127+00-28' Lt.	88'	2"	--	184'	(2) #4 RHW	92'	(1) #6 THW
124+70-29' Rt.		127+00-29' Rt.	230'	2"	--	468'	(2) #4 RHW	234'	(1) #6 THW

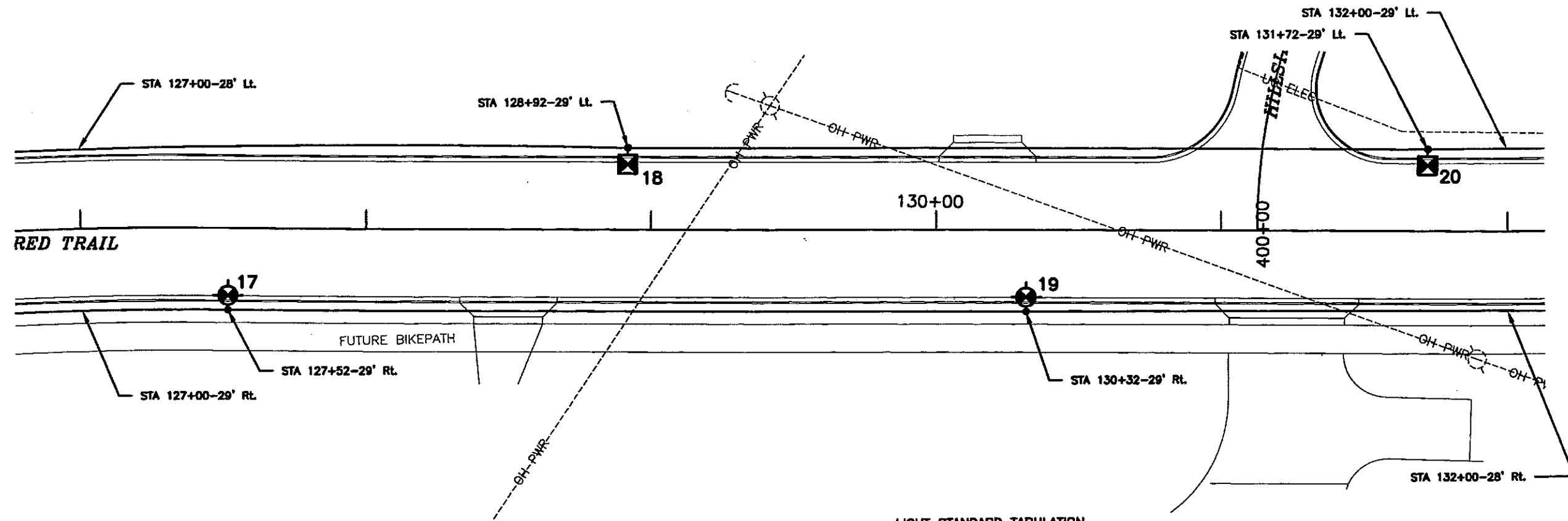
QUANTITY TABULATION

DESCRIPTION	UNIT	QUAN.	DESCRIPTION	UNIT	QUAN.	DESCRIPTION	UNIT	QUAN.
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3	2" DIA. RIGID CONDUIT	LF	600'	UNDERGROUND CONDUCTOR No. 4 RHW	LF	1232'
			UNDERGROUND CONDUCTOR No. 6 THW	LF	616'	LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	3
						H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	3
								SU FUNDS



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STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	179
OLD RED TRAIL LIGHTING LAYOUT STA 127+00 TO STA 132+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
17	127+52	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
18	128+92	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
19	130+32	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
20	131+72	29' Lt.	(1) 250W	B-1	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
127+00-28' Lt.	128+92-29' Lt.	192'	2"	--	392'	(2) #4 RHW	196'	(1) #6 THW
128+92-29' Lt.	131+72-29' Lt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
131+72-29' Lt.	132+00-29' Lt.	28'	2"	--	64'	(2) #4 RHW	32'	(1) #6 THW
127+00-29' Rt.	127+52-29' Rt.	52'	2"	--	112'	(2) #4 RHW	56'	(1) #6 THW
127+52-29' Rt.	130+32-29' Rt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
130+32-29' Rt.	132+00-28' Rt.	168'	2"	--	344'	(2) #4 RHW	172'	(1) #6 THW

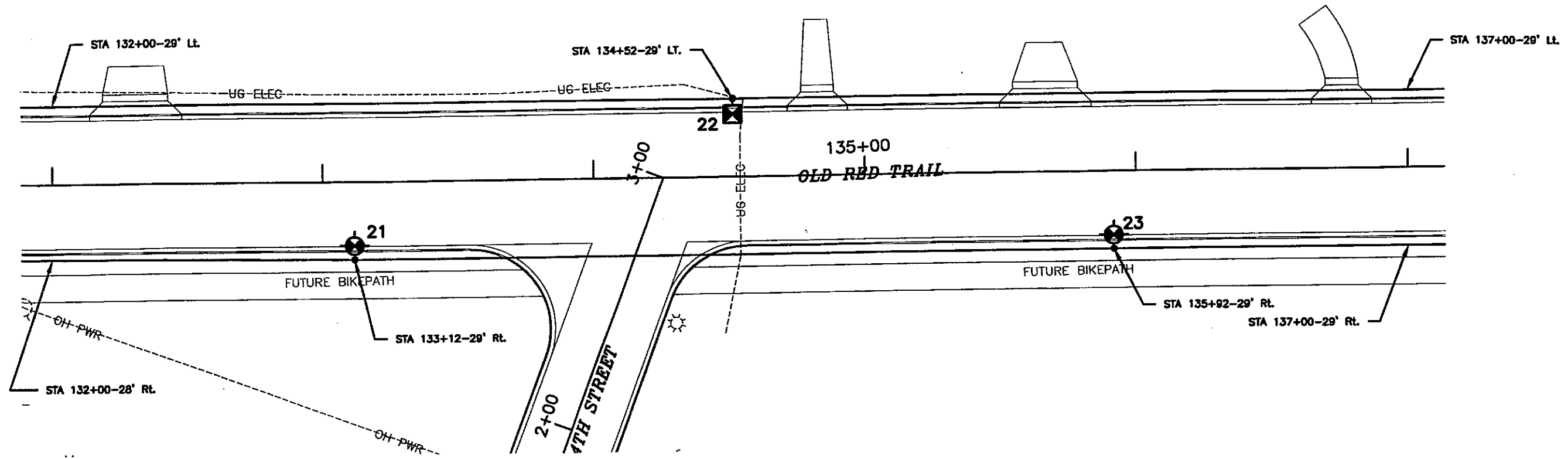
QUANTITY TABULATION

DESCRIPTION	UNIT	QUAN.
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4
2" DIA. RIGID CONDUIT	LF	1000'
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2064'
UNDERGROUND CONDUCTOR No. 6 THW	LF	1032'
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4

SU FUNDS	0	20'	40'
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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	173
OLD RED TRAIL LIGHTING LAYOUT STA 132+00 TO STA 137+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
21	133+12	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
22	134+52	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
23	135+92	29' Rt.	(1) 250W	B-1	MSC III	40'	6'

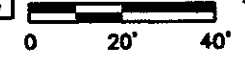
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
132+00-29' Lt.		134+52-29' Lt.	252'	2"	--	512'	(2) #4 RHW	256'	(1) #6 THW
134+52-29' Lt.		137+00-29' Lt.	248'	2"	--	504'	(2) #4 RHW	252'	(1) #6 THW
132+00-28' Rt.		133+12-29' Rt.	112'	2"	--	232'	(2) #4 RHW	116'	(1) #6 THW
133+12-29' Rt.		135+92-29' Rt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
135+92-29' Rt.		137+00-29' Rt.	108'	2"	--	224'	(2) #4 RHW	112'	(1) #6 THW

QUANTITY TABULATION

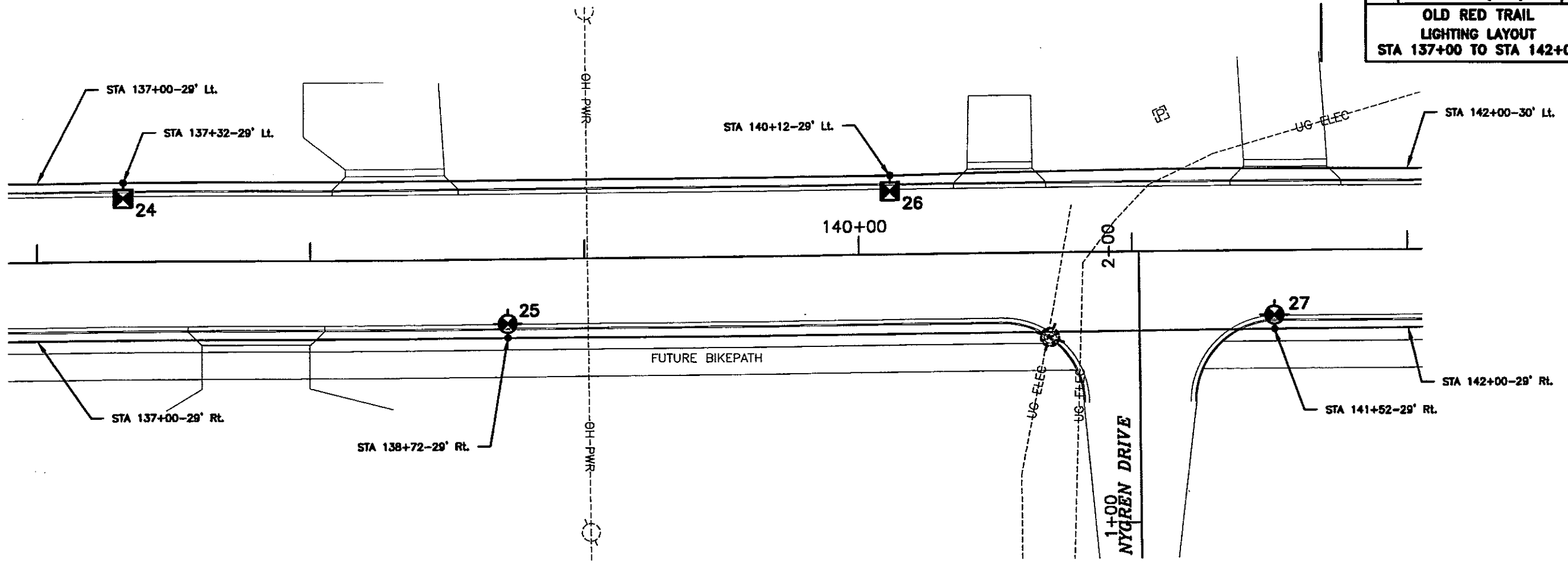
DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3					
2" DIA. RIGID CONDUIT	LF		1000'	2048'	1024'		
UNDERGROUND CONDUCTOR No. 4 RHW	LF						
UNDERGROUND CONDUCTOR No. 6 THW	LF						
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	3					
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	3					

SU FUNDS



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STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	174
OLD RED TRAIL LIGHTING LAYOUT STA 137+00 TO STA 142+00		



LIGHT STANDARD TABULATION

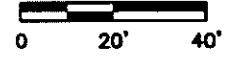
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
24	137+32	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
25	138+72	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
26	140+12	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
27	141+52	29' Rt.	(1) 250W	B-1	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

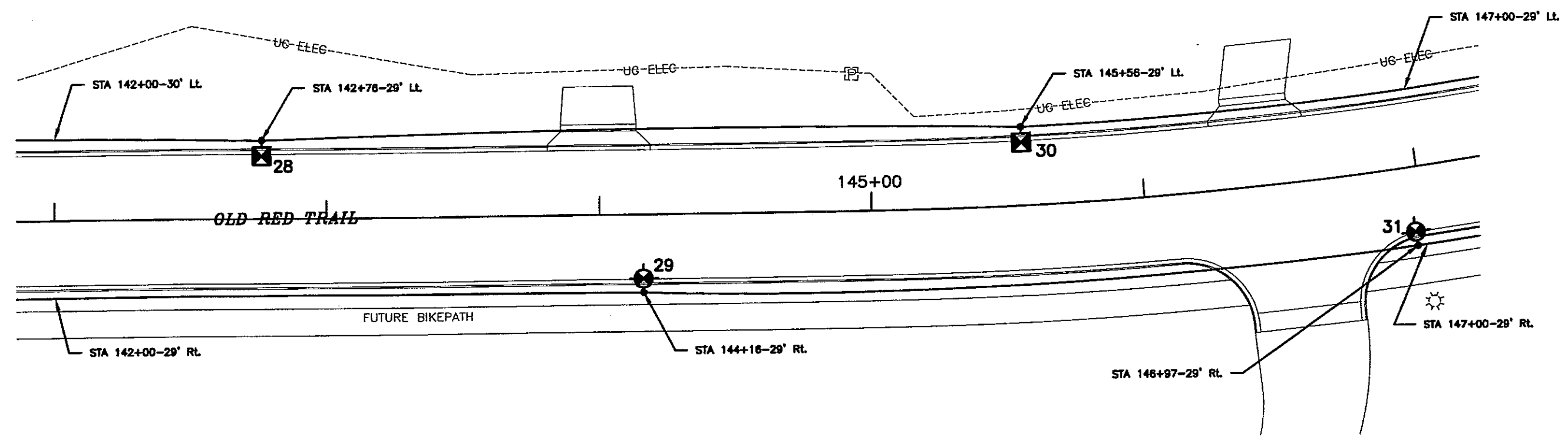
STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
137+00-29' Lt.	137+32-29' Lt.	32'	2"	--	72'	(2) #4 RHW	36'	(1) #6 THW
137+32-29' Lt.	140+12-29' Lt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
140+12-29' Lt.	142+00-30' Lt.	188'	2"	--	384'	(2) #4 RHW	192'	(1) #6 THW
137+00-29' Rt.	138+72-29' Rt.	172'	2"	--	352'	(2) #4 RHW	176'	(1) #6 THW
138+72-29' Rt.	141+52-29' Rt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
141+52-29' Rt.	142+00-29' Rt.	48'	2"	--	104'	(2) #4 RHW	52'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	QUANTITY
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4
2" DIA. RIGID CONDUIT	LF	1000
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2064
UNDERGROUND CONDUCTOR No. 6 THW	LF	1032
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4
	SU FUNDS	



STATE	PROJECT	SHEET
ND	SU-1-988(008)019	175
OLD RED TRAIL LIGHTING LAYOUT STA 142+00 TO STA 147+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
28	142+76	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
29	144+16	29' Rt.	(1) 250W	B-1	MSC III	40'	6'
30	145+56	29' Lt.	(1) 250W	B-1	MSC III	40'	6'
31	146+97	29' Rt.	(1) 250W	B-1	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

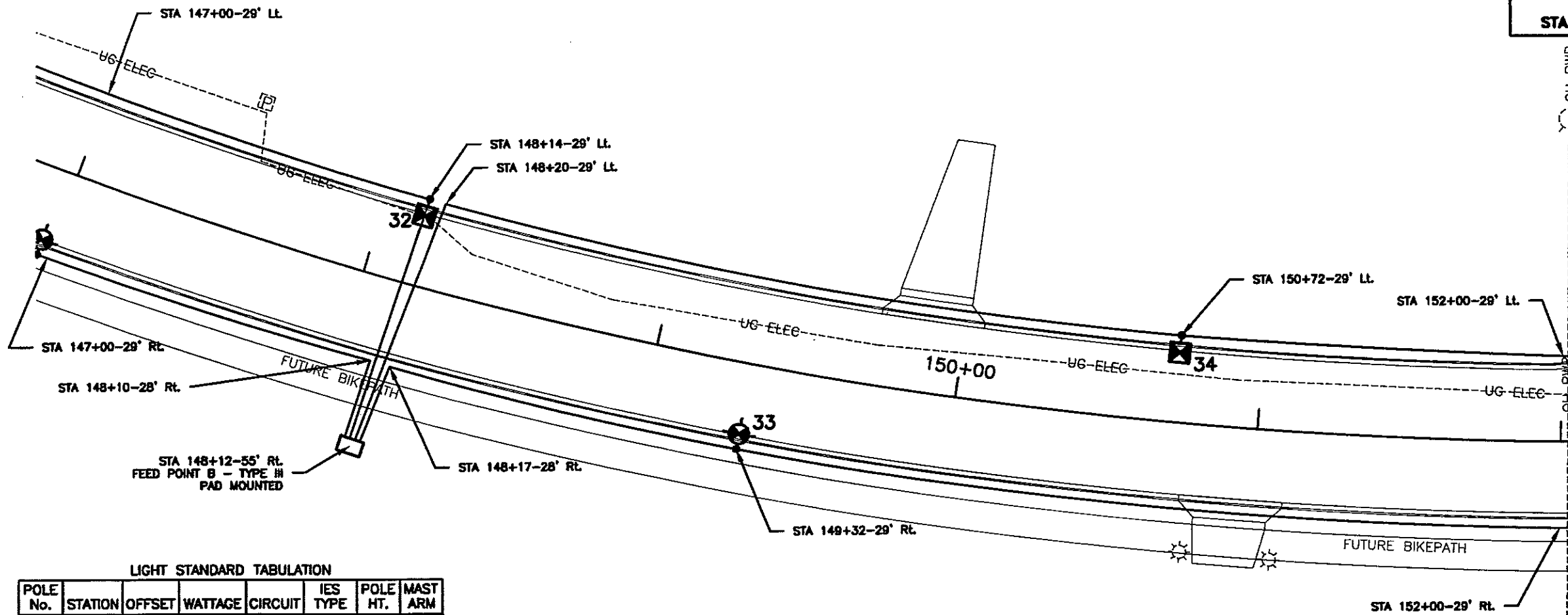
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
142+00-30' Lt.		142+76-29' Lt.	76'	2"	--	160'	(2) #4 RHW	80'	(1) #6 THW
142+76-29' Lt.		145+56-29' Lt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
145+56-29' Lt.		147+00-29' Lt.	144'	2"	--	296'	(2) #4 RHW	148'	(1) #6 THW
142+00-29' Rt.		144+16-29' Rt.	216'	2"	--	440'	(2) #4 RHW	220'	(1) #6 THW
144+16-29' Rt.		146+97-29' Rt.	281'	2"	--	578'	(2) #4 RHW	289'	(1) #6 THW
146+97-29' Rt.		147+00-29' Rt.	3'	2"	--	14'	(2) #4 RHW	7'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4						
2" DIA. RIGID CONDUIT	LF		1000'					
UNDERGROUND CONDUCTOR No. 4 RHW	LF			2064'				
UNDERGROUND CONDUCTOR No. 6 THW	LF				1032'			
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4						

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LIGHT STANDARD TABULATION

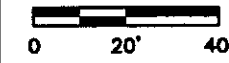
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
32	148+14	29' Lt.	(1) 250W	B-1	MSC III	40' 6"	6'
33	149+32	29' Rt.	(1) 250W	B-2	MSC III	40' 6"	6'
34	150+72	29' Lt.	(1) 250W	B-2	MSC III	40' 6"	6'

QUANTITY TABULATION

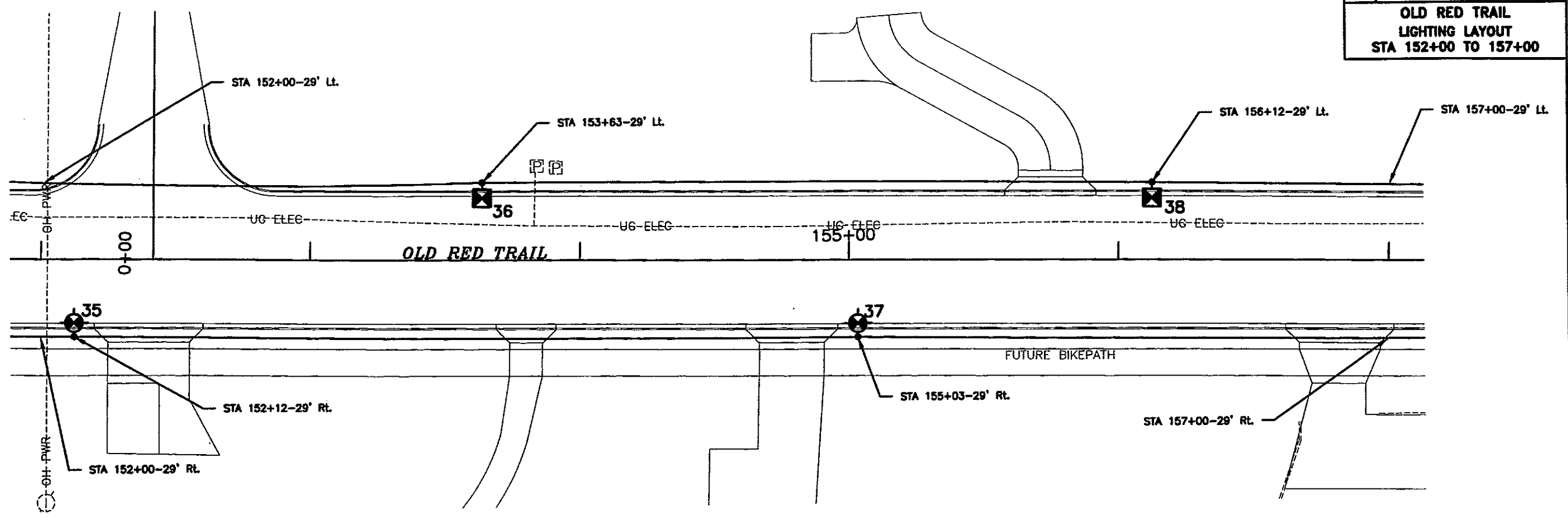
DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3	1210'	2556'	1278'	3	3	1	1	
2" DIA. RIGID CONDUIT	LF									
UNDERGROUND CONDUCTOR No. 4 RHW	LF									
UNDERGROUND CONDUCTOR No. 6 THW	LF									
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA									
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA									
FEED POINT - TYPE III PAD MOUNTED	EA									
CONCRETE FOUNDATION FEED POINT - TYPE A	EA									

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
147+00-29' Lt.		148+14-29' Lt.	114'	2"	---	236'	(2) #4 RHW	118'	(1) #6 THW
148+14-29' Lt.		148+12-55' Rt.	84'	2"	---	196'	(2) #4 RHW	98'	(1) #6 THW
148+12-55' Rt.		148+20-29' Lt.	84'	2"	---	196'	(2) #4 RHW	98'	(1) #6 THW
148+20-29' Lt.		150+72-29' Lt.	252'	2"	---	512'	(2) #4 RHW	256'	(1) #6 THW
150+72-29' Lt.		152+00-29' Lt.	128'	2"	---	264'	(2) #4 RHW	132'	(1) #6 THW
147+00-29' Rt.		148+10-28' Rt.	110'	2"	---	220'	(2) #4 RHW	110'	(1) #6 THW
148+10-28' Rt.		148+12-55' Rt.	27'	2"	---	74'	(2) #4 RHW	37'	(1) #6 THW
148+12-55' Rt.		148+17-28' Rt.	28'	2"	---	76'	(2) #4 RHW	38'	(1) #6 THW
148+17-28' Rt.		149+32-29' Rt.	115'	2"	---	238'	(2) #4 RHW	119'	(1) #6 THW
149+32-29' Rt.		152+00-29' Rt.	268'	2"	---	544'	(2) #4 RHW	272'	(1) #6 THW



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	177
OLD RED TRAIL LIGHTING LAYOUT STA 152+00 TO 157+00		



LIGHT STANDARD TABULATION

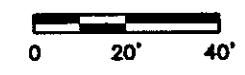
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
35	152+12	29' Rt.	(1) 250W	B-2	MSC III	40'	6'
36	153+63	29' Lt.	(1) 250W	B-2	MSC III	40'	6'
37	155+03	29' Rt.	(1) 250W	B-2	MSC III	40'	6'
38	156+12	29' Lt.	(1) 250W	B-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
152+00-29' Lt.		153+63-29' Lt.	163'	2"	--	334'	(2) #4 RHW	167'	(1) #6 THW
153+63-29' Lt.		156+12-29' Lt.	249'	2"	--	514'	(2) #4 RHW	257'	(1) #6 THW
156+12-29' Lt.		157+00-29' Lt.	88'	2"	--	184'	(2) #4 RHW	92'	(1) #6 THW
152+00-29' Rt.		152+12-29' Rt.	12'	2"	--	32'	(2) #4 RHW	16'	(1) #6 THW
152+12-29' Rt.		155+03-29' Rt.	291'	2"	--	598'	(2) #4 RHW	299'	(1) #6 THW
155+03-29' Rt.		157+00-29' Rt.	197'	2"	--	402'	(2) #4 RHW	201'	(1) #6 THW

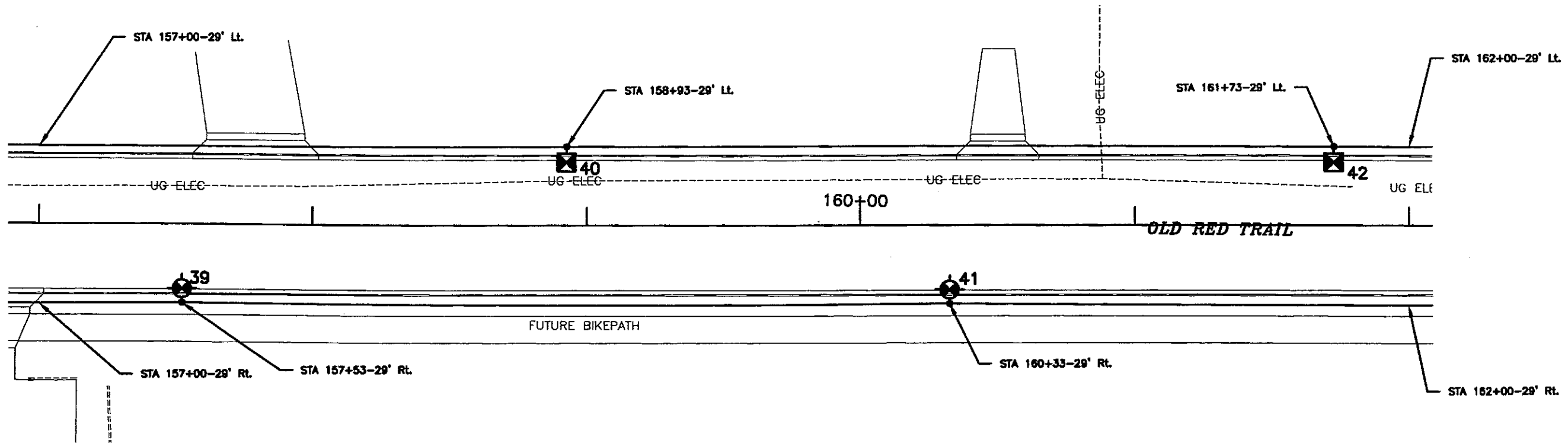
QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4	1000'	2064'	1032'	4	4	
2" DIA. RIGID CONDUIT	LF							
UNDERGROUND CONDUCTOR No. 4 RHW	LF							
UNDERGROUND CONDUCTOR No. 6 THW	LF							
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4						



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STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	178
OLD RED TRAIL LIGHTING LAYOUT STA 157+00 TO 162+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
39	157+53	29' Rt.	(1) 250W	B-2	MSC III	40'	6'
40	158+93	29' Lt.	(1) 250W	B-2	MSC III	40'	6'
41	160+33	29' Rt.	(1) 250W	B-2	MSC III	40'	6'
42	161+73	29' Lt.	(1) 250W	B-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

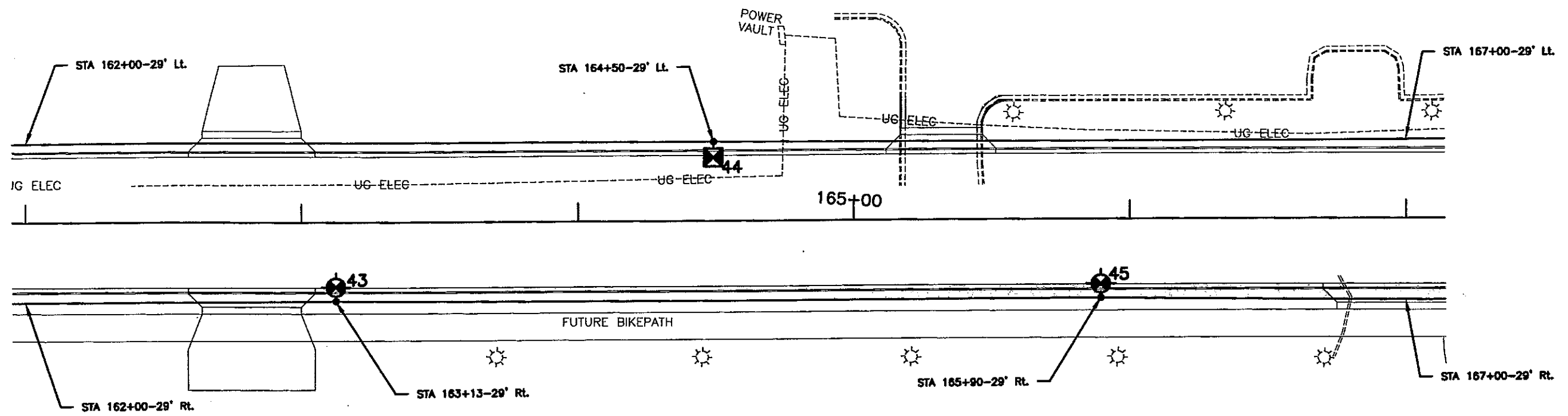
STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
157+00-29' Lt.		158+93-29' Lt.	193'	2"	--	394'	(2) #4 RHW	197'	(1) #6 THW
158+93-29' Lt.		161+73-29' Lt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
161+73-29' Lt.		162+00-29' Lt.	27'	2"	--	62'	(2) #4 RHW	31'	(1) #6 THW
157+00-29' Rt.		157+53-29' Rt.	53'	2"	--	114'	(2) #4 RHW	57'	(1) #6 THW
157+53-29' Rt.		160+33-29' Rt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
160+33-29' Rt.		162+00-29' Rt.	167'	2"	--	342'	(2) #4 RHW	171'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4						
2" DIA. RIGID CONDUIT	LF	1000'						
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2064'						
UNDERGROUND CONDUCTOR No. 6 THW	LF	1032'						
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4						



STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	179
OLD RED TRAIL LIGHTING LAYOUT STA 162+00 TO 167+00		



LIGHT STANDARD TABULATION

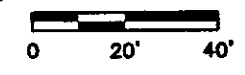
POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
43	163+13	29' Rt.	(1) 250W	B-2	MSC III	40'	6'
44	164+50	29' Lt.	(1) 250W	B-2	MSC III	40'	6'
45	165+90	29' Rt.	(1) 250W	B-2	MSC III	40'	6'

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
		LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
					TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
162+00-29' Lt.	164+50-29' Lt.	250'	2"	--	508'	(2) #4 RHW	254'	(1) #6 THW
164+50-29' Lt.	167+00-29' Lt.	250'	2"	--	508'	(2) #4 RHW	254'	(1) #6 THW
162+00-29' Rt.	163+13-29' Rt.	113'	2"	--	234'	(2) #4 RHW	117'	(1) #6 THW
163+13-29' Rt.	165+90-29' Rt.	277'	2"	--	570'	(2) #4 RHW	285'	(1) #6 THW
165+90-29' Rt.	167+00-29' Rt.	110'	2"	--	228'	(2) #4 RHW	114'	(1) #6 THW

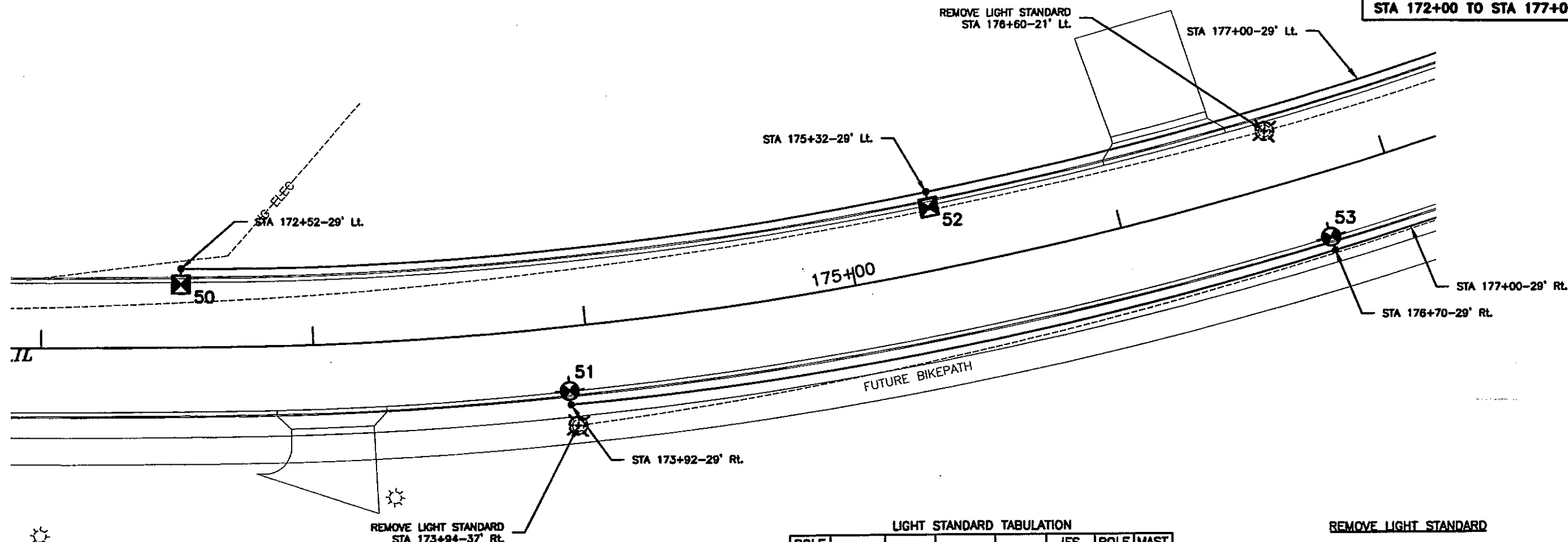
QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3						
2" DIA. RIGID CONDUIT	LF		1000'					
UNDERGROUND CONDUCTOR No. 4 RHW	LF		2048'					
UNDERGROUND CONDUCTOR No. 6 THW	LF		1024'					
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	3						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	3						



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STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	181
OLD RED TRAIL LIGHTING LAYOUT STA 172+00 TO STA 177+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
50	172+52	29' Lt.	(1) 250W	E-1	MSC III	40'	6'
51	173+92	29' Rt.	(1) 250W	E-2	MSC III	40'	6'
52	175+32	29' Lt.	(1) 250W	E-1	MSC III	40'	6'
53	176+70	29' Rt.	(1) 250W	E-2	MSC III	40'	6'

REMOVE LIGHT STANDARD

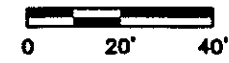
STA 173+94-37' Rt.
STA 176+60-21' Lt.

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
172+52-29' Lt.		175+32-29' Lt.	280'	2"	--	576'	(2) #4 RHW	288'	(1) #6 THW
175+32-29' Lt.		177+00-29' Lt.	168'	2"	--	344'	(2) #4 RHW	172'	(1) #6 THW
173+92-29' Rt.		176+70-29' Rt.	278'	2"	--	572'	(2) #4 RHW	286'	(1) #6 THW
176+70-29' Rt.		177+00-29' Rt.	30'	2"	--	68'	(2) #4 RHW	34'	(1) #6 THW

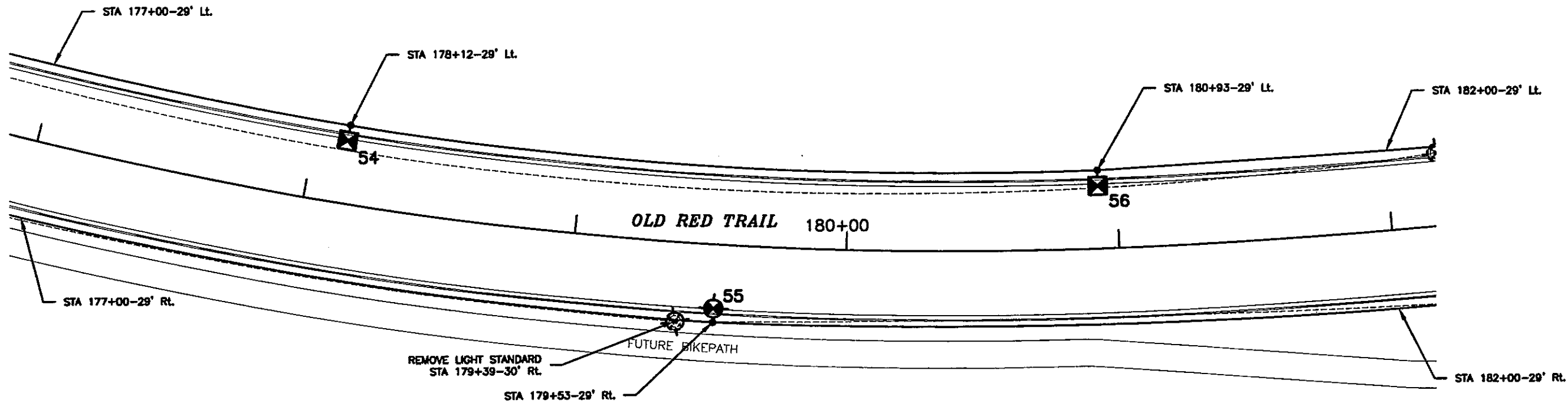
QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	LF	EA	EA	EA
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	4						
2" DIA. RIGID CONDUIT	LF		756'					
UNDERGROUND CONDUCTOR No. 4 RHW	LF		1560'					
UNDERGROUND CONDUCTOR No. 6 THW	LF		780'					
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	4						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	4						
REMOVE LIGHT STANDARD	EA	2						
	SU FUNDS							



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STATE	PROJECT	DISTRICT
ND	SU-1-988(008)019	182
OLD RED TRAIL LIGHTING LAYOUT STA 177+00 TO STA 182+00		



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
54	178+12	29' Lt.	(1) 250W	E-1	MSC III	40'	6'
55	179+53	29' Rt.	(1) 250W	E-2	MSC III	40'	6'
56	180+93	29' Lt.	(1) 250W	E-1	MSC III	40'	6'

REMOVE LIGHT STANDARD
STA 179+39-30' Rt.

CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
177+00-29' Lt.		178+12-29' Lt.	112'	2"	--	232'	(2) #4 RHW	116'	(1) #6 THW
178+12-29' Lt.		180+93-29' Lt.	281'	2"	--	578'	(2) #4 RHW	289'	(1) #6 THW
180+93-29' Lt.		182+00-29' Lt.	107'	2"	--	222'	(2) #4 RHW	111'	(1) #6 THW
177+00-29' Rt.		179+53-29' Rt.	253'	2"	--	514'	(2) #4 RHW	257'	(1) #6 THW
179+53-29' Rt.		182+00-29' Rt.	247'	2"	--	502'	(2) #4 RHW	251'	(1) #6 THW

QUANTITY TABULATION

DESCRIPTION	UNIT	EA	LF	LF	EA	EA	EA	SU FUNDS
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3						
2" DIA. RIGID CONDUIT	LF		1000					
UNDERGROUND CONDUCTOR No. 4 RHW	LF			2048				
UNDERGROUND CONDUCTOR No. 6 THW	LF				1024			
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	3						
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	3						
REMOVE LIGHT STANDARD	EA	1						

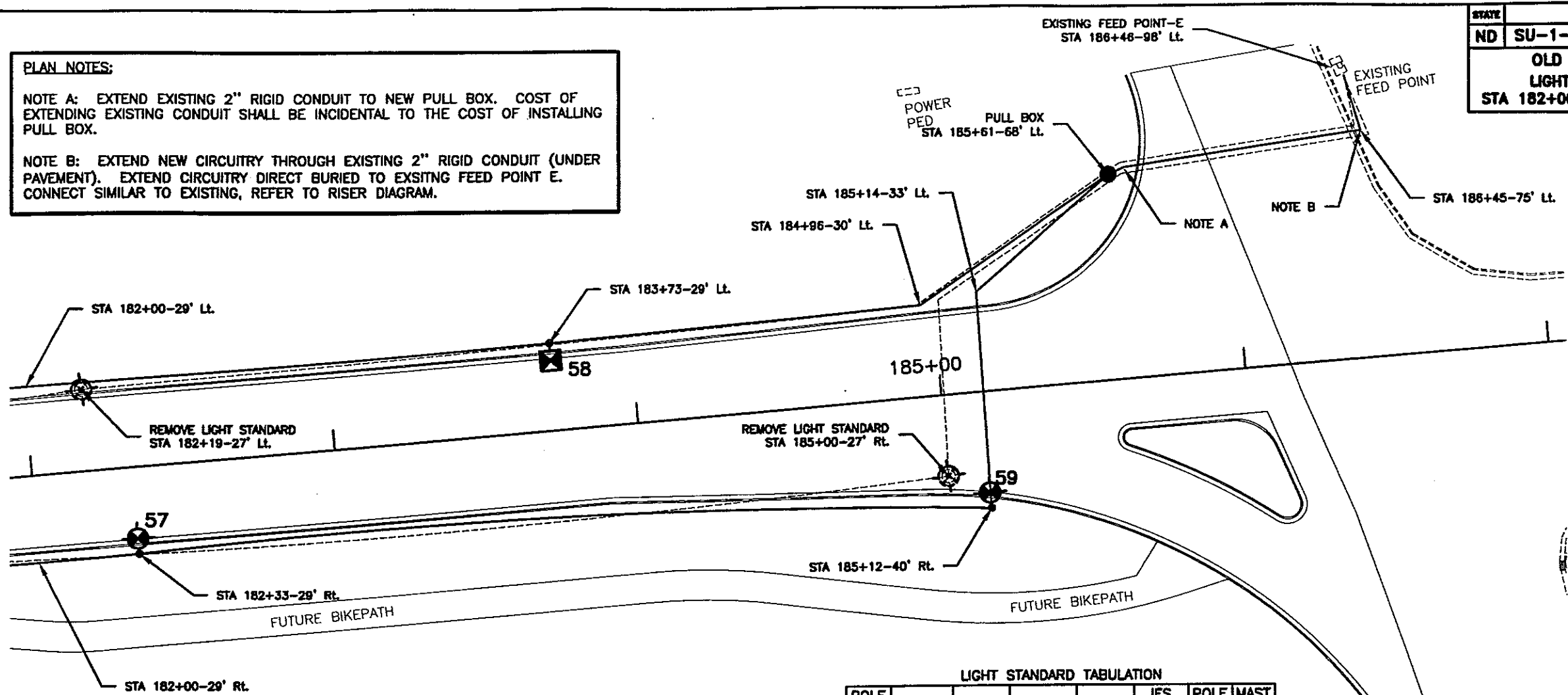


STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	183
OLD RED TRAIL LIGHTING LAYOUT STA 182+00 TO STA 187+00		

PLAN NOTES:

NOTE A: EXTEND EXISTING 2" RIGID CONDUIT TO NEW PULL BOX. COST OF EXTENDING EXISTING CONDUIT SHALL BE INCIDENTAL TO THE COST OF INSTALLING PULL BOX.

NOTE B: EXTEND NEW CIRCUITRY THROUGH EXISTING 2" RIGID CONDUIT (UNDER PAVEMENT). EXTEND CIRCUITRY DIRECT BURIED TO EXISTING FEED POINT E. CONNECT SIMILAR TO EXISTING, REFER TO RISER DIAGRAM.



LIGHT STANDARD TABULATION

POLE No.	STATION	OFFSET	WATTAGE	CIRCUIT	IES TYPE	POLE HT.	MAST ARM
57	182+33	29' Rt.	(1) 250W	E-2	MSC III	40'	6'
58	183+73	29' Lt.	(1) 250W	E-1	MSC III	40'	6'
59	185+12	40' Rt.	(1) 250W	E-2	MSC III	40'	6'

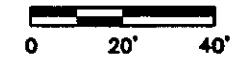
CONDUIT/CONDUCTOR RUN TABULATION

STATION No.	TO	STATION No.	CONDUIT RUNS		LENGTH OF CABLE TRENCH	CONDUCTOR RUNS			
			LENGTH	SIZE		PHASE CONDUCTORS		GROUND CONDUCTORS	
						TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY	TOTAL CONDUCTOR LENGTH	CONDUCTOR SIZE, TYPE & QUANTITY
182+00-29' Lt.		183+73-29' Lt.	173'	2"	---	354'	(2) #4 RHW	177'	(1) #6 THW
183+73-29' Lt.		184+96-30' Lt.	123'	2"	---	254'	(2) #4 RHW	127'	(1) #6 THW
184+96-30' Lt.		185+61-68' Lt.	76'	2"	---	152'	(2) #4 RHW	76'	(1) #6 THW
185+61-68' Lt.		186+45-75' Lt.	---	---	---	170'	(2) #4 RHW	85'	(1) #6 THW
186+14-75' Lt.		186+45-98' Lt.	---	---	39'	196'	(4) #4 RHW	98'	(2) #6 THW
182+00-29' Rt.		182+33-29' Rt.	33'	2"	---	74'	(2) #4 RHW	37'	(1) #6 THW
182+33-29' Rt.		185+12-40' Rt.	280'	2"	---	576'	(2) #4 RHW	288'	(1) #6 THW
185+12-40' Rt.		185+14-33' Lt.	73'	2"	---	154'	(2) #4 RHW	77'	(1) #6 THW
185+14-33' Lt.		185+61-68' Lt.	59'	2"	---	118'	(2) #4 RHW	59'	(1) #6 THW
185+61-68' Lt.		186+45-75' Lt.	---	---	---	170'	(2) #4 RHW	85'	(1) #6 THW

QUANTITY TABULATION

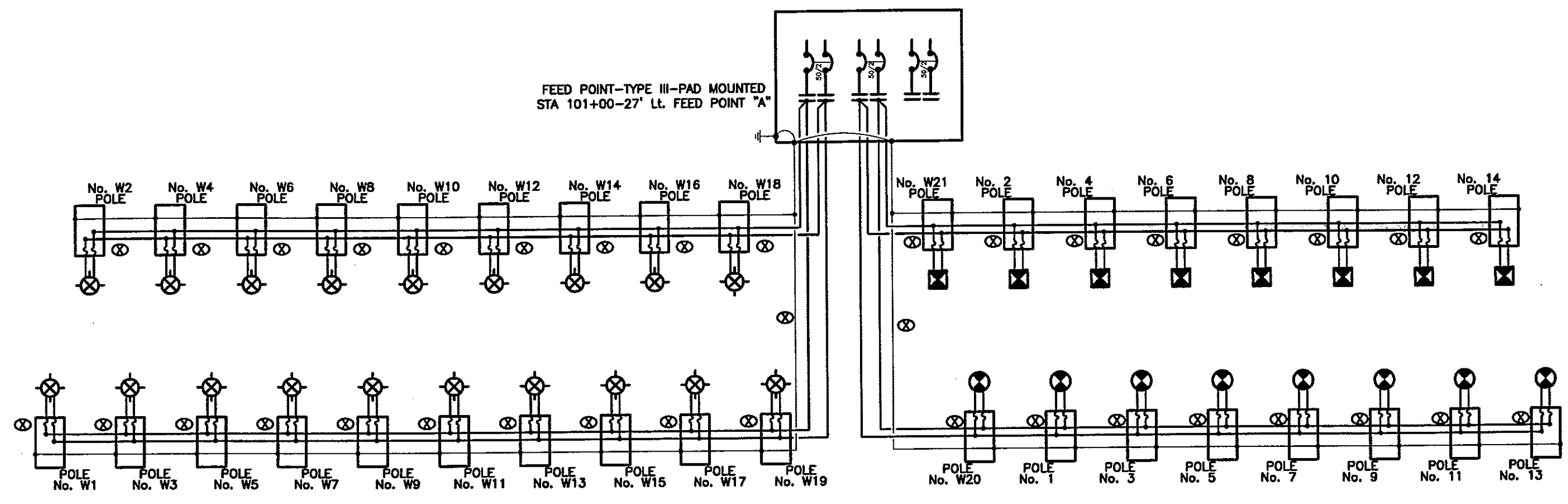
DESCRIPTION	UNIT	QUANTITY
CABLE TRENCH - TYPE I	LF	39
CONCRETE FOUNDATION HIGHWAY LIGHTING	EA	3
2" DIA. RIGID CONDUIT	LF	817'
UNDERGROUND CONDUCTOR No. 4 RHW	LF	2218'
UNDERGROUND CONDUCTOR No. 6 THW	LF	1109'
LIGHT STANDARD 6 FT. M.A. 40 FT. MOUNTING HEIGHT	EA	3
H.P. SODIUM VAPOR LUMINAIRE, 250 WATT	EA	3
REMOVE LIGHT STANDARD	EA	2
PULL BOX	EA	1

REMOVE LIGHT STANDARD
 STA 182+19-27' Lt.
 STA 185+00-27' Rt.



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STATE	PROJECT	PROJECT NO.
ND	SU-1-988(008)019	195
OLD RED TRAIL FEED POINT "A" RISER DIAGRAM		

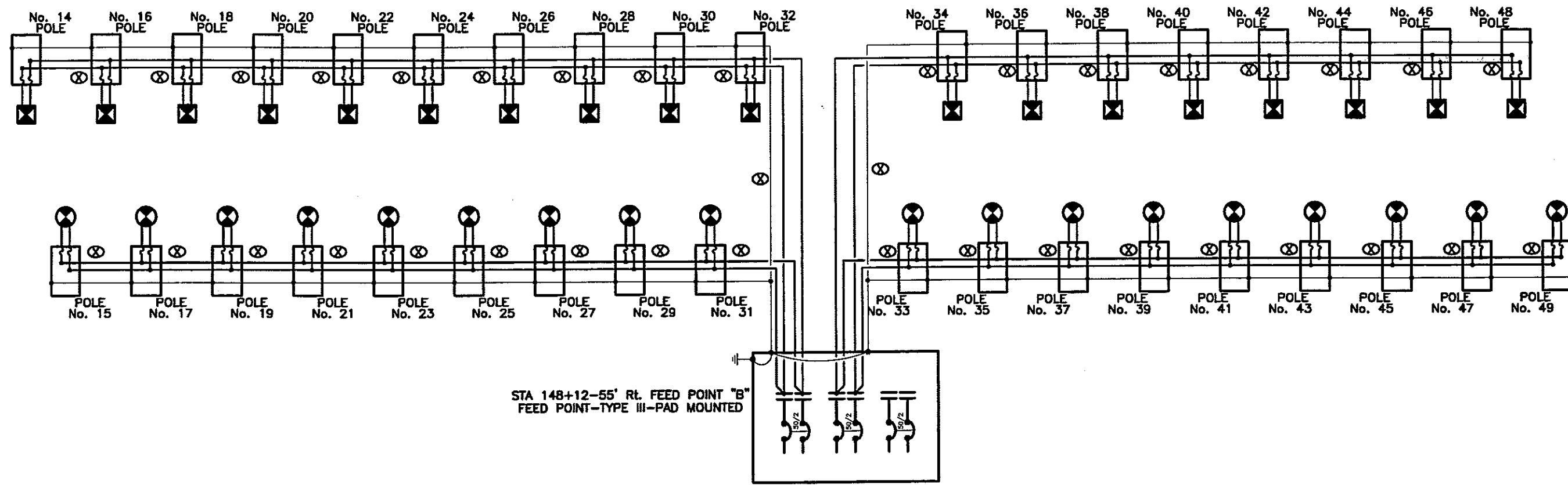


LEGEND

- NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 5° TILT UNLESS OTHERWISE NOTED
- NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 0° TILT UNLESS OTHERWISE NOTED
- NEW H.P. SODIUM VAPOR LUMINAIRE- 150 WATT WITH 5° TILT
- EXISTING 150 W HPS LUMINAIRE
- NEW LIGHT STANDARD
- EXISTING LIGHT STANDARD
- PHASE CONDUCTOR
- GROUND CONDUCTOR
- EXISTING CONDUCTOR (PHASE OR GROUND)
- 2-#4 RHW & 1-#6 THW

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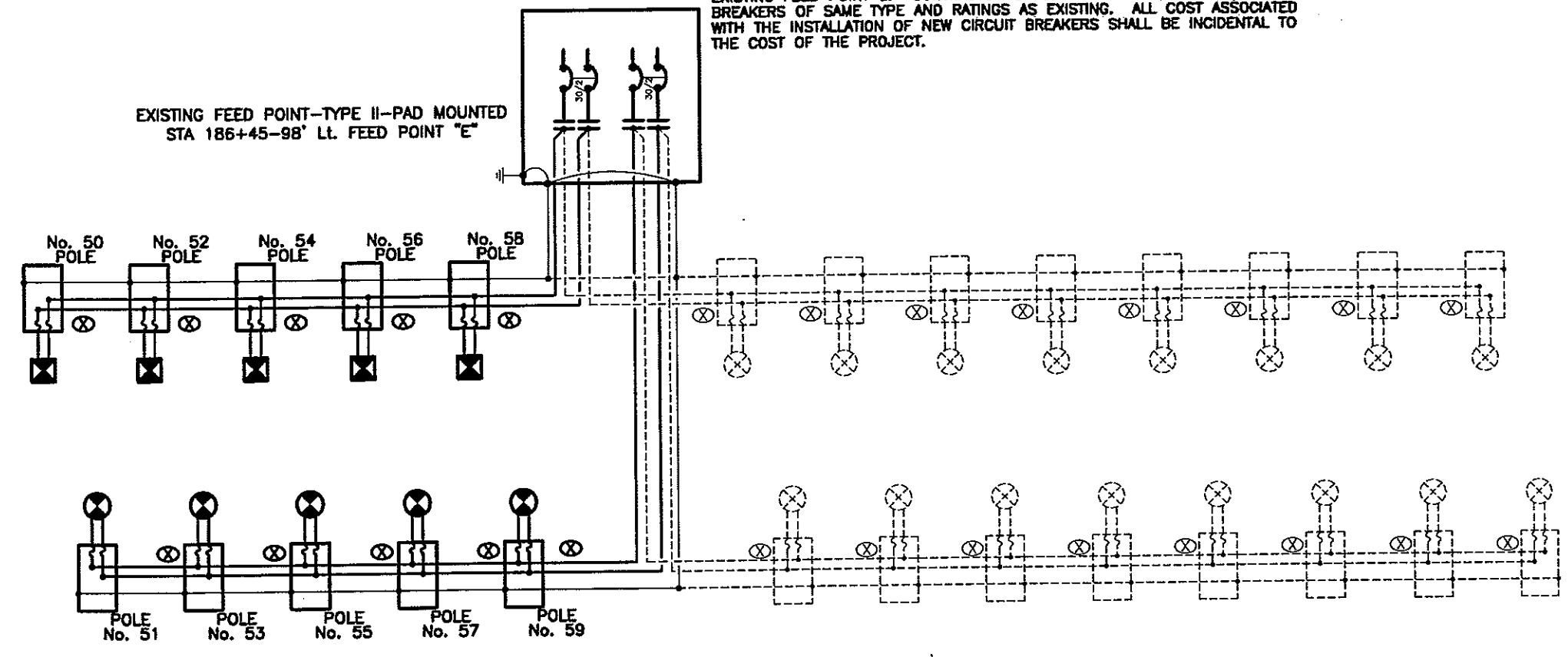


- LEGEND**
- NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 5° TILT UNLESS OTHERWISE NOTED
 - NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 0° TILT UNLESS OTHERWISE NOTED
 - EXISTING 150 W HPS LUMINAIRE
 - NEW LIGHT STANDARD
 - EXISTING LIGHT STANDARD
 - PHASE CONDUCTOR
 - GROUND CONDUCTOR
 - EXISTING CONDUCTOR (PHASE OR GROUND)
 - 2-#4 RHW & 1-#6 THW



STATE	PROJECT	SHEET NO.
ND	SU-1-988(008)019	187
OLD RED TRAIL EXISTING FEED POINT "E" RISER DIAGRAM		

EXISTING FEED POINT E: CONTRACTOR SHALL PROVIDE TWO NEW 30/2 CIRCUIT BREAKERS OF SAME TYPE AND RATINGS AS EXISTING. ALL COST ASSOCIATED WITH THE INSTALLATION OF NEW CIRCUIT BREAKERS SHALL BE INCIDENTAL TO THE COST OF THE PROJECT.



LEGEND

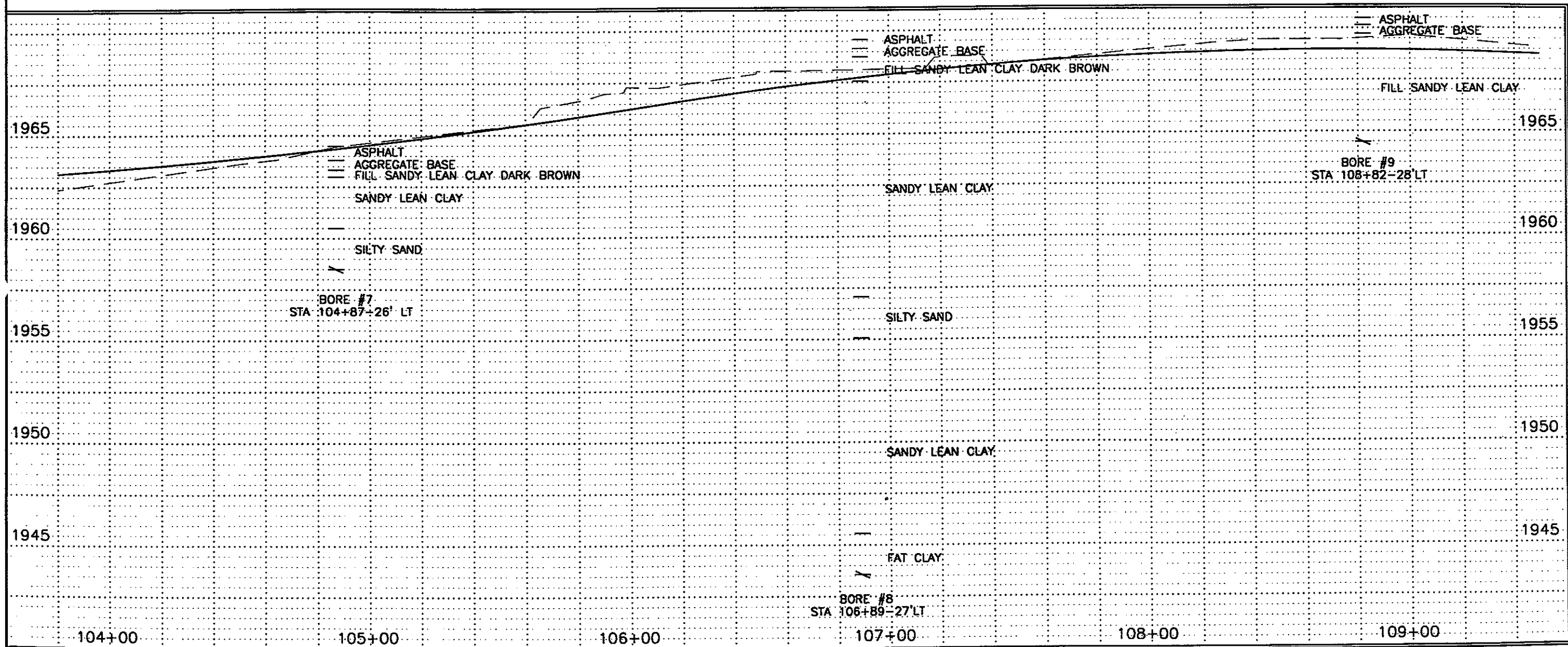
- NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 5° TILT UNLESS OTHERWISE NOTED
- NEW H.P. SODIUM VAPOR LUMINAIRE- 250 WATT WITH 0° TILT UNLESS OTHERWISE NOTED
- EXISTING 150 W HPS LUMINAIRE
- NEW LIGHT STANDARD
- EXISTING LIGHT STANDARD
- PHASE CONDUCTOR
- GROUND CONDUCTOR
- EXISTING CONDUCTOR (PHASE OR GROUND)
- 2-#4 RHW & 1-#6 THW



DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

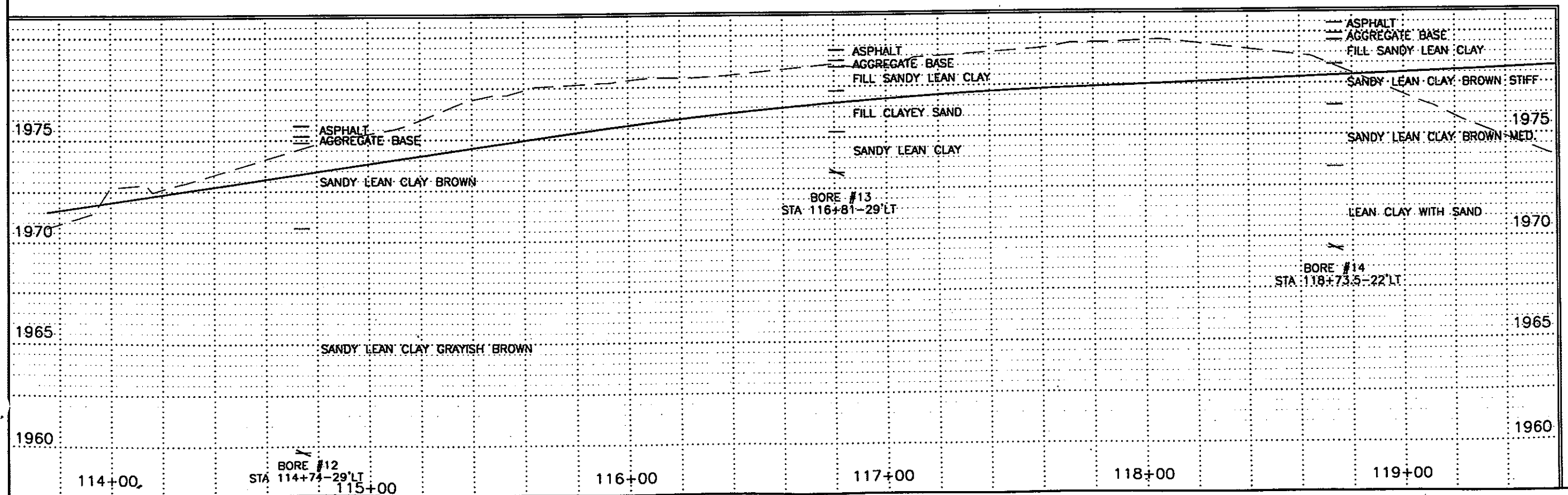
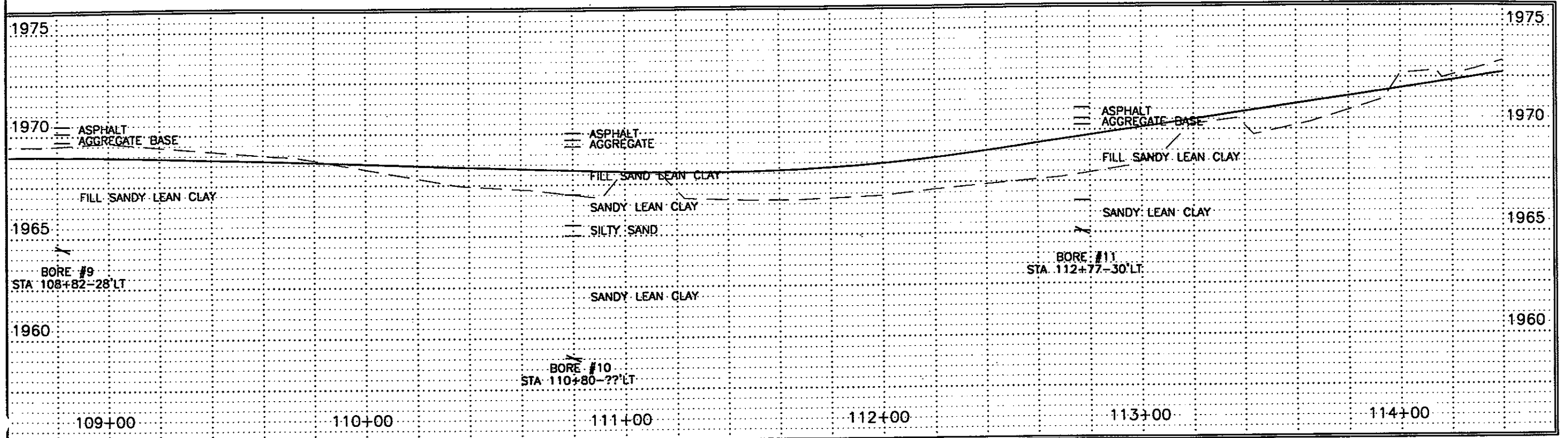
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	108

OLD RED TRAIL
STA. 104+00 TO STA. 109+00
SOILS PROFILE



DATE: 3/15/99 XREF: RCPRF003
 PLOT FILE: SOIL-PRF

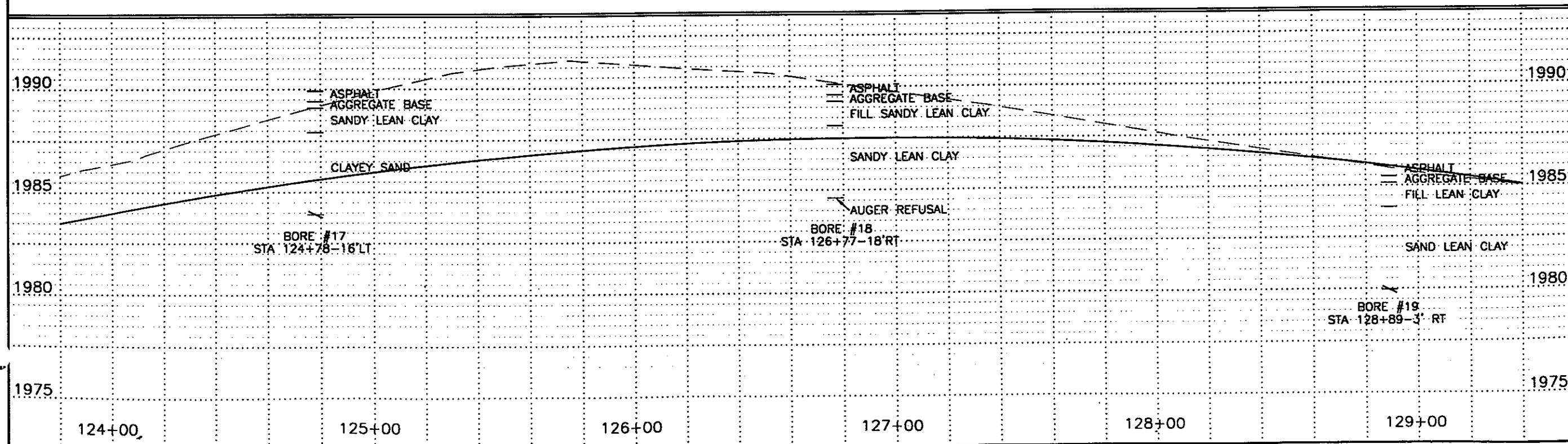
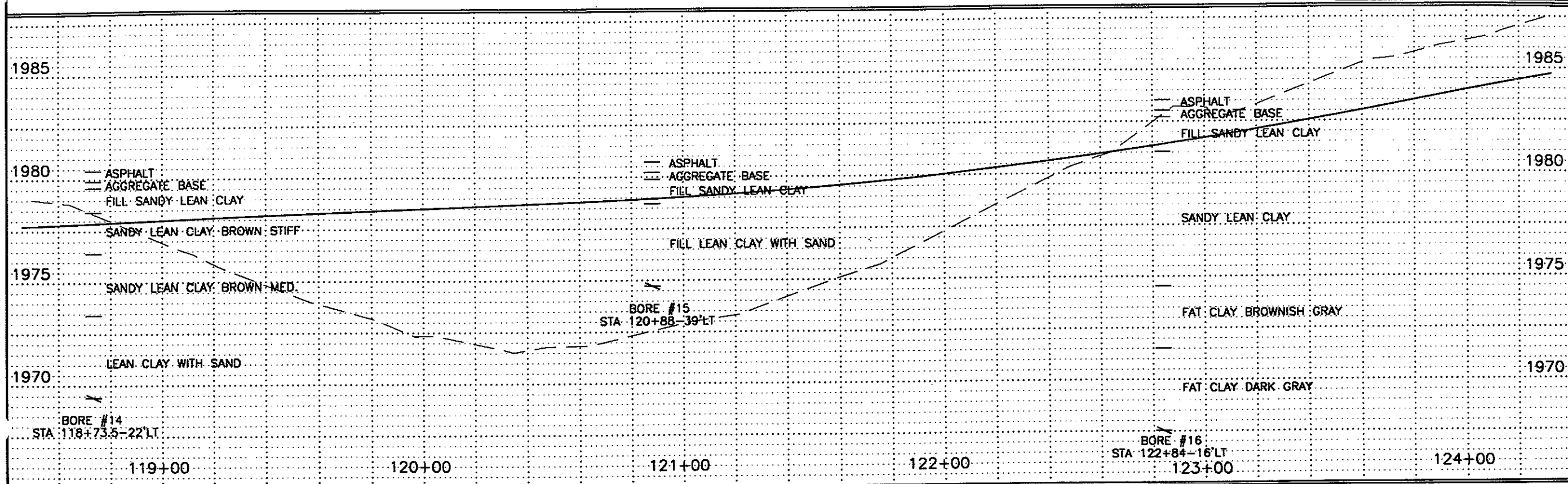
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	184
OLD RED TRAIL STA. 109+00 TO STA. 119+00 SOILS PROFILE			



DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	190

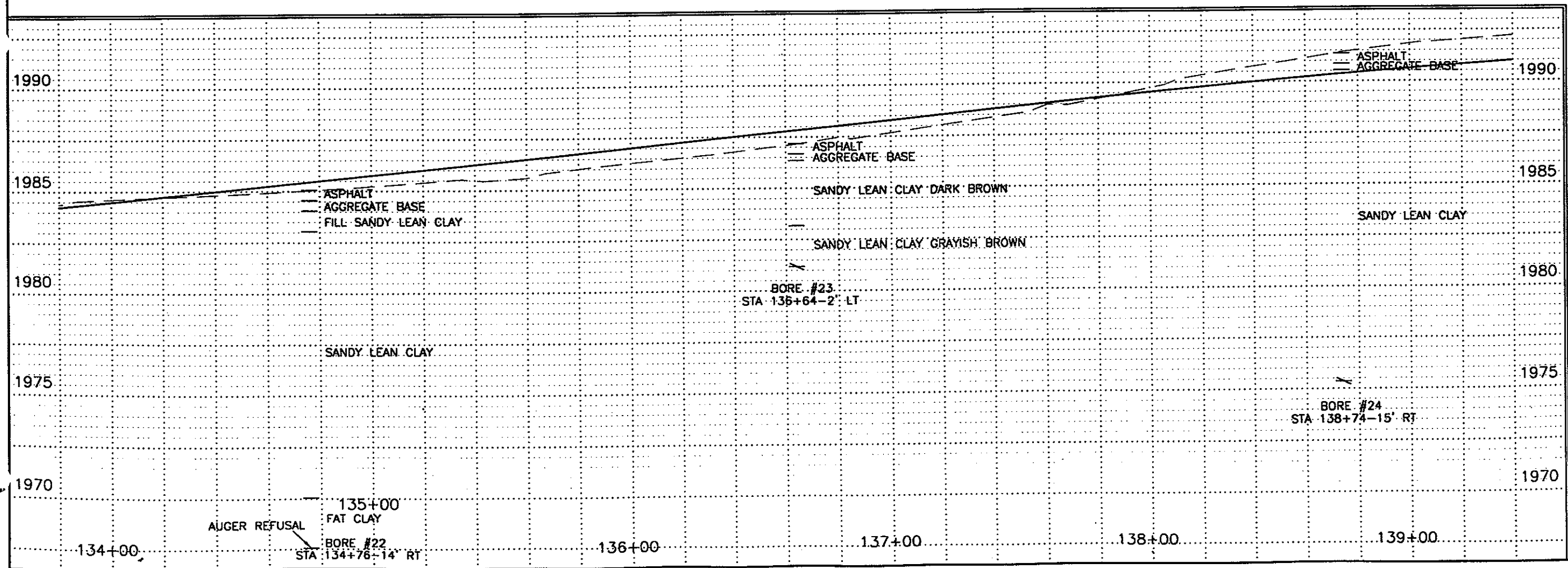
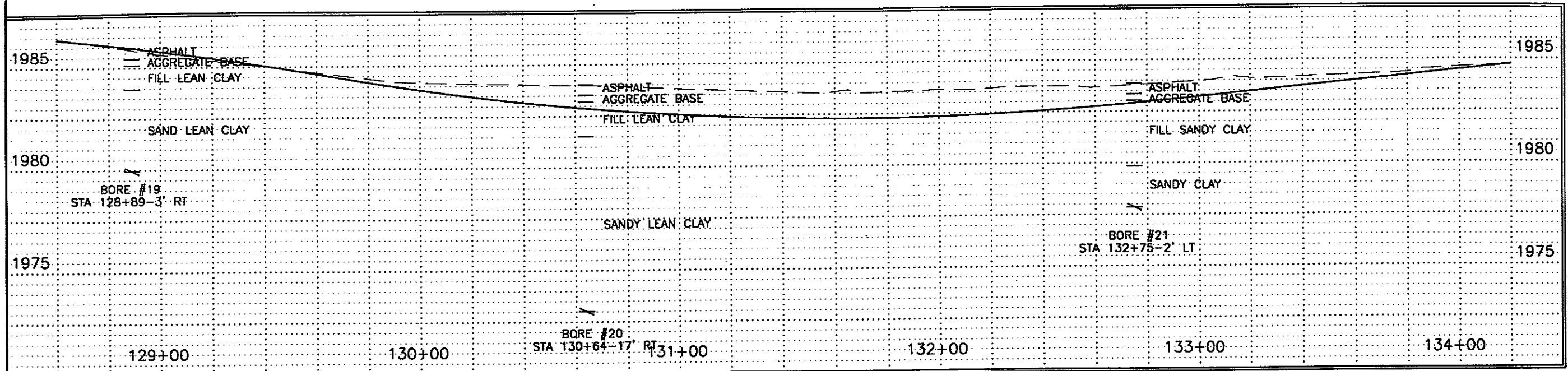
OLD RED TRAIL
STA. 119+00 TO STA. 129+00
SOILS PROFILE



DATE: 3/15/99 XREF: RCPRF003
 PLOT FILE: SOIL-PRF

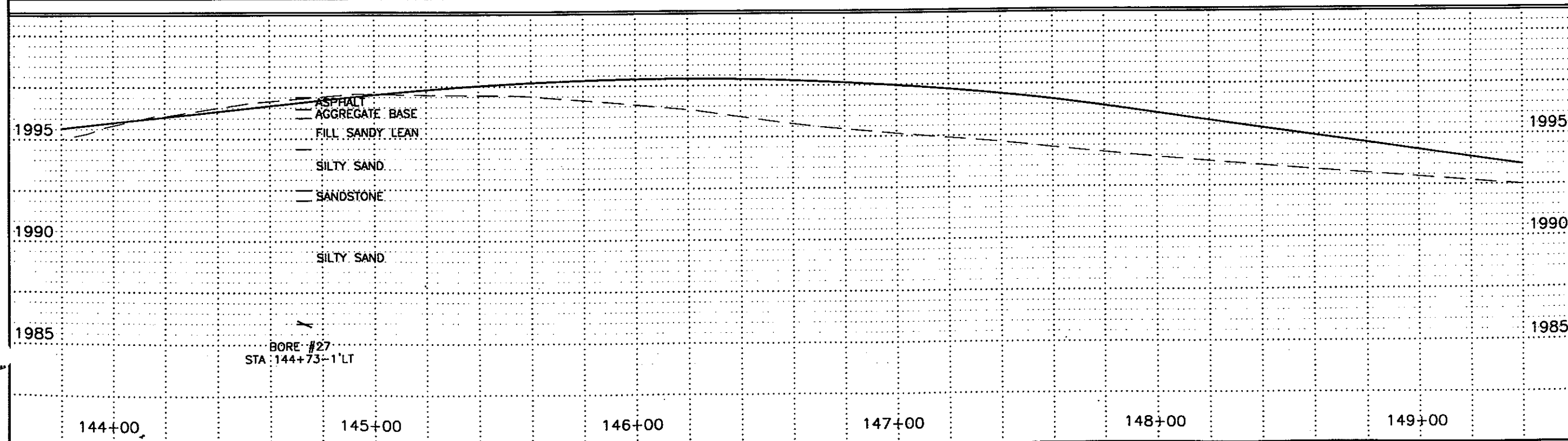
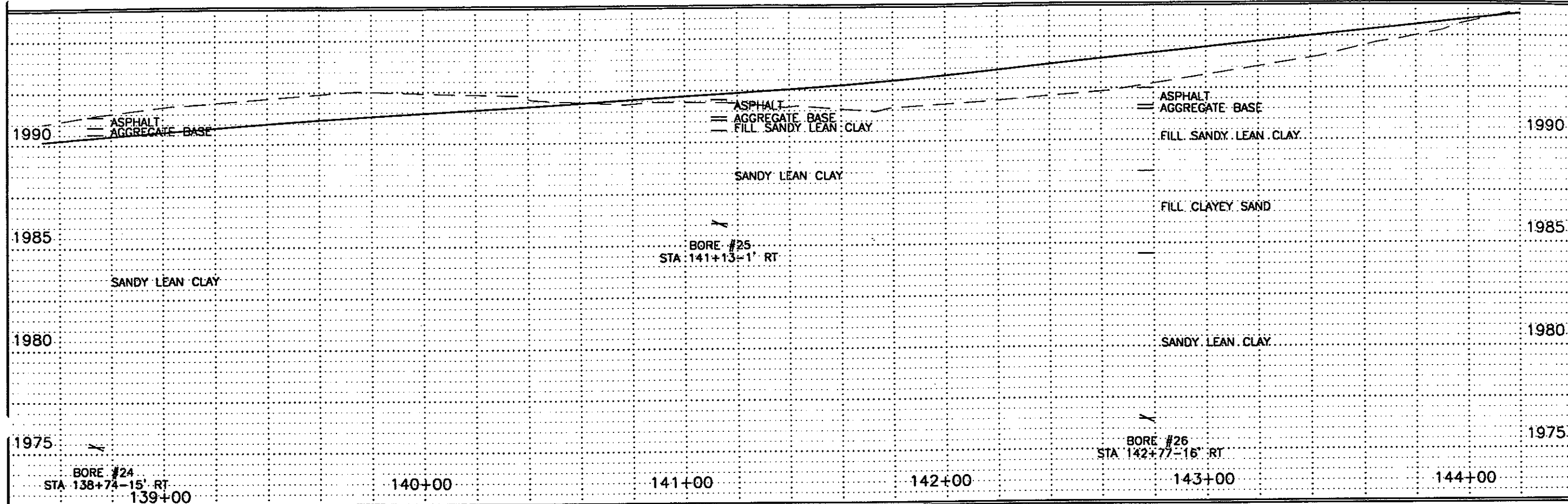
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	191

OLD RED TRAIL
 STA. 129+00 TO STA. 139+00
 SOILS PROFILE



DATE: 3/15/99 XREF: RCPRF003
 PLOT FILE: SOIL-PRF

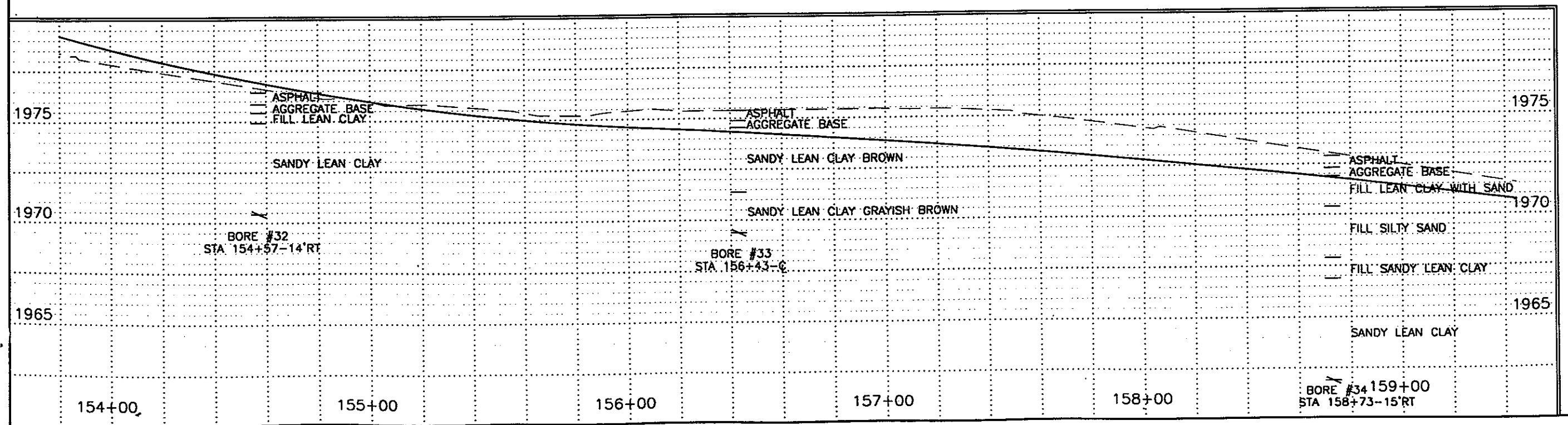
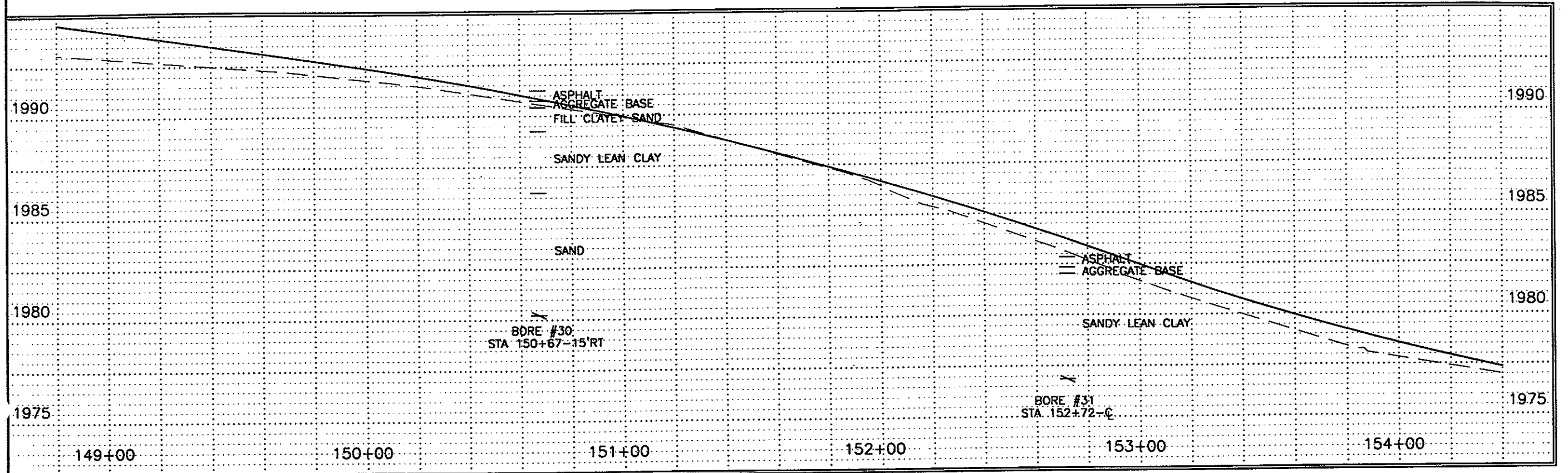
FEDERAL REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	142
OLD RED TRAIL STA. 139+00 TO STA. 149+00 SOILS PROFILE			



DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	193

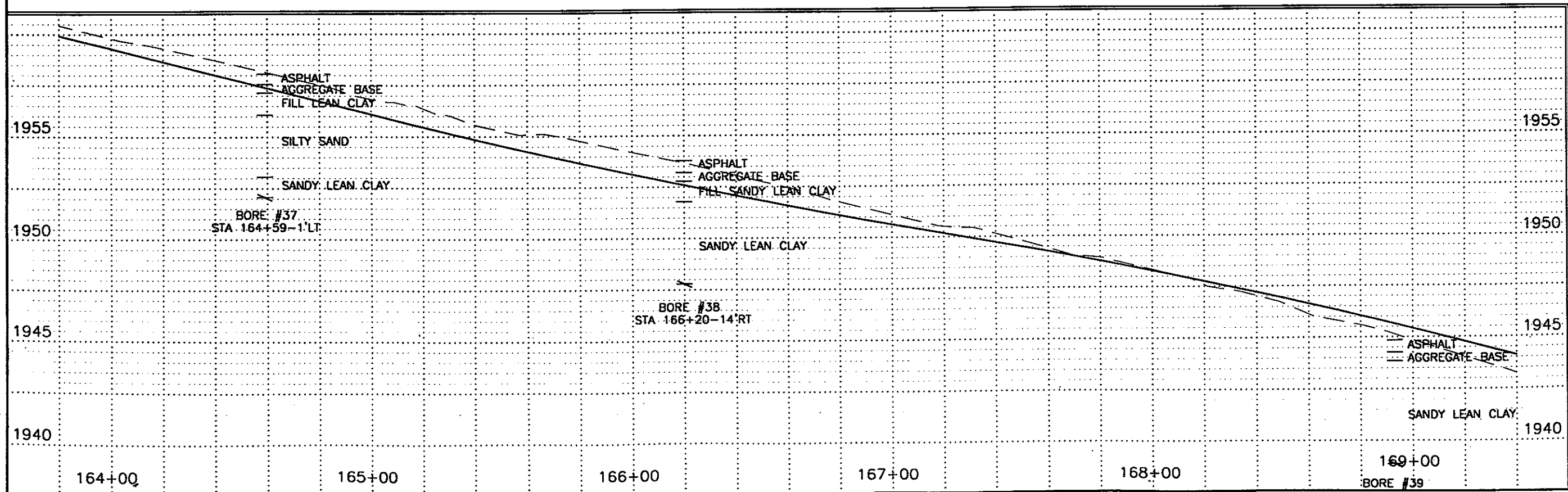
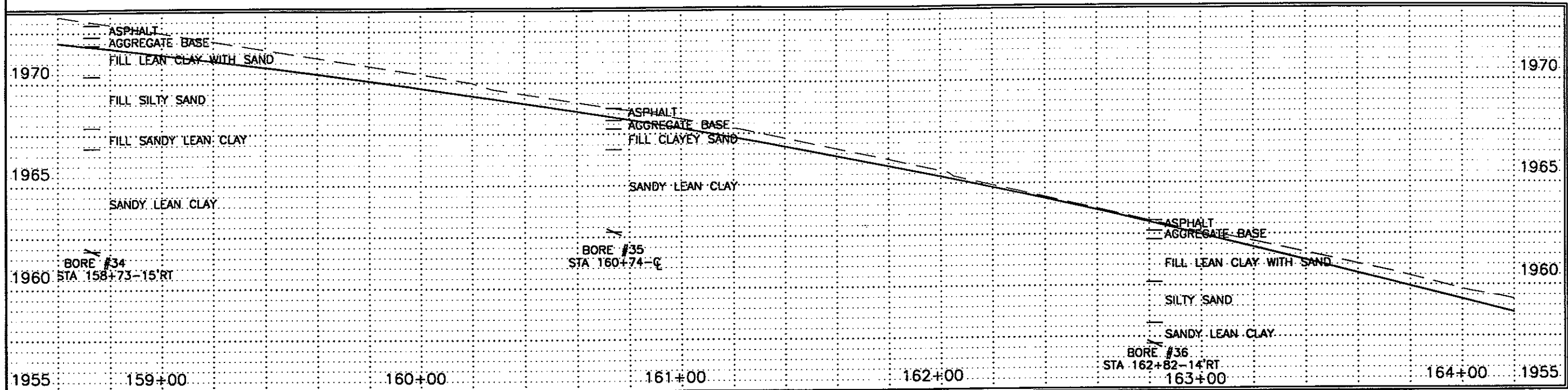
OLD RED TRAIL
STA. 149+00 TO STA. 159+00
SOILS PROFILE



DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

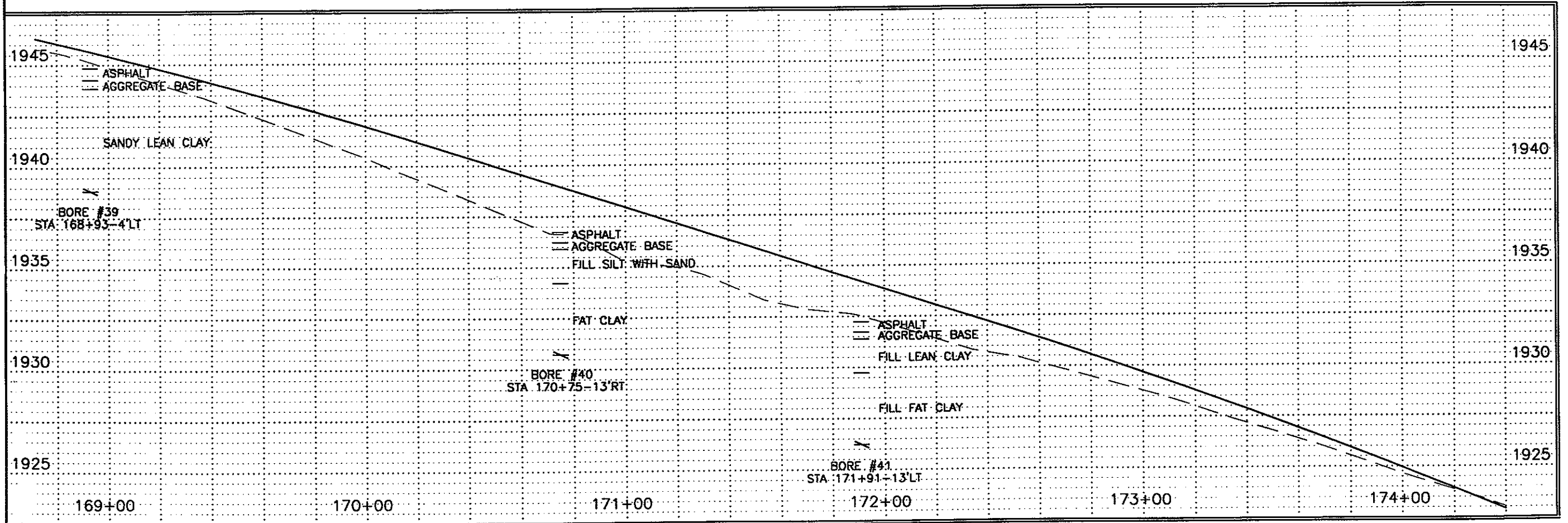
DNR REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	144

OLD RED TRAIL
STA. 159+00 TO STA. 169+00
SOILS PROFILE



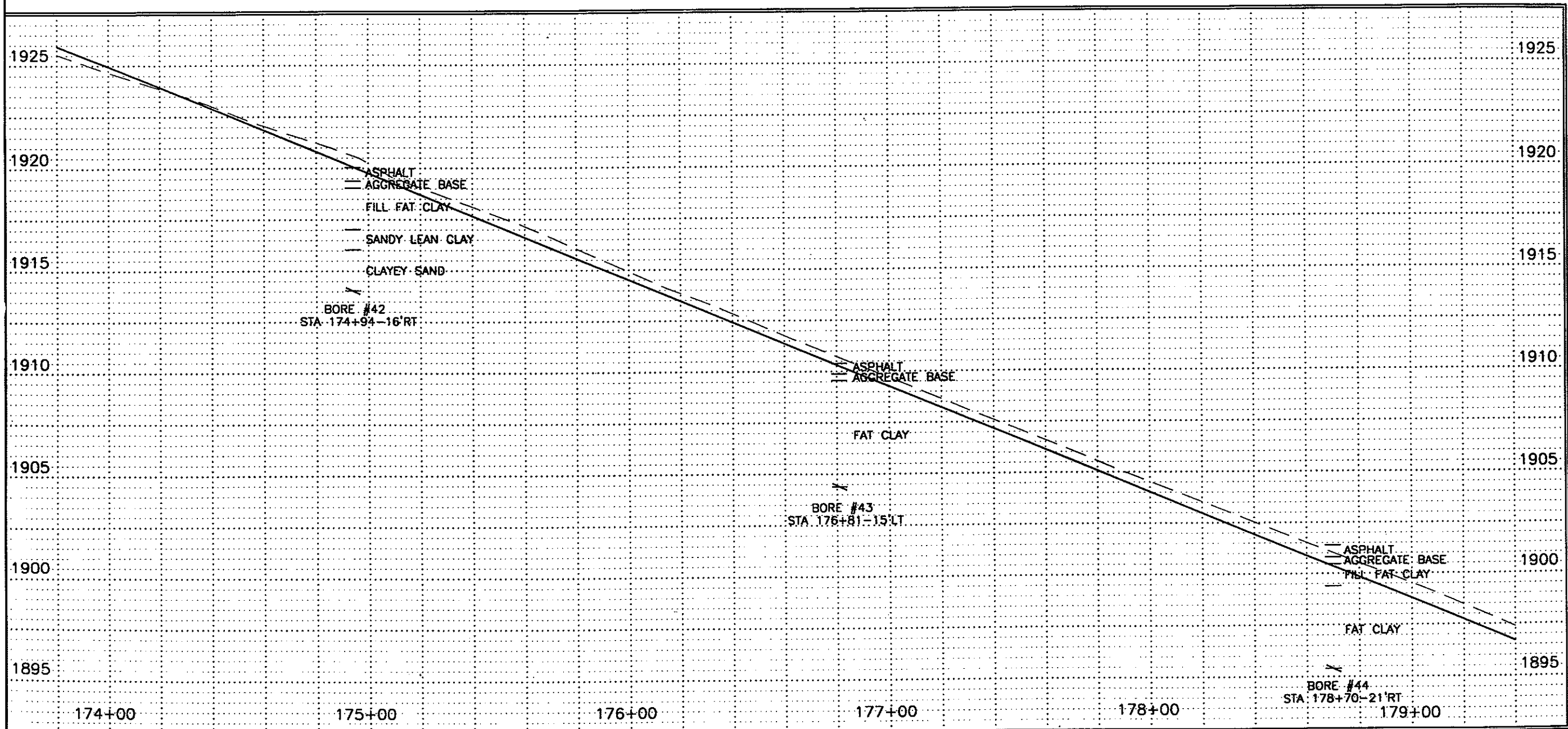
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PLOT FILE: SOIL-PRF

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	145
OLD RED TRAIL STA. 169+00 TO STA. 174+00 SOILS PROFILE			



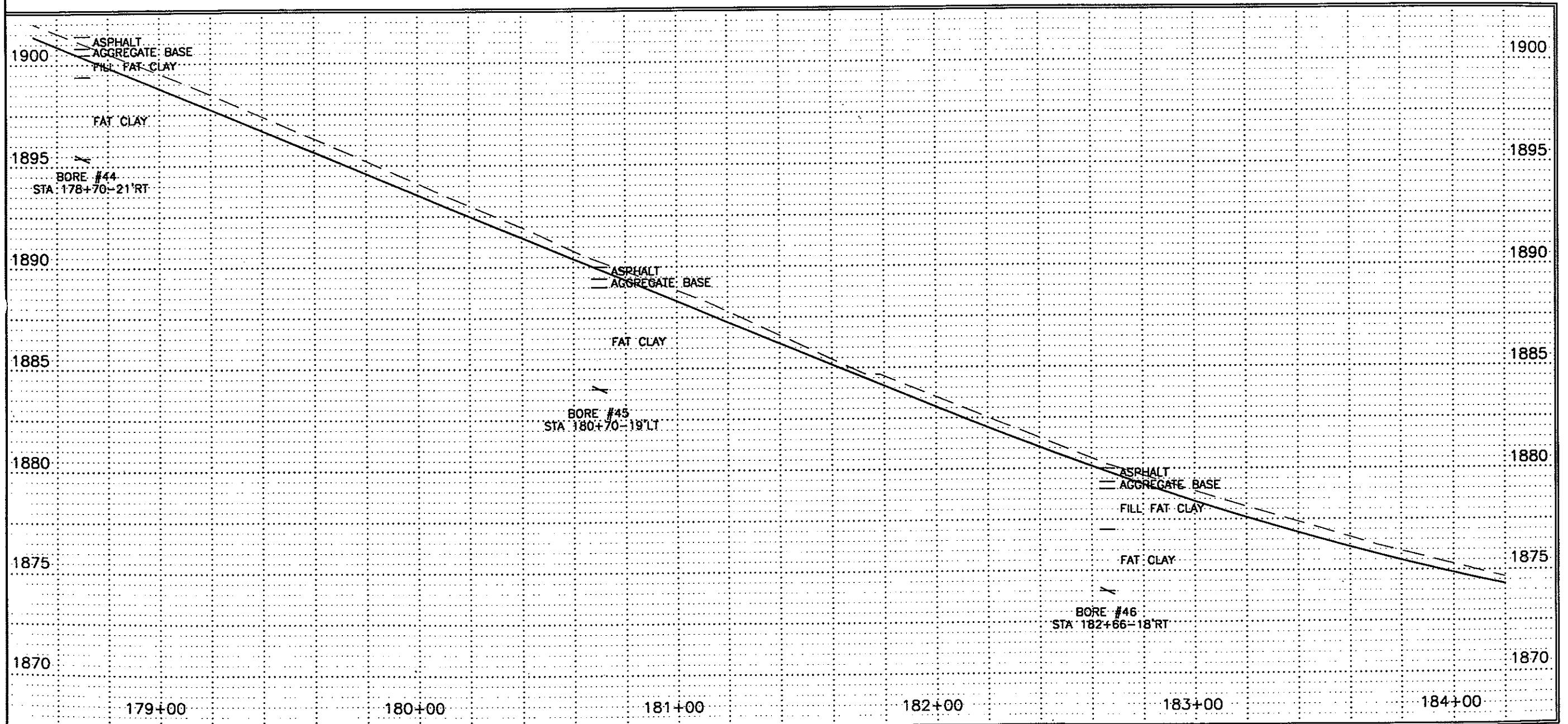
DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	116
OLD RED TRAIL			
STA. 174+00 TO STA. 179+00			
SOILS PROFILE			



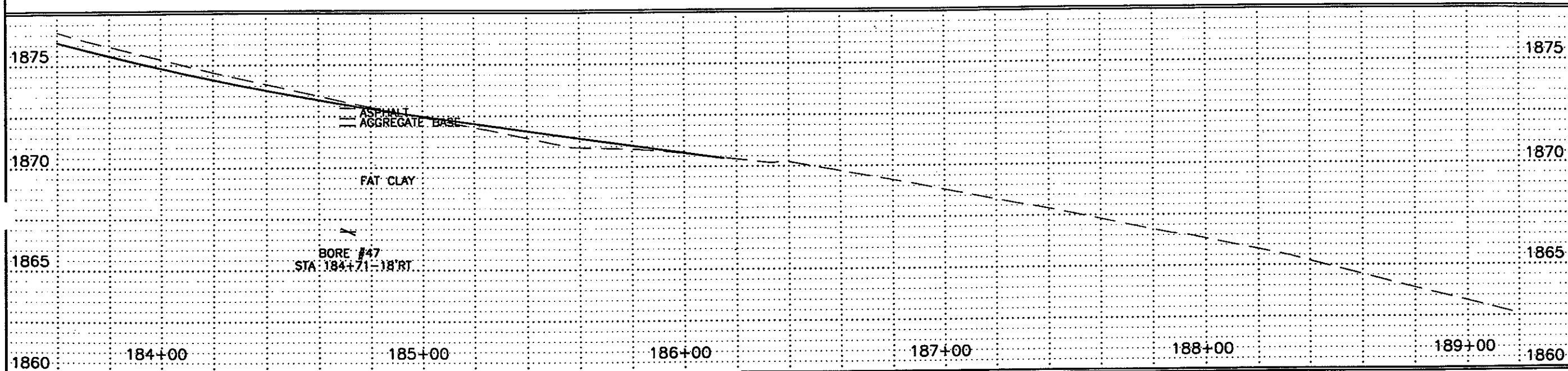
DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

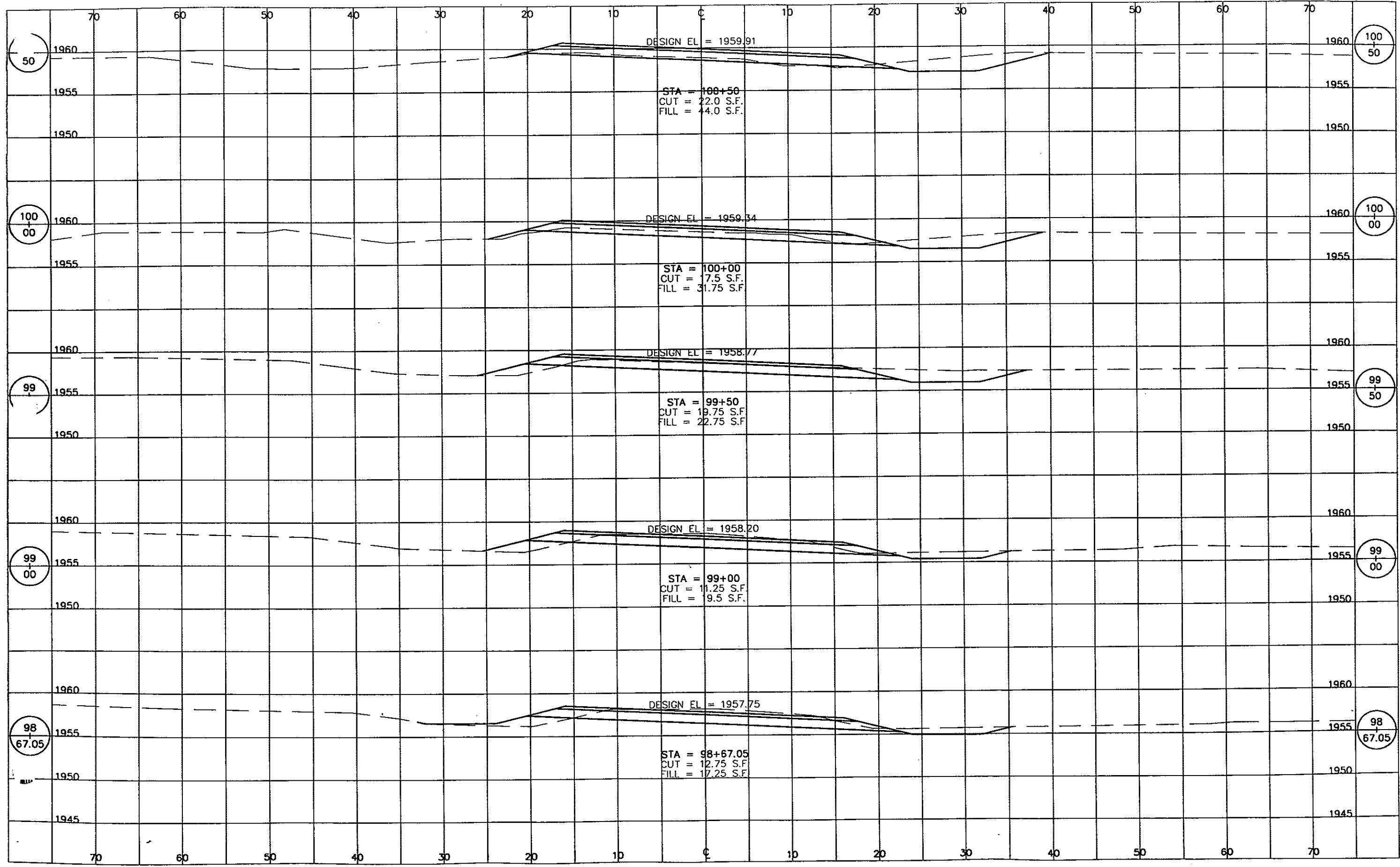
FYWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	197
OLD RED TRAIL STA. 179+00 TO STA. 184+00 SOILS PROFILE			

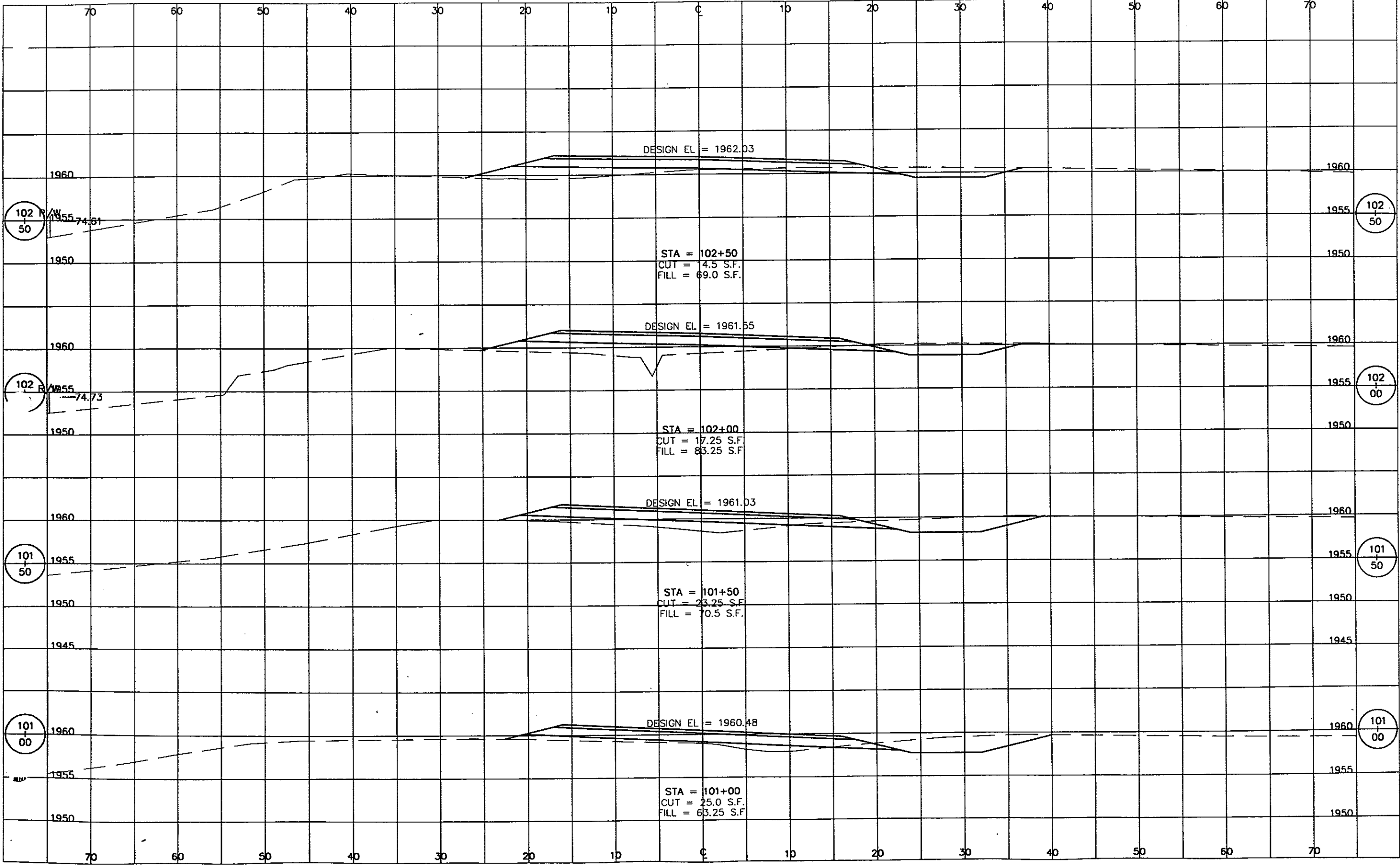


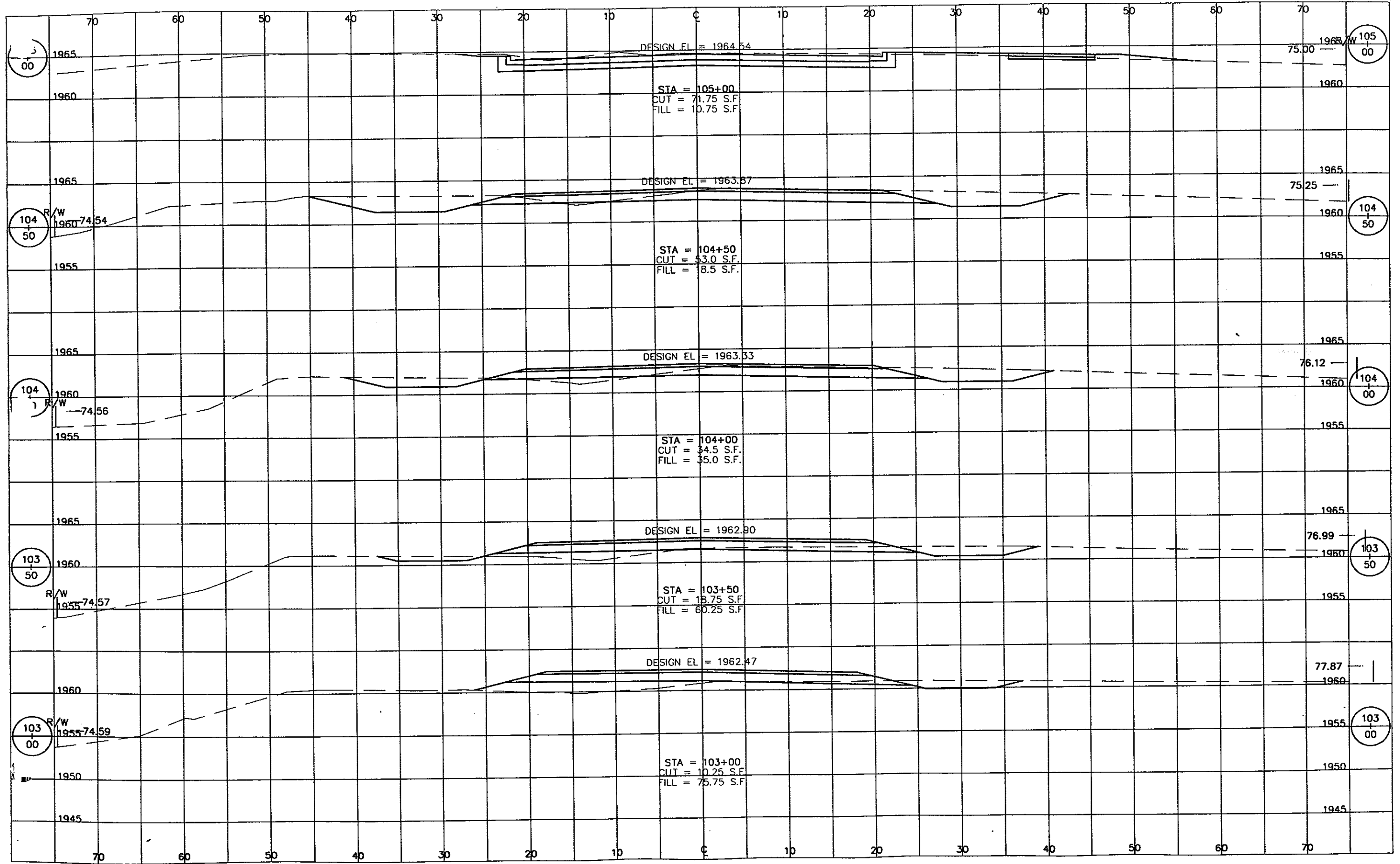
DATE: 3/15/99 XREF: RCPRF003
PLOT FILE: SOIL-PRF

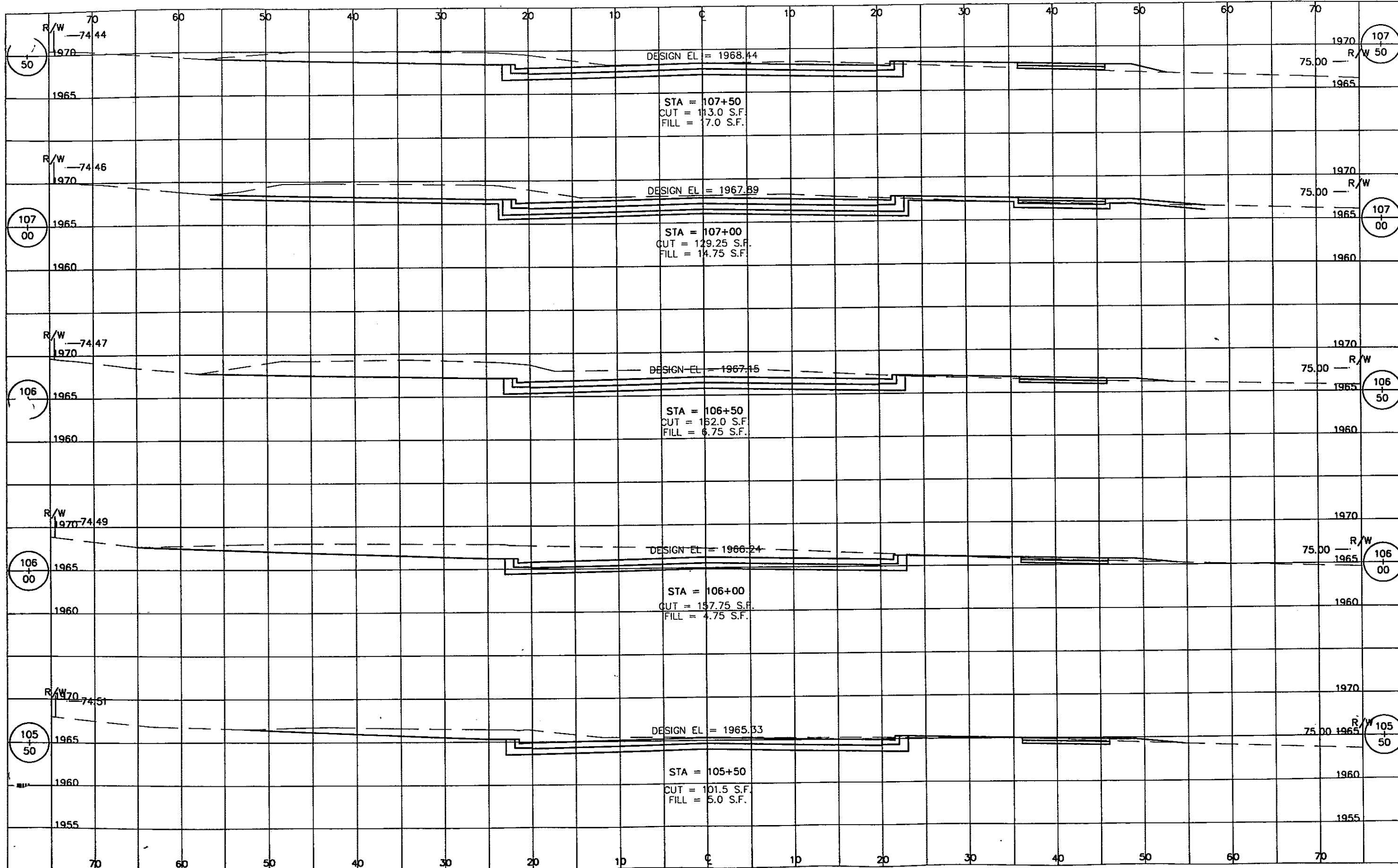
FHWA REGION	STATE	PROJECT	SHEET NO.
8	ND	SU-1-988(008)019	198
OLD RED TRAIL STA. 184+00 TO STA. 189+00 SOILS PROFILE			

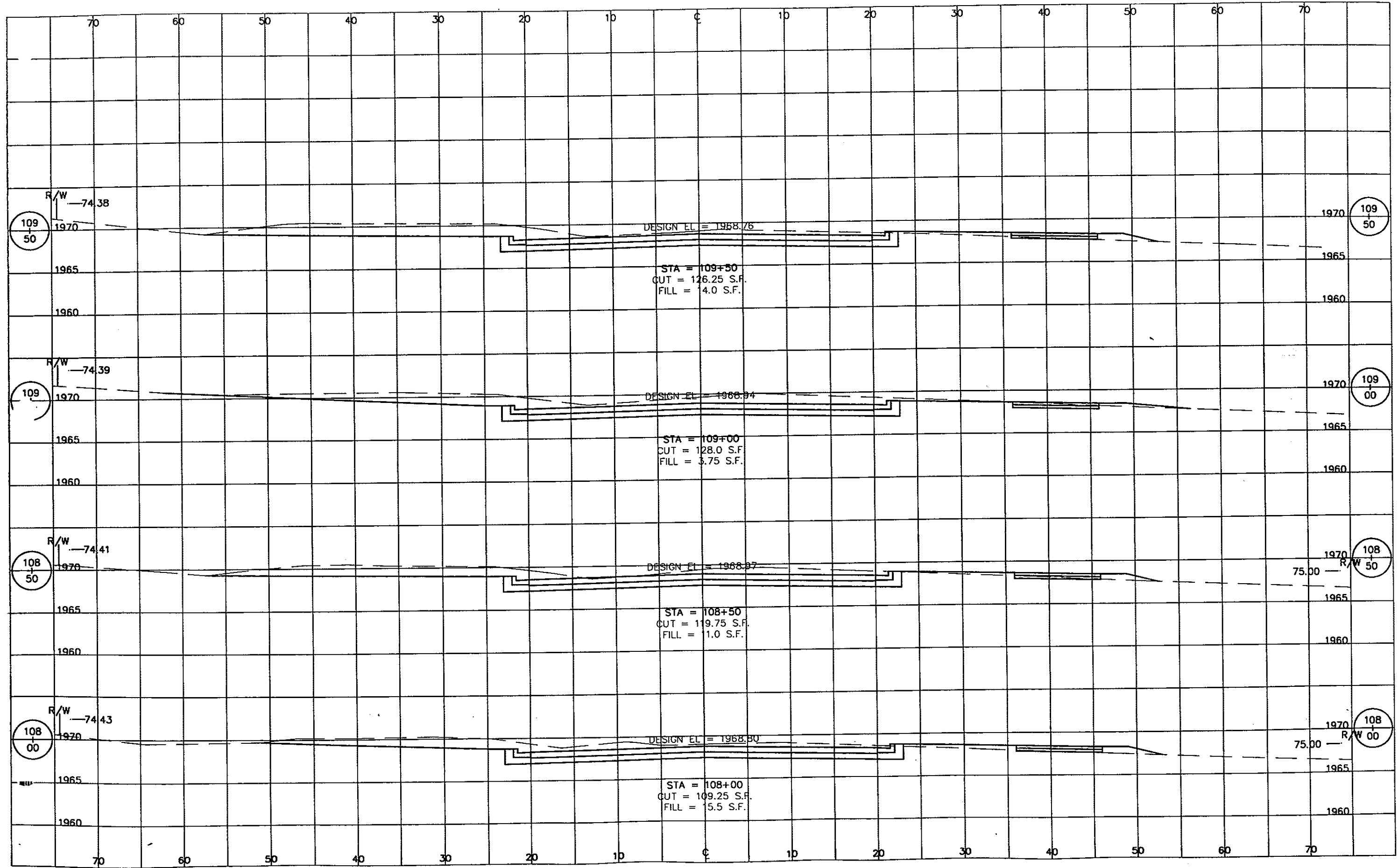


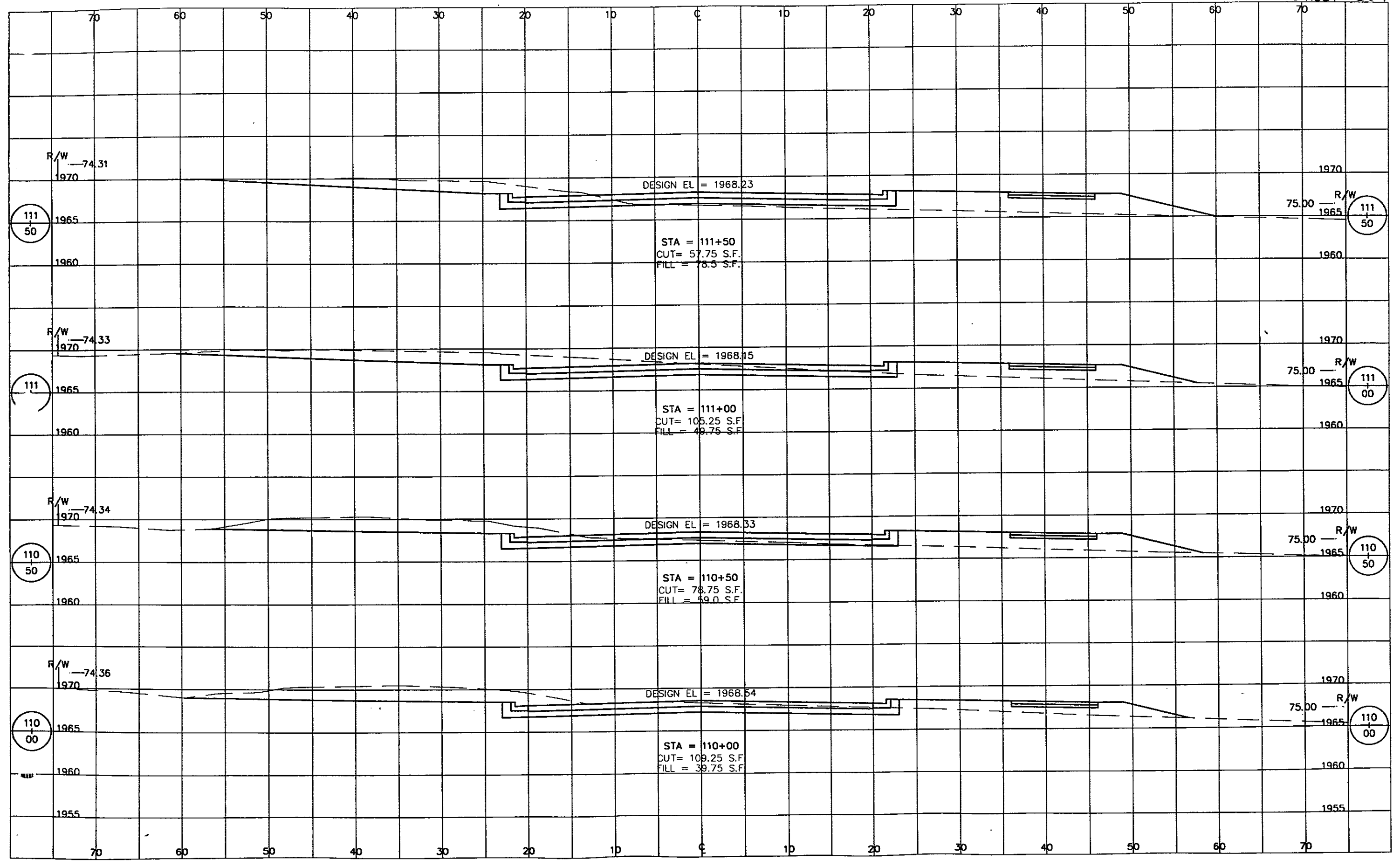












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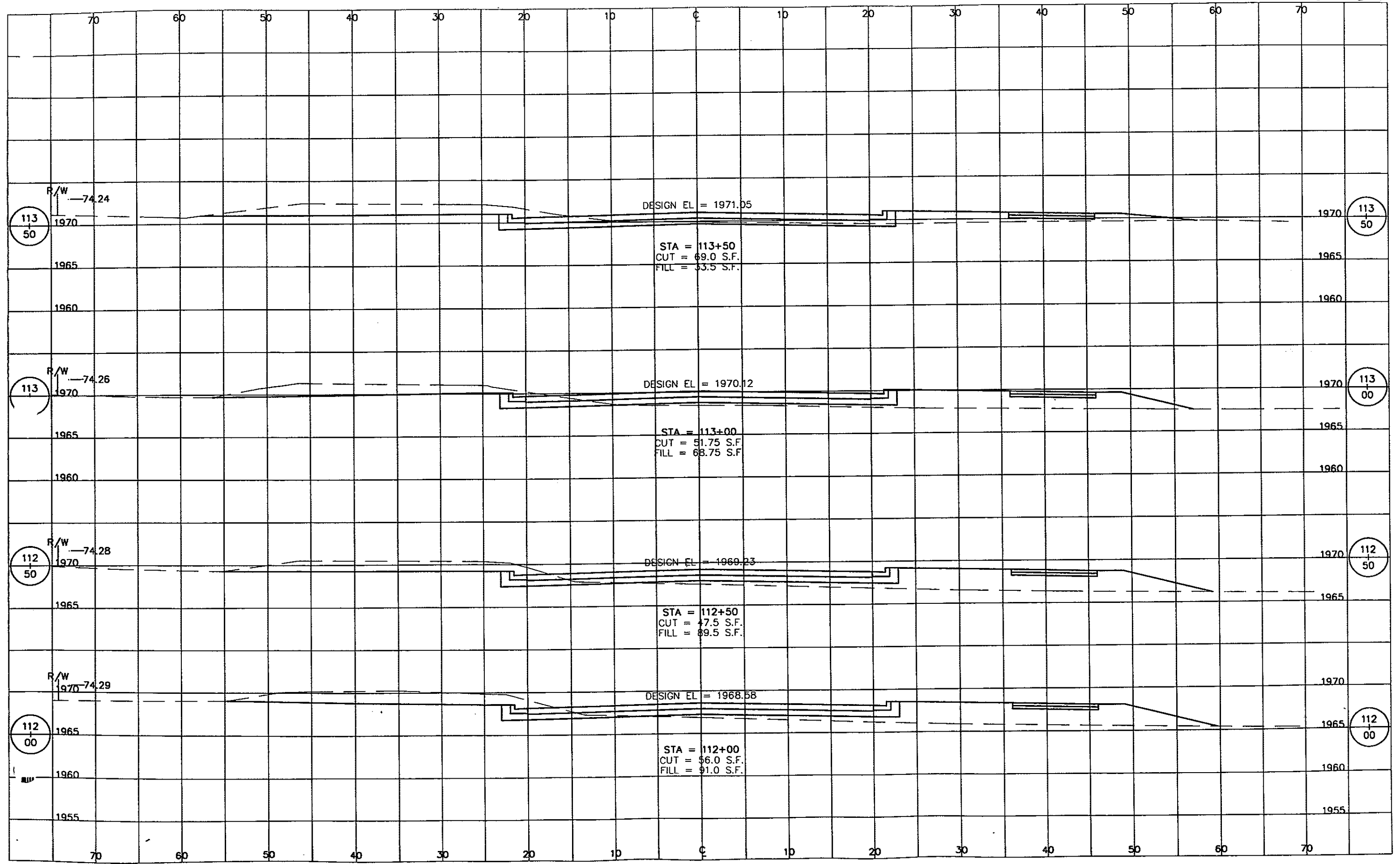
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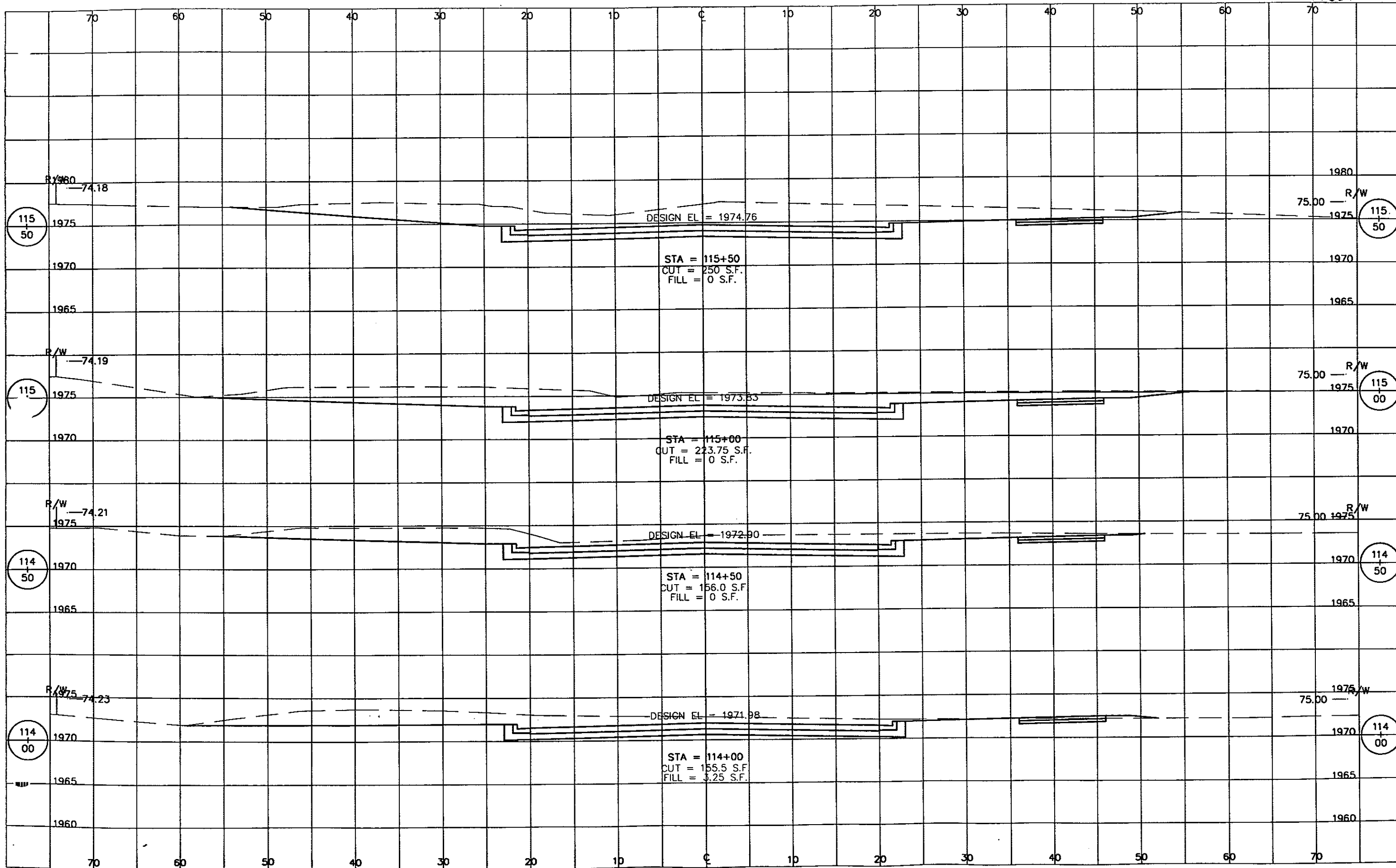
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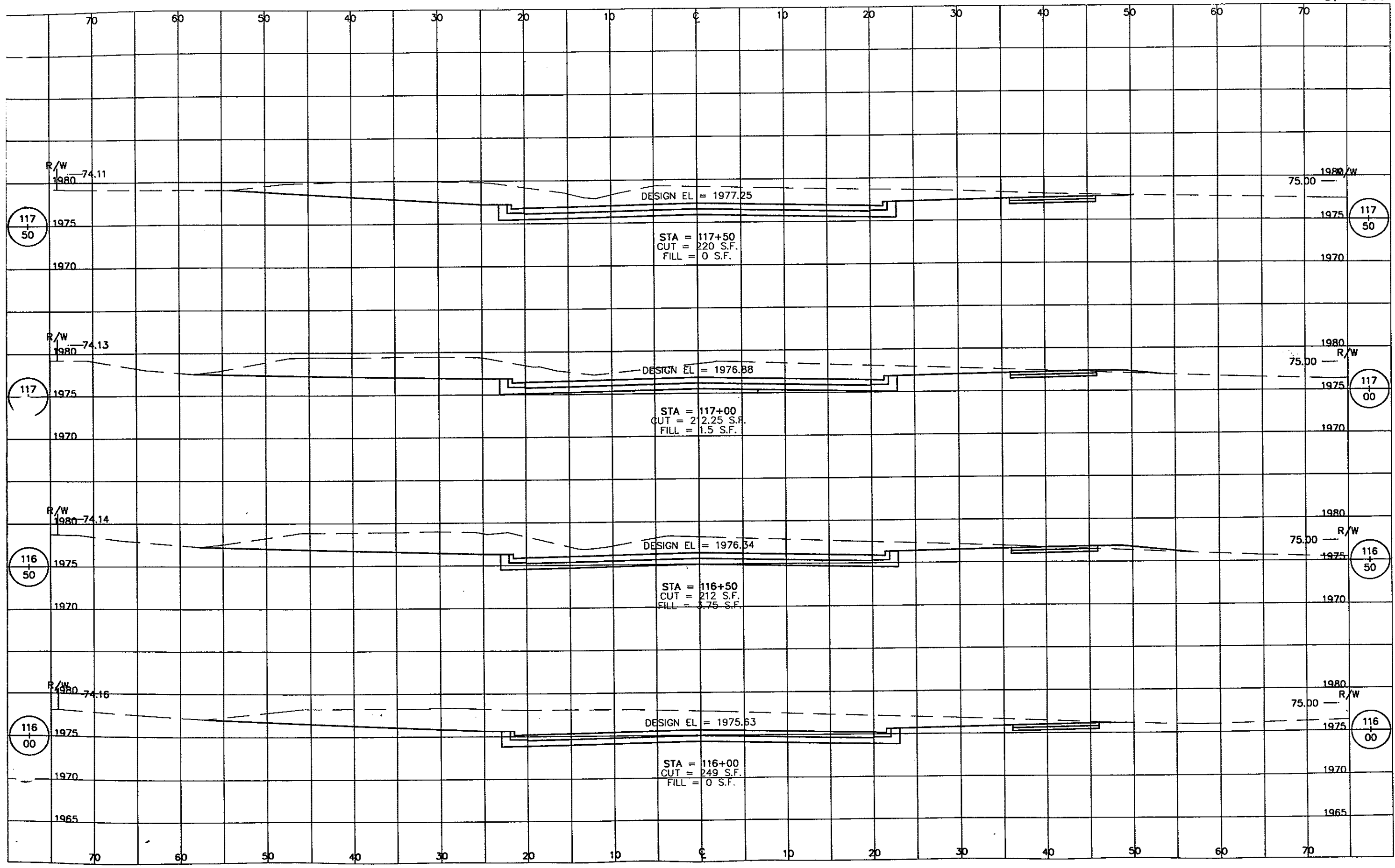
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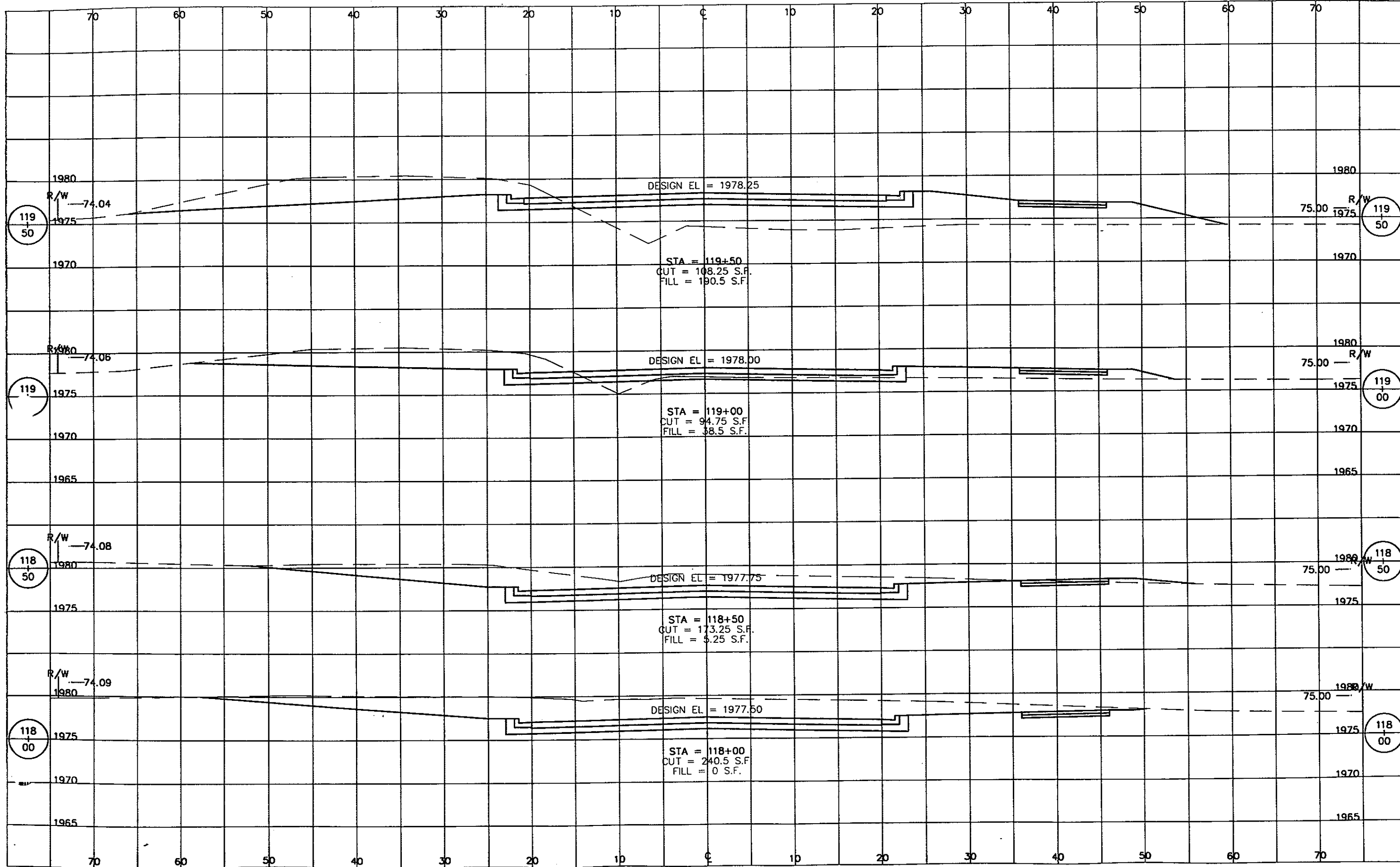
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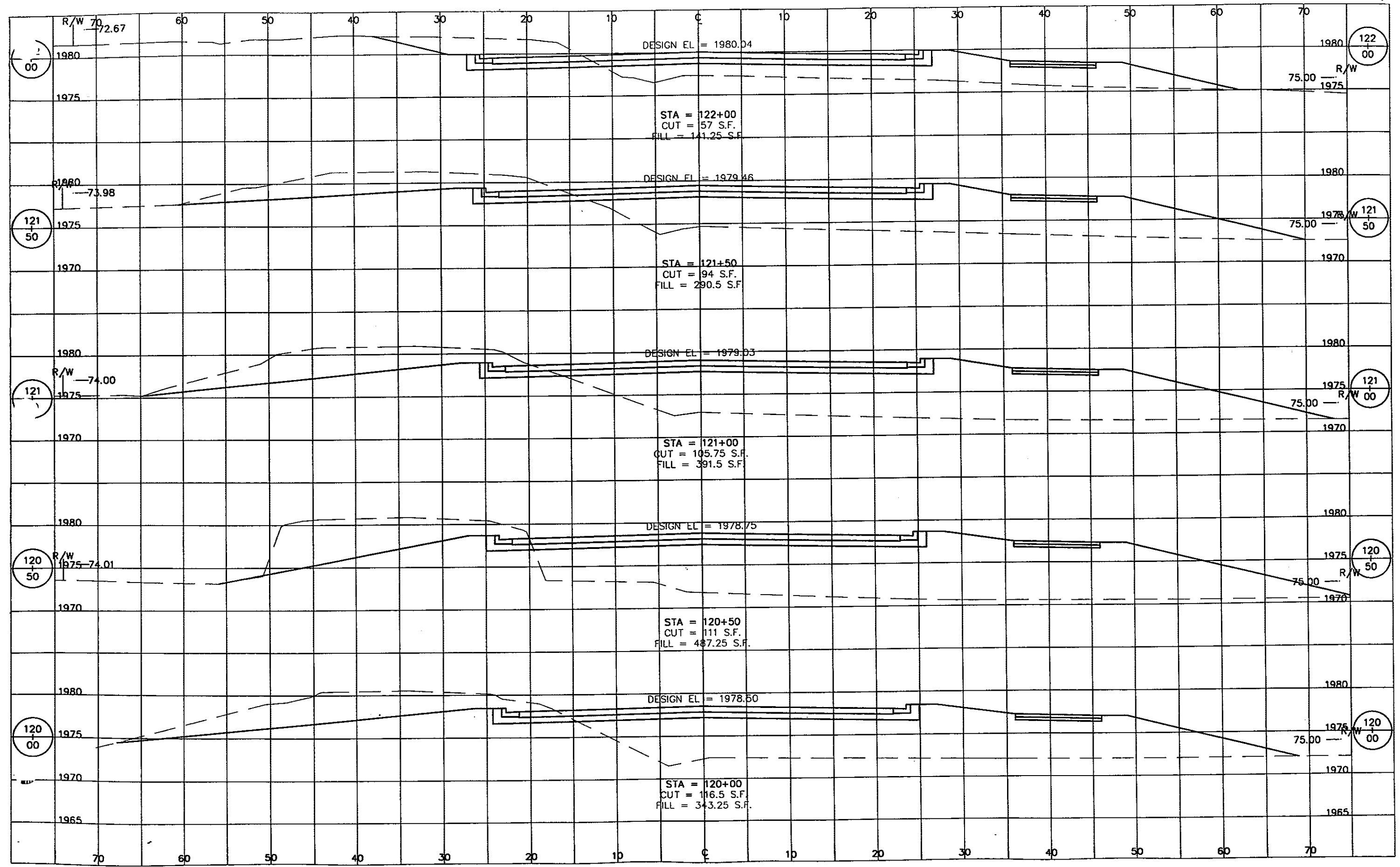
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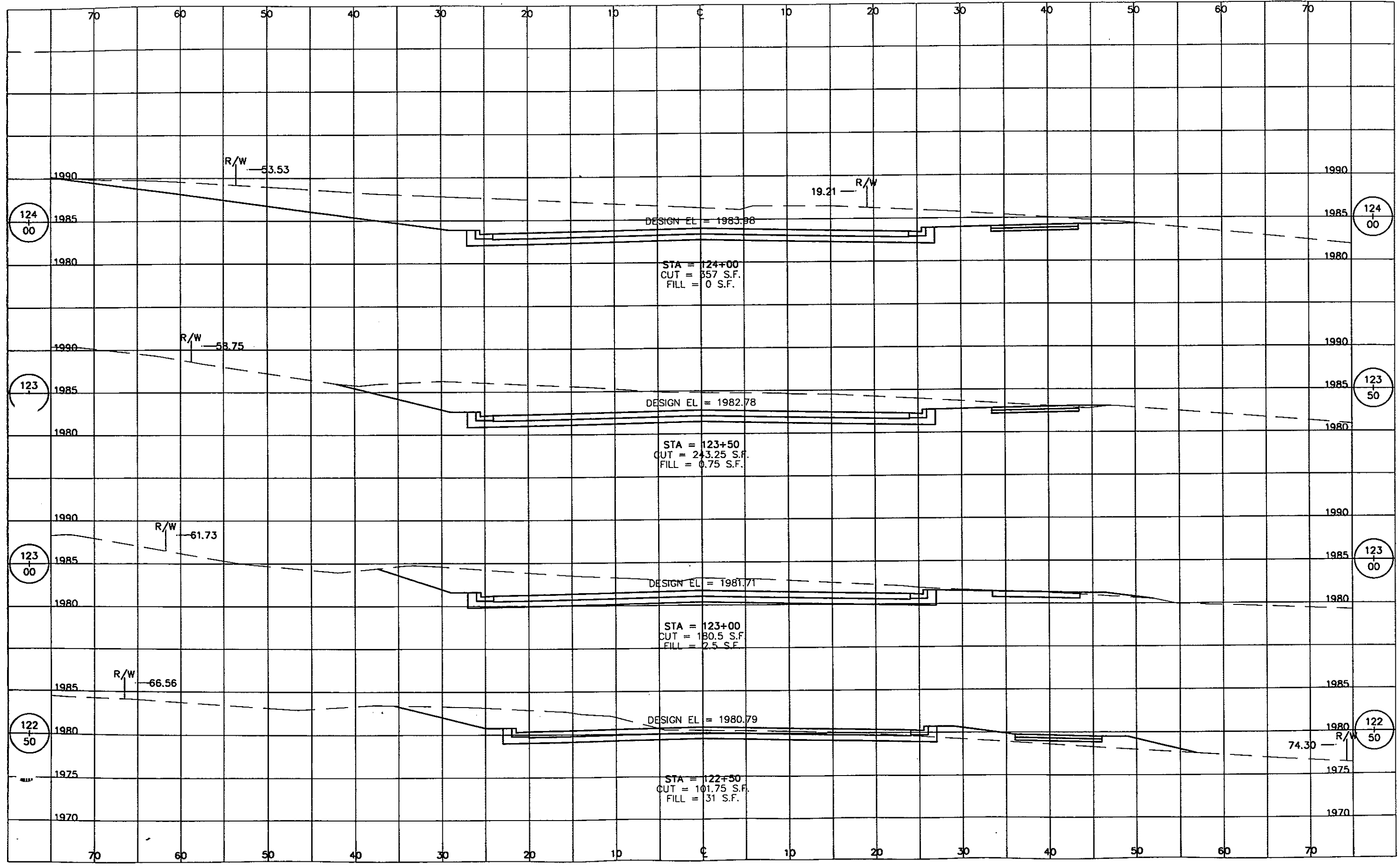


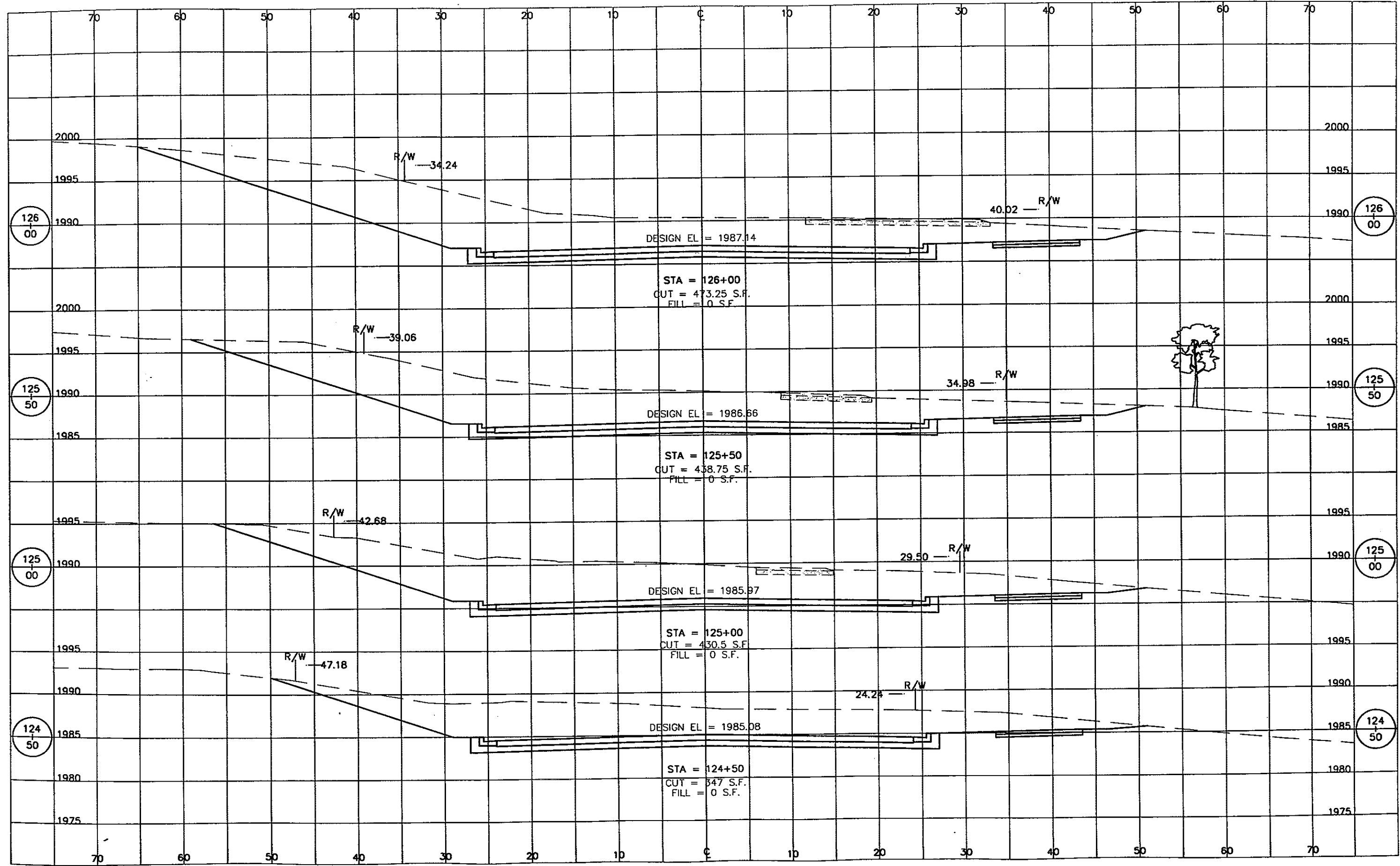




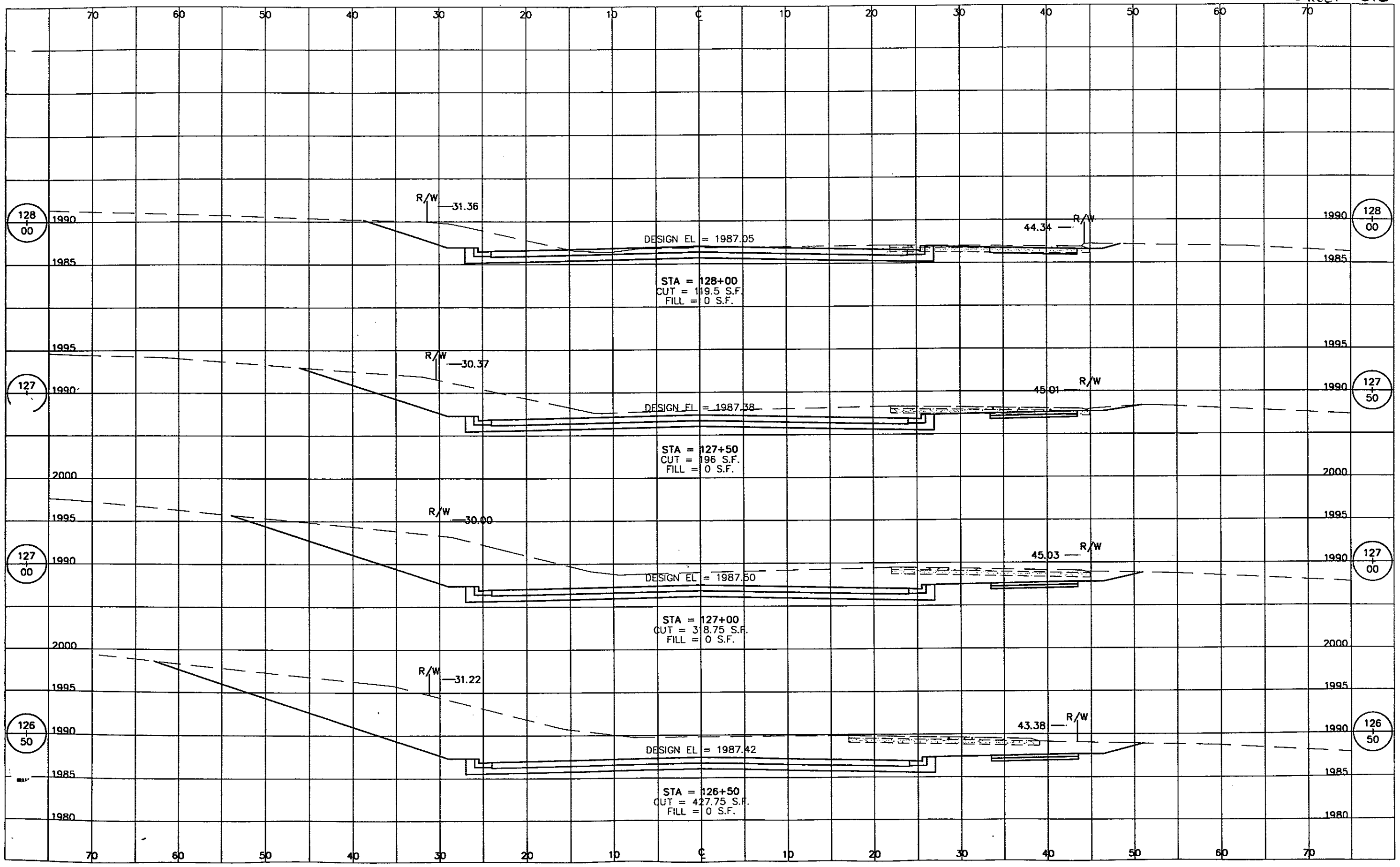


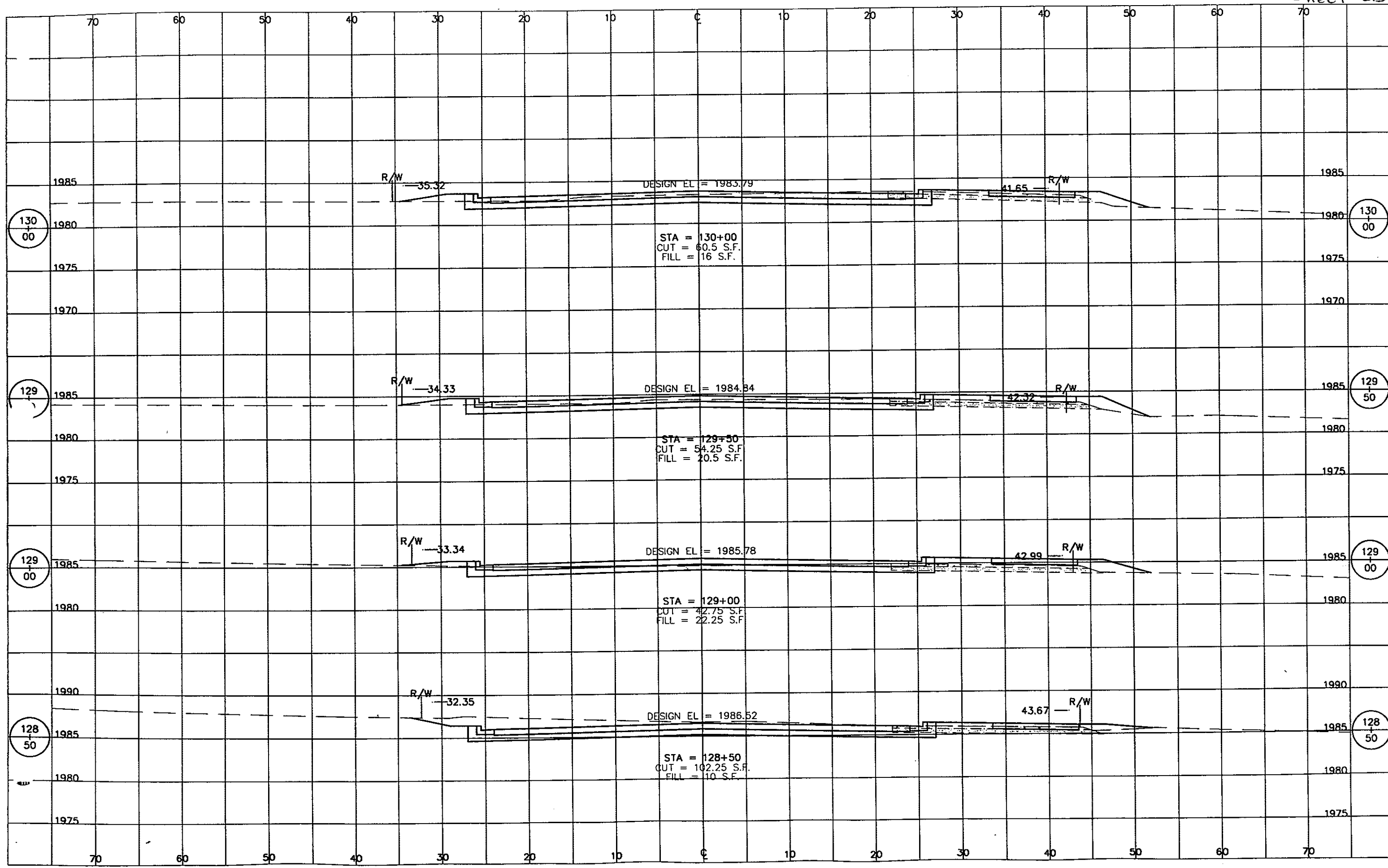


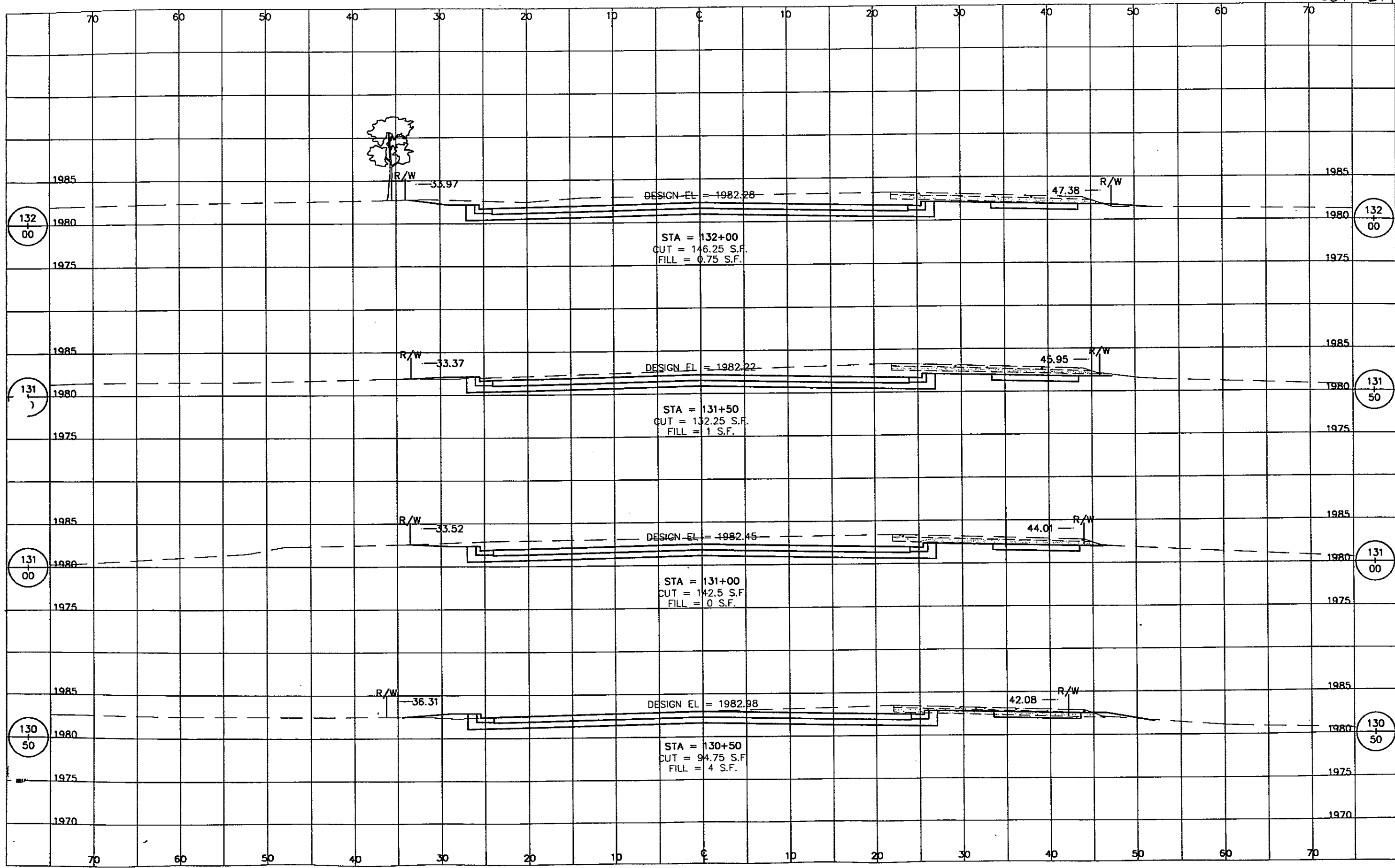


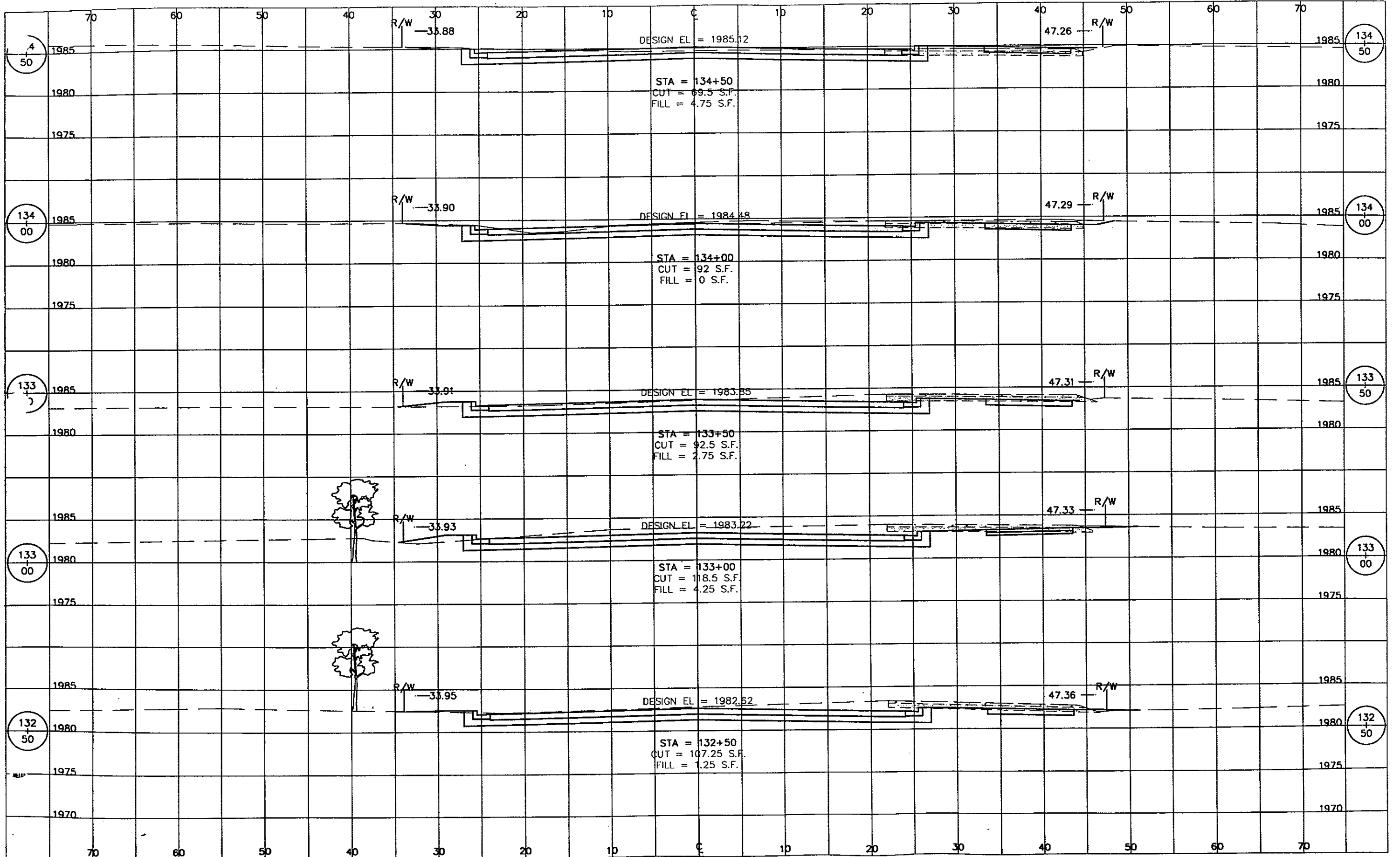


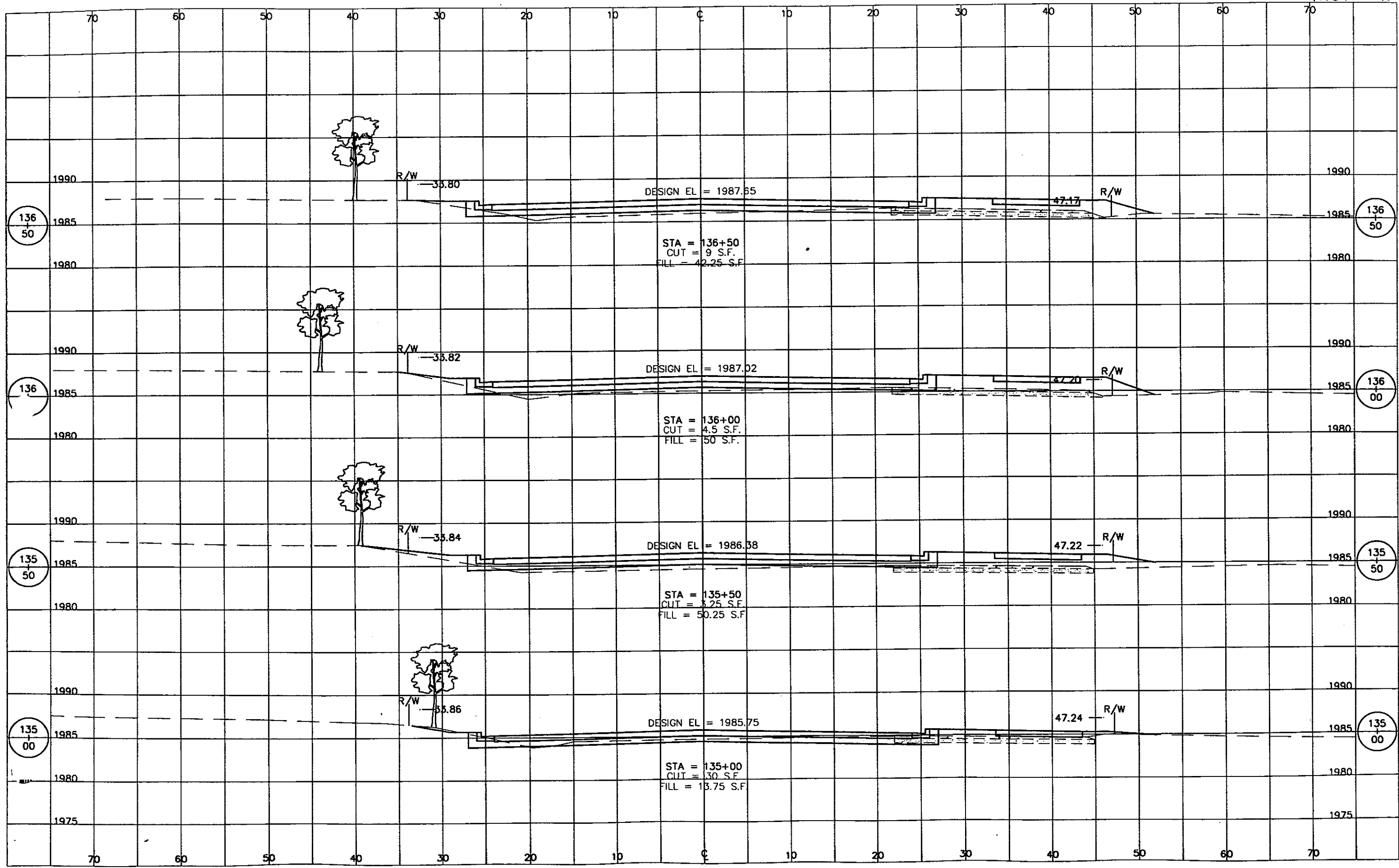
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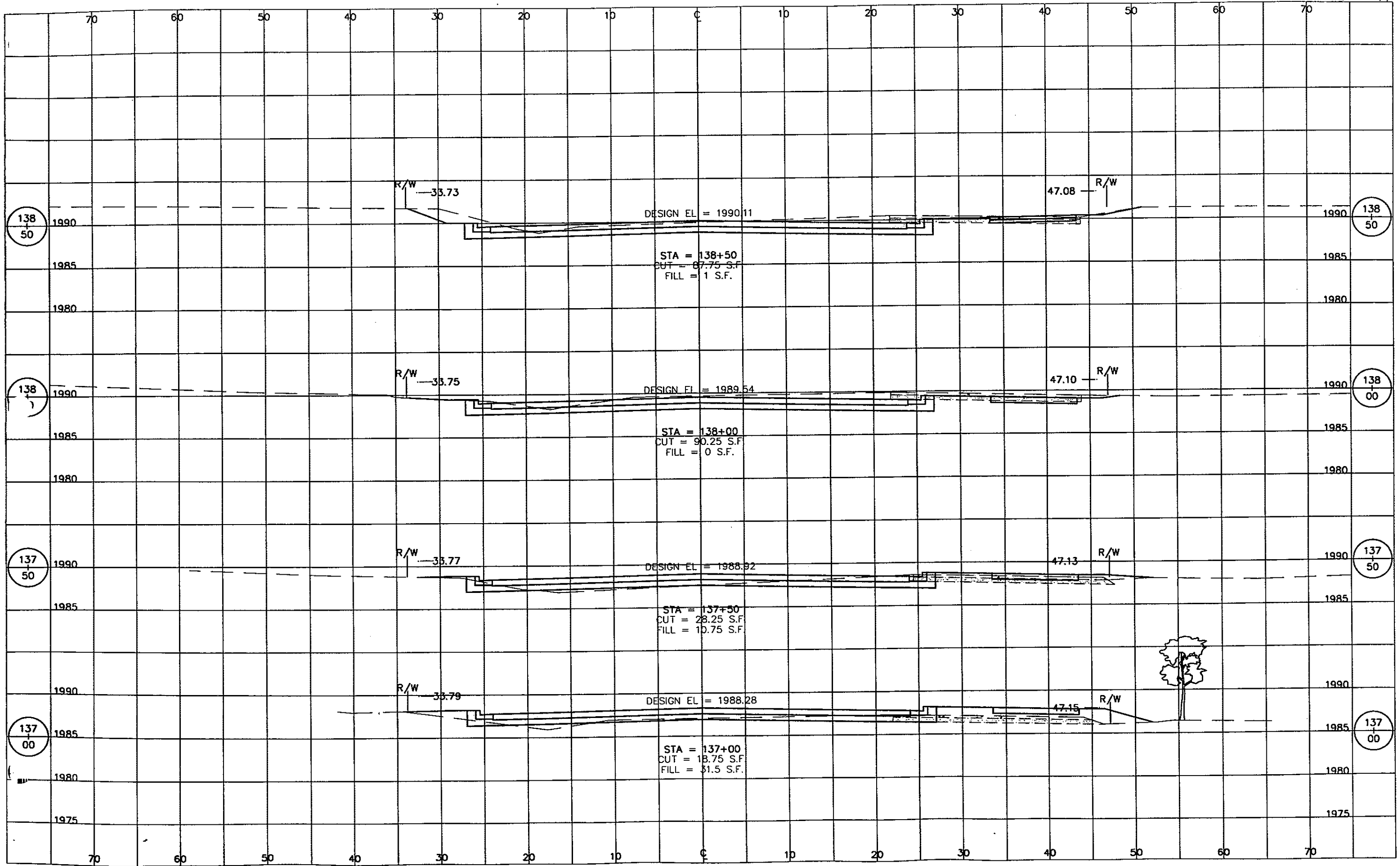












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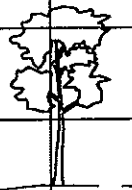
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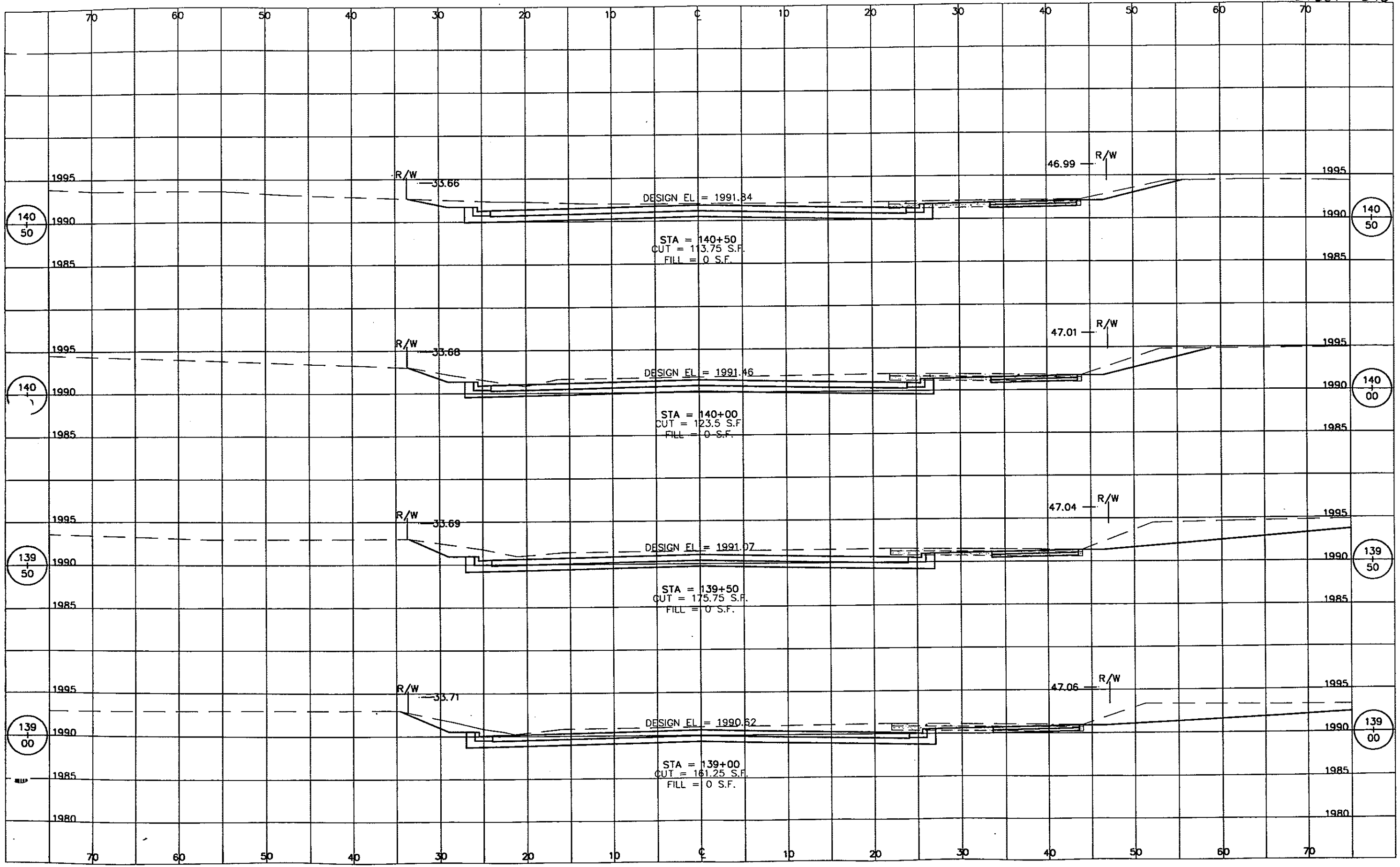
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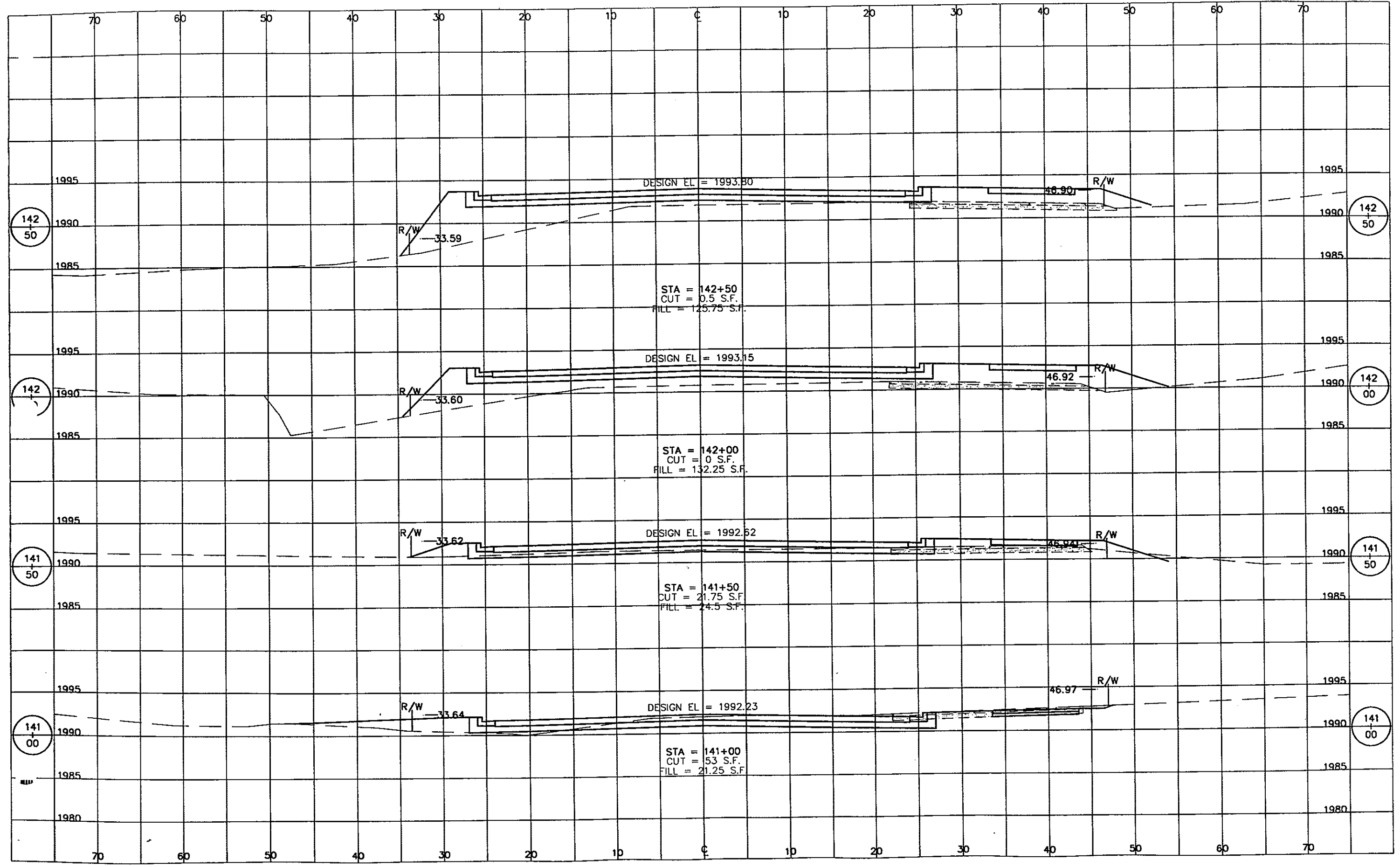
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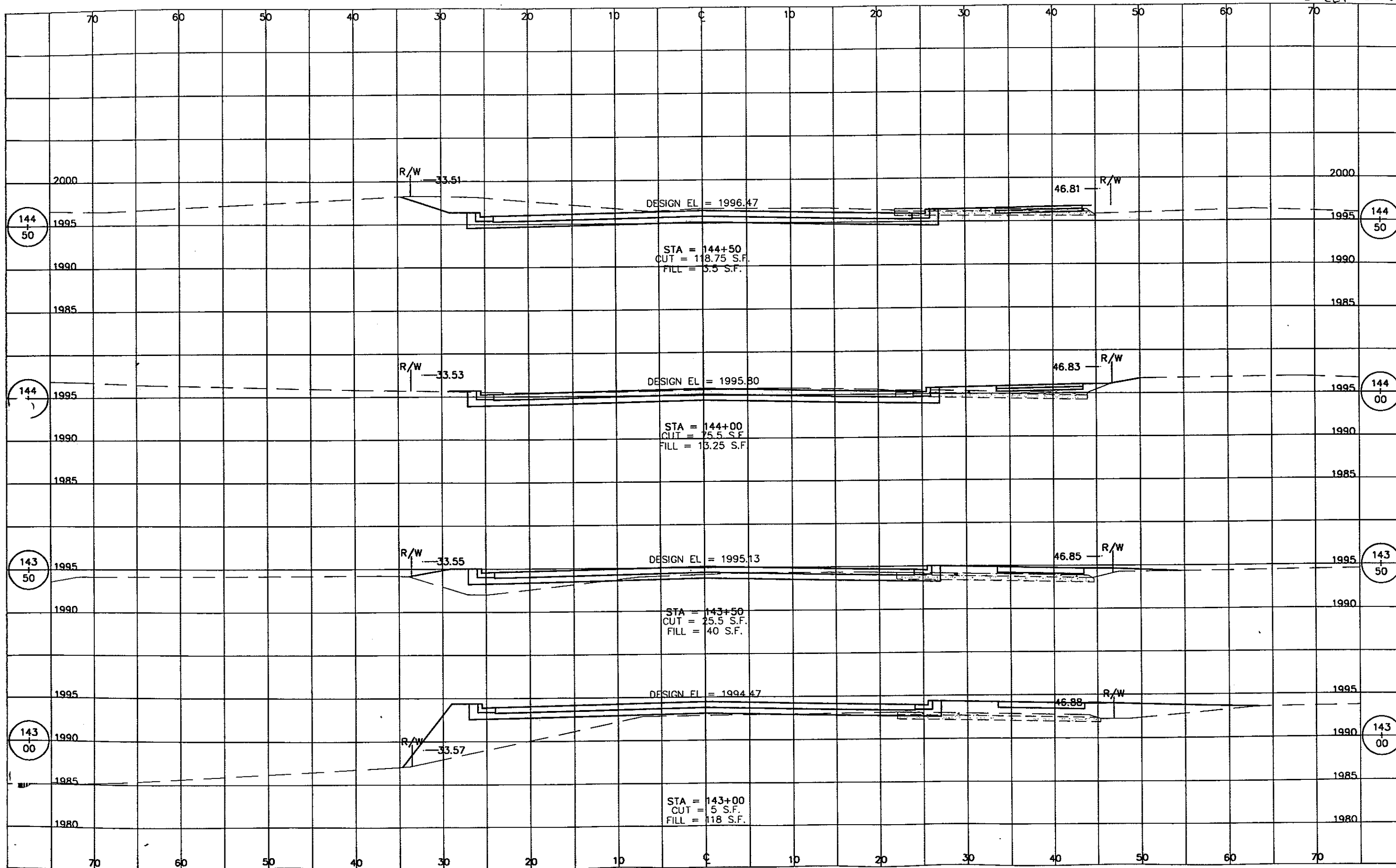
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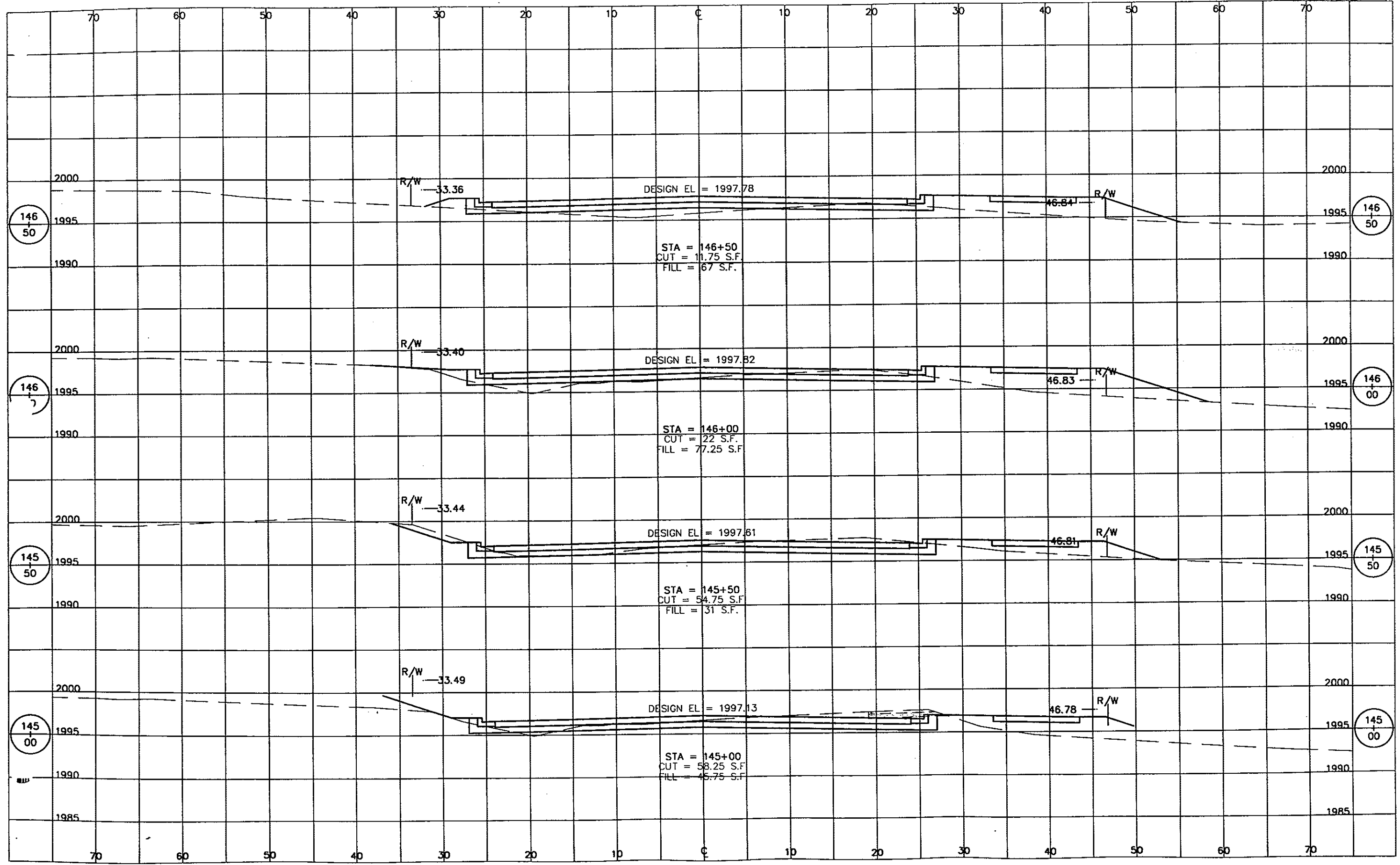
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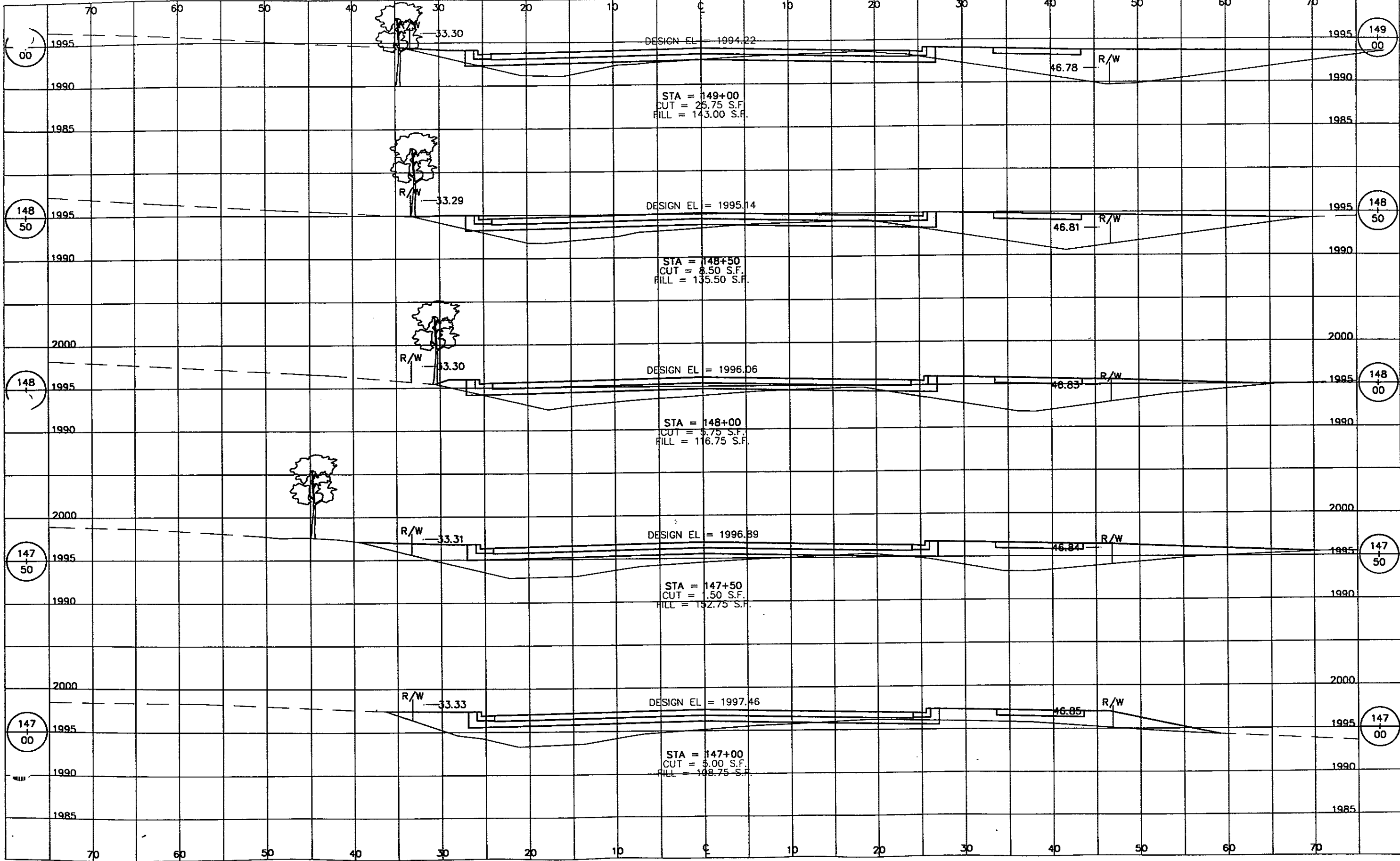


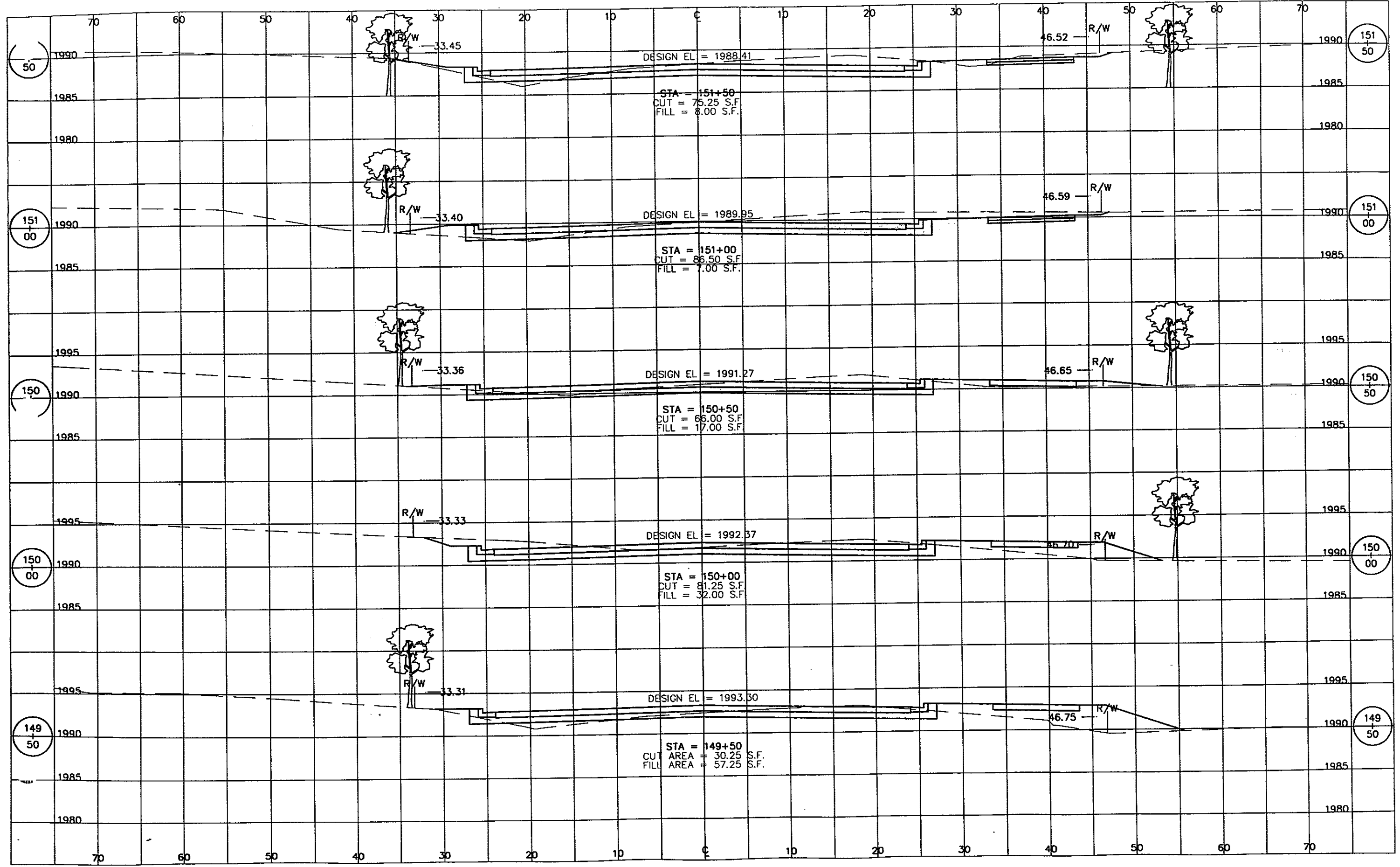


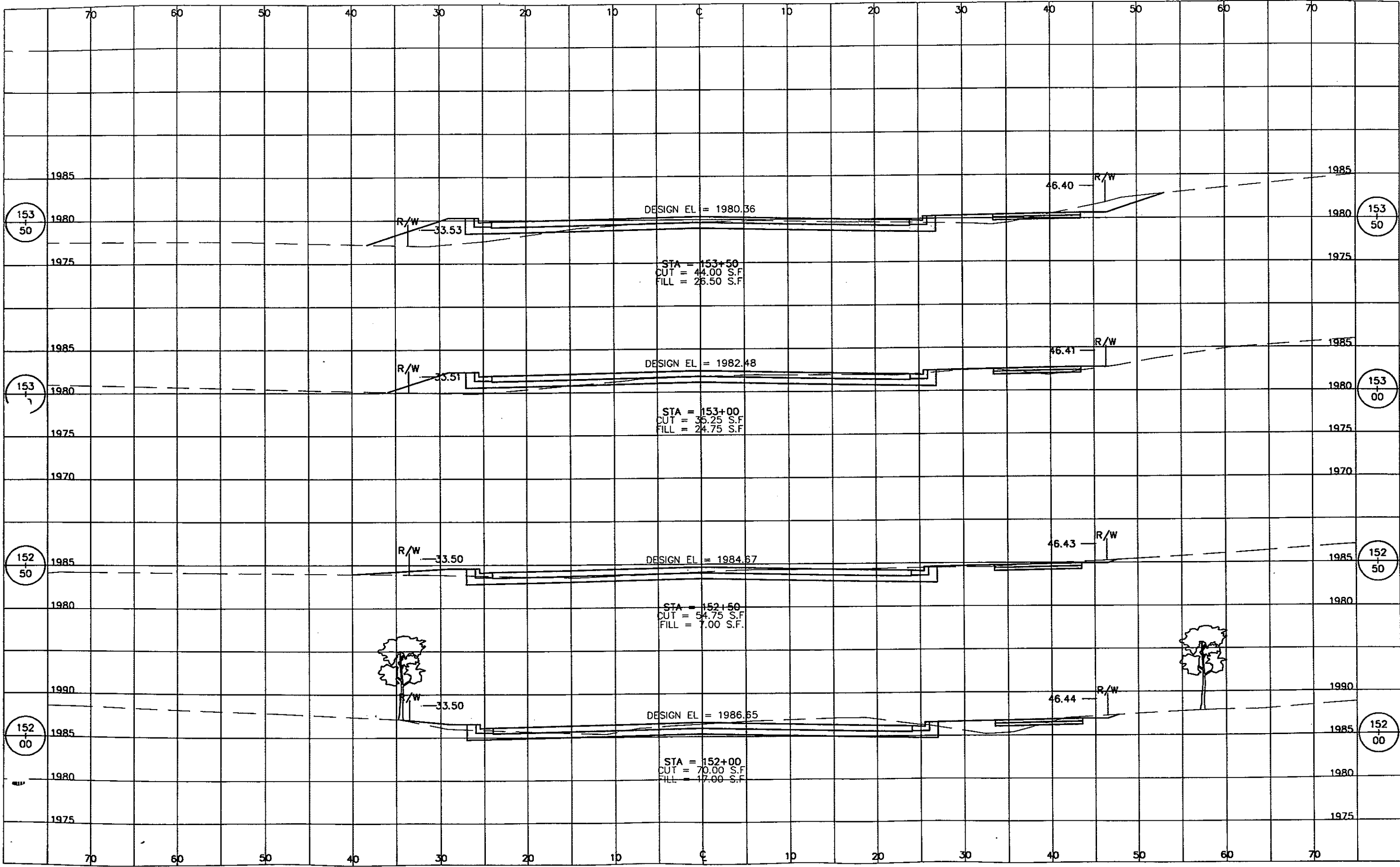


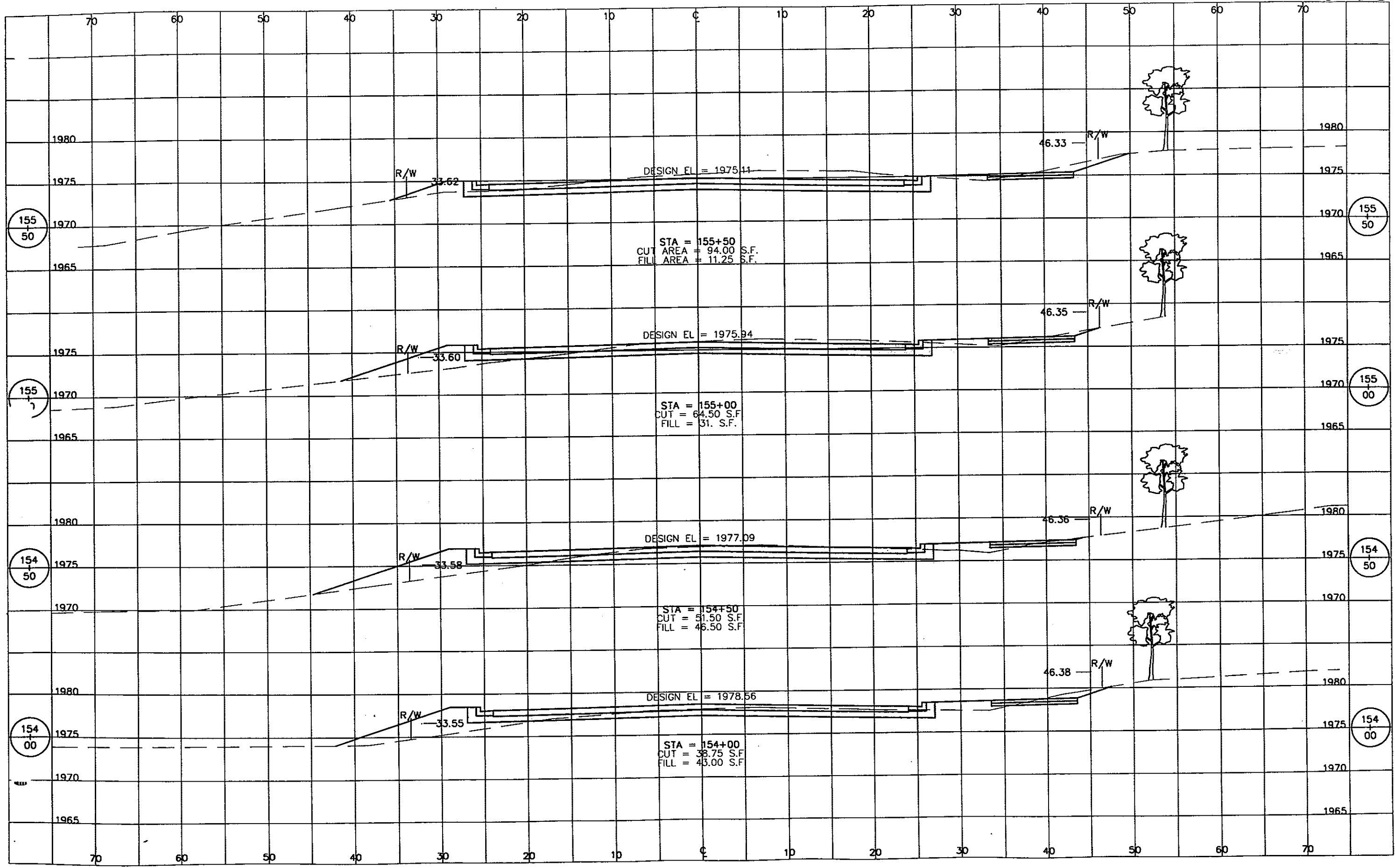


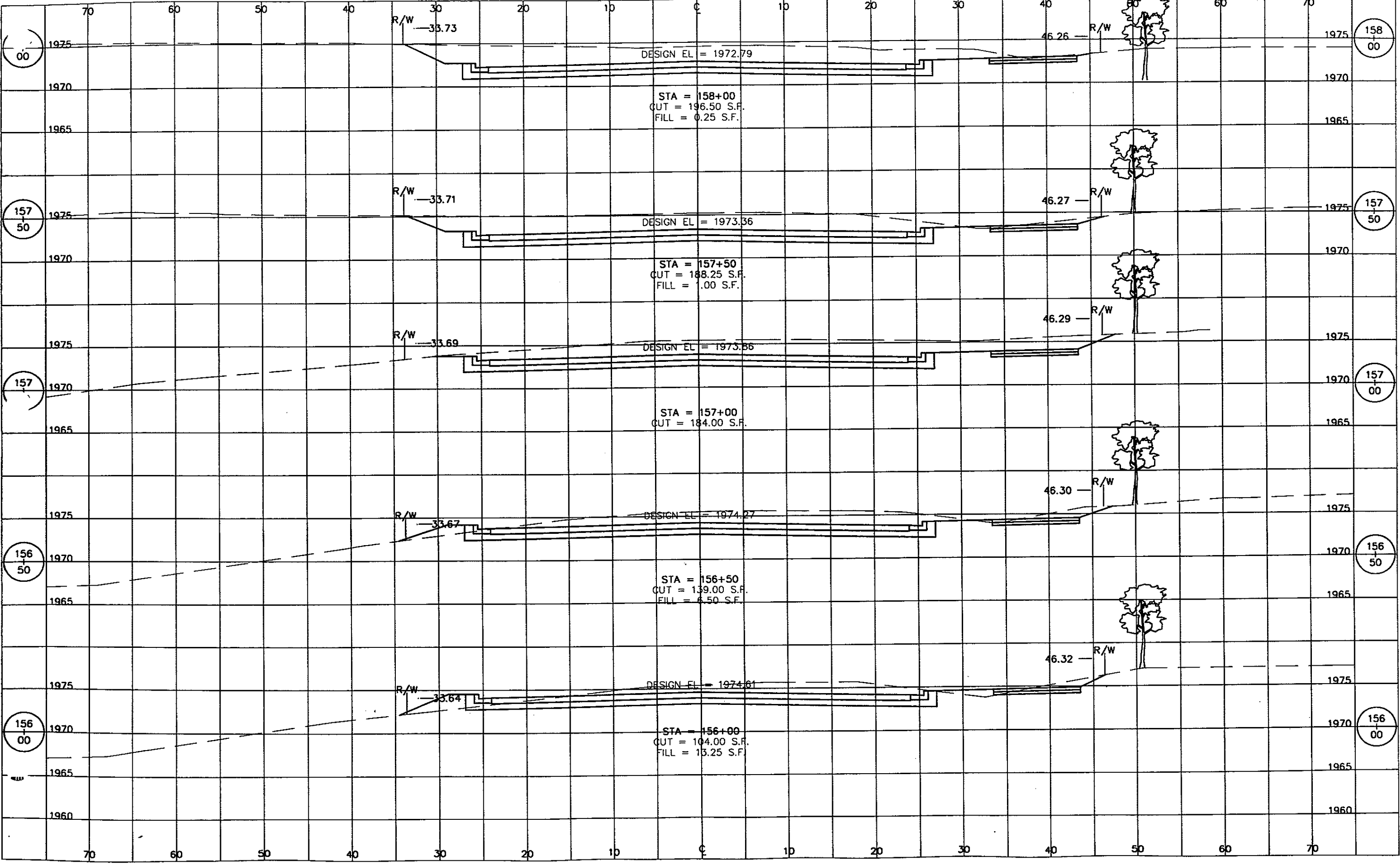


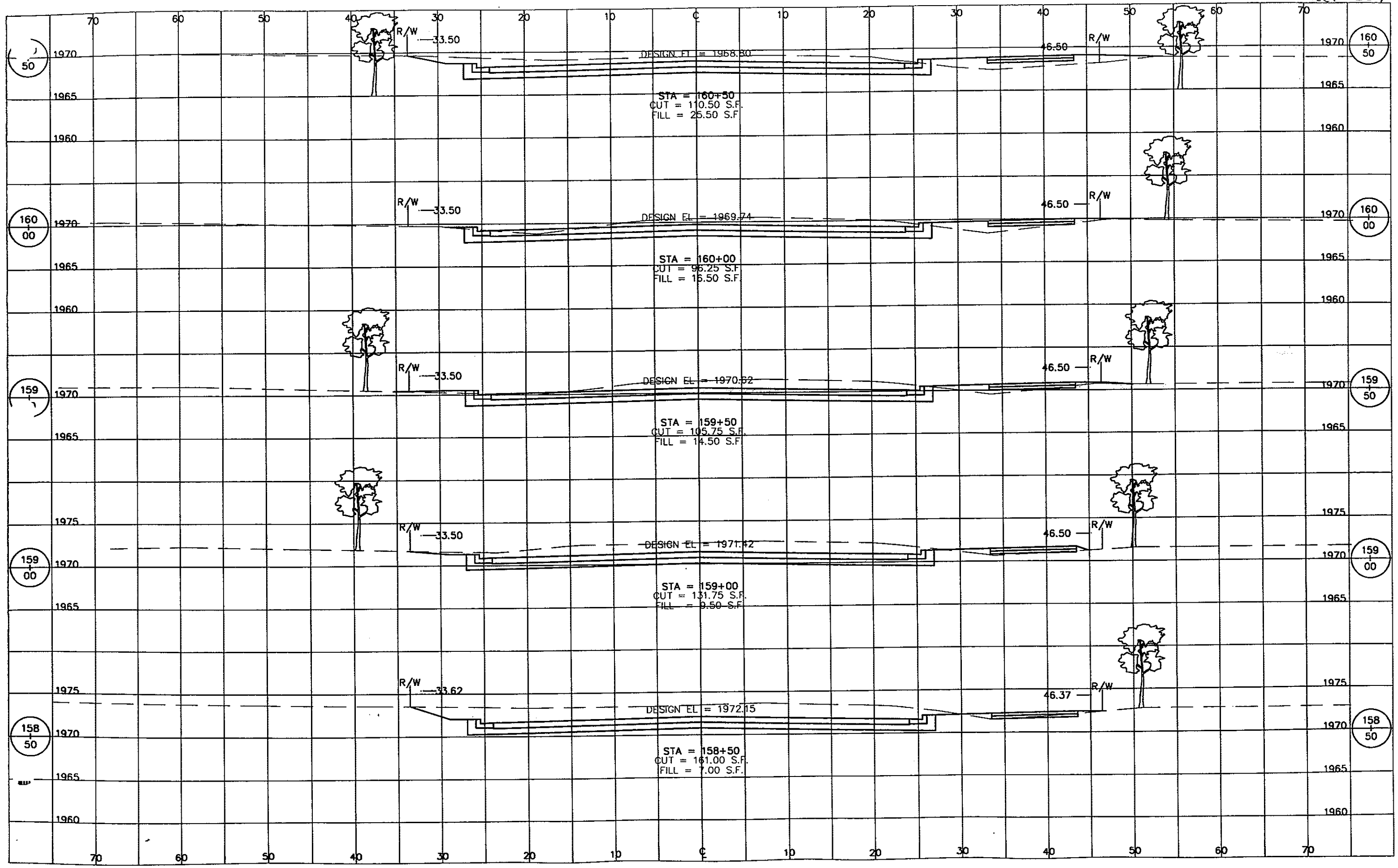












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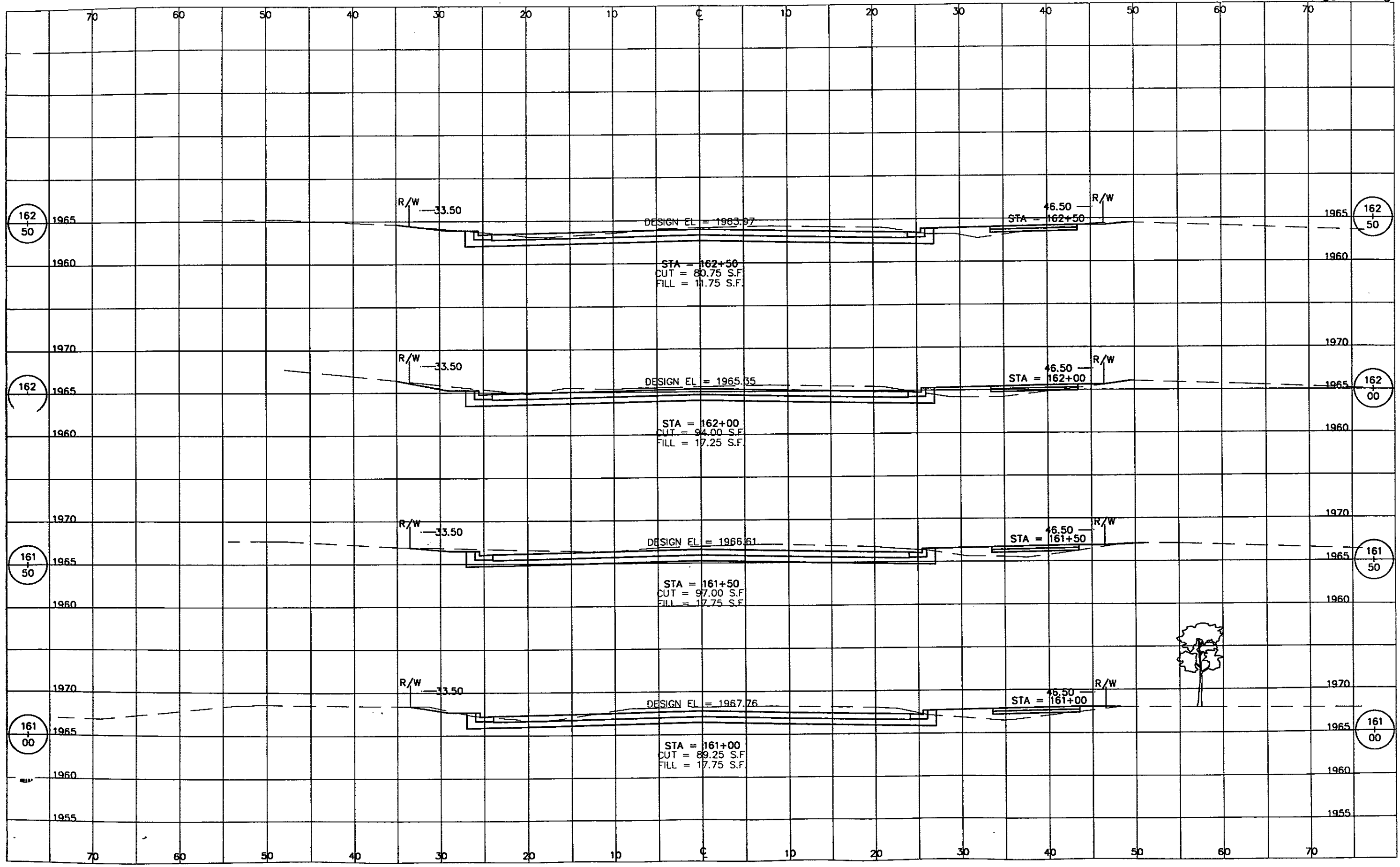
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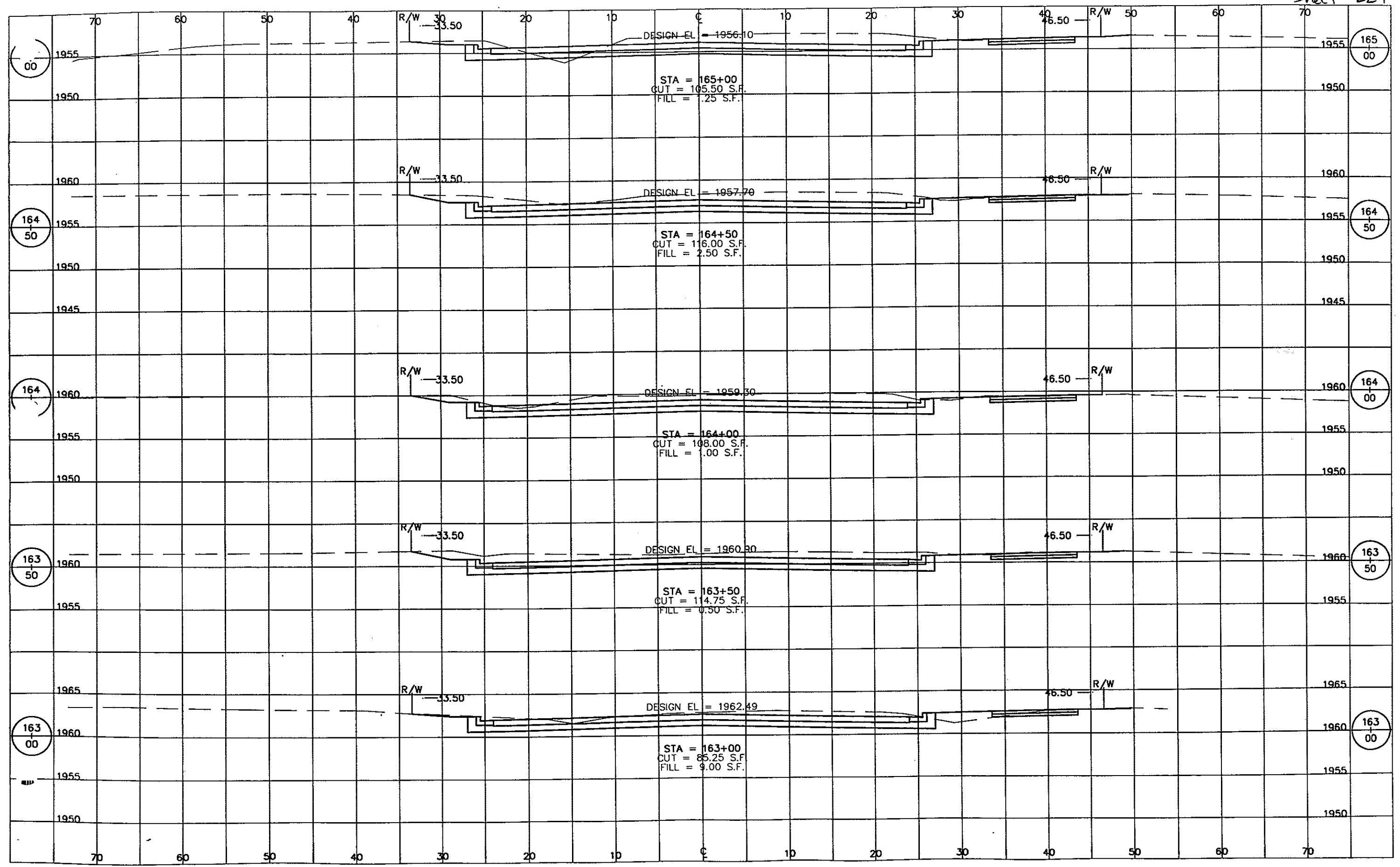
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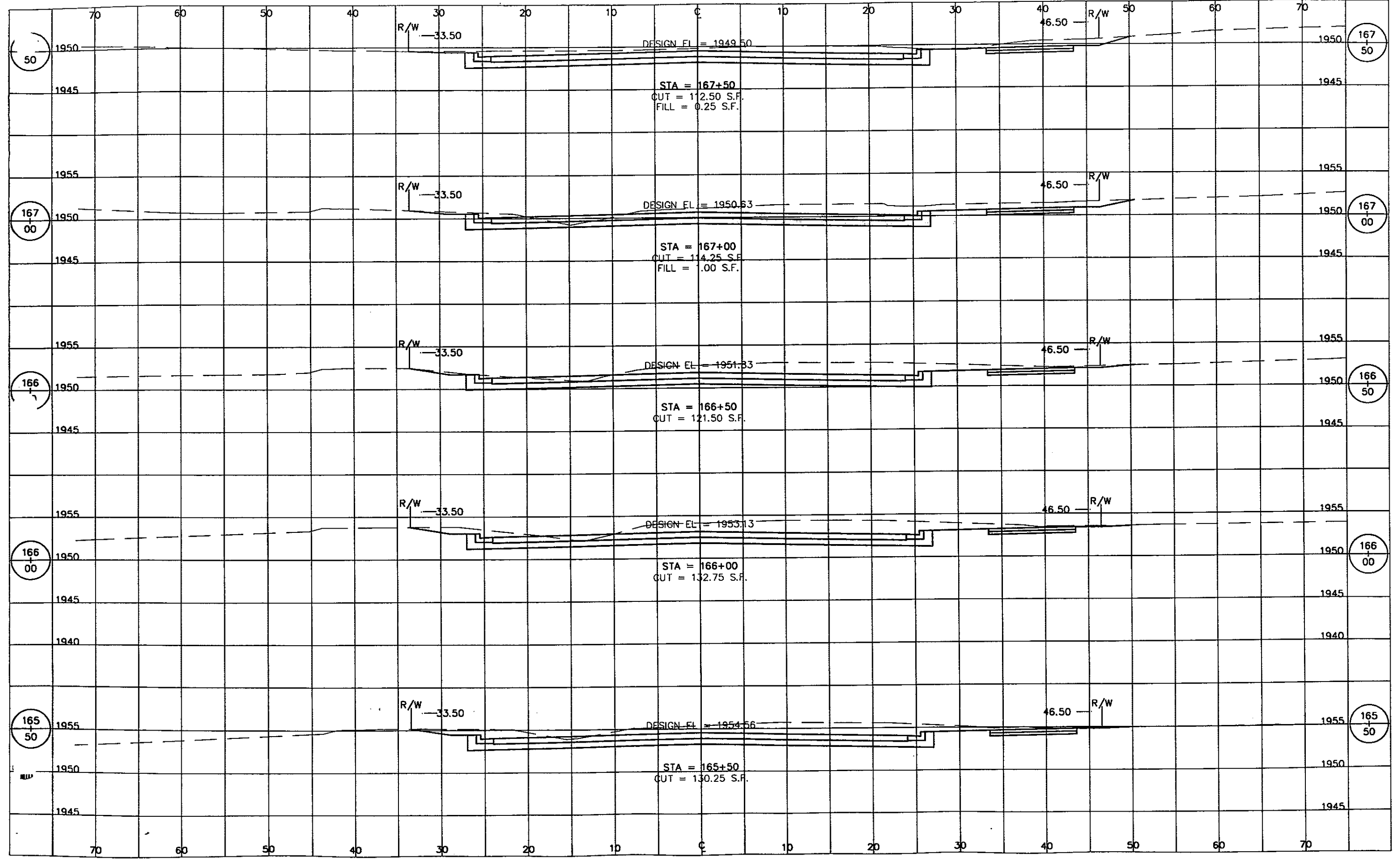
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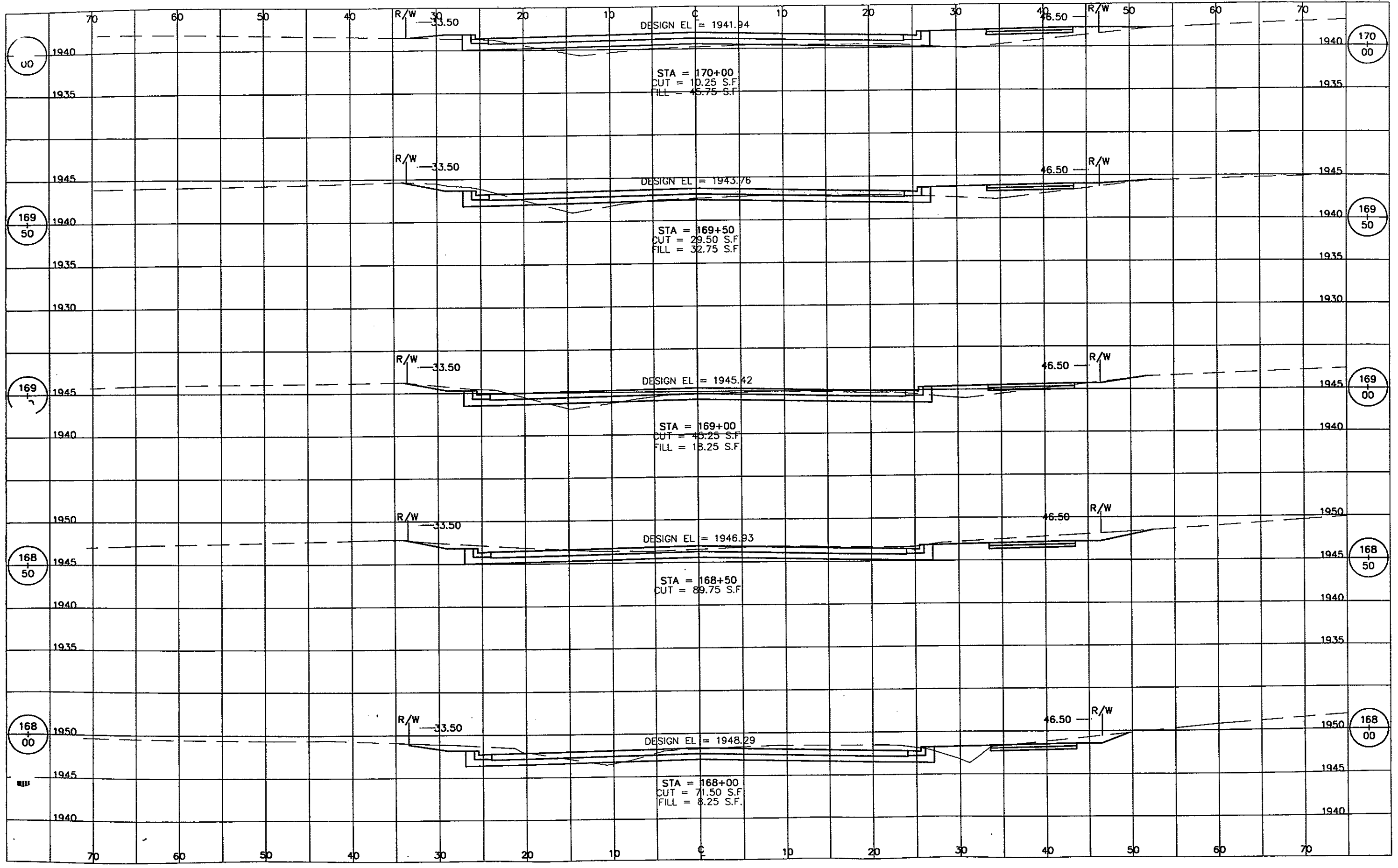
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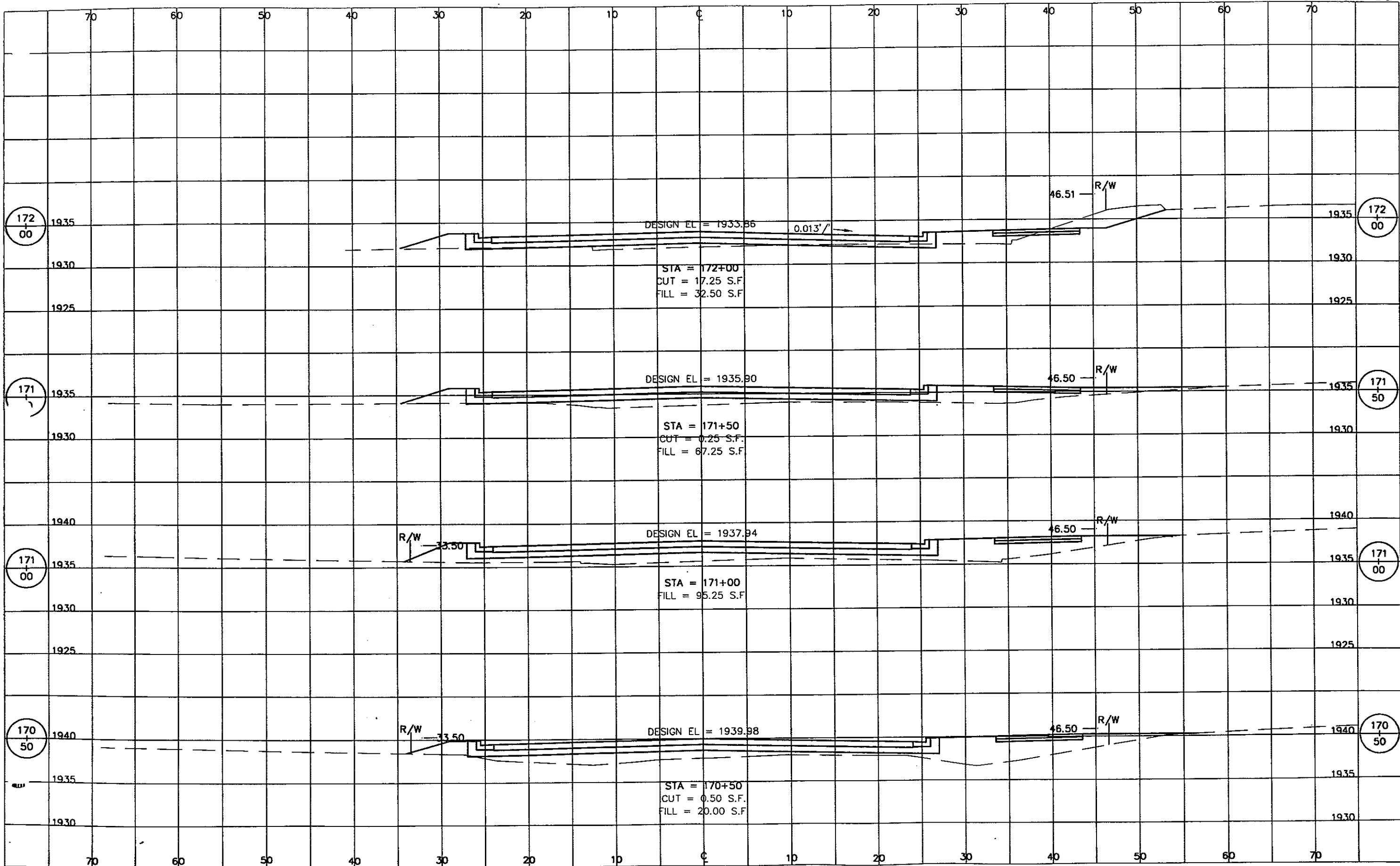
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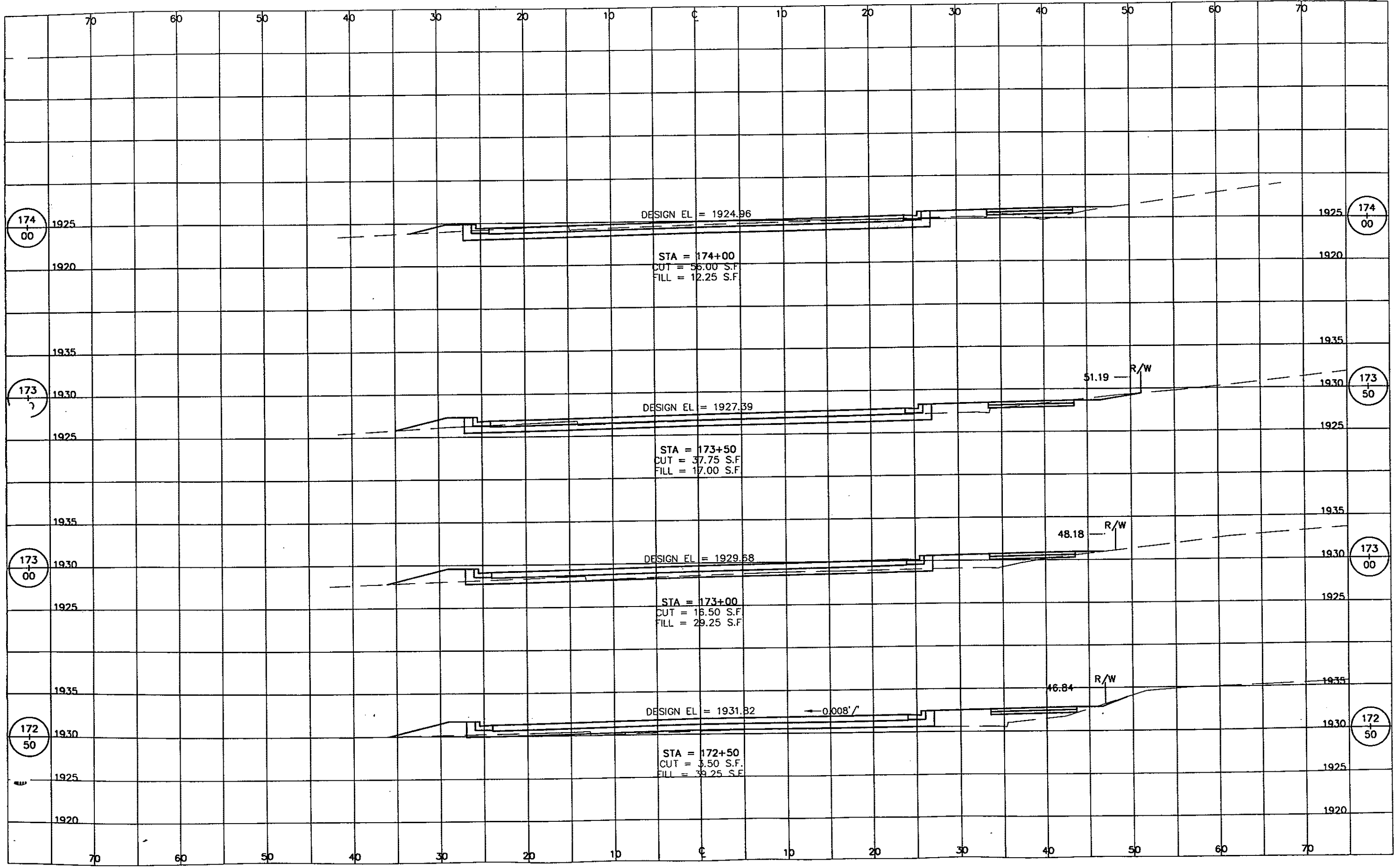


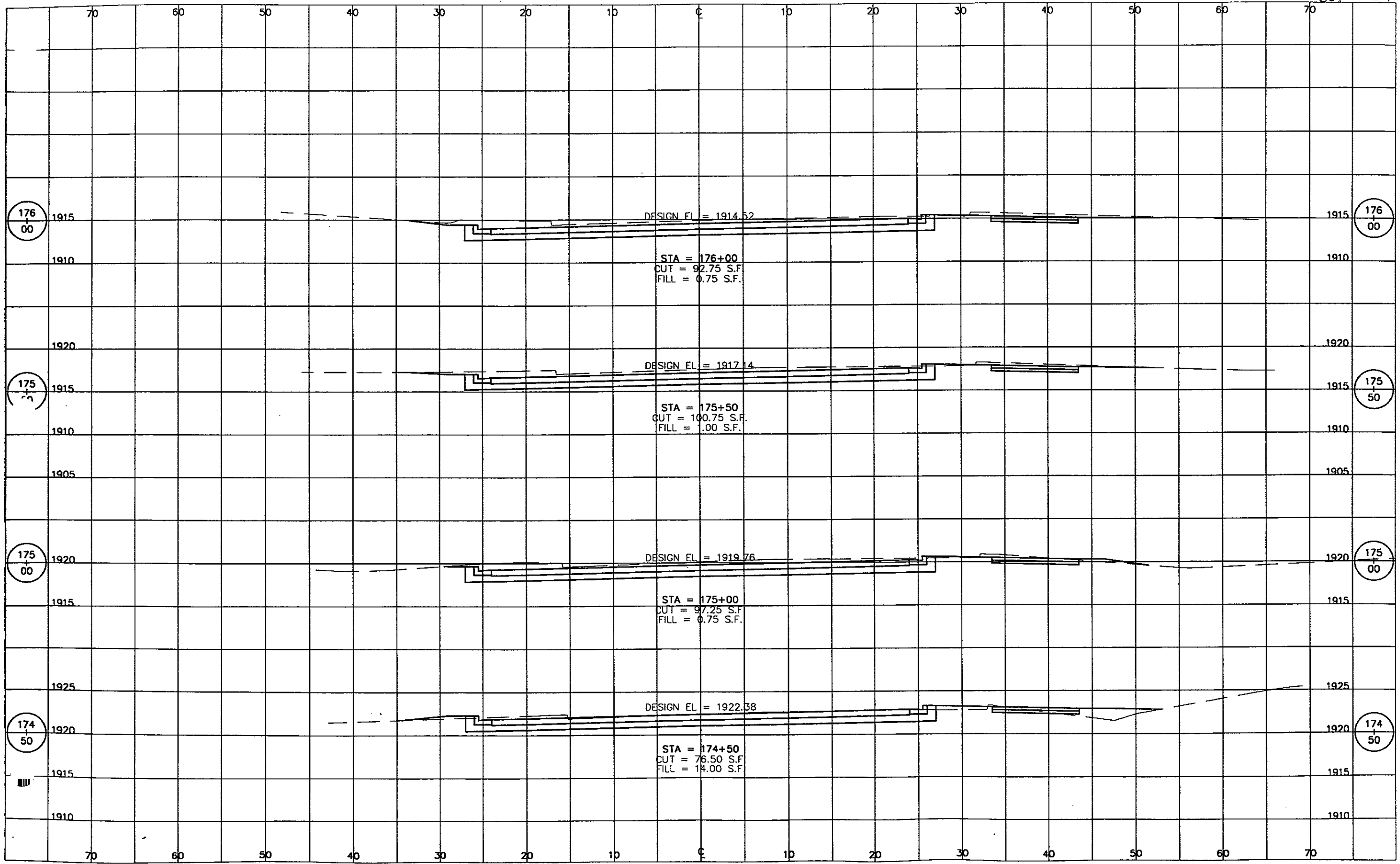


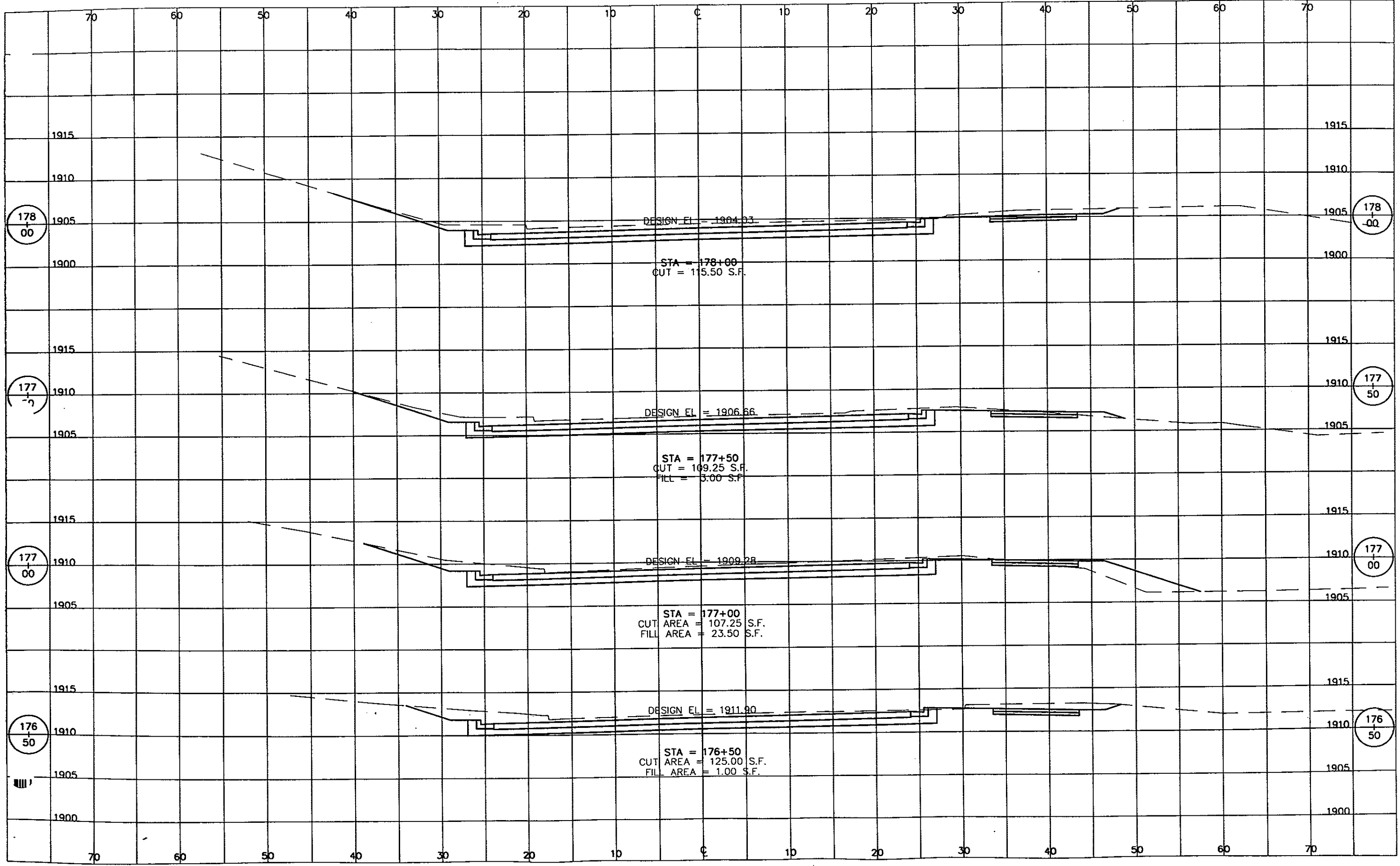


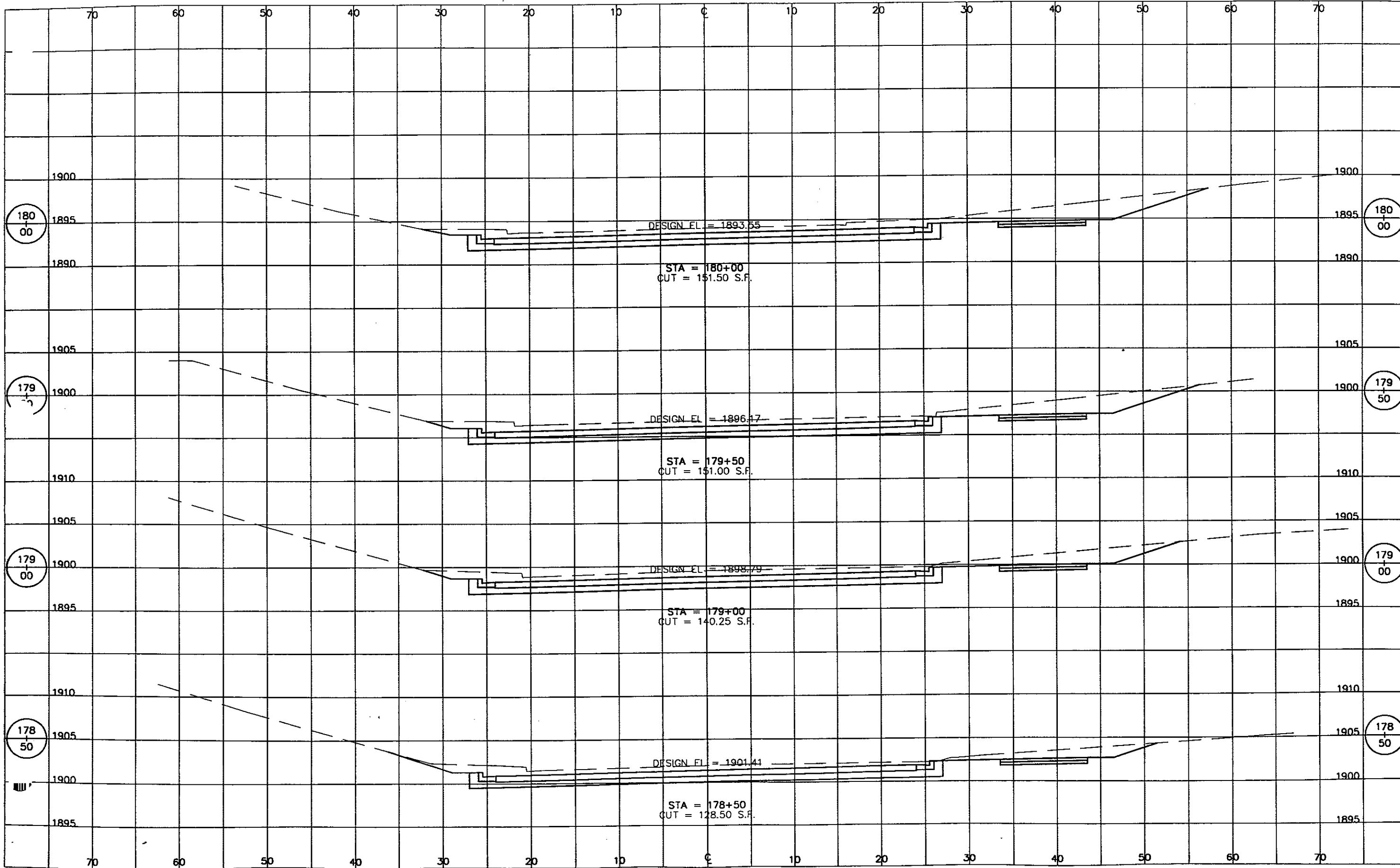


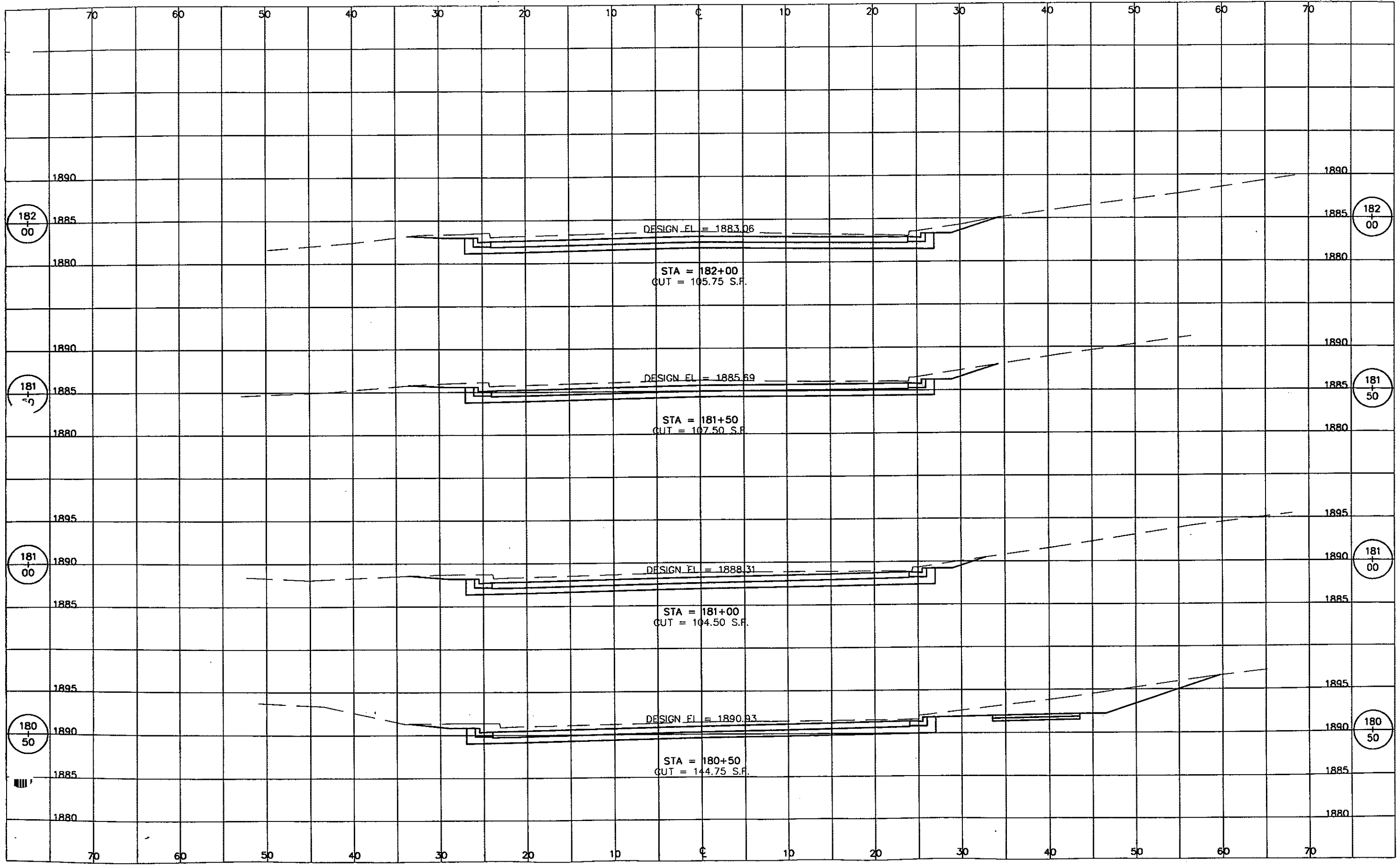


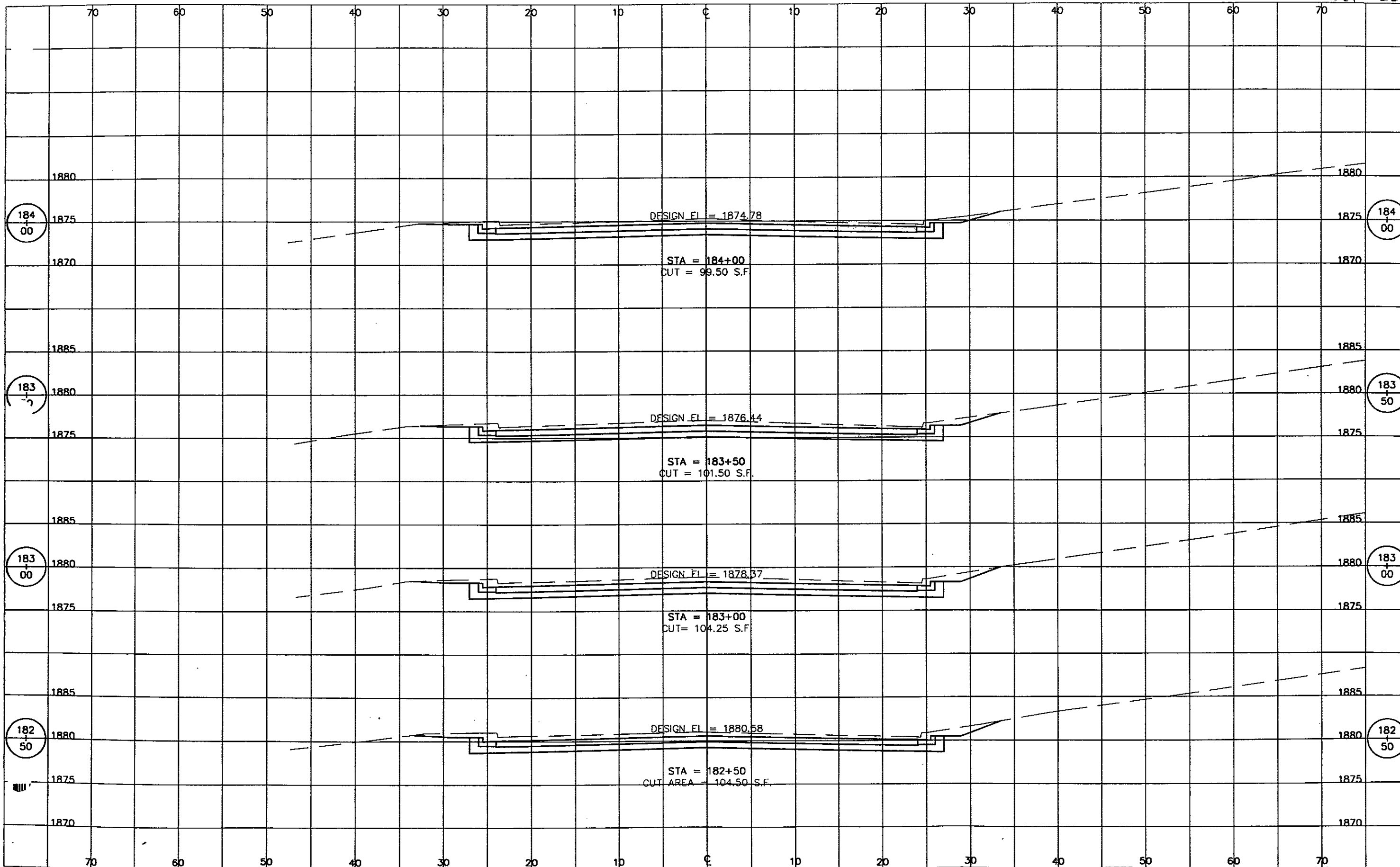


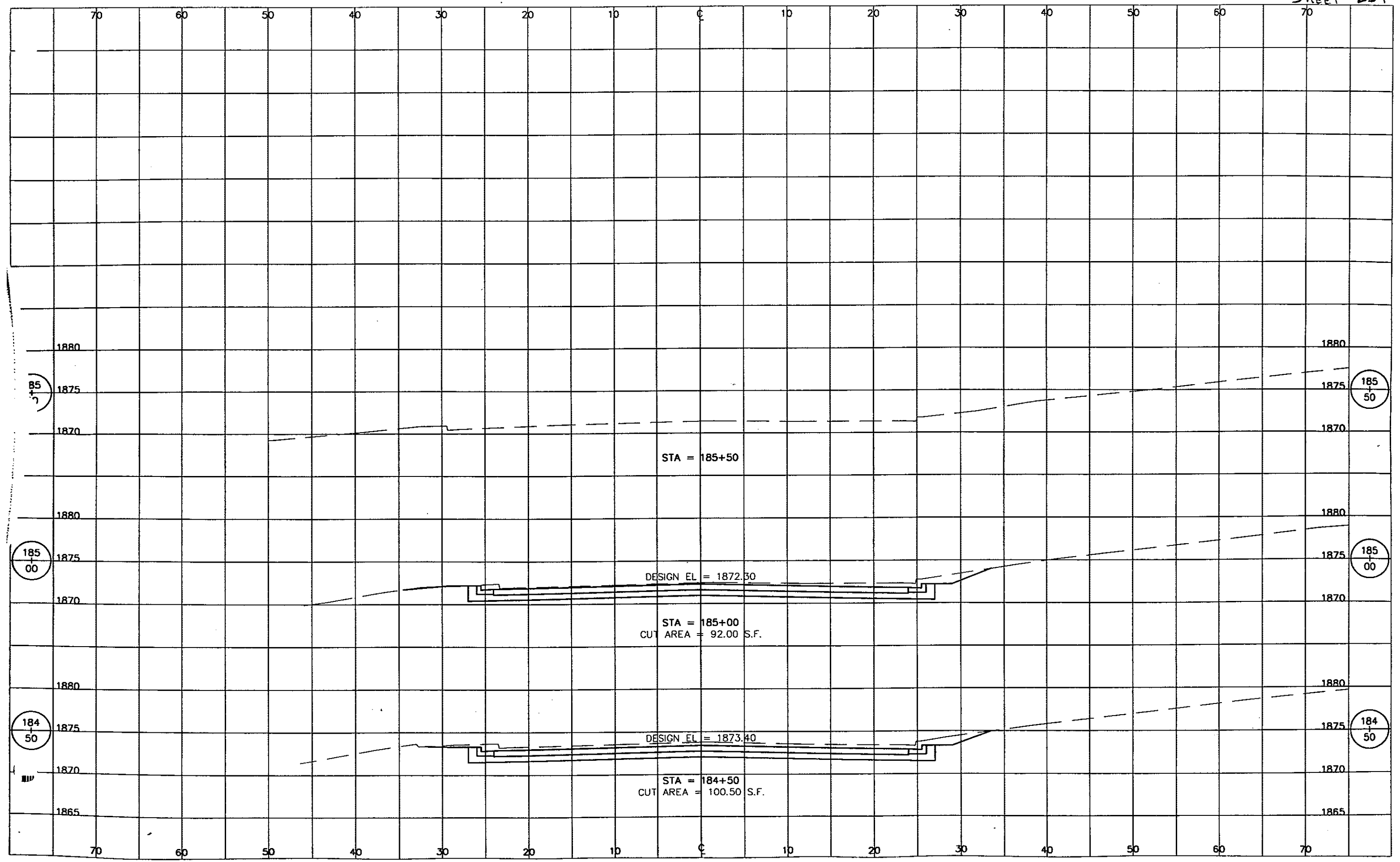


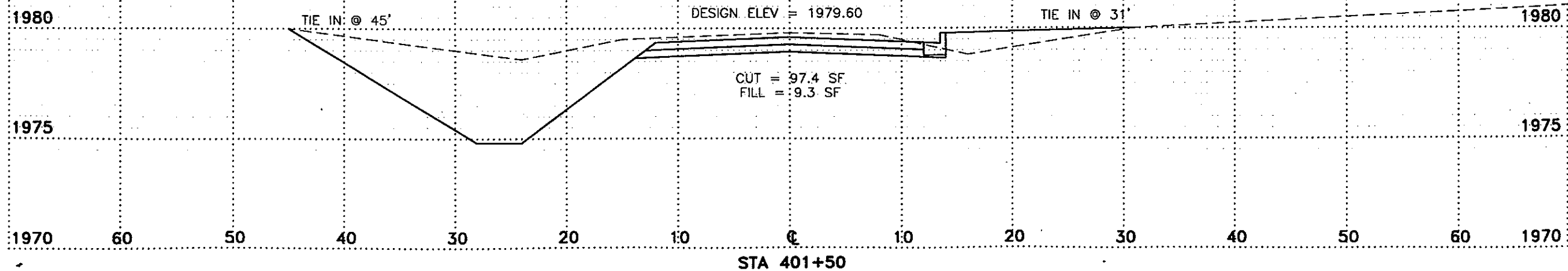
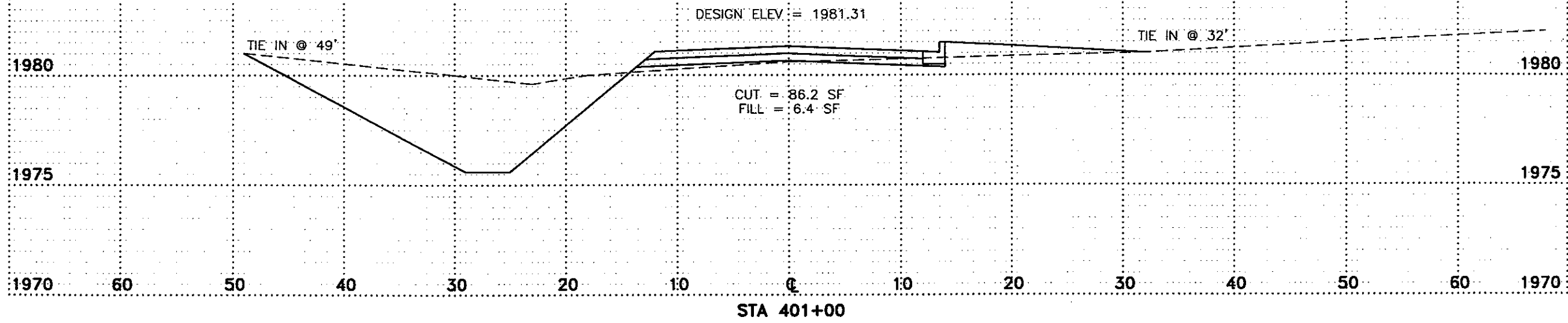
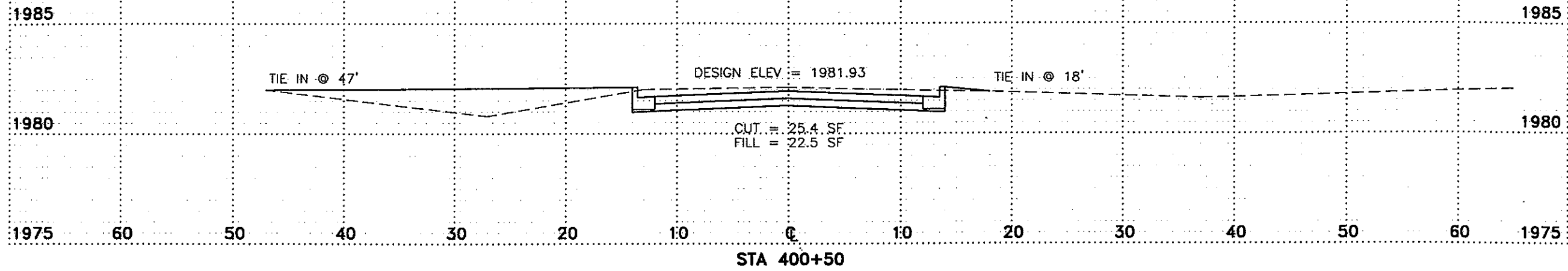


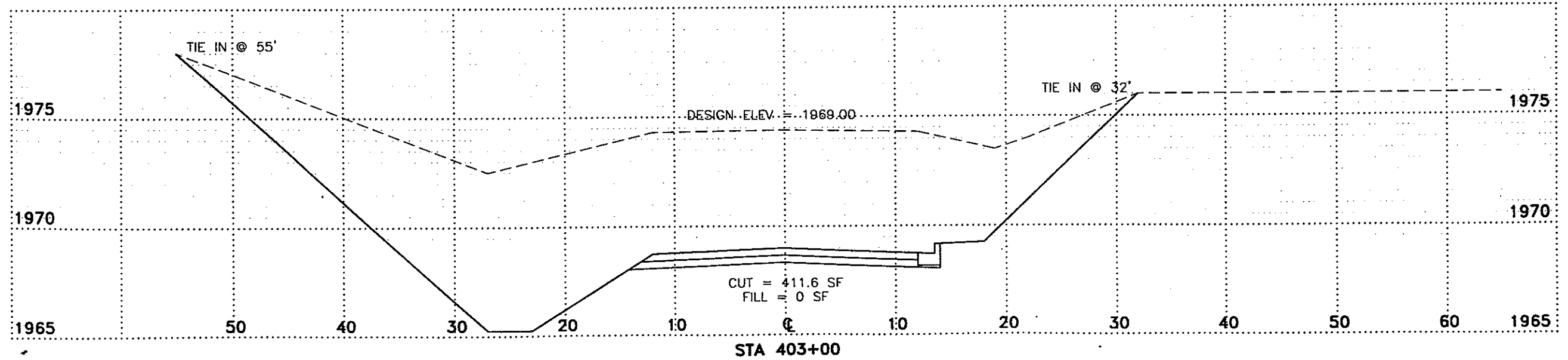
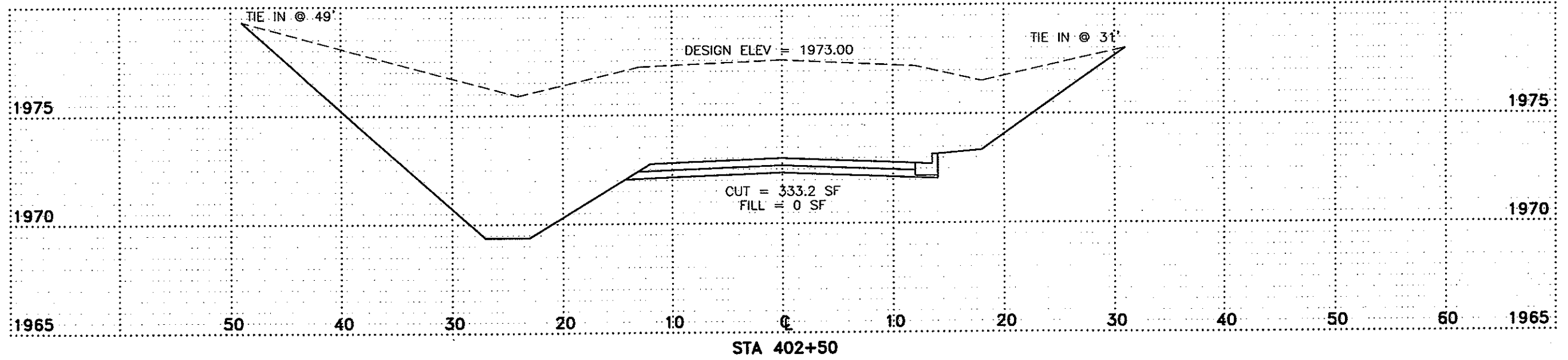
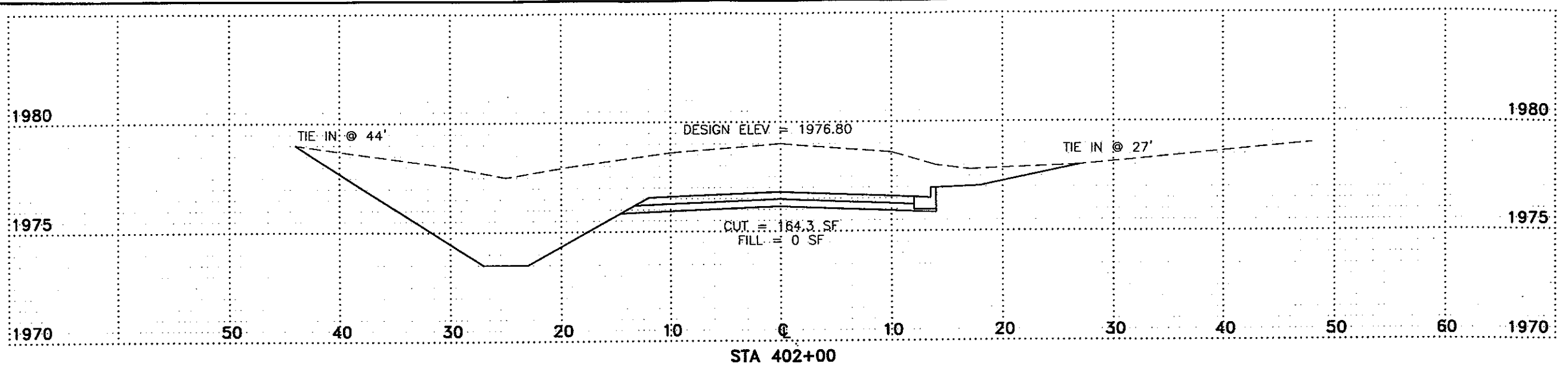


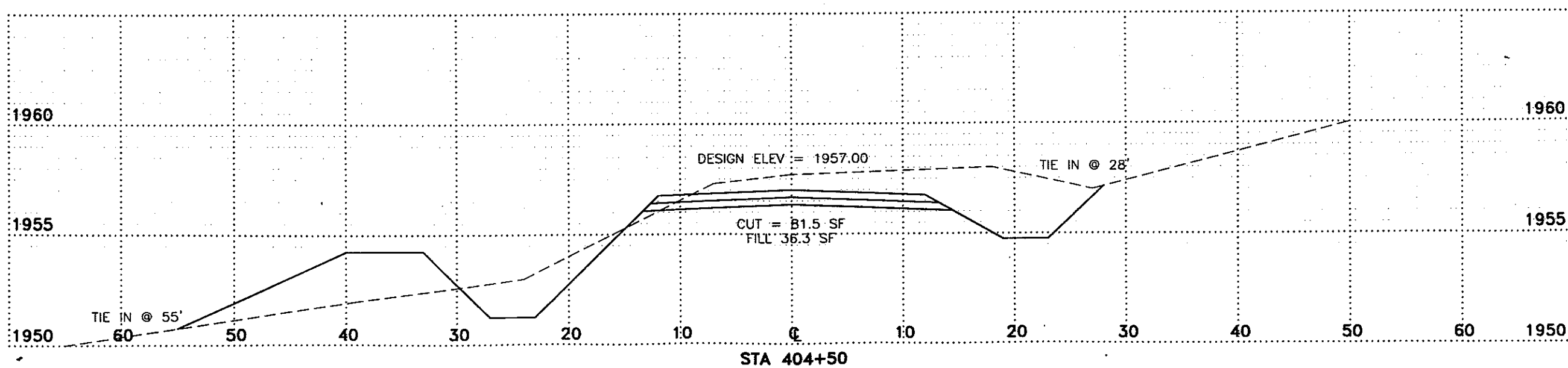
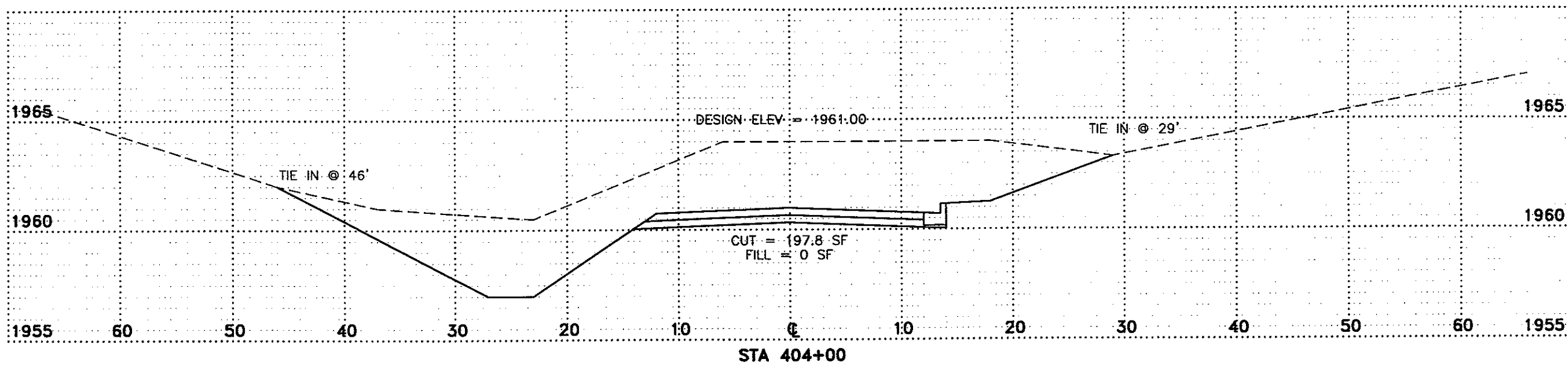
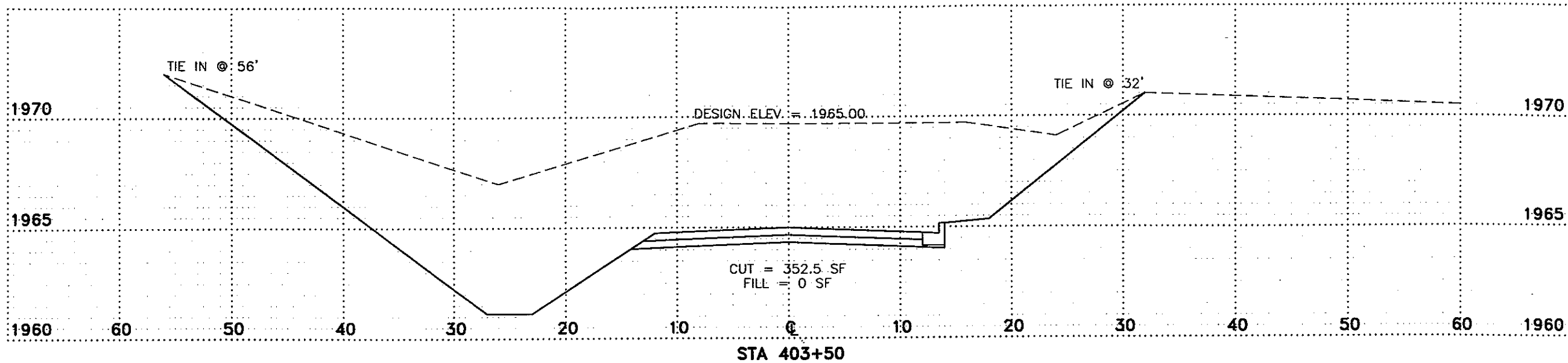


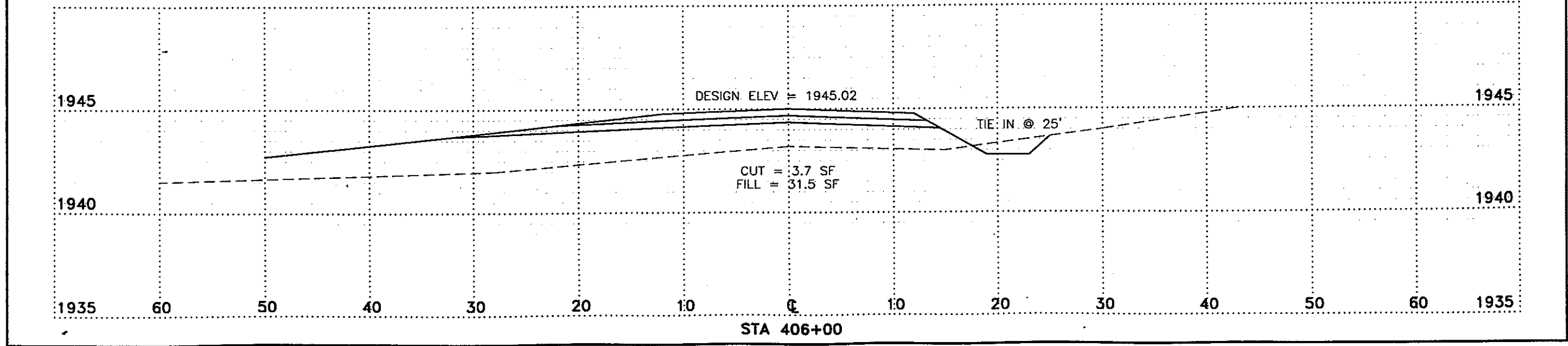
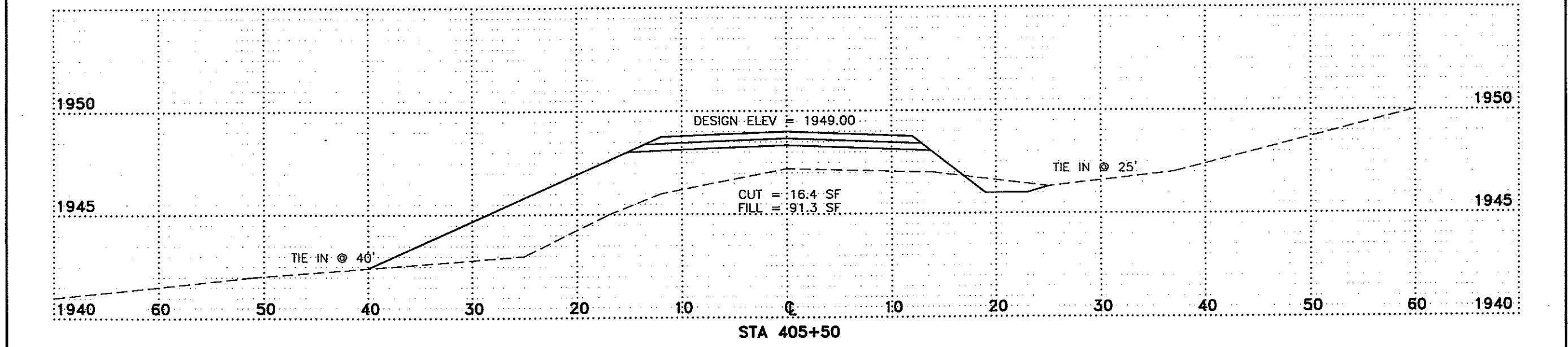
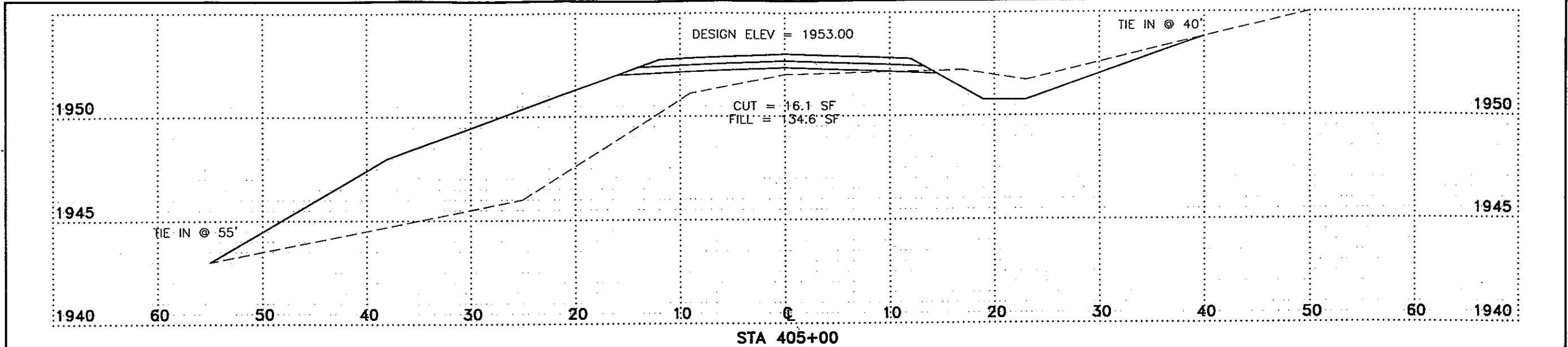


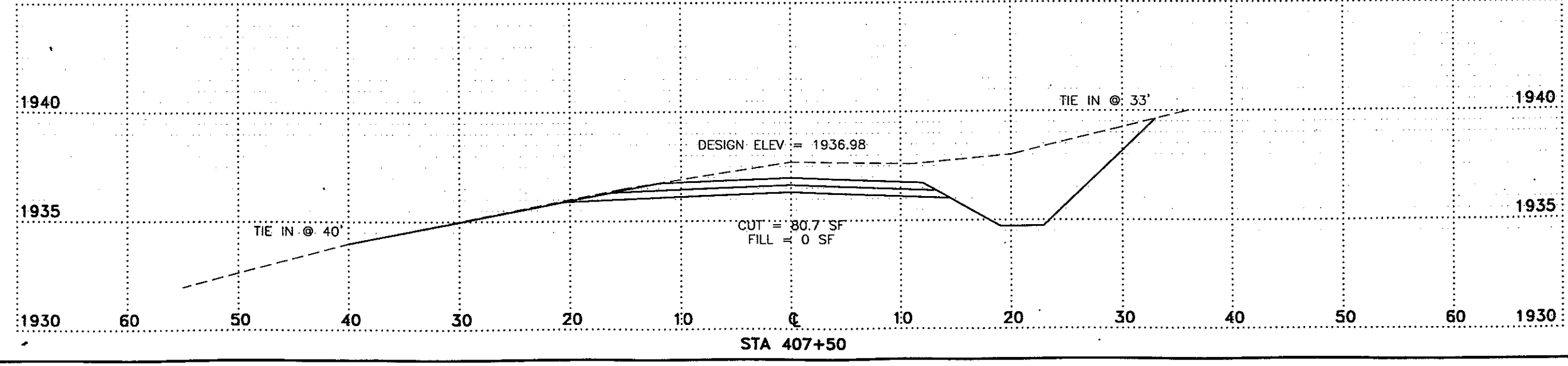
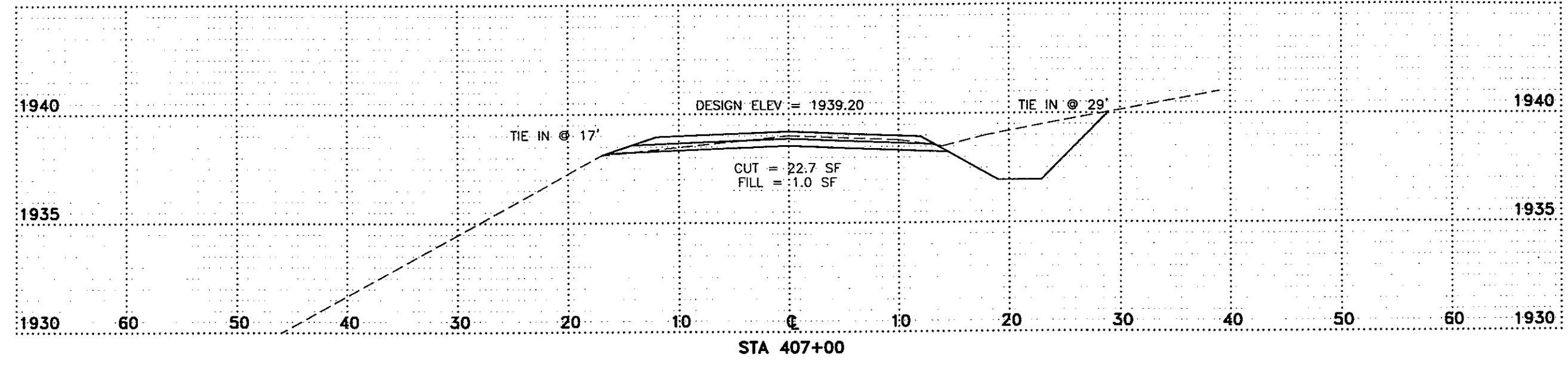
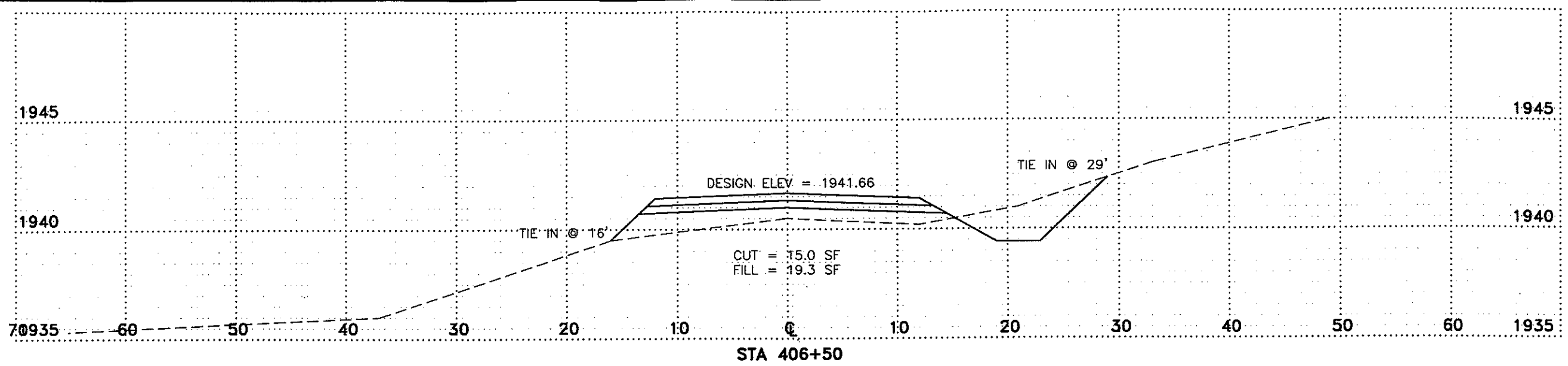


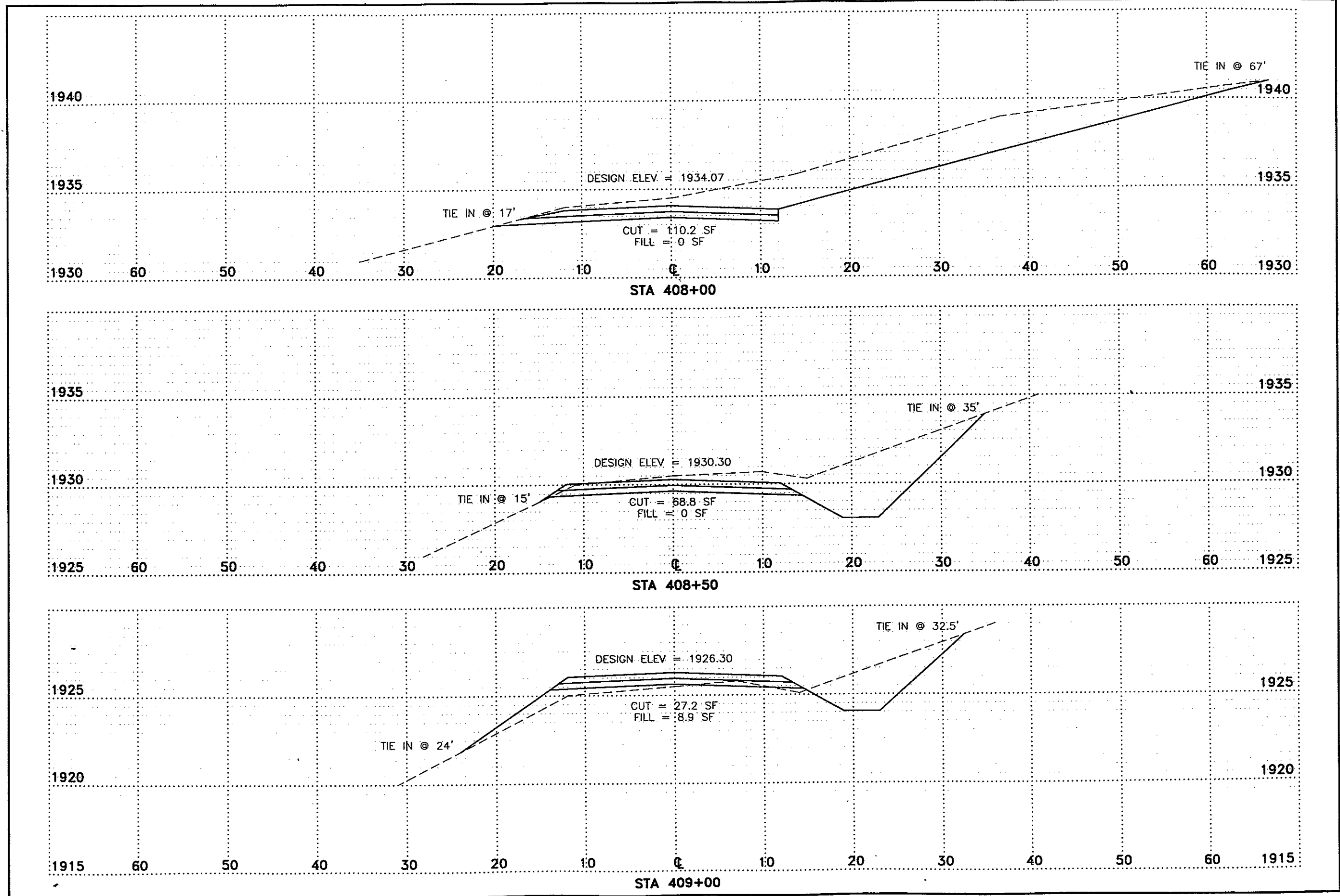


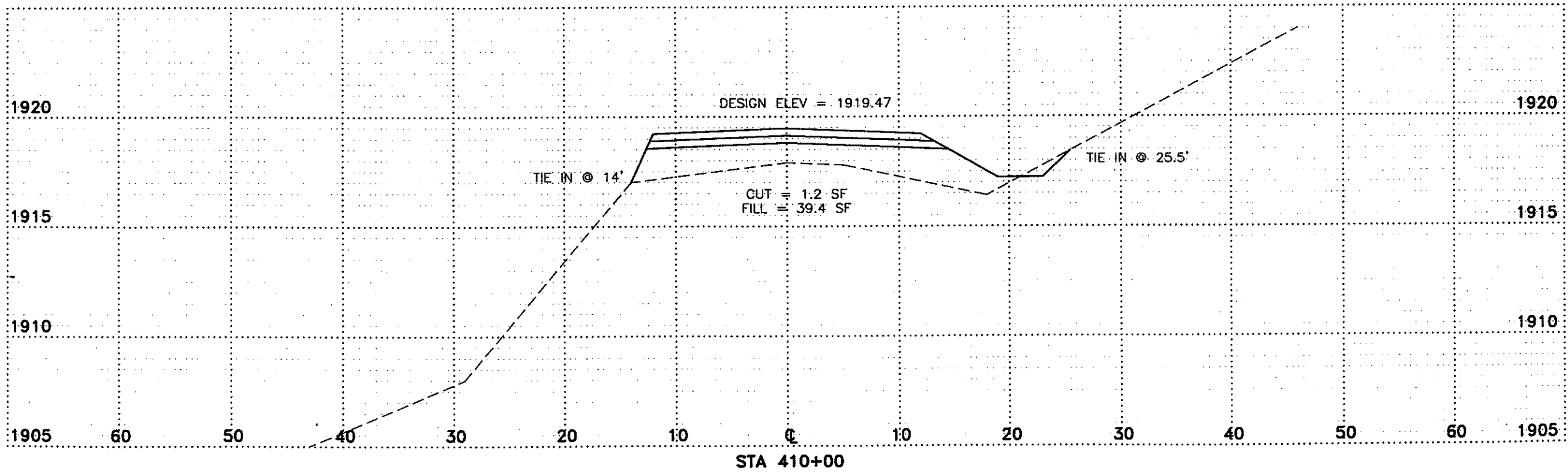
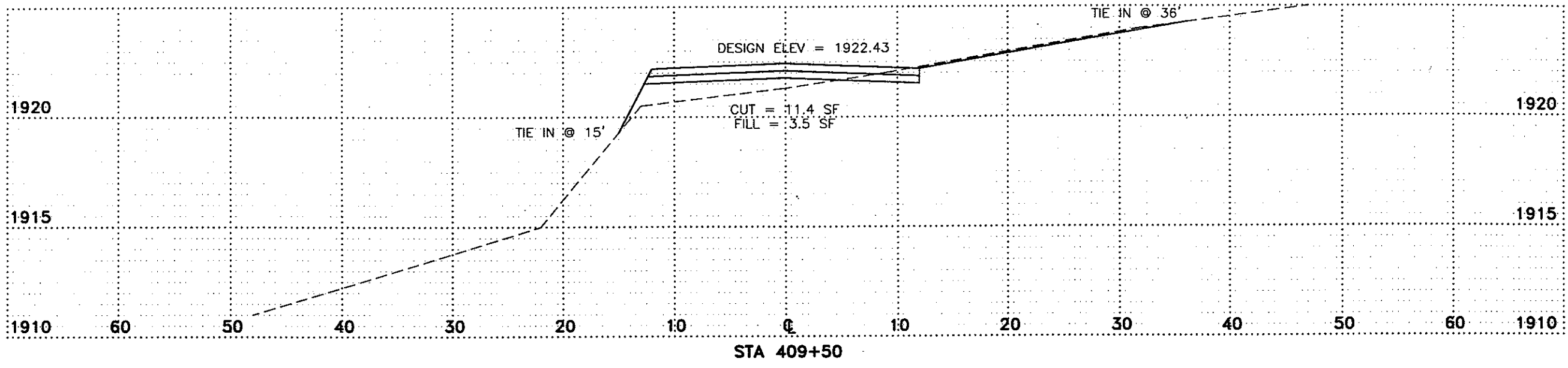


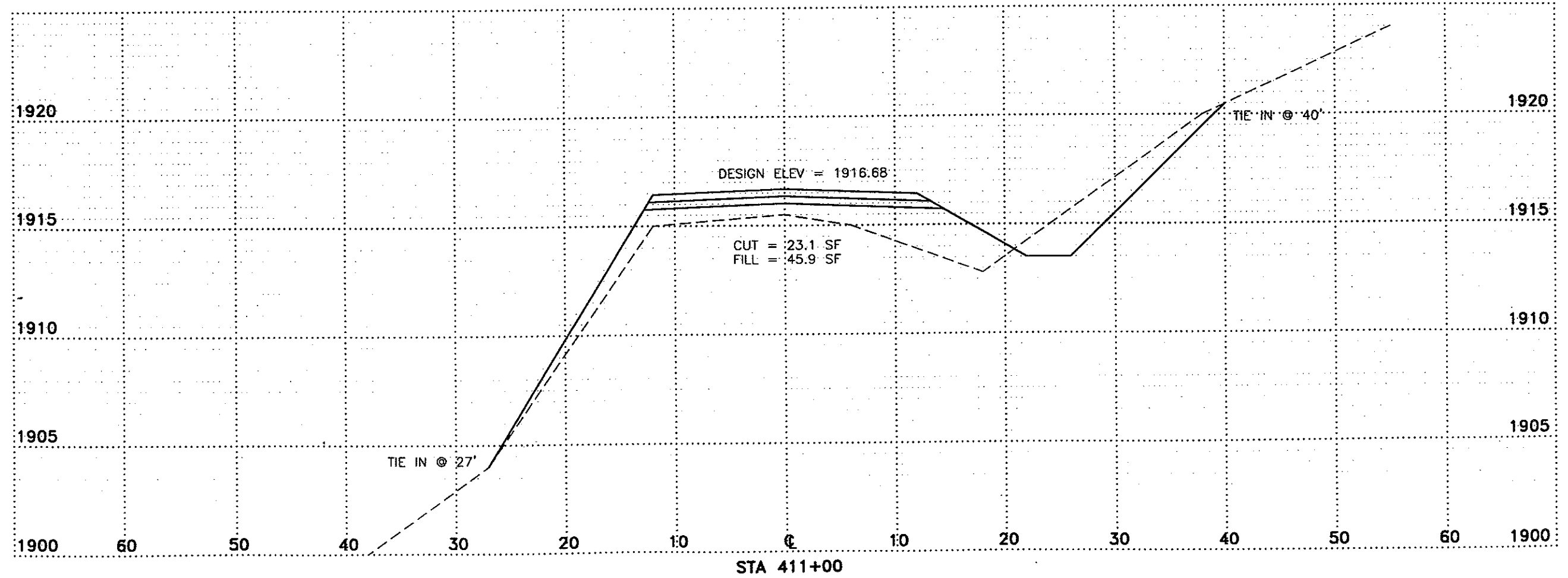
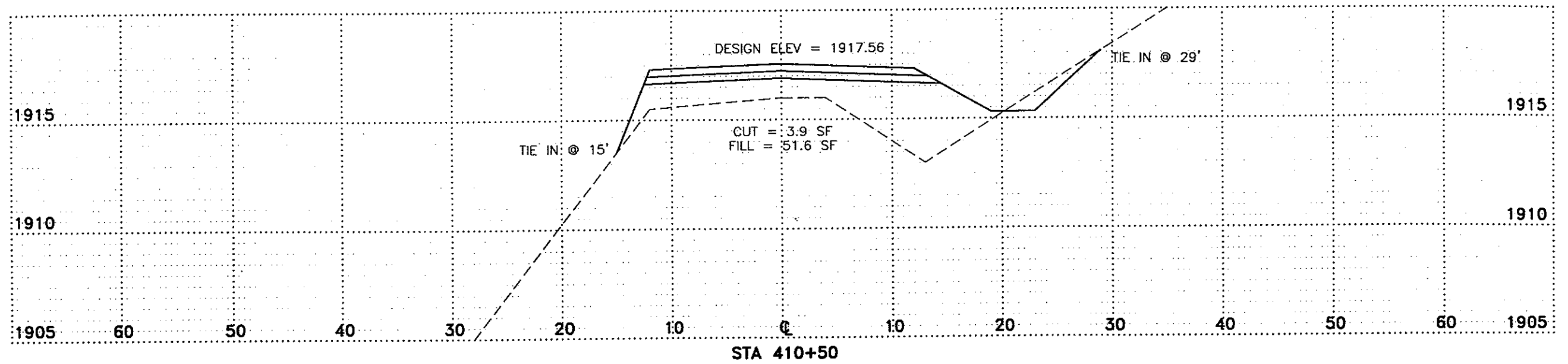


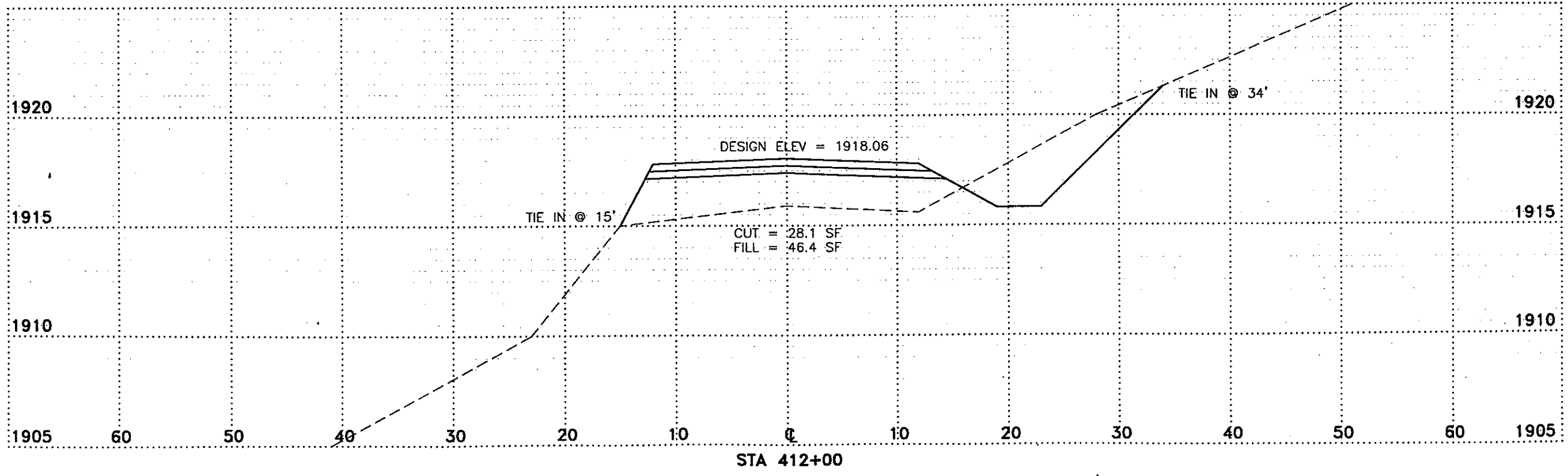
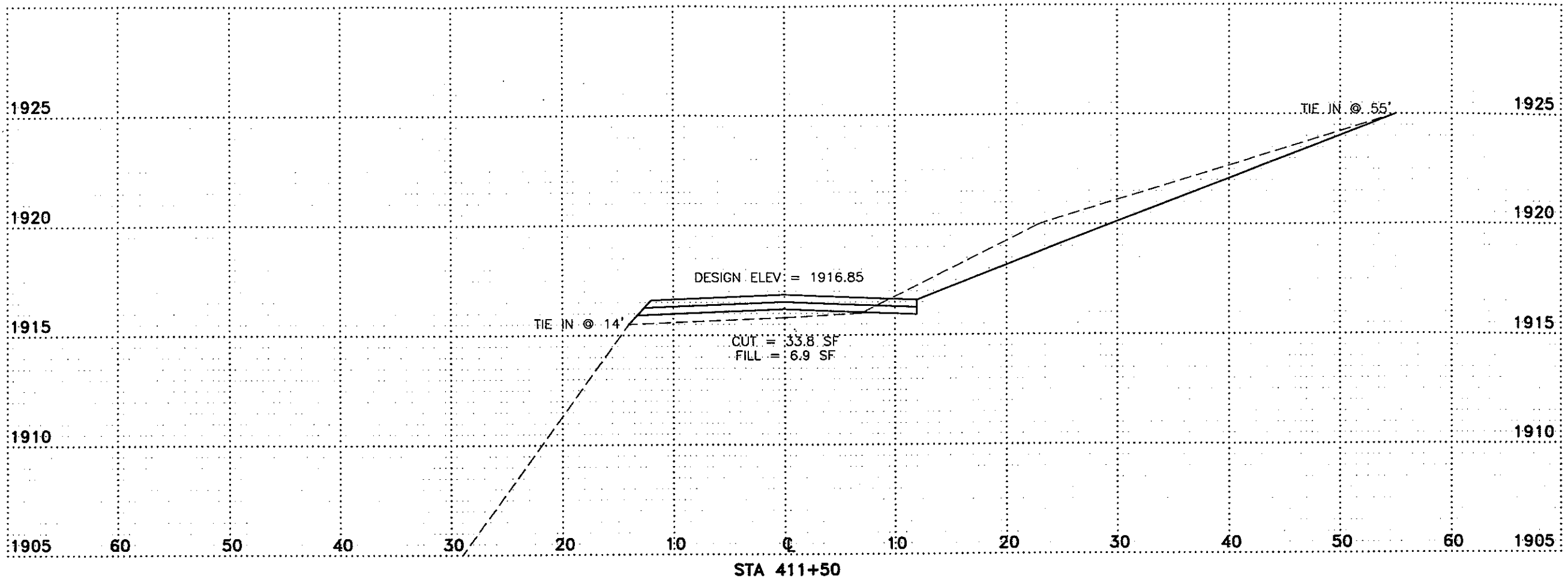


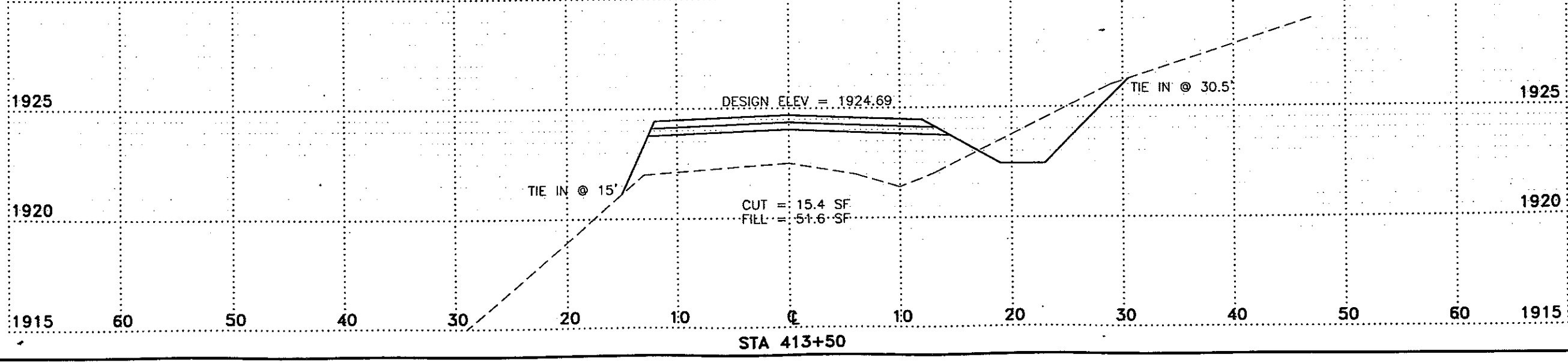
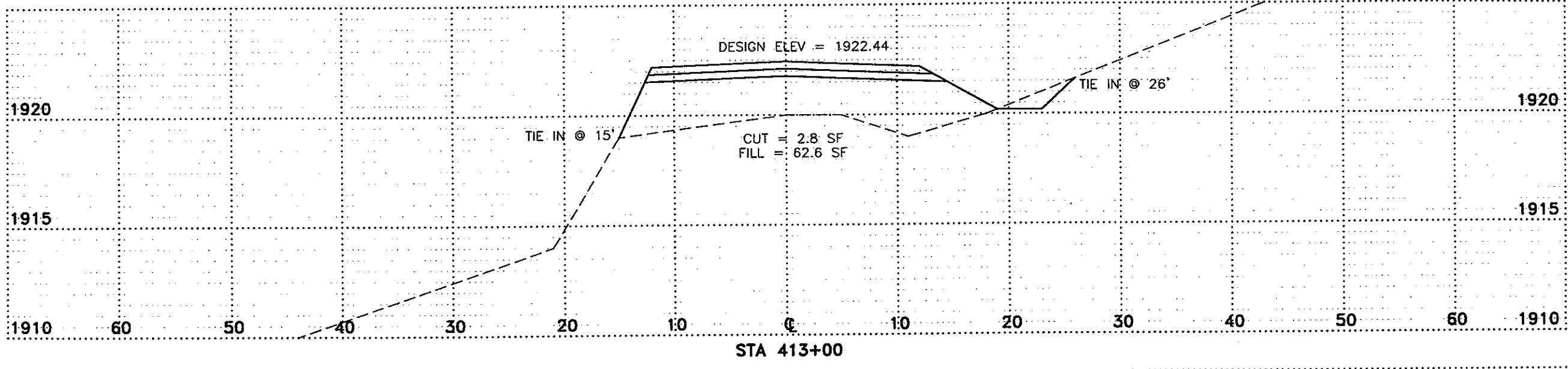
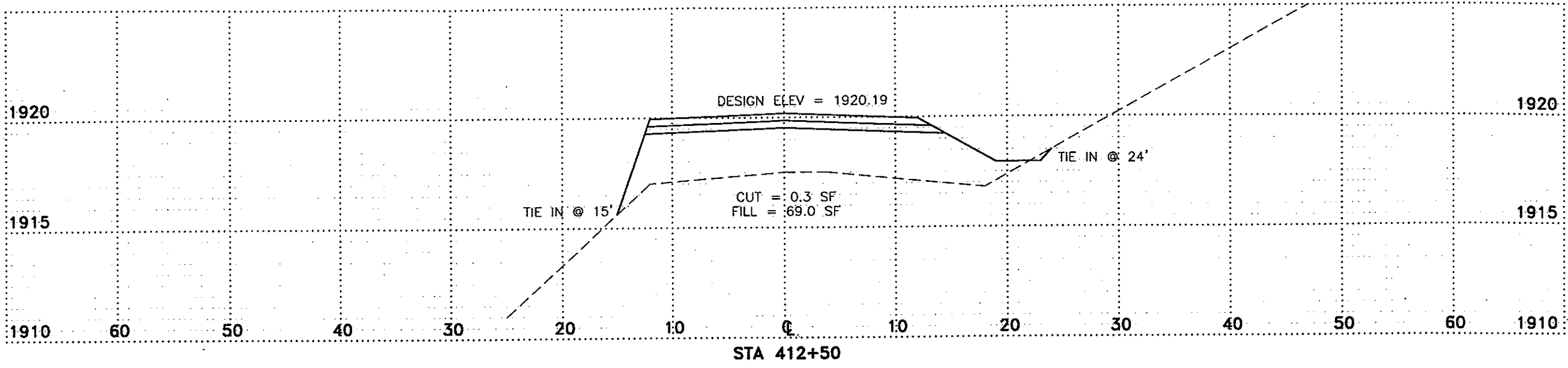


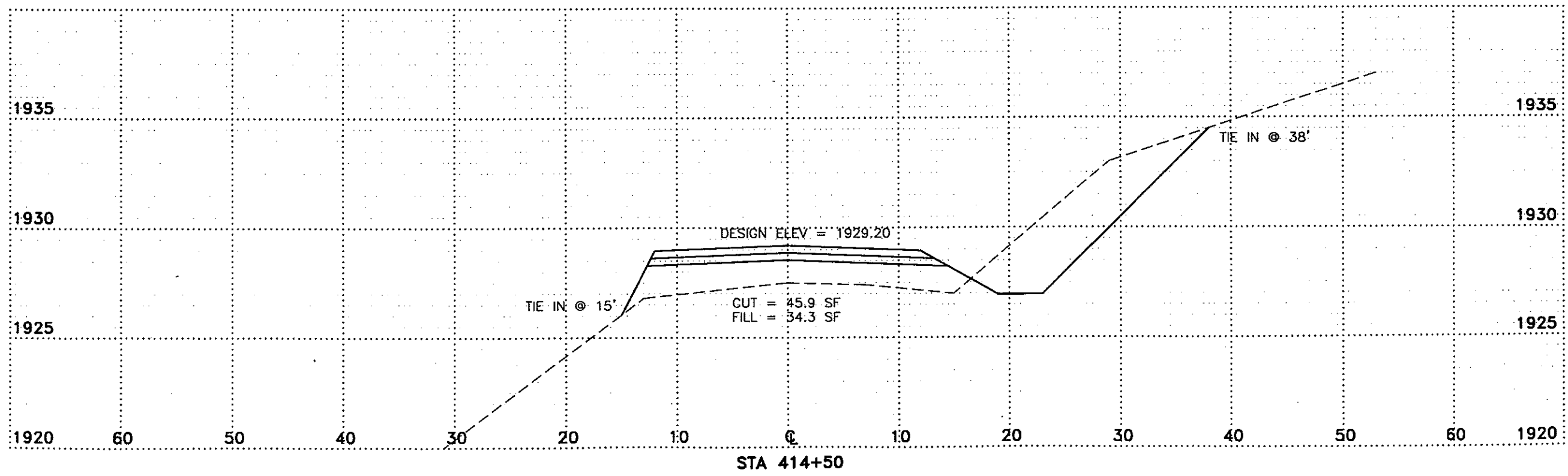
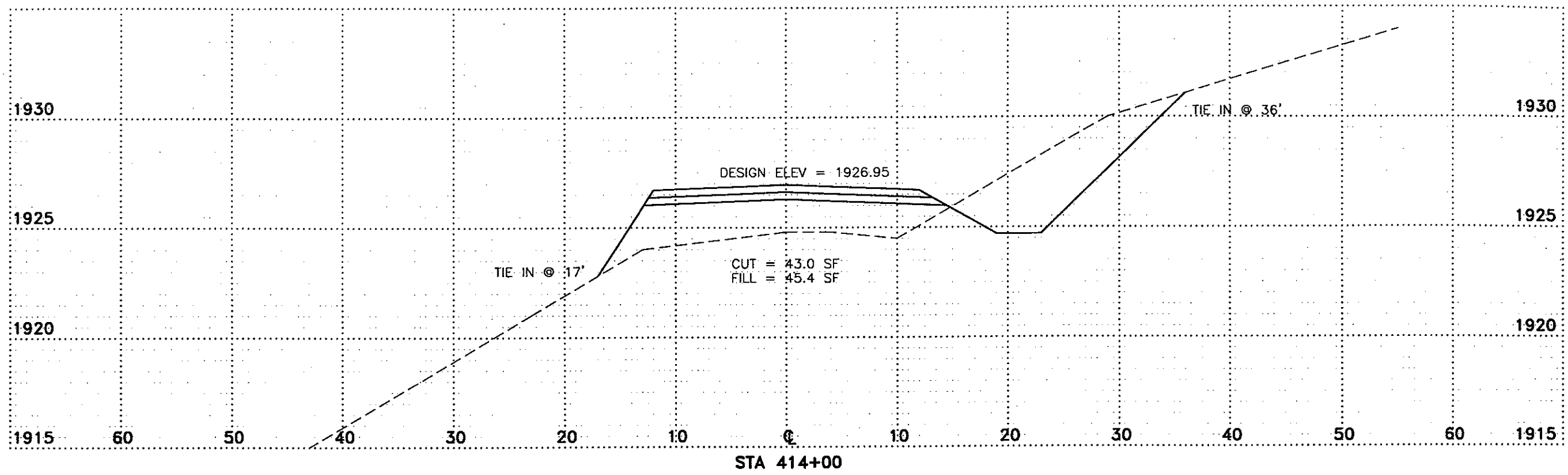


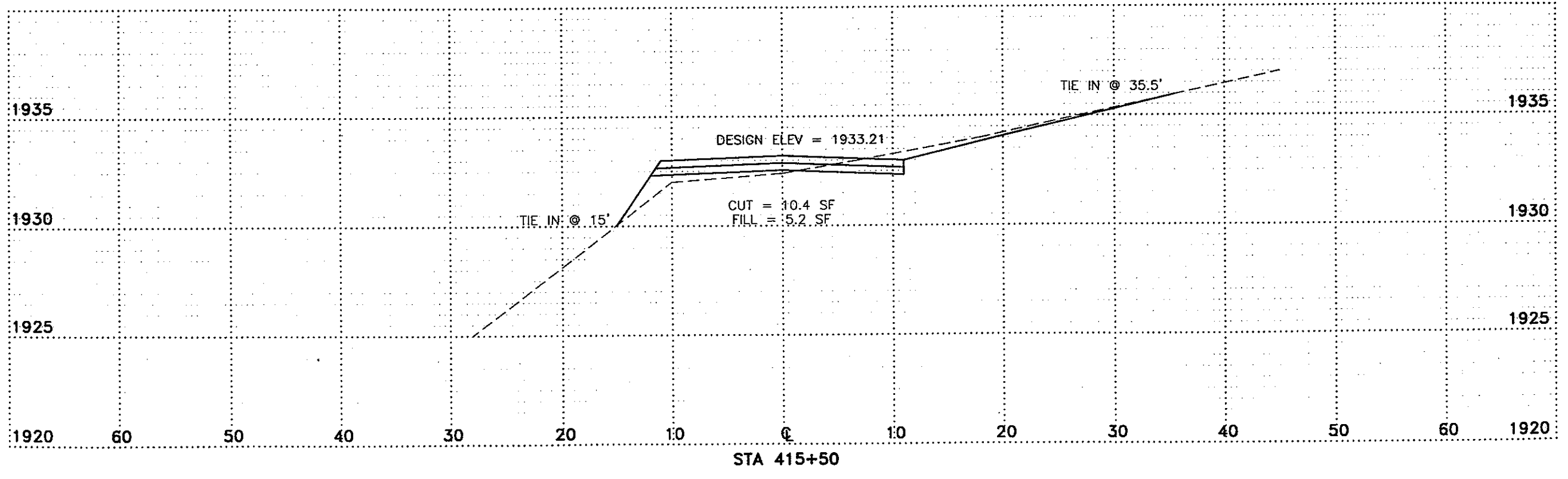
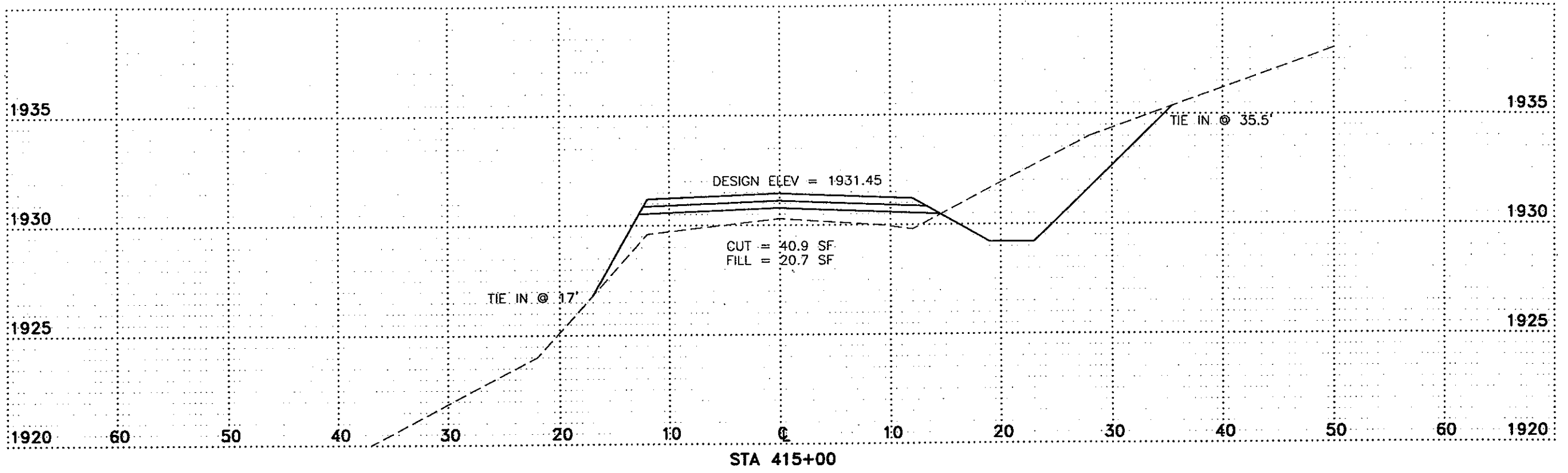


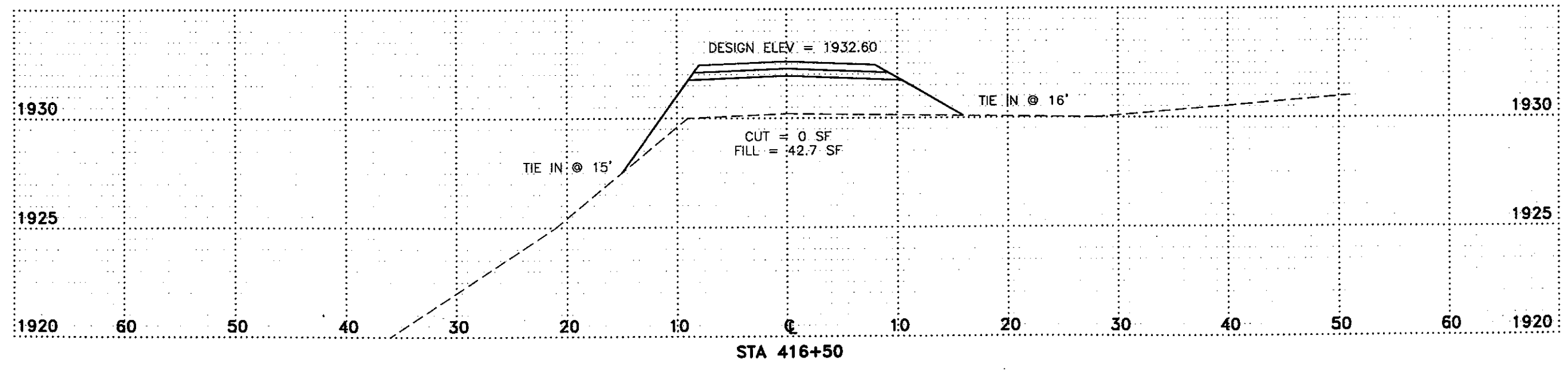
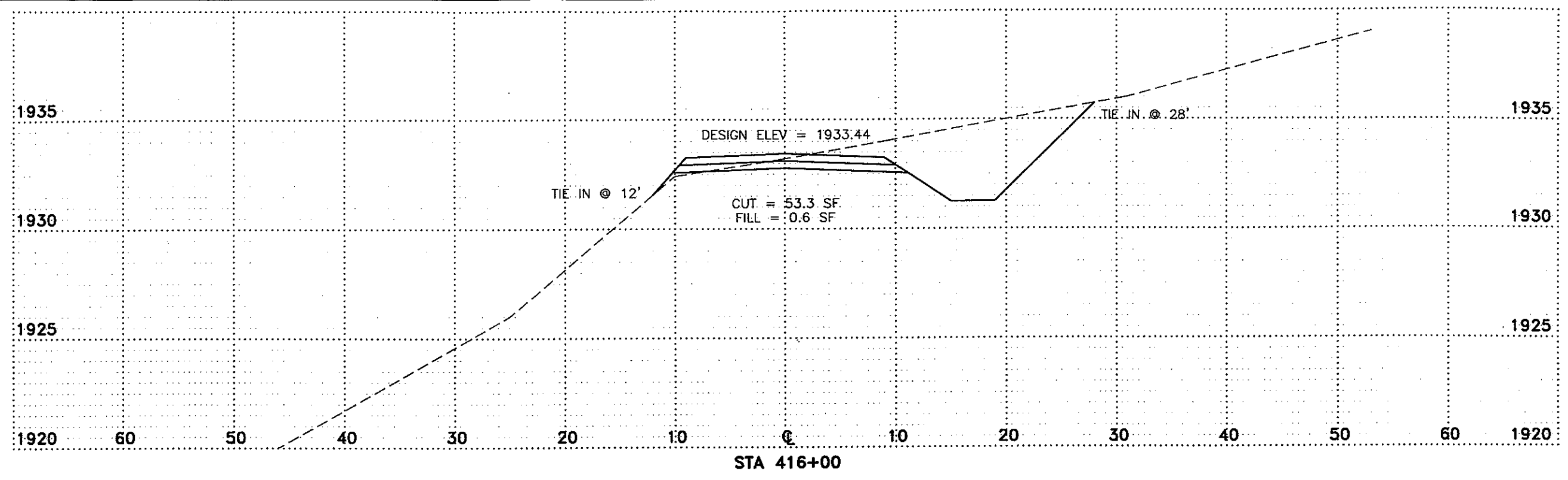


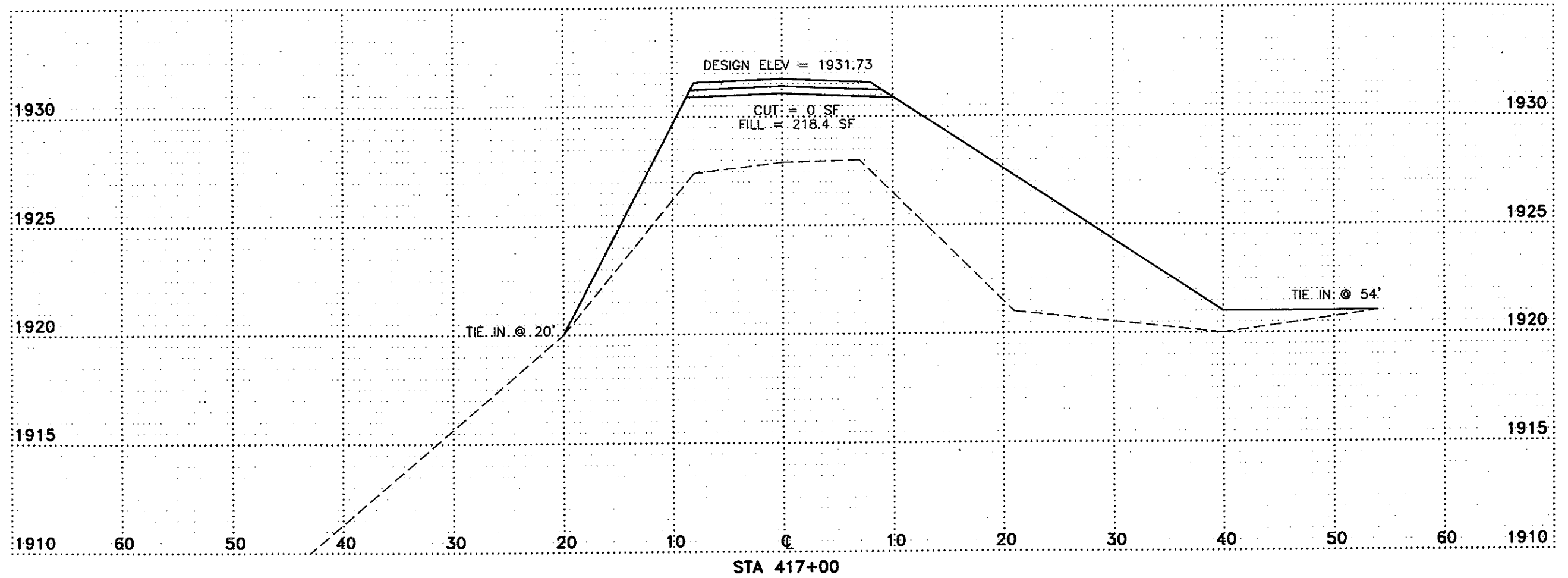


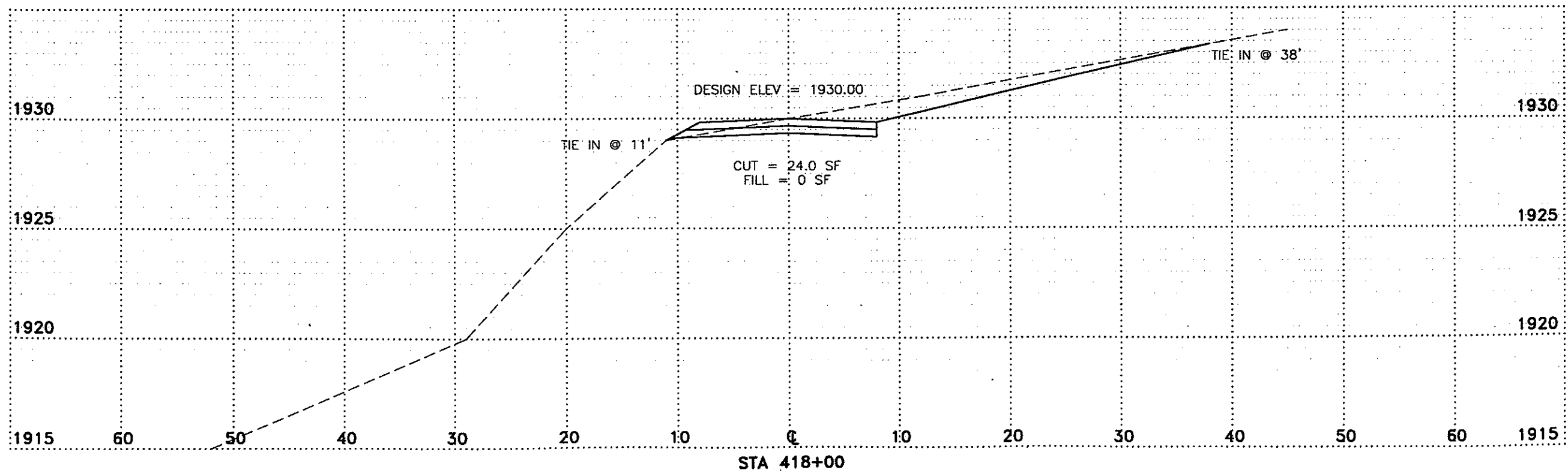
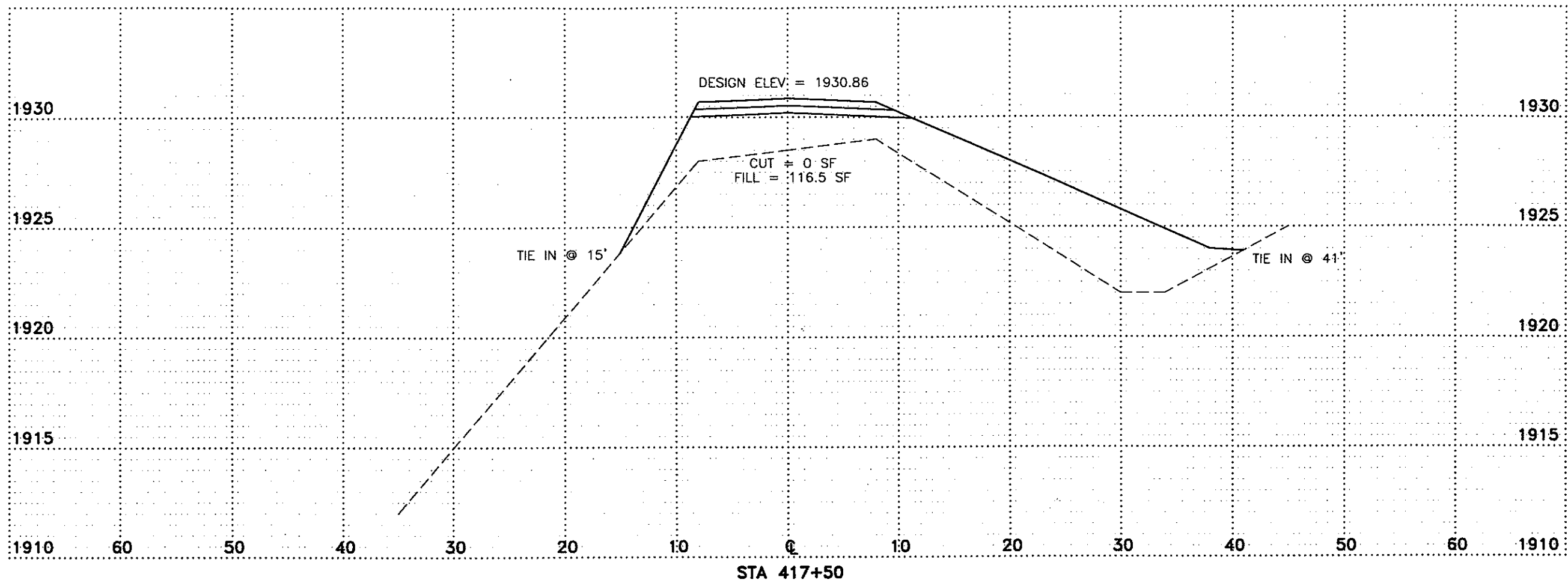


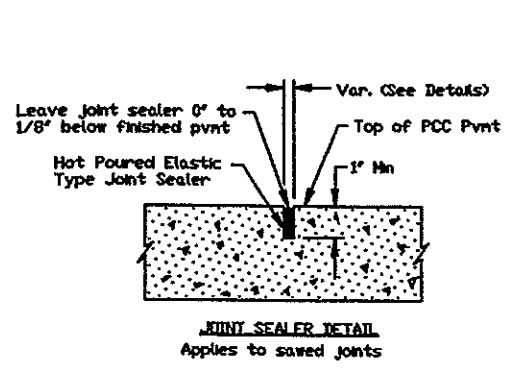






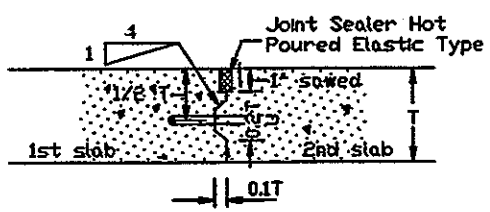
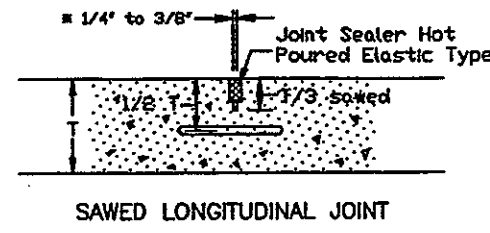




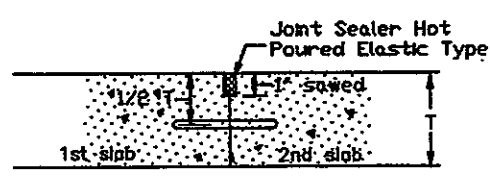


* Width requirement for top 1' only bottom portion of sawcut may be narrower.

TIED JOINTS
(With Hot Poured Elastic Seal)



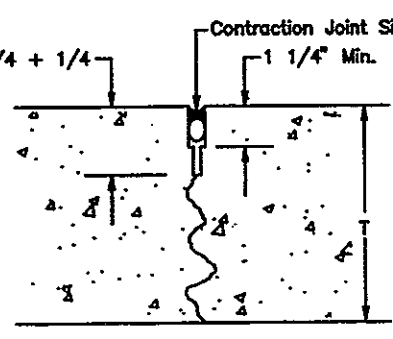
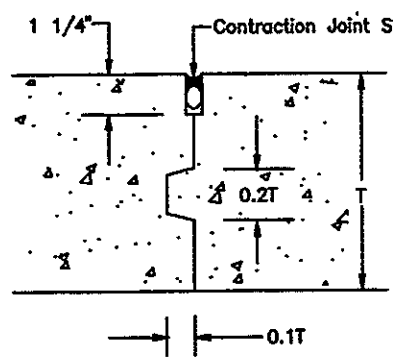
LONGITUDINAL CONSTRUCTION JOINT
(KEYED TIED JOINT)



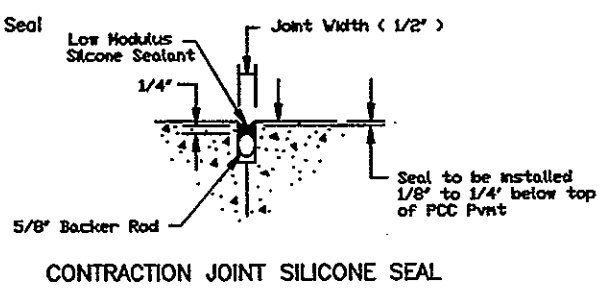
LONGITUDINAL CONSTRUCTION JOINT
(TIED BUTT JOINT)

LONGITUDINAL JOINT DETAILS

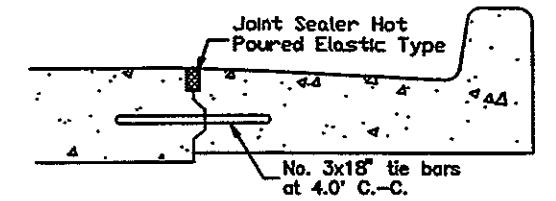
UNTIED JOINTS
(With Silicone Seal)



SAWED LONGITUDINAL JOINTS



CONTRACTION JOINT SILICONE SEAL



JOINT SEALER AT ALL CURB & GUTTER SECTIONS

NOTES

1. The hot poured elastic type joint sealer shall be in accordance with Section 826.02A.2 of the Standard Specifications.
2. The tied longitudinal joints and hot poured seal shall be included in the price bid for the pavement.
3. Tie bars shall not be placed within 15 (fifteen) inches of a transverse square joint or 18 (eighteen) inches of a transverse skew joint.
4. Where tiebars are installed bent and later straightened, Grade 40 Steel shall be used.
5. Tiebar spacing can be increased up to 10% to facilitate construction.

BAR SIZE
GRADE STEEL
LENGTH OF BAR
DIST. TO FREE EDGE (FT)
TYPE OF JOINT
PVT. THICKNESS

TIEBAR SPACINGS (In.)

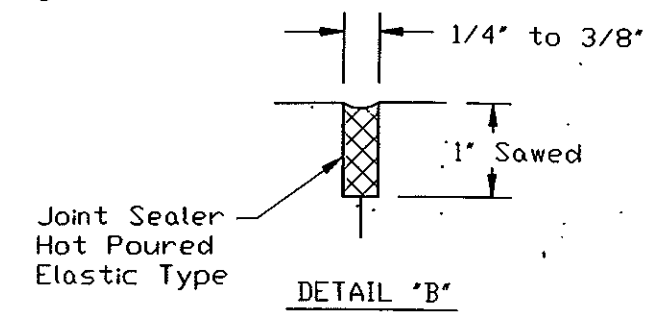
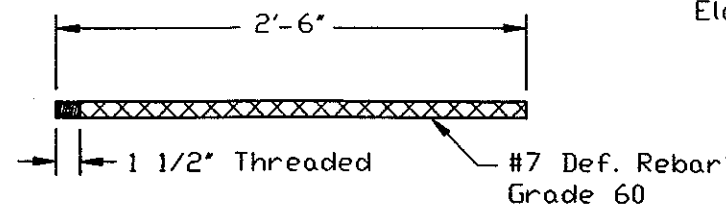
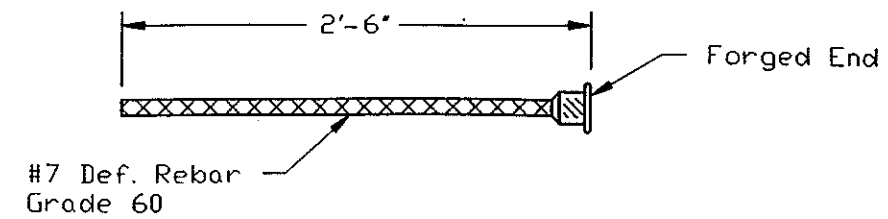
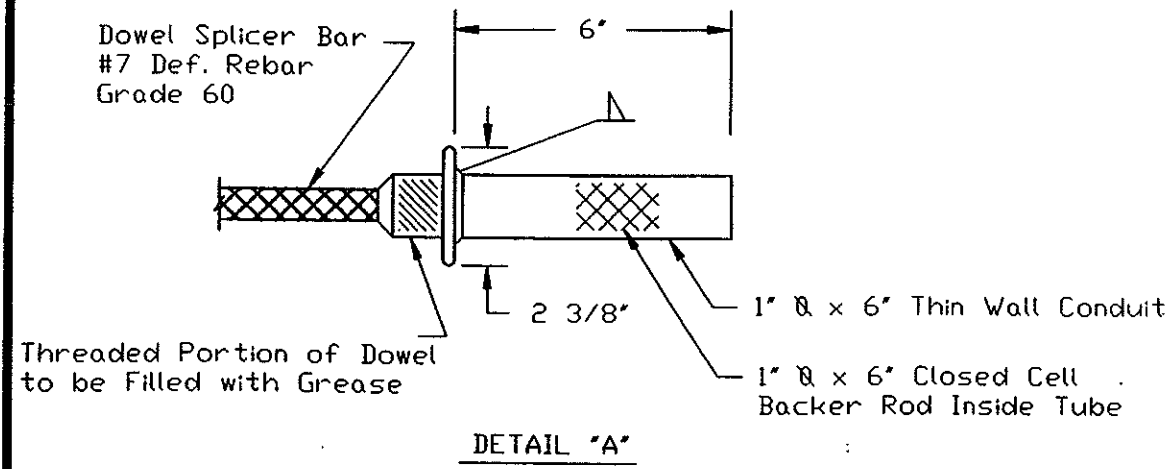
TYPE OF JOINT	PVT. THICKNESS	# 3 BAR						# 4 BAR						# 5 BAR																	
		GRADE 40			GRADE 60			GRADE 40			GRADE 60			GRADE 40			GRADE 60														
		24"	30"	36"	24"	30"	36"	24"	30"	36"	24"	30"	36"	24"	30"	36"	24"	30"	36"												
8"	WARP	48	40	24	20	15	48	48	35	29	22	42	35	26	19	48	48	39	28	26	48	48	41	30	28	48	48	48	44	41	
	BUTT	48	26	19	16	13	46	38	23	20	16	28	24	17	13	12	44	38	27	20	18	46	38	28	21	19	48	48	43	32	29
9"	WARP	48	35	21	18	13	48	48	32	26	19	37	31	23	17	16	48	47	35	25	23	48	48	36	26	24	48	48	48	40	36
	BUTT	40	24	17	15	12	42	34	22	18	14	26	22	16	12	11	40	34	25	18	16	42	35	26	19	17	48	48	39	29	26
10"	WARP	47	31	19	16	12	48	47	28	24	18	34	28	22	16	14	48	42	32	23	20	48	44	33	24	22	48	48	48	36	32
	BUTT	36	22	16	14	11	38	30	20	17	13	24	20	16	11	10	36	30	23	16	14	38	31	24	17	16	48	47	35	26	23
11"	WARP	43	29	17	14	11	48	43	25	21	16	31	25	20	15	13	47	38	29	21	19	48	40	30	22	20	48	48	44	32	30
	BUTT	33	20	15	13	10	34	27	19	15	12	22	18	14	11	9	34	27	21	15	14	34	29	21	16	14	48	43	31	23	21
12"	WARP	40	26	16	13	10	48	39	24	19	15	28	23	18	13	12	42	35	27	19	18	44	36	28	20	18	48	48	41	30	28
	BUTT	29	19	14	12	9	31	25	18	14	11	20	16	13	9	9	30	25	19	14	13	31	26	20	14	13	47	39	29	21	20

48 in maximum spacing
Warp joint: a sawed joint or a construction joint with a keyway.
Butt joint: a construction joint with no keyway
PAY ITEM:
LONGITUDINAL JOINT SILICONE SEAL- L.F.T.

11-1-92		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVISIONS		
DATE	CHANGE	APPROVED: DESIGN ENGINEER
12-8-95	JOINT DEPTH	

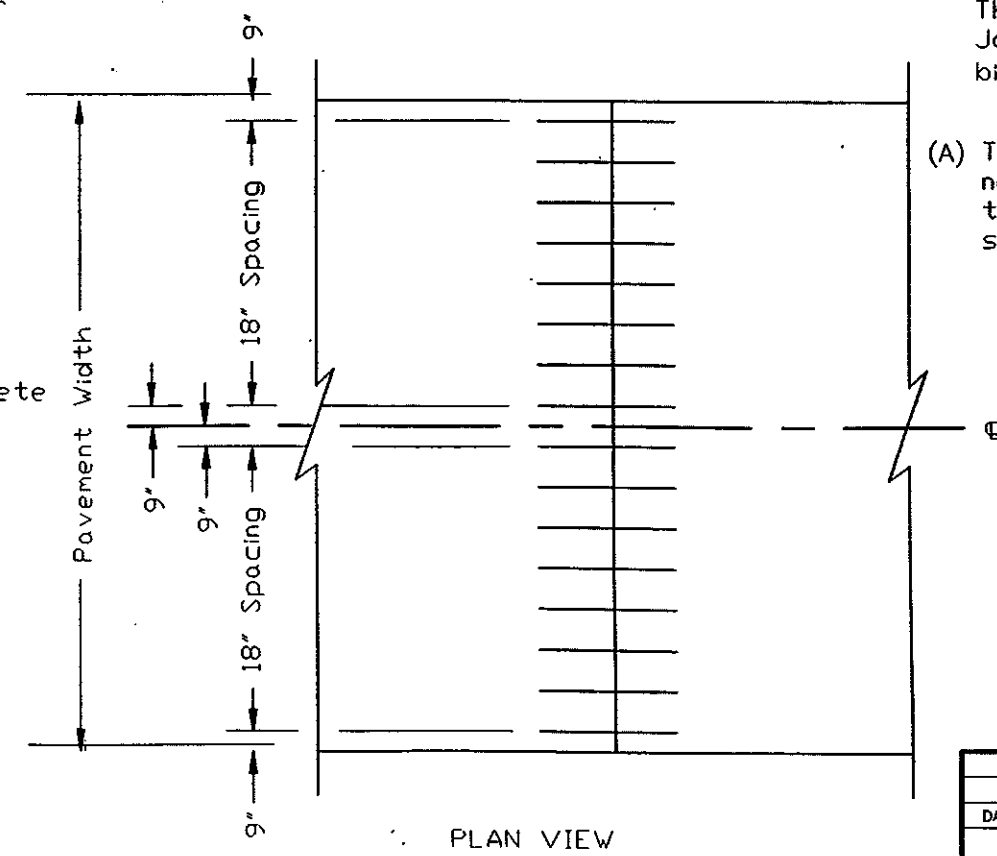
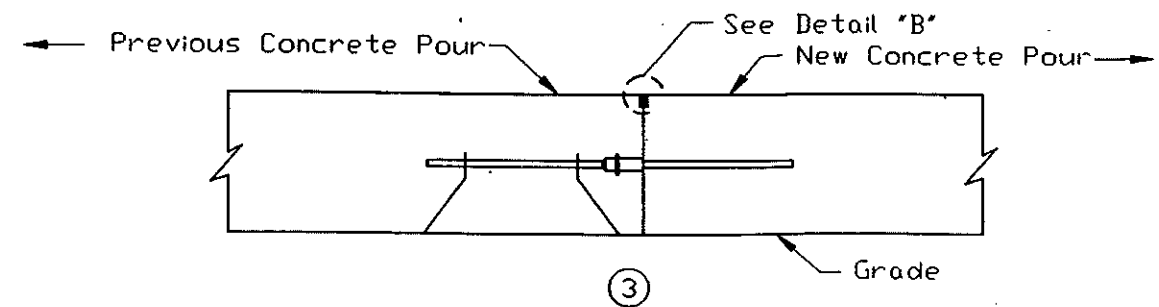
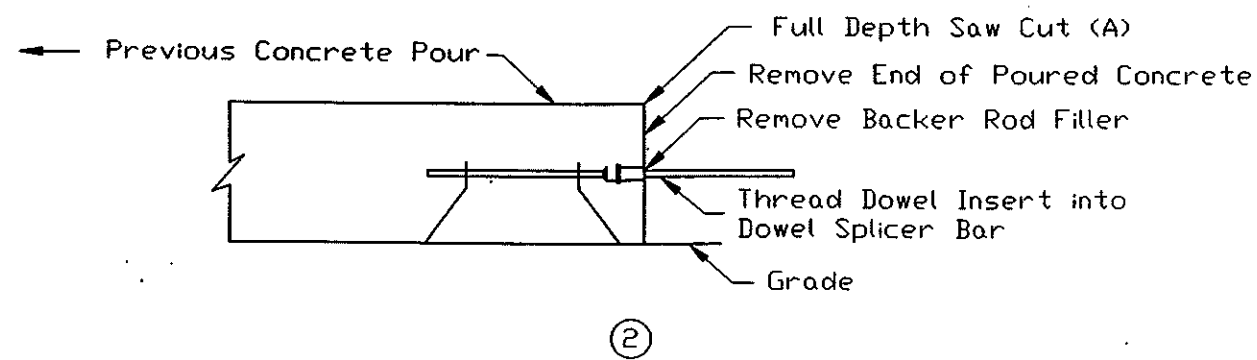
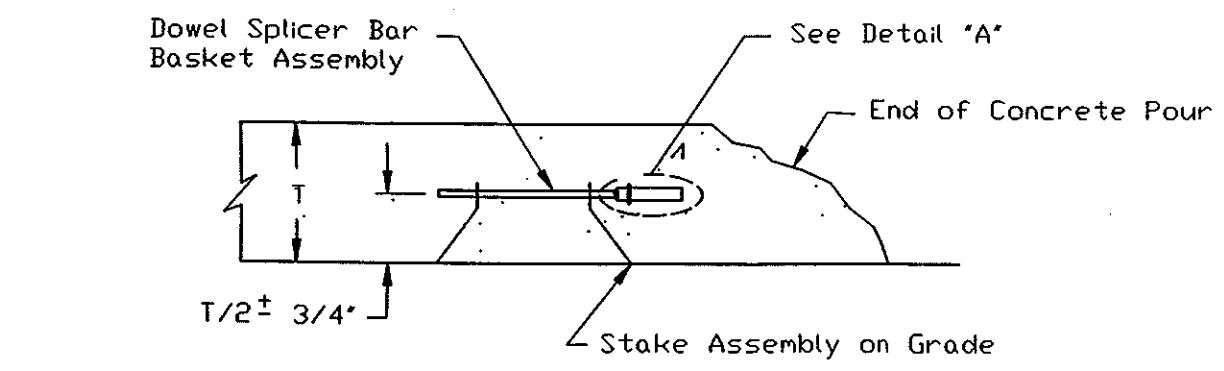
TRANSVERSE CONSTRUCTION JOINT

D-550-5



Notes:
Construction Joints Shall Be Sawed to a Depth of 1" & a Width of 1/4" to 3/8" & Sealed.
The Transverse Construction Joint shall be included in price bid for P.C.C. Pavement

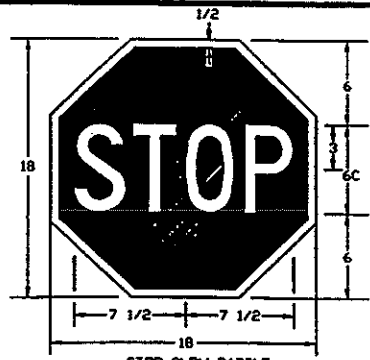
(A) The contractor shall not saturate the subgrade during the sawing operation



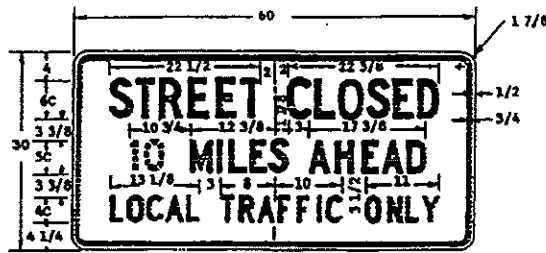
11-1-92	
REVISIONS	
DATE	CHANGE

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
David K. Johnson
APPROVED: DESIGN ENGINEER

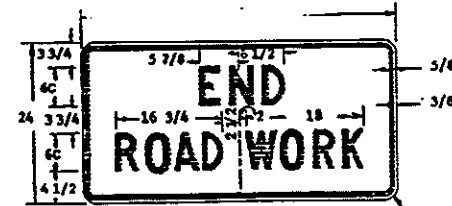
CONSTRUCTION SIGN DETAILS



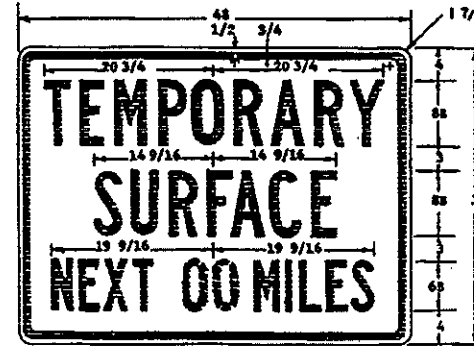
STOP-SLOW PADDLE
RED & WHITE
FLAGPERSON PADDLE



R11-3c-60
BLACK & WHITE



G20-2a-48
BLACK & ORANGE



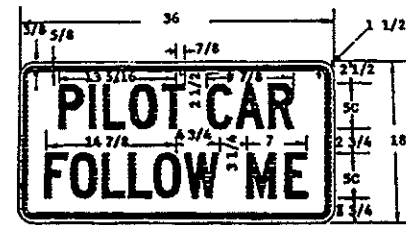
G20-8-48
BLACK & ORANGE



R11-2-48
BLACK & WHITE

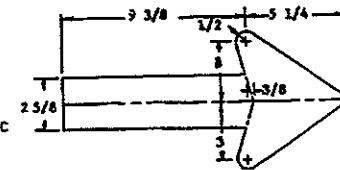


R11-4a-60
BLACK & WHITE

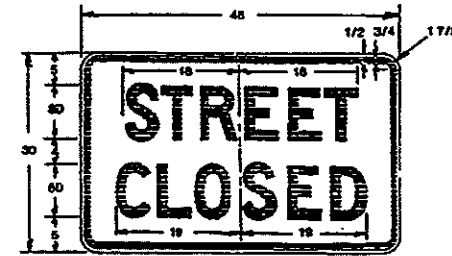


G20-4-36
BLACK & ORANGE

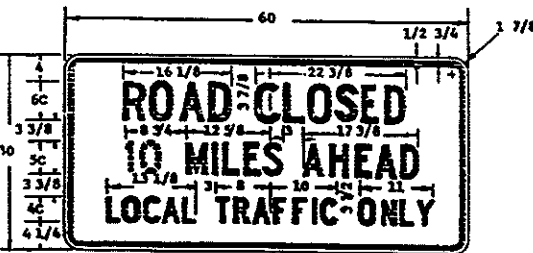
PILOT CAR SIGN SHALL BE MOUNTED ON REAR OF A VEHICLE USED FOR GUIDING CONTROLLED ONE-WAY TRAFFIC THROUGH A CONSTRUCTION AREA.



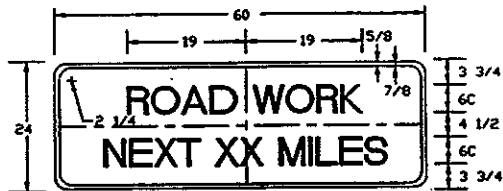
ARROW DETAIL FOR SIGN NOS.
G20-50a-72 & G20-52a-72



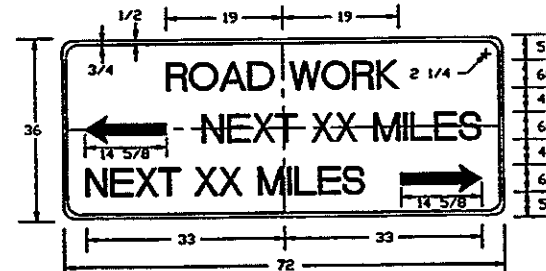
R11-2A-48
BLACK & WHITE



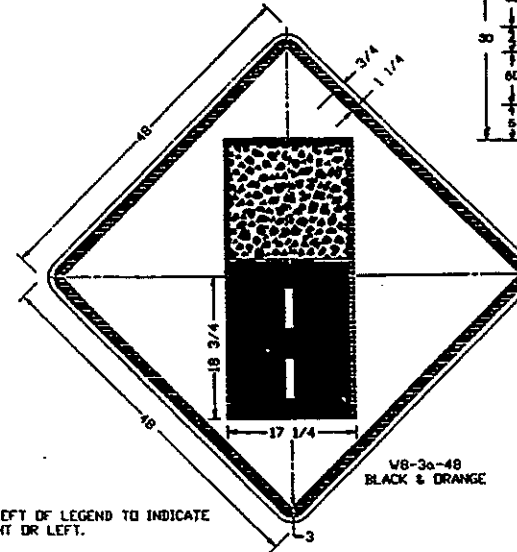
R11-3a-60
BLACK & WHITE



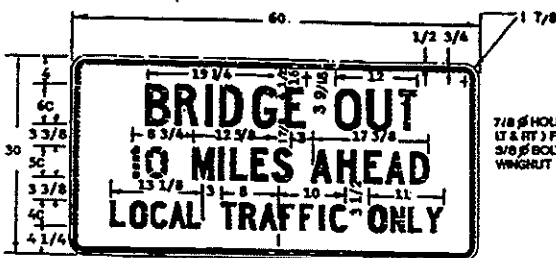
G20-1a-60
BLACK & ORANGE



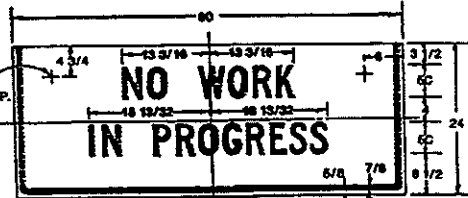
G20-50a-72
BLACK & ORANGE



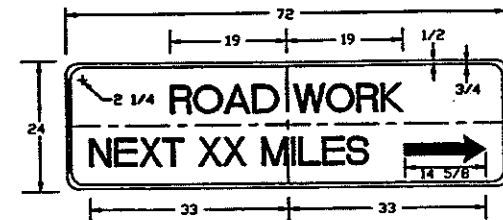
W8-3a-48
BLACK & ORANGE



R11-3b-60
BLACK & WHITE

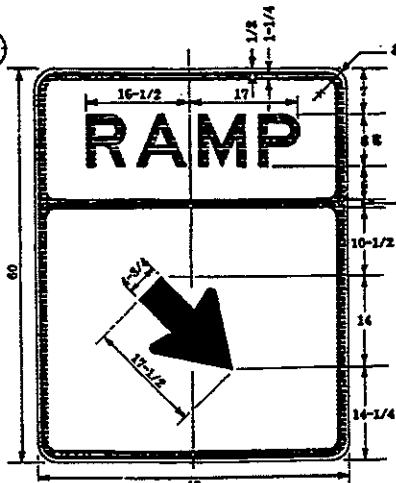


G20-1b-60
DOUBLE FACE SIGN
LEGEND: BLACK (NON-REFL.)
BACKGROUND: ORANGE

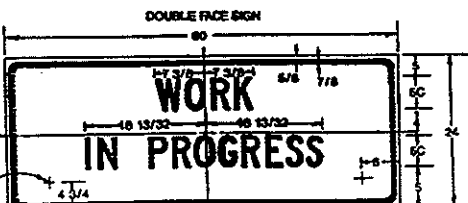


G20-52a-72
BLACK & ORANGE

ARROW MAY BE RIGHT OR LEFT OF LEGEND TO INDICATE CONSTRUCTION TO THE RIGHT OR LEFT.



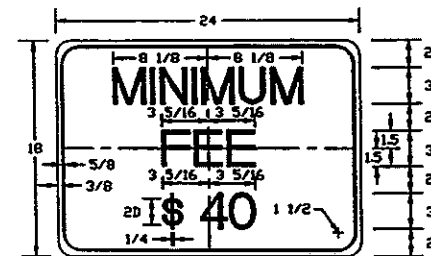
W13-4-48
BLACK & ORANGE



G20-1c-60
DOUBLE FACE SIGN
LEGEND: BLACK (NON-REFL.)
BACKGROUND: ORANGE



G20-54-48
BLACK & ORANGE

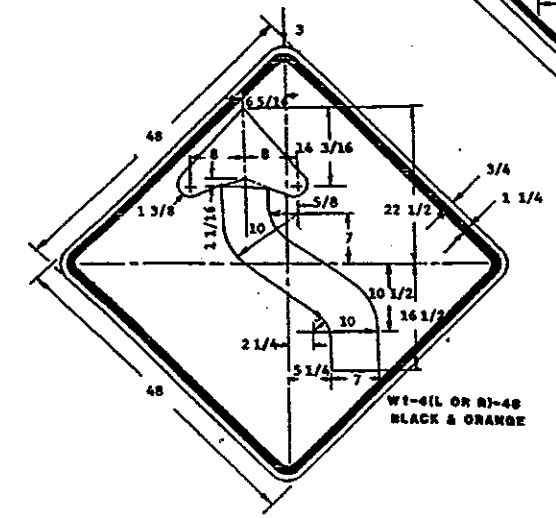
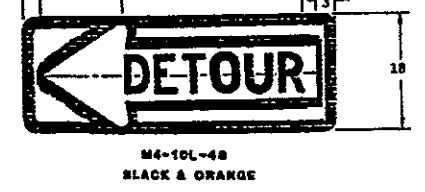
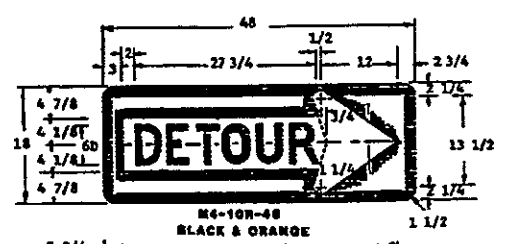
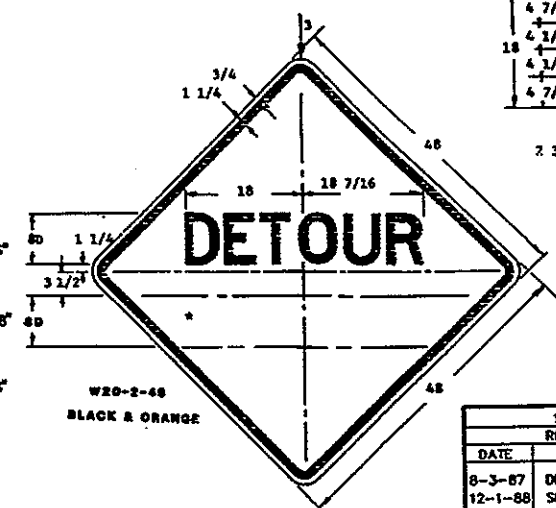
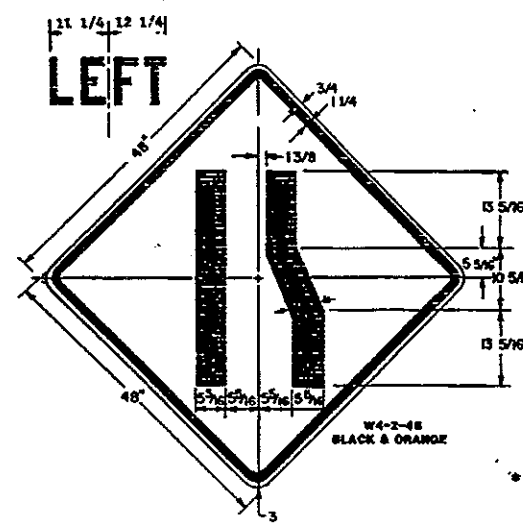
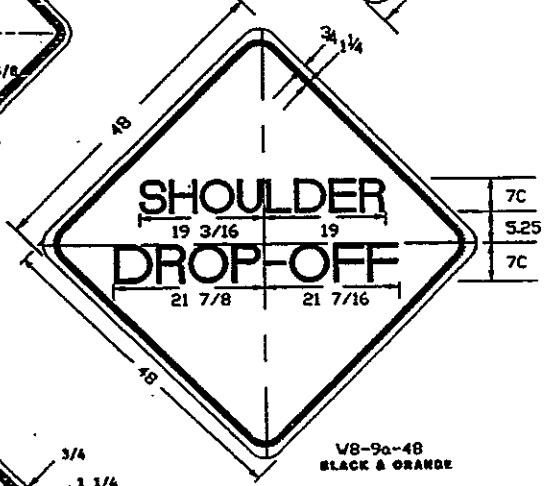
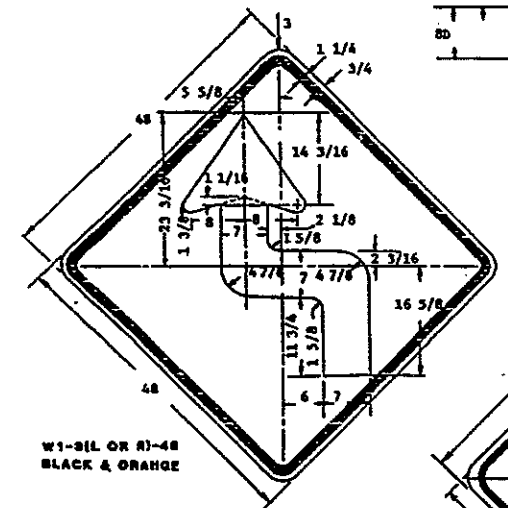
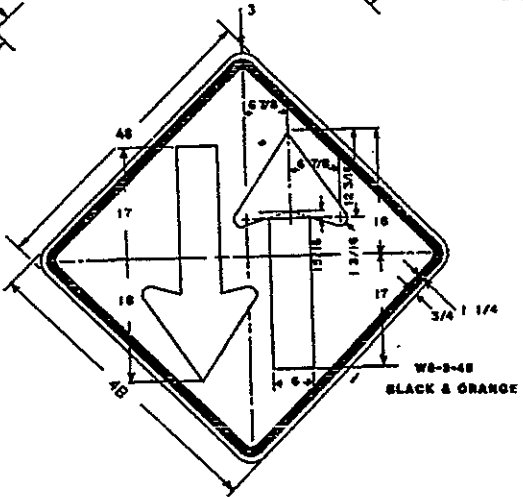
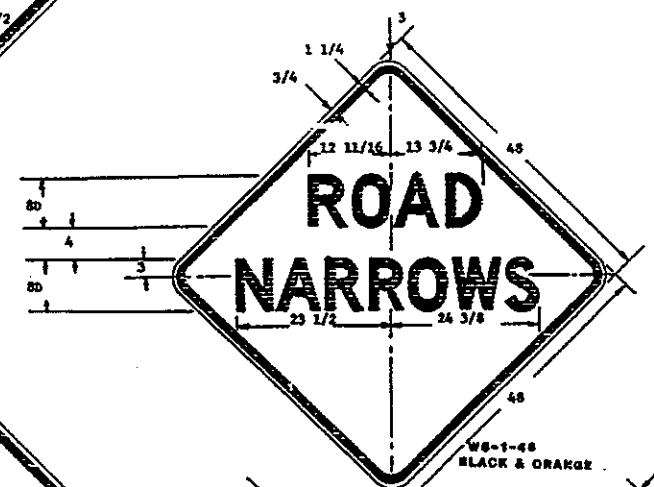
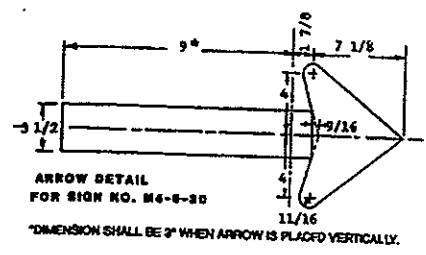
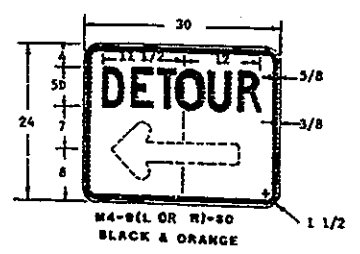
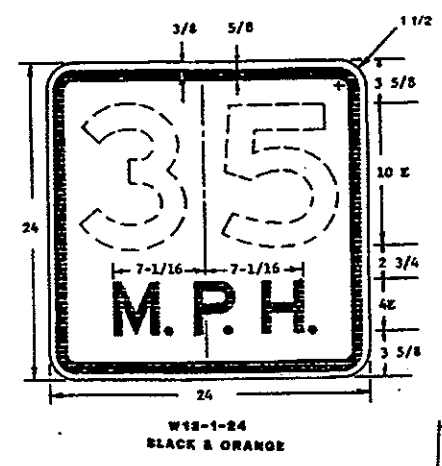
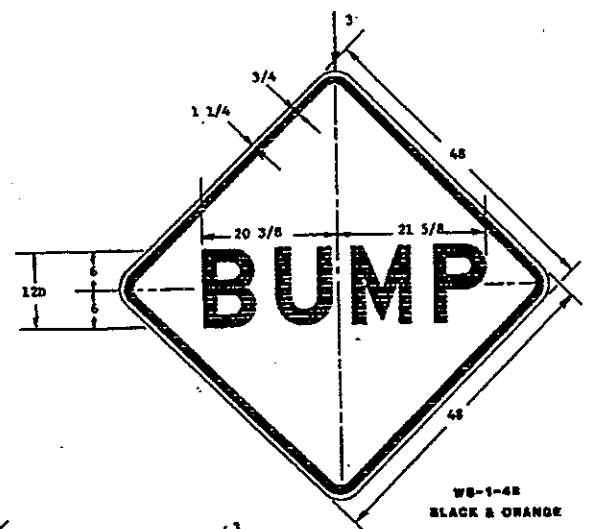
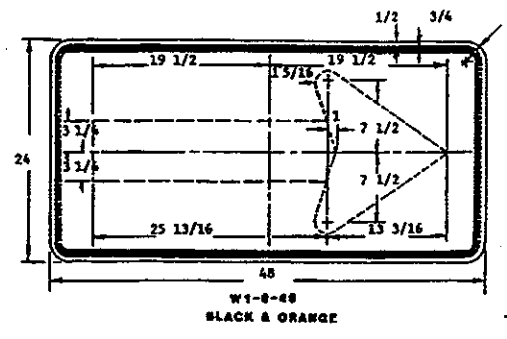
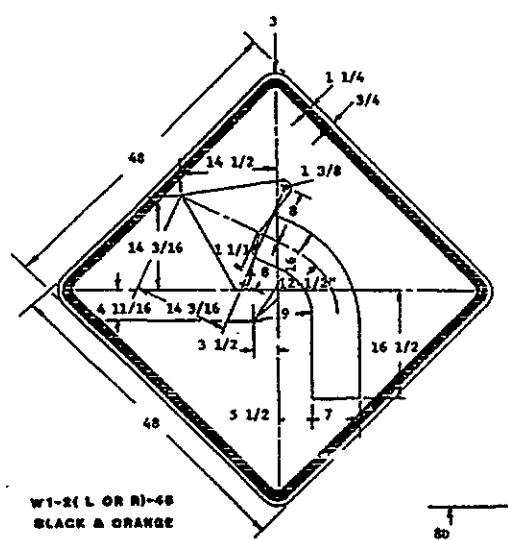


R2-1a-24
BLACK & WHITE

10-1-85 REVISIONS	
DATE	CHANGE
5-1-92	GENERAL REVISIONS
7-26-95	ADD SIGNS G20-1a, G20-50a, & R2-1a
3-4-96	REMOVE G20-2-60

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED *Frank C. Lee*
DISTRICT ENGINEER

CONSTRUCTION SIGN DETAILS

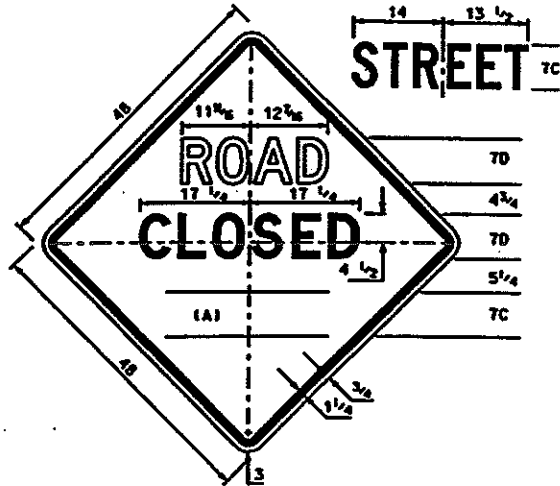


DATE	REVISIONS	CHANGE
8-3-87	DETOUR NO.	
12-1-88	SHOULDER DROP OFF	
5-1-92	GENERAL REVISIONS	
2-3-95	WB-9a-48	
3-4-96	REMOVE W20-1-48	

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *David K. Lee*
DESIGN ENGINEER

* SEE TABLE ON STANDARD D-704-12 FOR MESSAGES AND DIMENSIONS.

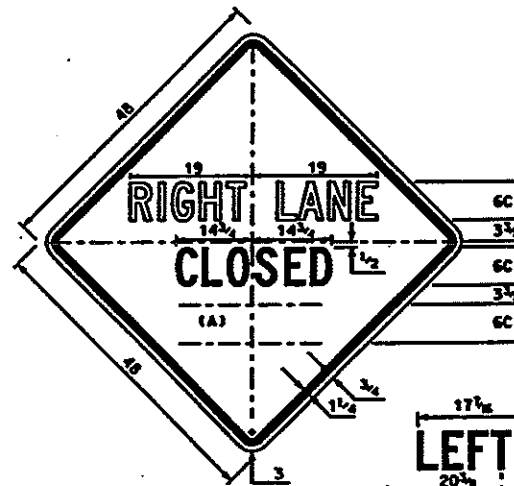
CONSTRUCTION SIGN DETAIL



W20-3-48
Black & orange



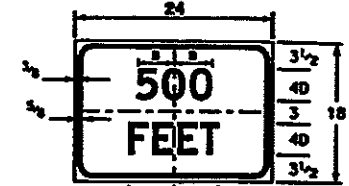
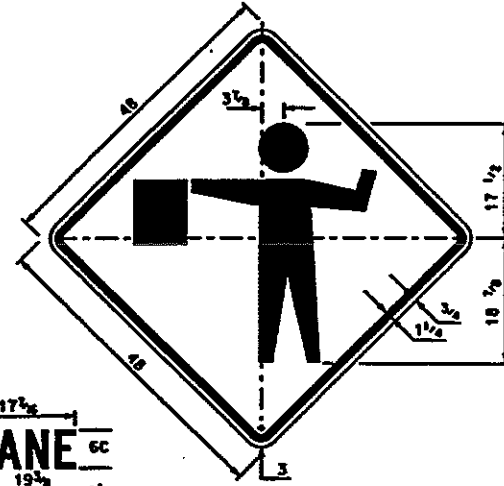
W20-4-48
Black & orange



W20-5-48
Black & orange



W20-7a-48
Black & orange



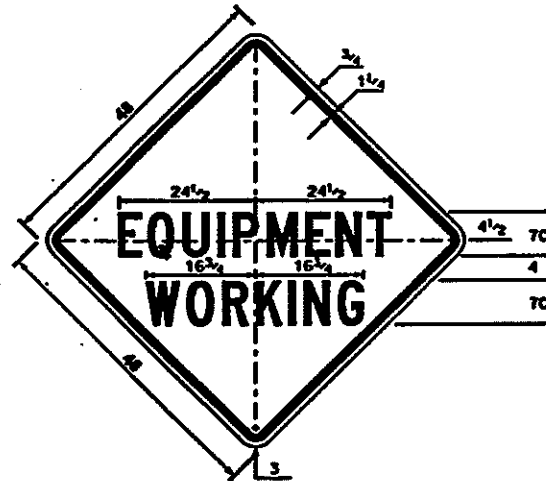
W20-7k-24
Black & orange

SIGN	DIMENSION B (INCHES)
500'	4 11/16
1000'	5 1/2
1500'	5 5/16

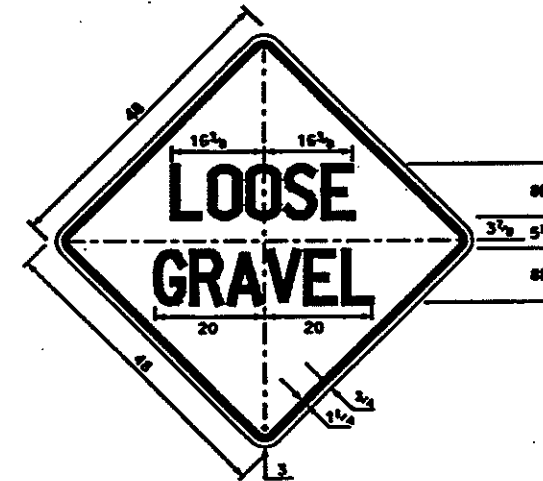
For use with
W20-7a-48 &
W21-1a-48



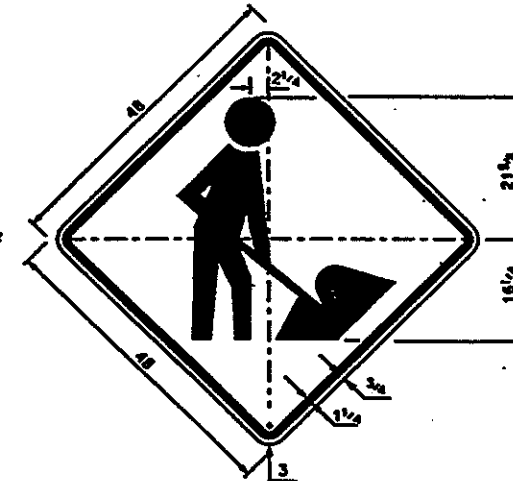
W20-8-48
Black & orange



W20-51-48
Black & orange



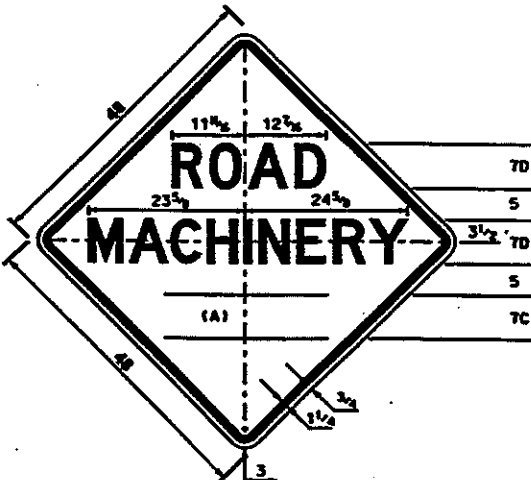
W8-7-48
Black & orange



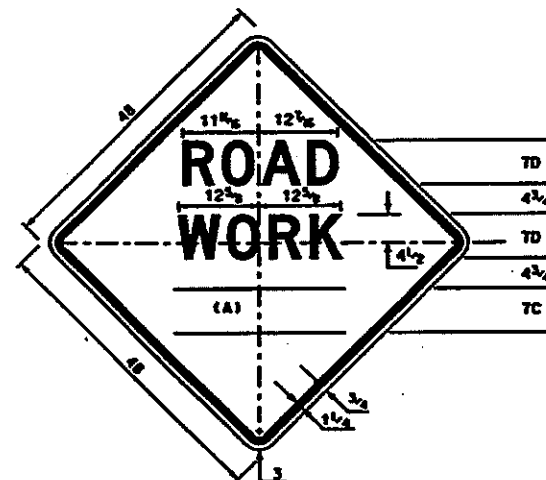
W21-1a-48
Black & orange



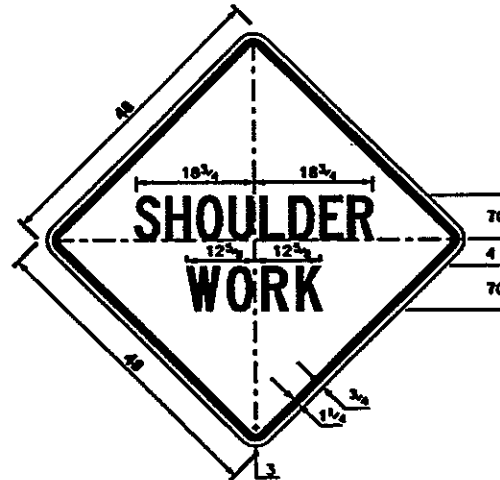
W21-2-48
Black & orange



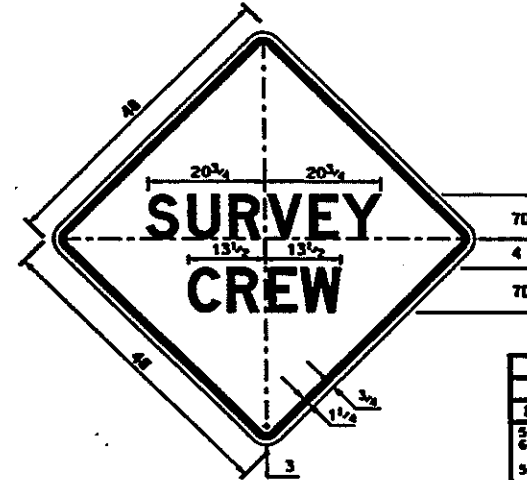
W21-3-48
Black & orange



W21-4-48
Black & orange



W21-5-48
Black & orange



W21-6-48
Black & orange



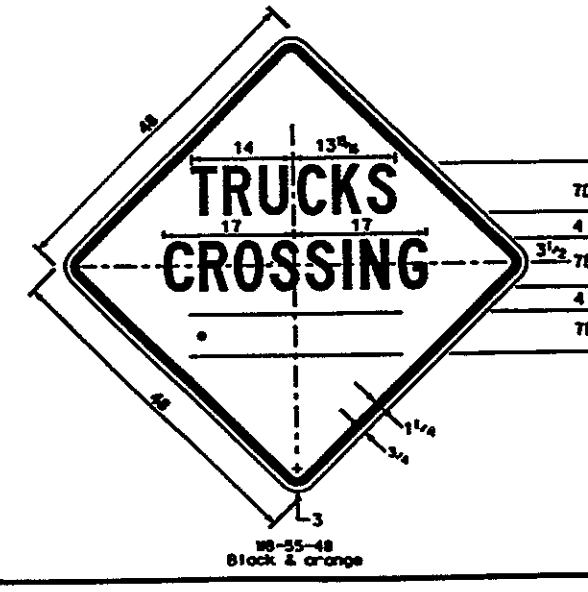
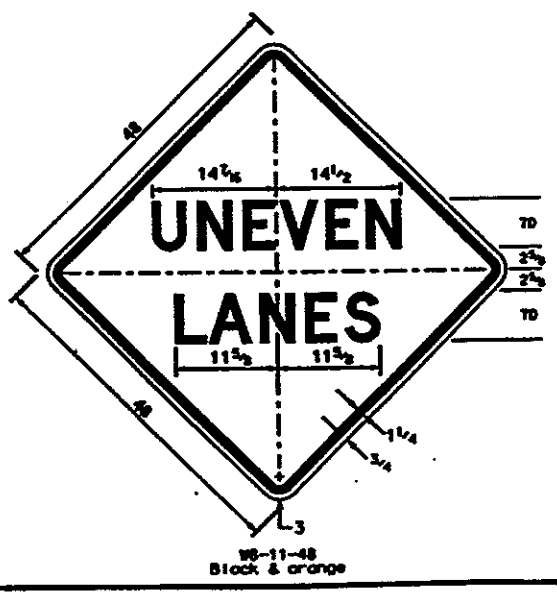
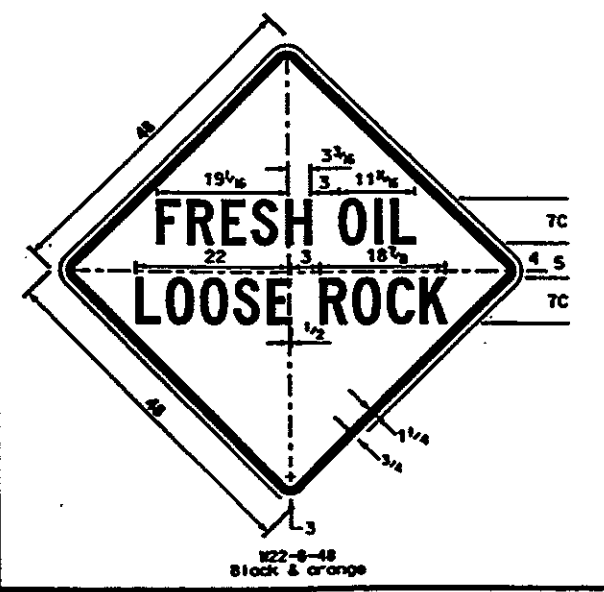
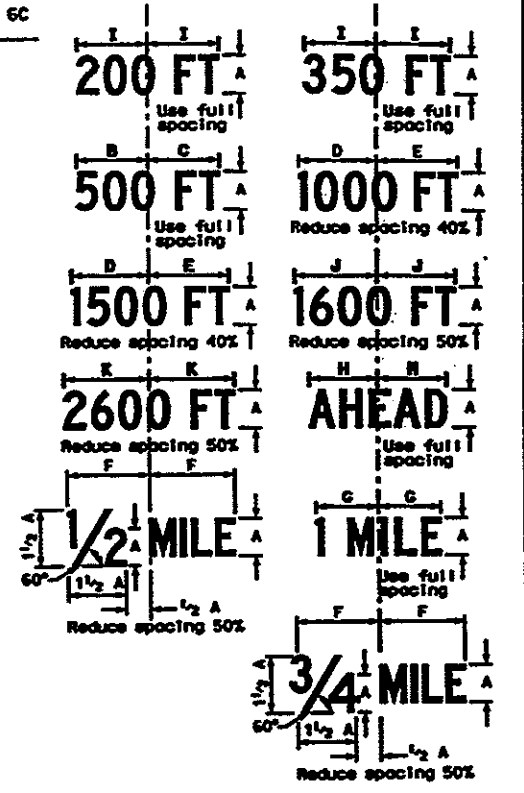
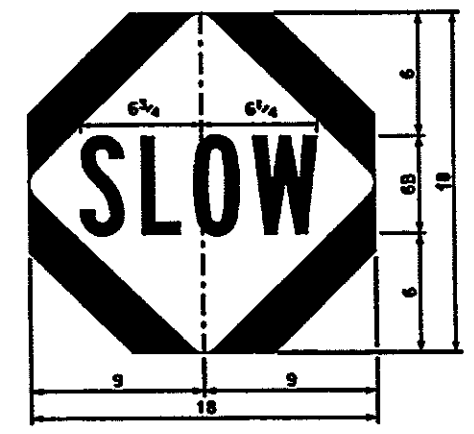
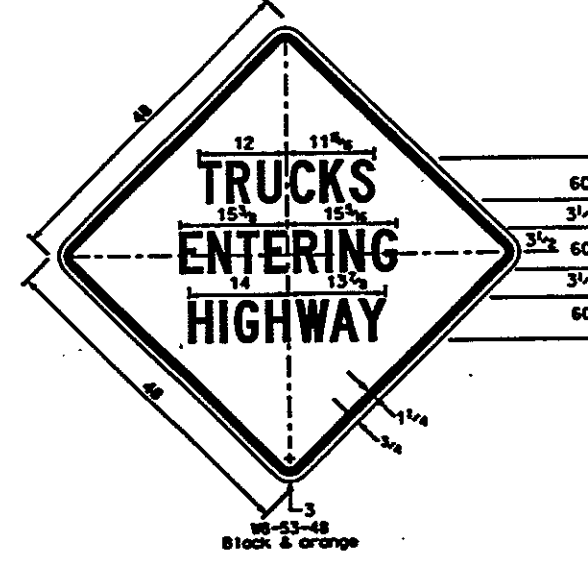
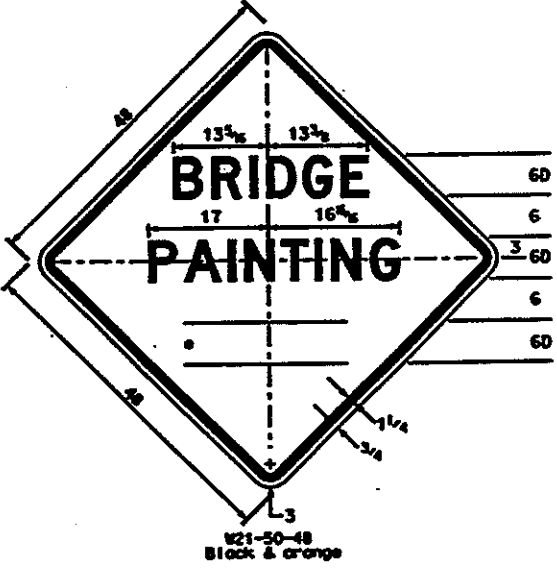
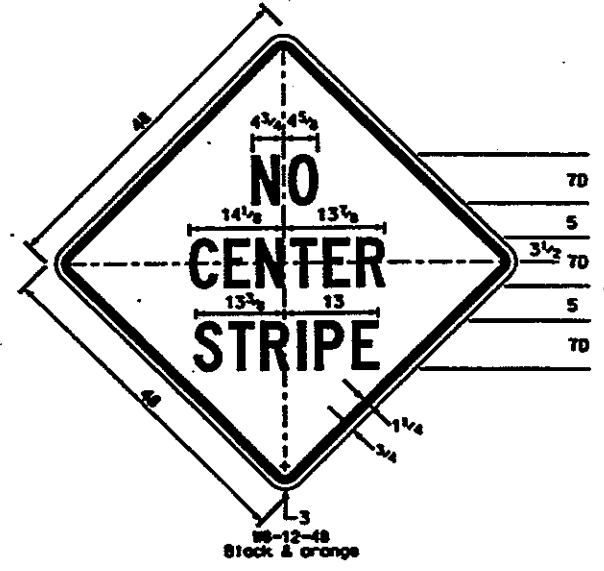
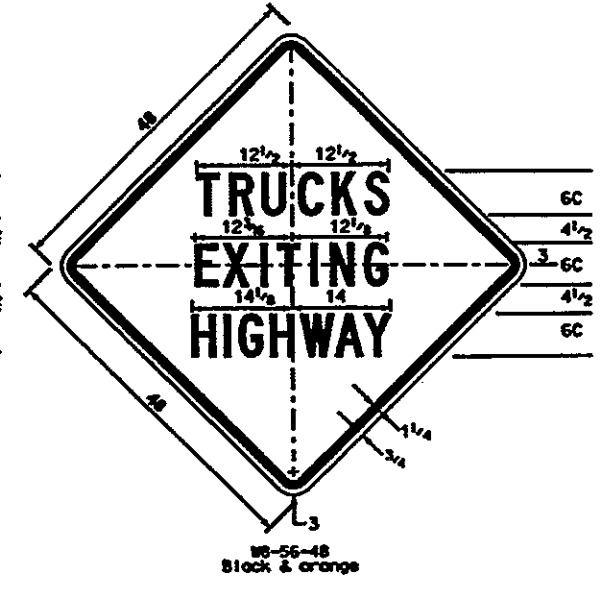
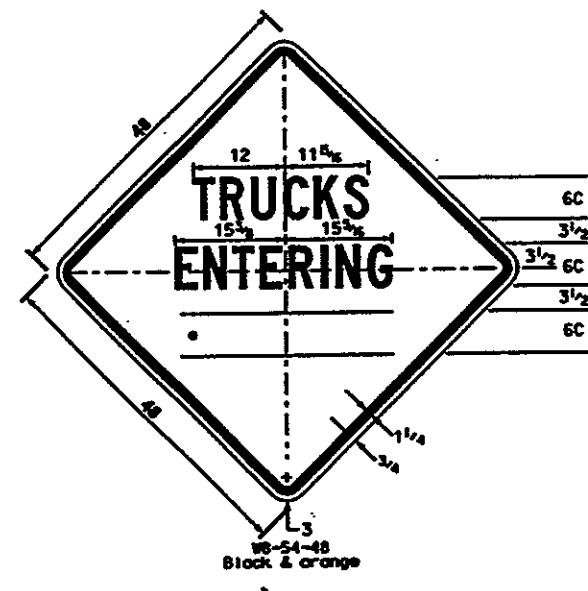
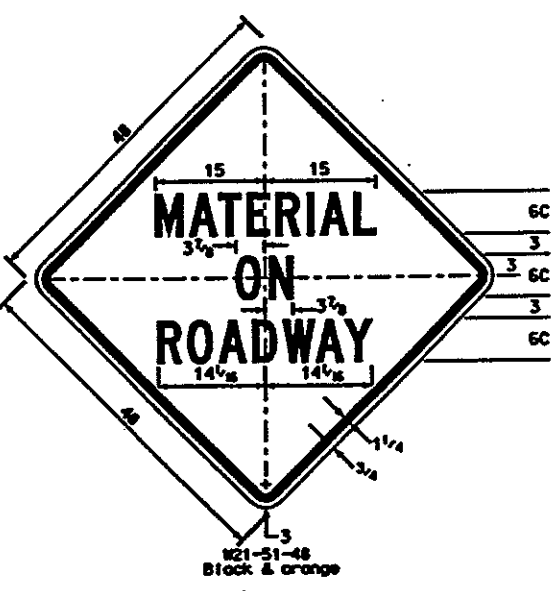
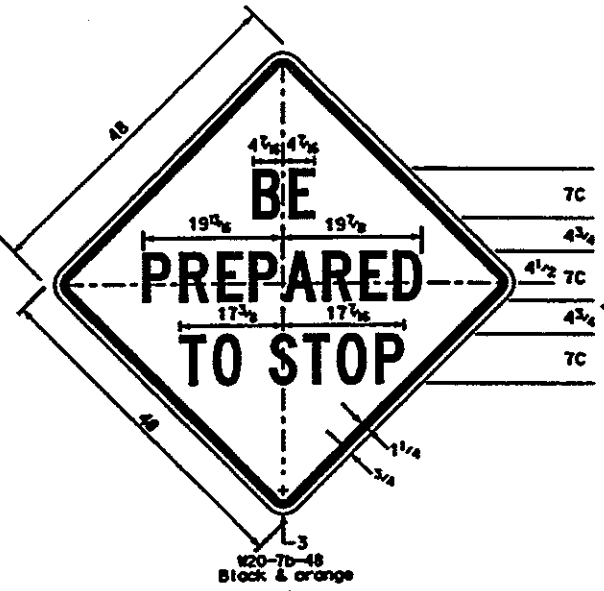
W20-52-48
Black & orange

NOTES:
(A) See table on standard D-704-12
for messages and dimensions.
All dimensions are in inches

10-1-86	
REVISIONS	
DATE	CHANGE
2-1-82	General revisions
6-9-85	Chg 70 to 70 (bug W20-3, W21-3 & W21-4)
5-26-98	Added W8-7-48

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *K. H. [Signature]*
DESIGN ENGINEER

CONSTRUCTION SIGN DETAIL



* DIMENSIONS (INCHES)

A	B	C	D	E	F	G	H	I	J	K
4C	6 3/8	7	7 1/2	8	8 3/8	6 1/8	7	8 3/8	9 1/8	9 3/8
5C	8 3/8	8 3/8	9 3/8	10	10 3/8	7 3/8	8 3/8	10 3/8	11 3/8	12 3/8
6C	10 3/8	10 3/8	11 3/8	12	12 3/8	9 3/8	10 3/8	12 3/8	13 3/8	14 3/8
7C	12	12 3/8	13 3/8	14	14 3/8	10 3/8	12 3/8	14 3/8	15	15 3/8
8C	13 3/8	14	15	16	16 3/8	12 3/8	14	16 3/8	18 3/8	19 3/8
4D	8 1/8	8 3/8	8 1/2	9	9	7 3/8	8 3/8	9 3/8	10 3/8	11 3/8
5D	10 3/8	10 3/8	11 3/8	11 1/2	11 1/2	9 1/2	10 3/8	12 3/8	13 3/8	14 3/8
6D	12 3/8	12 3/8	12 3/8	13 1/2	13 1/2	11 3/8	13 3/8	14 3/8	14 3/8	15 1/2
7D	14 1/8	15 1/8	14 3/8	15 3/8	15 3/8	13 3/8	15 1/2	15 3/8	15 3/8	16 3/8
8D	16 1/8	17 1/8	17	18	18	14 3/8	17 3/8	19 3/8	17 3/8	19 3/8

Standard signs that are shown in the construction sign and barricade location details shall be fabricated in the shape, color, and dimensions as shown in the standard signs layout booklet.

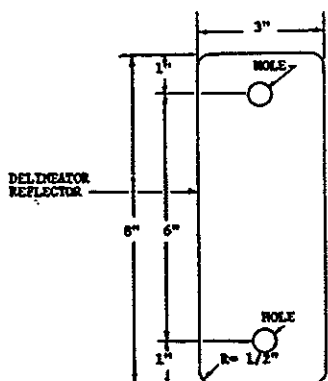
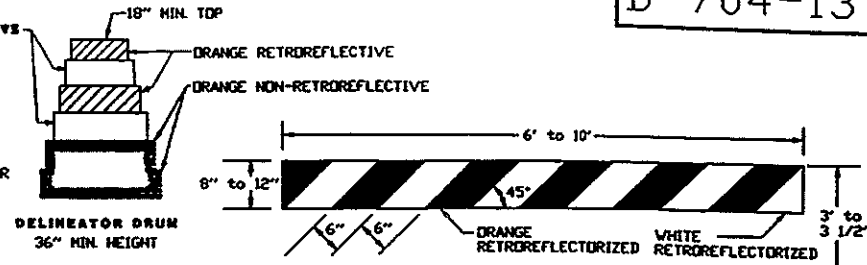
10-1-86
REVISIONS

DATE	CHANGE
2-1-86	Uneven pavement
5-1-86	General revisions
1-24-86	W-11-48
2-3-86	W-11-48
6-1-86	General revisions
5-12-86	Added 1/2 mile
3-26-86	Added W-26-48

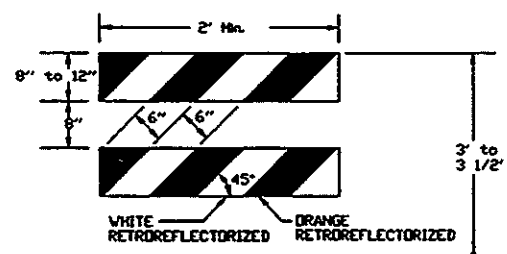
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *[Signature]*
DESIGN ENGINEER

BARRICADE DETAILS

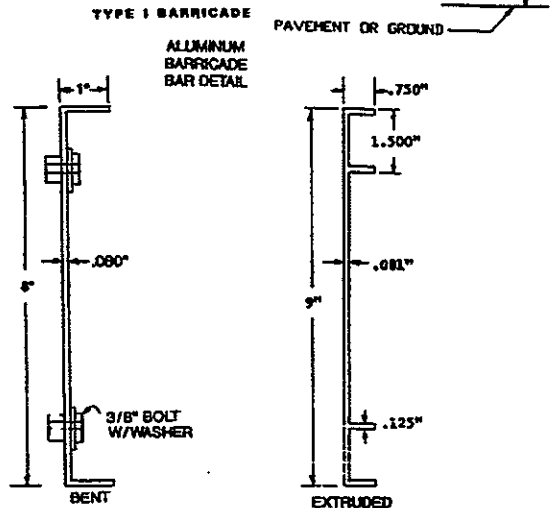
DELINEATOR DRUMS
 THE MARKINGS ON DRUMS SHALL BE ORANGE AND WHITE STRIPES 4 TO 6 INCHES WIDE. THERE SHALL BE AT LEAST TWO ORANGE AND TWO WHITE STRIPES. WHERE DRUMS HAVE RIBS OR INDENTATIONS, THERE SHALL BE NO RETRO-REFLECTORIZED SHEETING IN THIS AREA. THIS SPACE SHALL BE NO MORE THAN 2 INCHES WIDE. THE DRUM SURFACE SHALL BE PREPARED AS RECOMMENDED BY THE SHEETING MANUFACTURER BEFORE RETROREFLECTIVE SHEETING IS APPLIED.



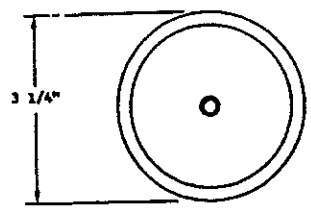
3" x 8" - 18 GAUGE GALVANIZED STEEL SHEETS OR .080" ALUMINUM PLATE WITH WHITE RETROREFLECTIVE SHEETING (TYPE 3A OR 3B) AS SPECIFIED IN SECTION 694 OF THE STANDARD SPECIFICATIONS.



TYPE I BARRICADE

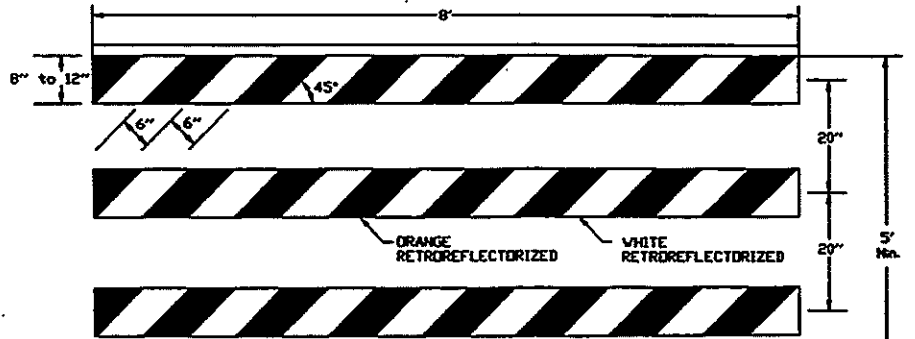


ALUMINUM BARRICADE BAR DETAIL

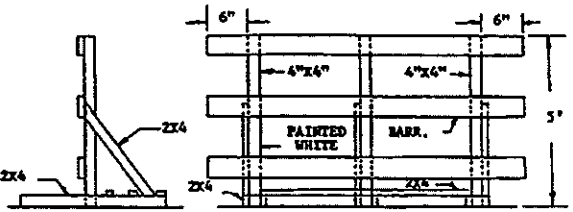


ACRYLIC PLASTIC REFLECTOR DELINEATOR REFLECTOR SHALL MEET THE REQUIREMENTS OF SECTION 694.

NOTE: VERTICAL PANELS USED ON THE EXPRESSWAYS OR OTHER HIGH SPEED ROADWAYS SHALL BE 12" BY 24".

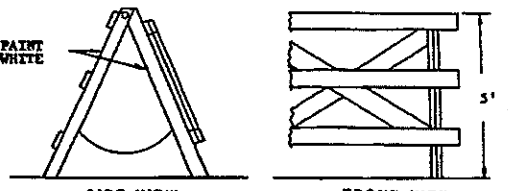


TYPE II BARRICADE

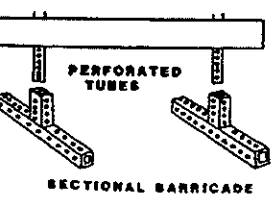


MOVABLE BARRICADE ASSEMBLY

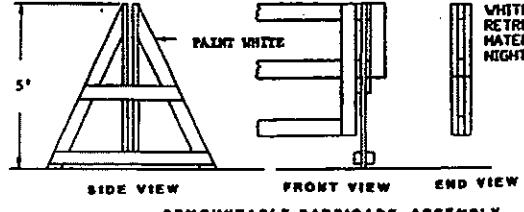
NOTE: EACH MOVABLE BARRICADE SHALL BE WEIGHED DOWN BY A SUFFICIENT NUMBER OF SAND BAGS SO THAT IT WILL NOT BE BLOWN OVER BY THE WIND UNLESS THE MOVABLE SUPPORTING STRUCTURE IS CONSTRUCTED IN SUCH A MANNER THAT THE WIND CANNOT BLOW IT OVER. WEIGHT USED SHALL BE APPROVED BY THE ENGINEER IN THE FIELD. THE STRIPES SHALL SLANT DOWNWARD TOWARD THE SIDE WHICH TRAFFIC IS TO PASS. BARRICADES USED AT THE BEGINNING OF A PROJECT SHALL FACE TRAFFIC ENTERING THAT PROJECT.



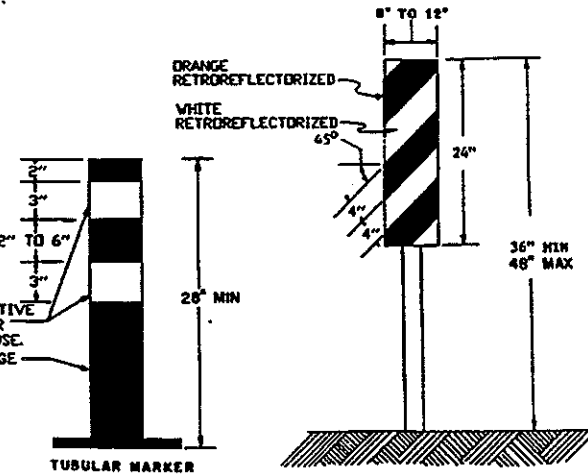
HINGED BARRICADE ASSEMBLY



SECTIONAL BARRICADE



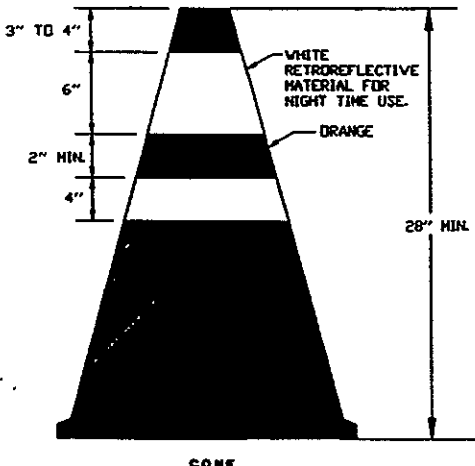
DEMOUNTABLE BARRICADE ASSEMBLY



TUBULAR MARKER

VERTICAL PANEL

(RETROREFLECTIVE SHEETING SHALL BE PLACED ON BOTH SIDES)



CONE

BARRICADES: NUMBER OF RETROREFLECTORIZED RAIL FACES

	TYPE I	TYPE II	TYPE III
Direction	2 (One Each)	4 (Two Each)	6 (Facing in two Directions)

BARRICADE RAIL MATERIAL MAY BE 1" NOMINAL THICKNESS STANDARD LUMBER OR 3/4" PLYWOOD AND PREPARED AS RECOMMENDED BY THE SHEETING MANUFACTURER BEFORE RETROREFLECTIVE SHEETING IS APPLIED.

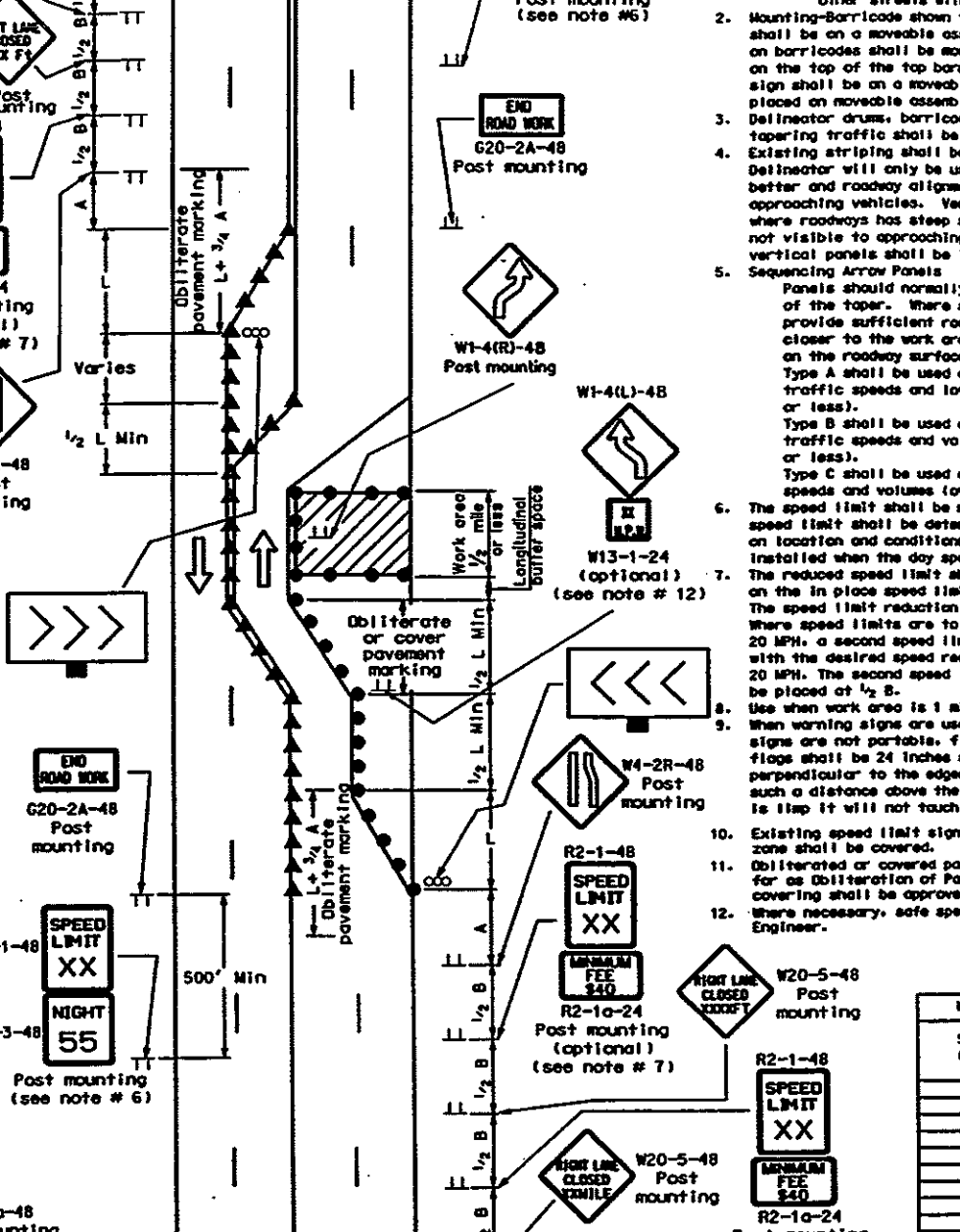
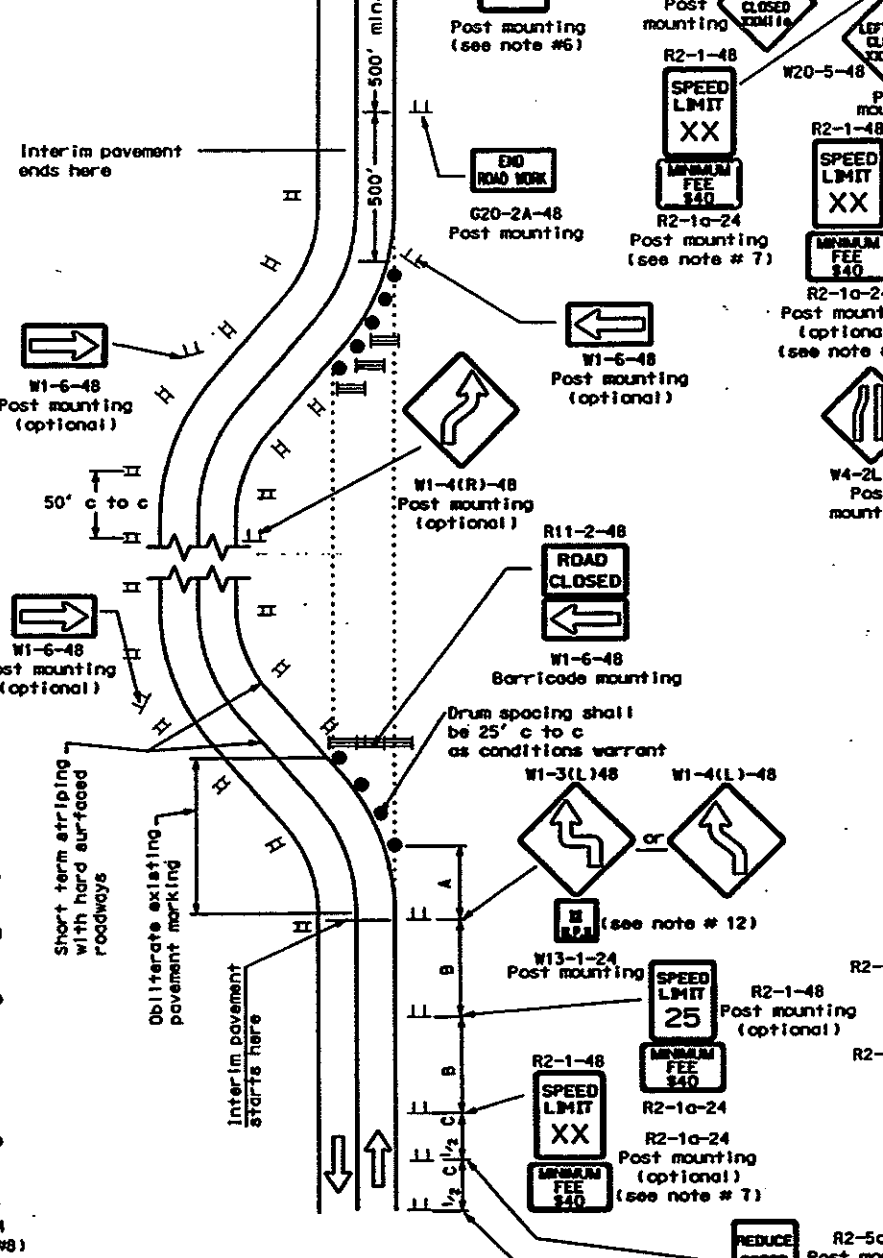
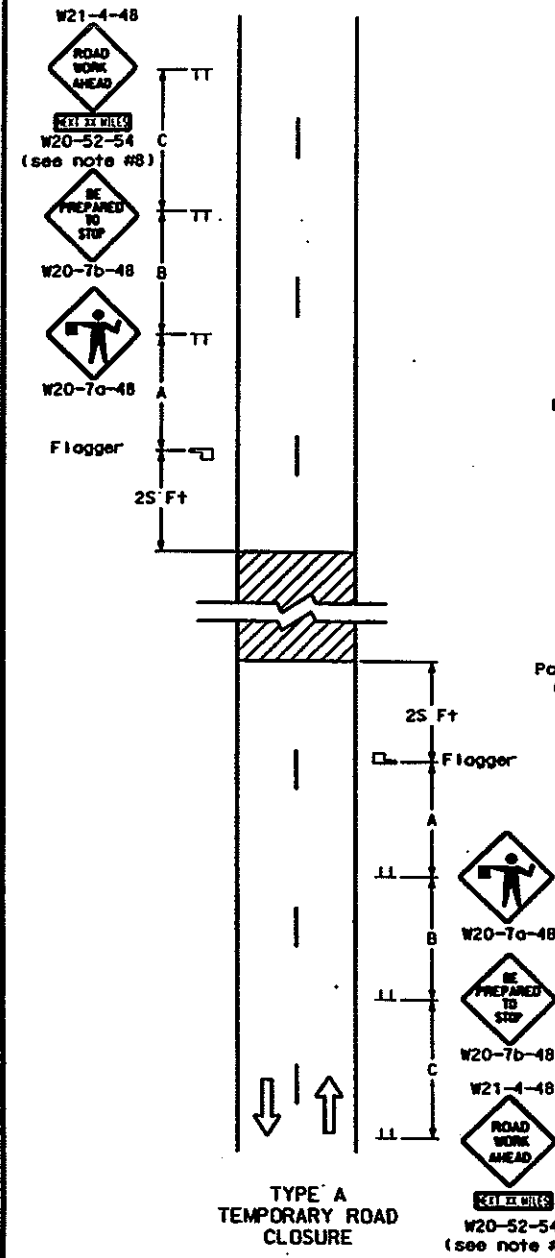
10-1-86 REVISIONS	
DATE	CHANGE
8-3-87	TYPE SHEETING
10-1-87	DELINEATOR DRUM NOTE
6-9-88	BARRICADES TYPE II
5-1-92	GENERAL REVISIONS
6-10-93	GENERAL REVISIONS
9-23-93	VERTICAL PANEL
6-9-95	RETROREFLECTIVE SHEETING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
 APPROVED *David K. Lee*
 DESIGN ENGINEER

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs (ft)		
	A	B	C
Urban - Low Speed (less than 40 mph)	200	200	200
Urban - High Speed (40 mph or more)	350	350	350
Rural	500	500	500
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500
Interstate/4-Lane Divided (Construction)	1000	1600	2600



KEY

—	Type I barricade	▨	Work area
—	Type II barricade	□	Flagger
—	Type III barricade	○	Sequencing arrow panel
—	Sign	—	Type A delineator or vertical panels back to back
●	Delineator drum		
▲	Cones		

Two lane highway where roadway is closed and detour is provided (signing shown for one direction of travel only). Use on bridge and culvert installation where closure is 1/2 mile or less. Longer than one day or outside of major work area.

4 lane undivided highway with half the roadway closed longer than one day or outside of major work area.

- Notes
- Variables:
 - S = Numerical value of speed limit or 85th percentile.
 - L = Minimum length of taper, or S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x 5/80 for urban, residential, and other streets with speeds of 40 mph or less.
 - Mounting-Barricade shown to be placed on roadway shall be on a moveable assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar. Intermediate sign shall be on a moveable assembly sign show to be placed on moveable assemblies.
 - Delineator drums, barricades or cones used for tapering traffic shall be spaced at the dimension "S". Existing striping shall be removed as required. Delineator will only be used when in slope is 4:1 or better and roadway alignment is visible to approaching vehicles. Vertical panels shall be used where roadways has steep slopes and alignment is not visible to approaching vehicles. Delineators and vertical panels shall be installed back to back.
 - Sequencing Arrow Panels:
 - Panel should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room, the panel should be moved closer to the work area so that it can be placed on the roadway surface.
 - Type A shall be used on roadways with slow moving traffic speeds and low volumes (25 mph & 750 ADT or less).
 - Type B shall be used on roadways with moderate traffic speeds and volumes (40 mph and 5000 ADT or less).
 - Type C shall be used on roadways with high traffic speeds and volumes (over 40 mph and 5000 ADT).
 - The speed limit shall be re-established. The exact speed limit shall be determined in the field, dependent on location and conditions. Sign R2-3-48 shall be installed when the day speed limit is 65 MPH.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction shall not exceed 20 MPH. Where speed limits are to be reduced more than 20 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 20 MPH. The second speed limit sign shall be placed at 1/2 S.
 - Use when work area is 1 mile or longer.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is flap it will not touch the sign.
 - Existing speed limit signs within a reduced speed zone shall be covered.
 - Obliterated or covered pavement marking shall be paid for as Obliteration of Pavement Marking. The covering shall be approved by the engineer.
 - Where necessary, safe speed to be determined by the Engineer.

Longitudinal Buffer Space

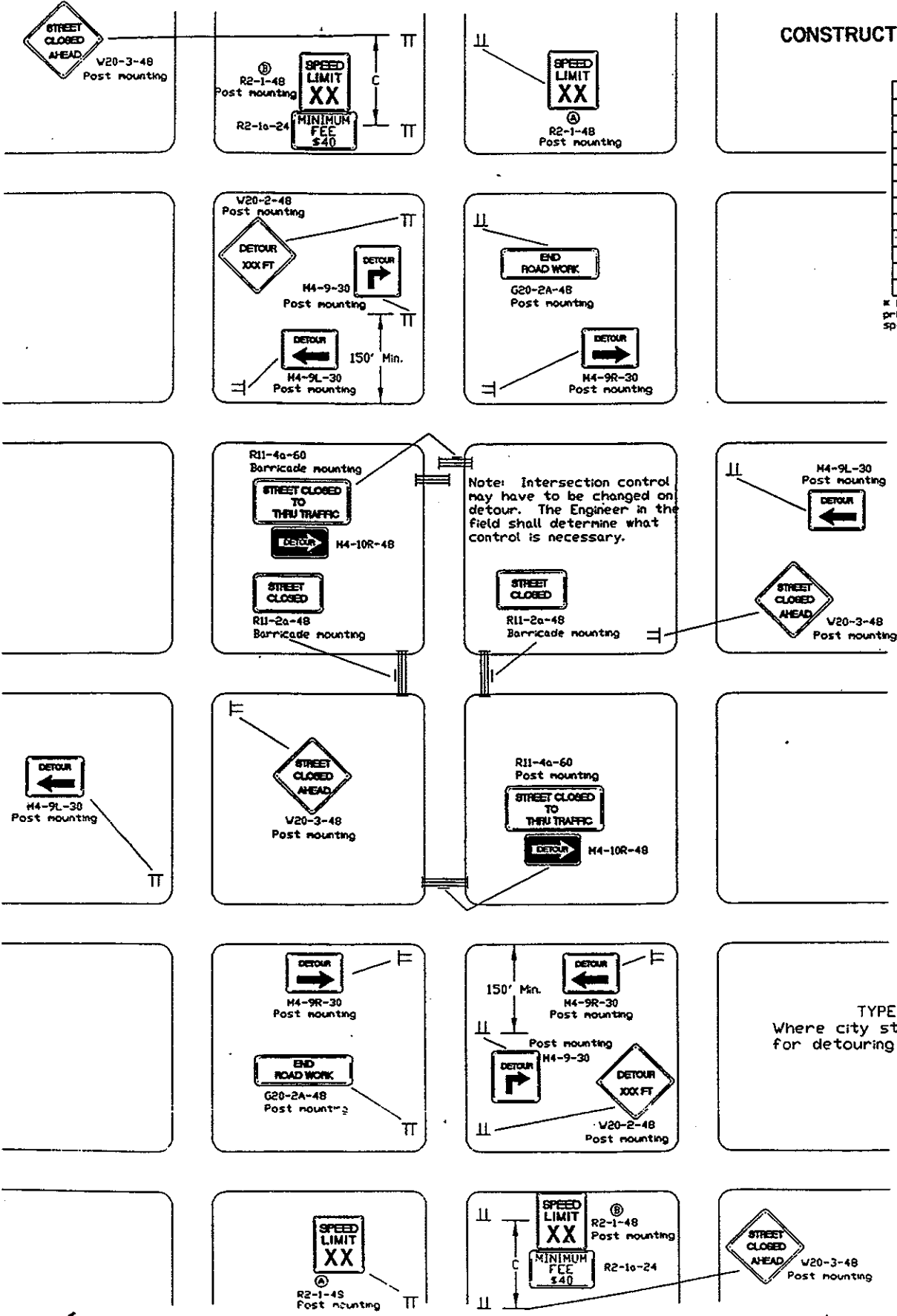
Speed (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
70	585

REVISIONS

DATE	CHANGE
6-28-85	General revisions
5-28-96	Buffer space
8-15-96	Revise flag note
9-3-96	70 mph
7-31-97	Sign spacing
6-9-98	General revisions

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPROVED: *[Signature]* DESIGN ENGINEER

CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS



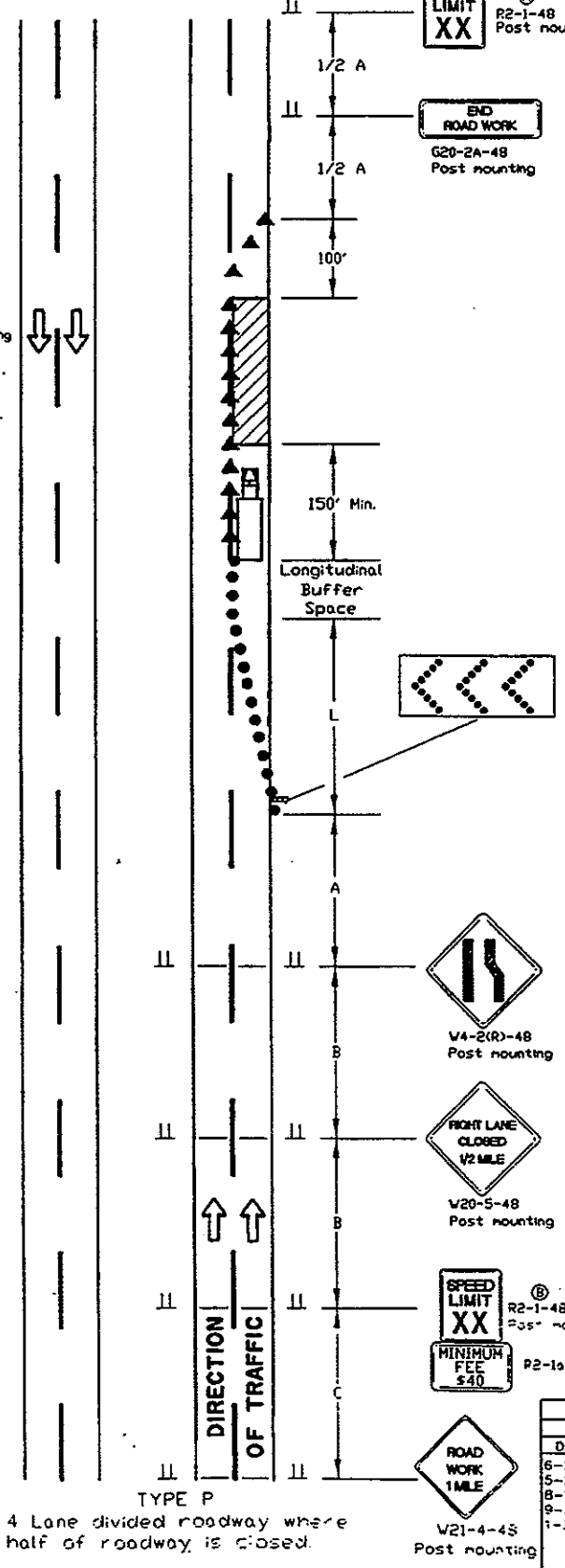
Speed (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	495
70	585

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

L = Minimum length of taper
 S = Numerical value of speed limit or 85th percentile speed
 W = Width of offset
 L = SW for freeways, expressways, and all other roads with speeds of 45 mph or greater
 L = WS²/60 for urban, residential, and other streets with speeds 40 mph or less

- KEY
- || TYPE I BARRICADE
 - || TYPE II BARRICADE
 - || TYPE III BARRICADE
 - F SIGN
 - DELINEATOR DRUM
 - ▲ CONES
 - ▨ WORK AREA
 - ⌋ FLAGGER
 - ⌋ TYPE A DELINEATOR
 - OOO SEQUENCING ARROW PANEL

TYPE Q
Where city streets are used for detouring traffic.



Delineator drums or cones used for tapering or channelizing traffic shall be spaced at the dimension "S".

Sequencing arrow panels should normally be placed at the beginning of the taper. Where shoulder width does not provide sufficient room the arrow panel should be moved closer to the work area so that it can be placed on the roadway surface.

Sequencing arrow panels shall be Type A, B, or C dependent on traffic volumes and speeds as follows:

Type A sequencing arrow panels shall be used on roadways with slow moving traffic speeds and low volume (25 mph and 750 ADT or less).

Type B sequencing arrow panels shall be used on roadways with moderate traffic speeds and moderate traffic volumes (40 mph and less and 5000 ADT or less).

Type C sequencing arrow panels shall be used on roadways with high traffic speeds and high traffic volumes (more than 40 mph and over 5000 ADT).

Flags: When warning signs are in urban areas, flags shall be installed. These flags shall be 24 inch square mounted perpendicular to the edges of the diamond sign and at such a distance above the edge so that when flag is limp it will not touch the sign. Portable warning signs will not require flags. Rural areas will not require flags.

Mounting-Barricade shown to be placed on roadway shall be on a movable assembly. Sign to be mounted on barricades shall be mounted with the sign bottom on the top of the top barricade bar. Intermediate sign shall be on a movable assembly sign show to be placed on roadway shall be placed on movable assemblies.

Ⓐ The speed limit shall be re-established. The exact speed limit shall be determined in the field dependent on location and conditions.

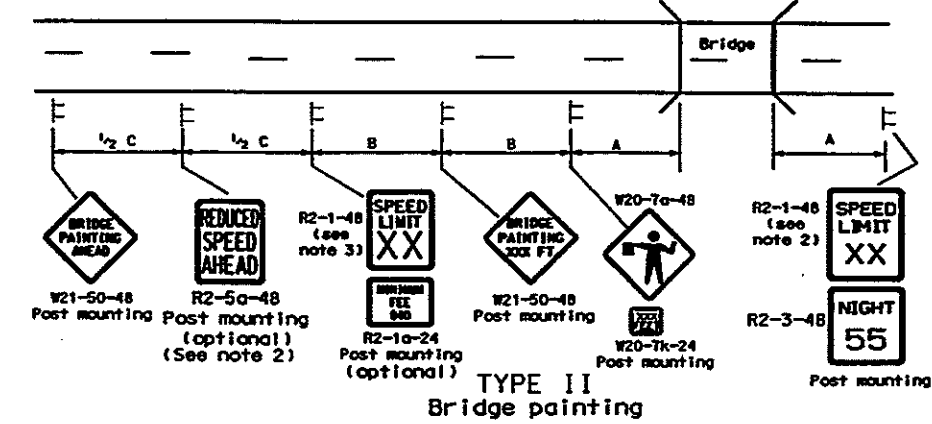
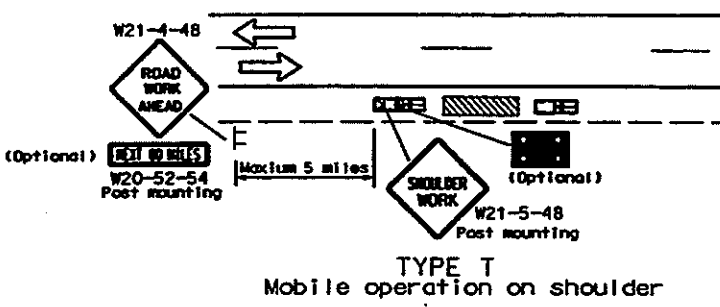
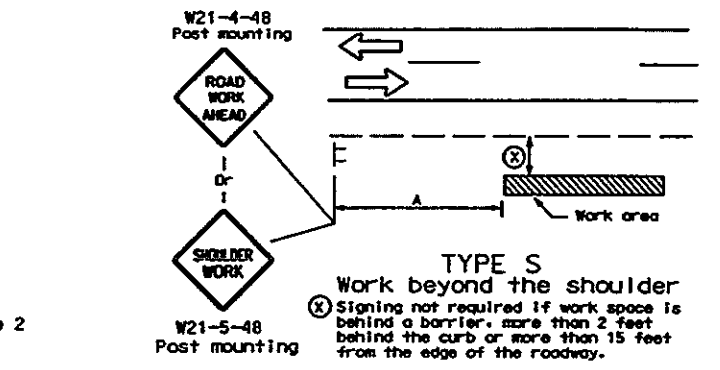
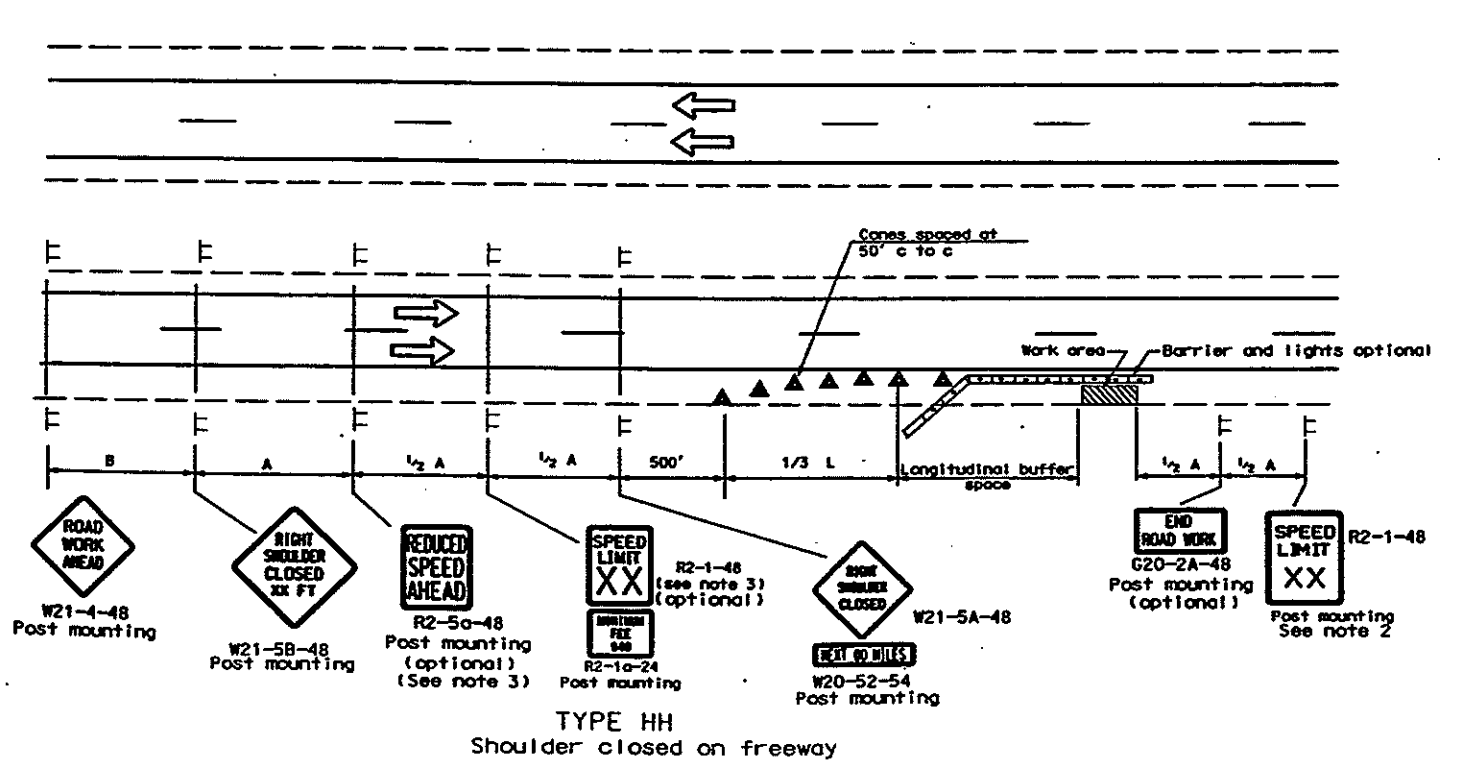
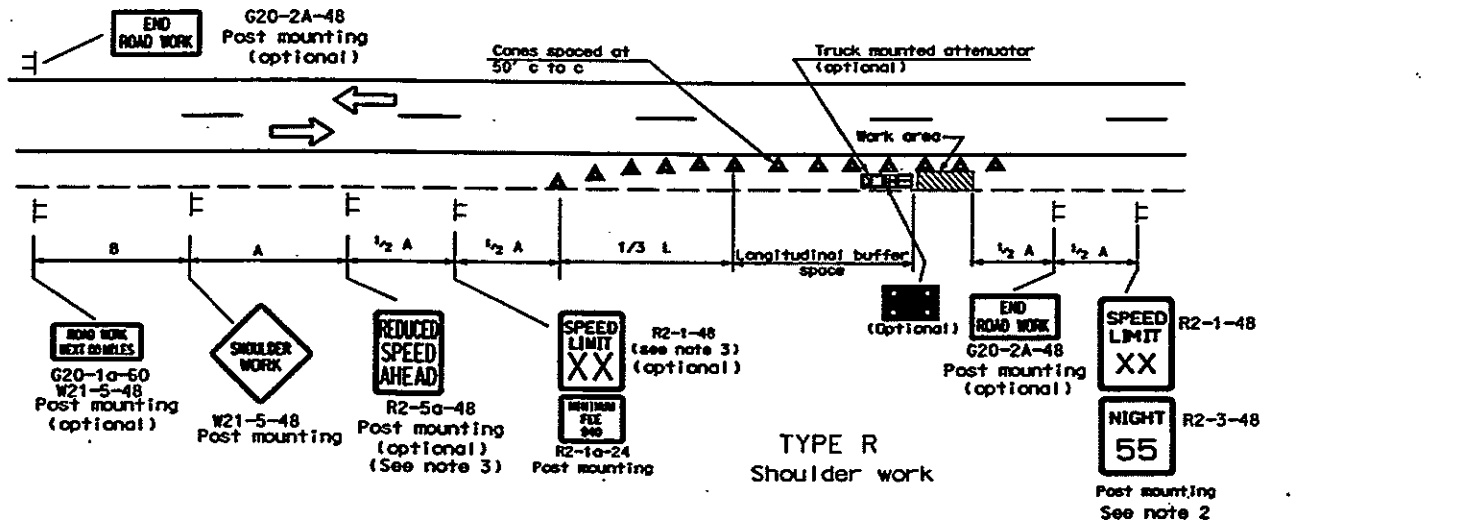
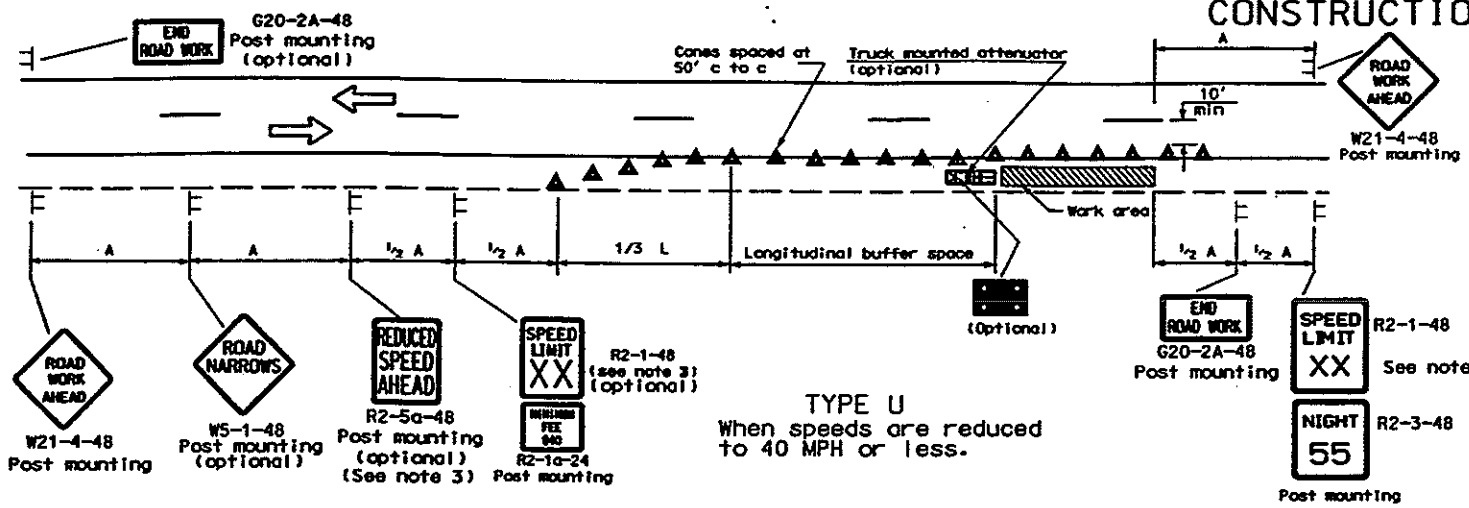
Ⓑ The speed limit shall be determined by the engineer in the field.

Road type	Distance between signs (ft)		
	A	B	C
Urban - low speed (less than 40 mph)	200	200	200
Urban - high speed (40 mph or more)	350	350	350
Rural	500	500	500
Interstate/4-lane divided (Maintenance and surveying)	750	1000	1500
Interstate/4-lane divided (Construction)	1000	1600	2600

10-1-86 REVISIONS	
DATE	CHANGE
6-21-95	GENERAL REVISIONS
5-28-96	BUFFER SPACE
8-15-96	REVIS FLAG NOTE
9-3-96	70 MPH
1-31-97	SIGN SPACING

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
 APPROVED *David K. Lee*
 DESIGN ENGINEER

CONSTRUCTION SIGN AND BARRICADE DETAILS



- Notes
- Variables
S = Numerical value of speed limit or 85th percentile.
L = Minimum length of taper, or
S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or
W x S/60 for urban, residential, and other streets with speeds of 40 mph or less.
 - The speed limit shall be re-established, the exact speed limit shall be determined in the field, dependent on location and conditions. Sign R2-3-48 shall be installed when the day speed limit is 65 MPH.
 - The reduced speed limit shall be determined dependent on the in place speed limit before construction. The speed limit reduction shall not exceed 20 MPH. Where speed limits are to be reduced more than 20 MPH, a second speed limit sign shall be installed with the desired speed reduction but shall not exceed 20 MPH. The second speed limit sign shall be placed at 1/2 A.
 - When warning signs are used in urban areas and the signs are not portable, flags shall be installed. The flags shall be 24 inches square, mounted perpendicular to the edges of the diamond sign, and at such a distance above the edge so that when the flag is limp it will not touch the sign.

Longitudinal Buffer Space

Speed (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
70	585

- KEY
- Sign
 - Cones
 - Flagger
 - Work Area
 - Flashing Arrow Panel, Caution Mode

ADVANCE WARNING SIGN SPACING

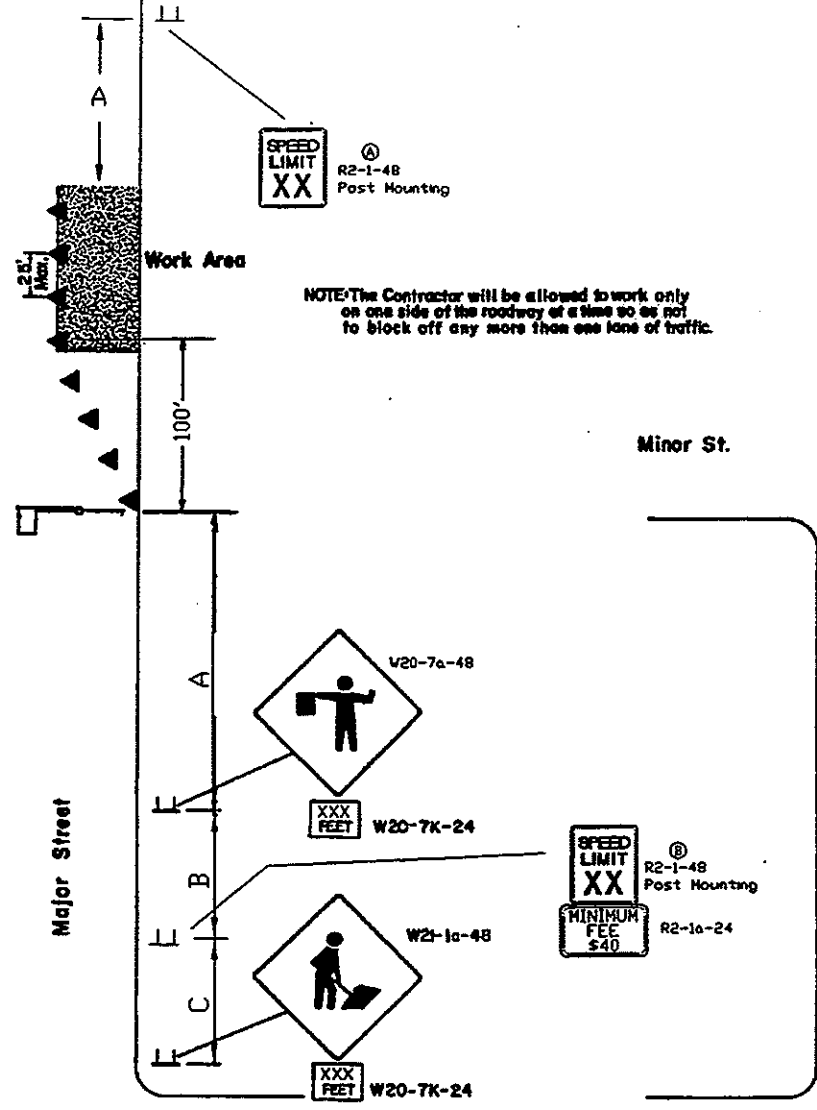
Road Type	Distance Between Signs (ft)		
	A	B	C
Urban - Low Speed (less than 40 mph)	200	200	200
Urban - High Speed (40 mph or more)	350	350	350
Rural	500	500	500
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500
Interstate/4-Lane Divided (Construction)	1000	1600	2600

10-1-86 REVISIONS

DATE	CHANGE
12-20-98	MAJOR REVISIONS

APPROVED: *K.H.E.B.*
DESIGN ENGINEER

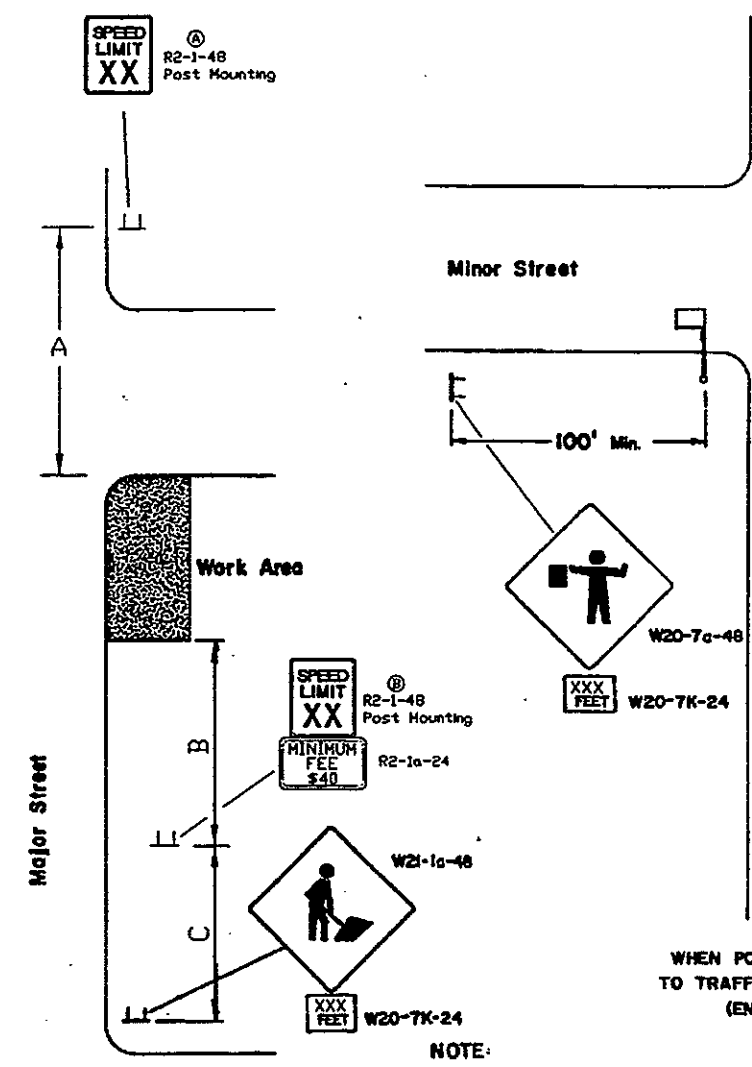
CONSTRUCTION SIGN AND BARRICADE LOCATION DETAILS



TYPE V
WHEN PORTION OF ROADWAY IS CLOSED
TO TRAFFIC ONLY DURING DAYLIGHT HOURS
(MID BLOCK LOCATION)

Road type	ADVANCE WARNING SIGN SPACING		
	Distance between signs (ft)		
	A	B	C
Urban - low speed (less than 40 mph)	200	200	200
Urban - high speed (40 mph or more)	350	350	350
Rural	500	500	500
Interstate/4-lane divided (Maintenance and surveying)	750	1000	1500
Interstate/4-lane divided (Construction)	1000	1600	2600

TYPE W
WHEN WORK AREA IS OUTSIDE OF DRIVING
LANE AND NO CLOSURE IS NECESSARY



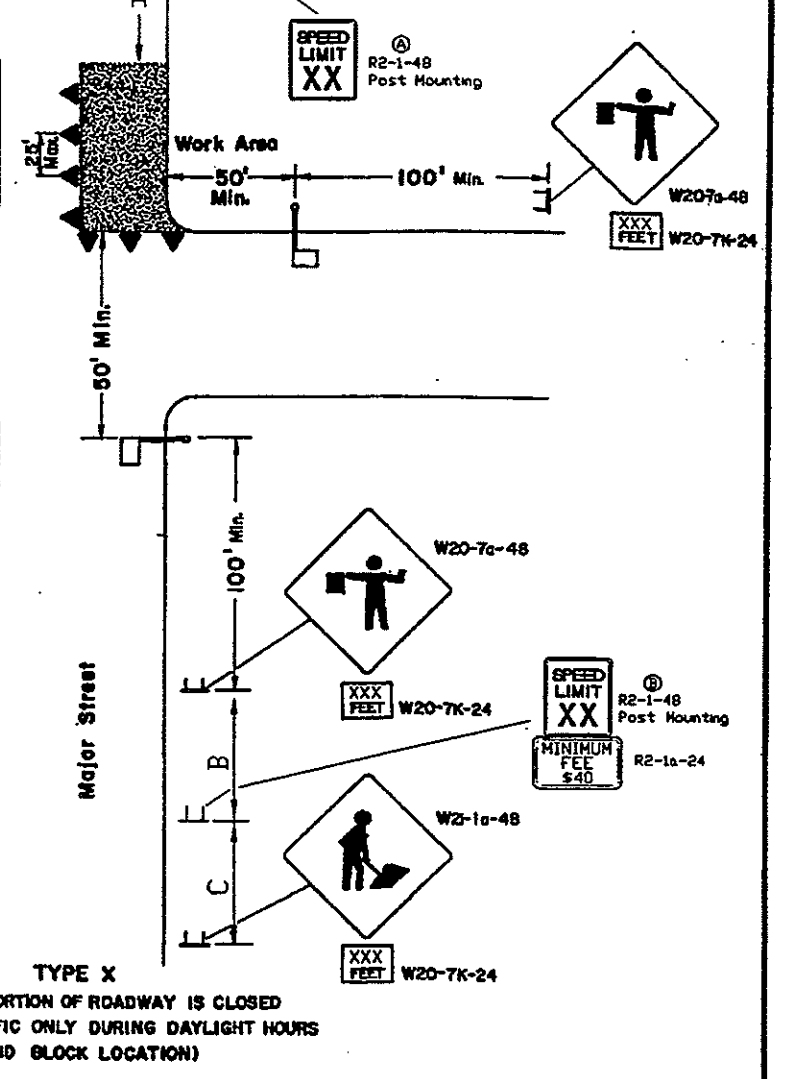
NOTE:

Where parking is present the signs shall be placed so they are entirely visible above the parked vehicles or placed at the edge of the parking area so they are visible to oncoming traffic.

Flags: When warning signs are in urban areas, flags shall be installed. These flags shall be 24 inch square mounted perpendicular to the edges of the diamond sign and at such a distance above the edge so that when flag is limp it will not touch the sign. Portable warning signs will not require flags. Rural areas will not require flags.

Mounting: Signs shown to be placed on the roadway shall be placed on moveable assemblies.

- (A) The speed limit shall be re-established. The exact speed limit shall be determined in the field dependent on location and conditions.
- (B) The speed limit shall be determined by the engineer in the field.



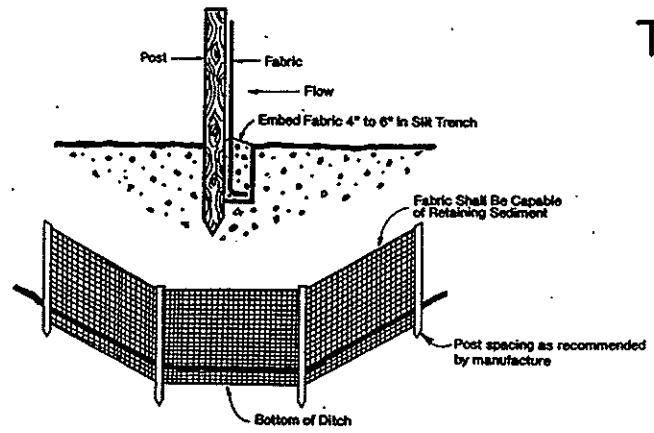
KEY

- Cones
- Flagger Signs
- Work Area

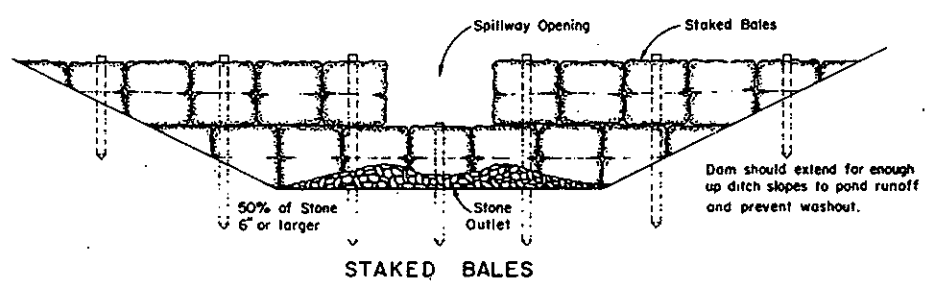
10-1-86 REVISIONS	
DATE	CHANGE
8-3-87	NOTE
5-1-92	GENERAL REVISIONS
9-30-93	GENERAL REVISIONS
6-19-95	SPEED LIMIT
8-15-96	REVISE FLAG NOTE
9-3-96	70 MPH
1-31-97	SIGN SPACING

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *David R. Low*
DESIGN ENGINEER

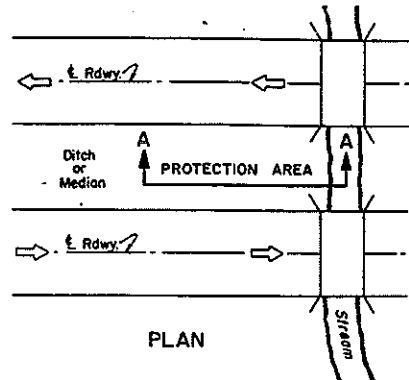
TEMPORARY EROSION AND SILTATION CONTROLS



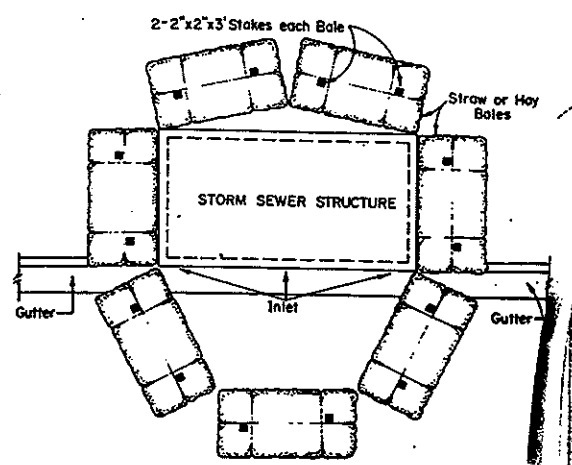
SEDIMENT CONTROL FENCING



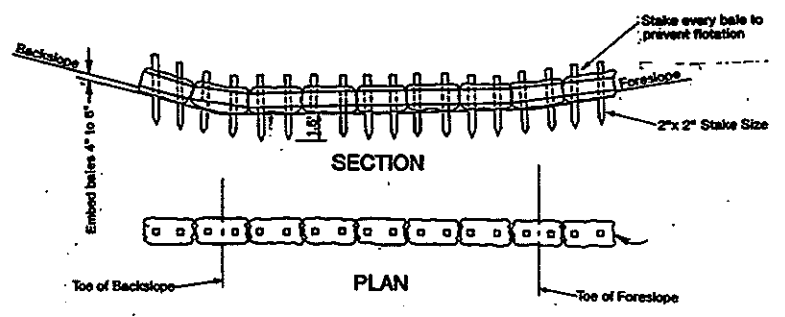
STAKED BALES



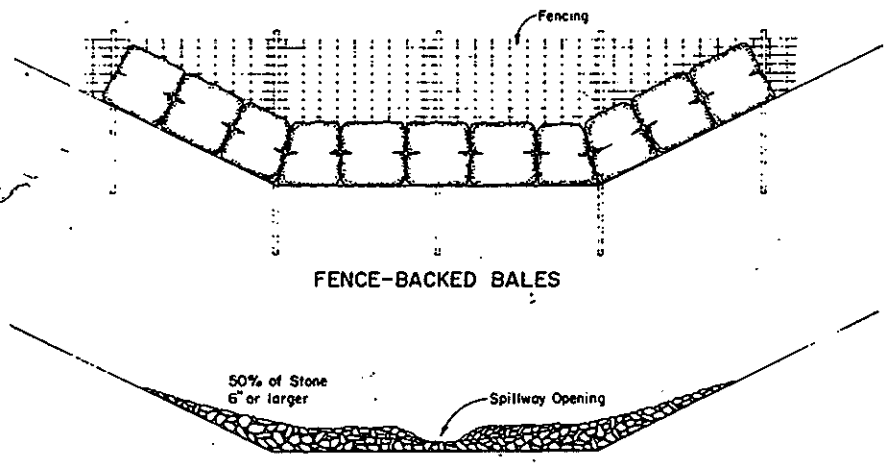
PLAN



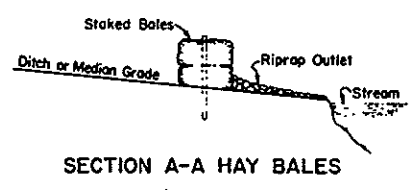
STORM SEWER INLET EROSION & SILTATION BARRIER



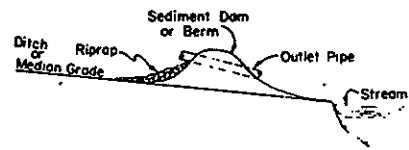
"TYPE A"



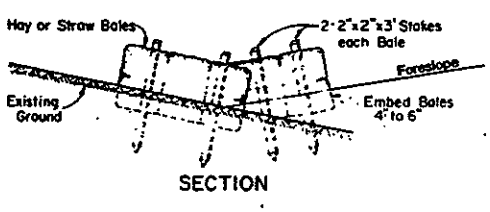
FENCE-BACKED BALES



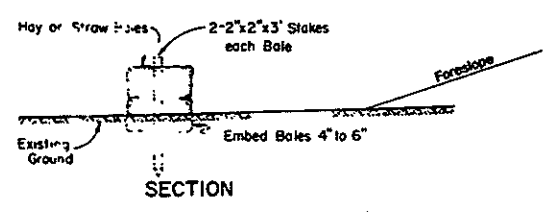
SECTION A-A HAY BALES



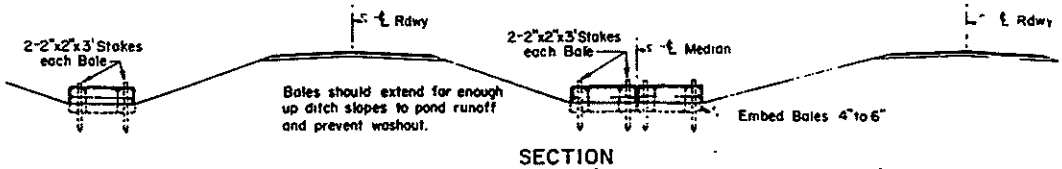
**SECTION A-A SEDIMENT DAM OR BERM
MEDIAN OR DITCH PROTECTION
AT STREAM CROSSINGS**



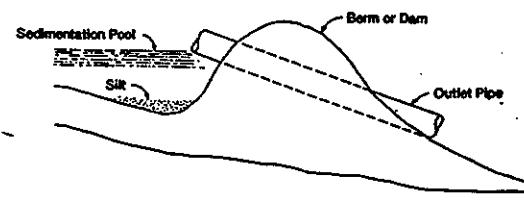
SECTION



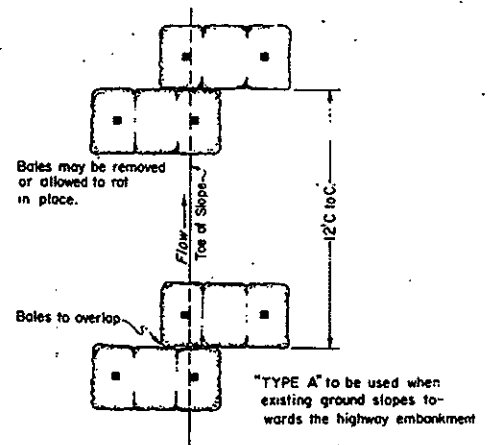
SECTION



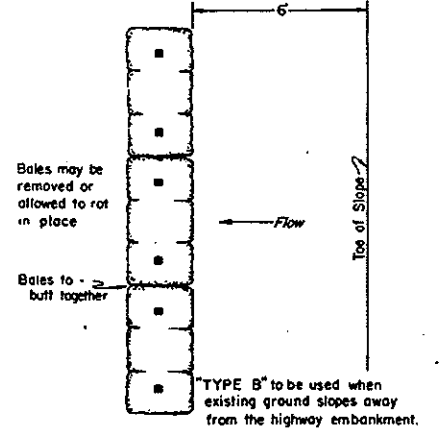
SECTION



SMALL SEDIMENT DAM OR BERM

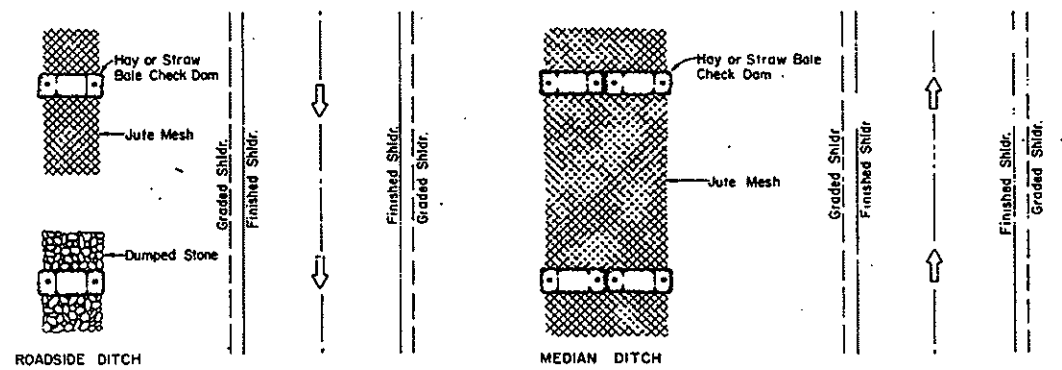


PLAN "TYPE B"



PLAN "TYPE C"

BALED HAY OR STRAW EROSION CHECKS



STONE, JUTE MESH, OR SOD DITCH & MEDIAN EROSION CONTROL

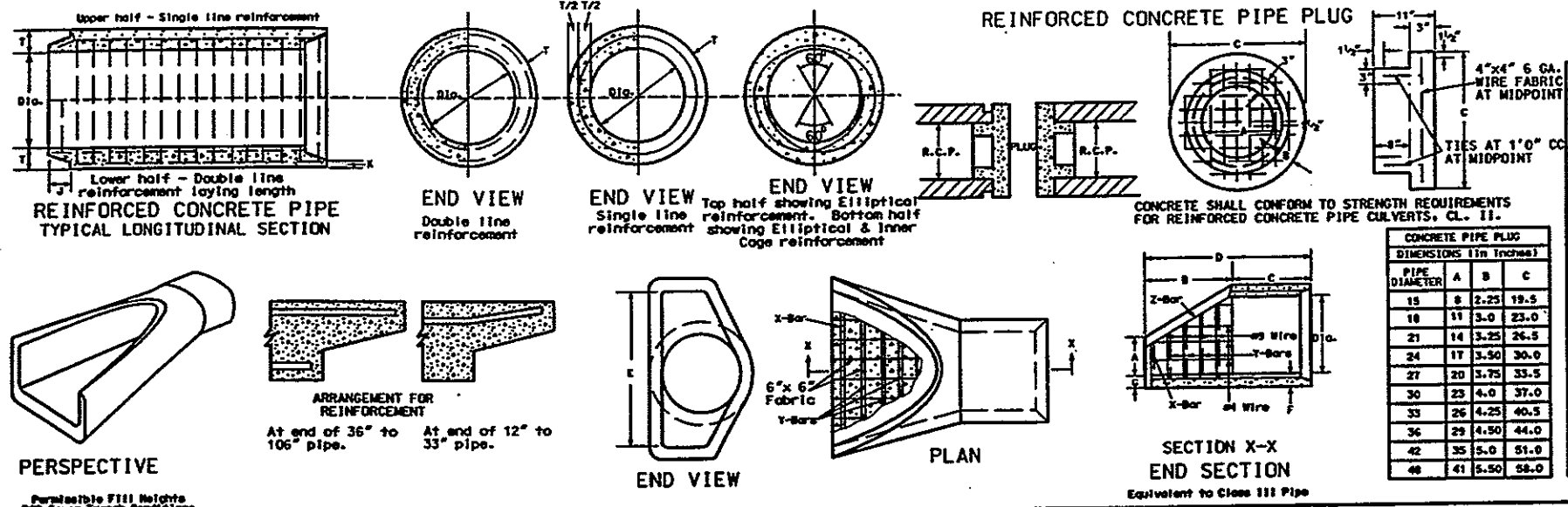
NOTES: These Temporary Erosion and Siltation Controls or modifications thereof may be used by the Contractor or directed by the Engineer to prevent erosion or siltation during the construction stage.

Payment for these items will be incidental unless shown otherwise on the plans.

10-1-86 REVISIONS		APPROVED: <i>David W. [Signature]</i> DESIGN ENGINEER
DATE	CHANGE	
9-4-92	DITCH CHECK	NORTH DAKOTA STATE HIGHWAY DEPARTMENT
1-16-92	SEDIMENT CONT. FENCING	
1-31-95	GENERAL REVISIONS	

REINFORCED CONCRETE PIPE CULVERT AND END SECTIONS

SEE STANDARD D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

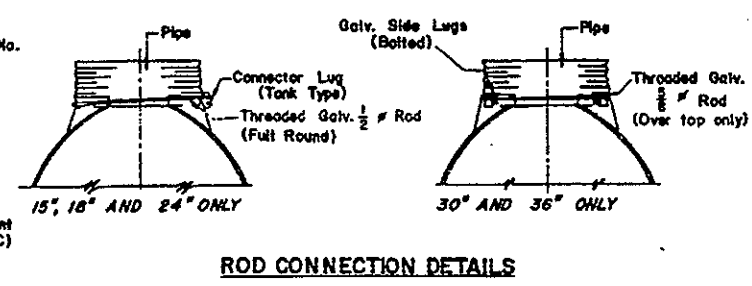
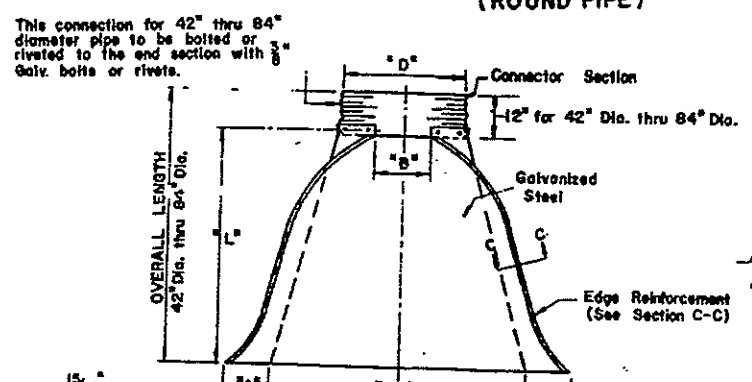


DIA	TERMINAL DIMENSIONS							REINFORCING STEEL		
	A	B	C	D	E	F	G	X	Y	Z
12	0'-4"	2'-0"	4'-0"	6'-0"	2'-0"	2"	2"	2-1/4" x 2'	6-1/4" x 2' @ 6" c.c.	2-1/4" x 4'
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/2"	2 1/2"	2-1/4" x 2 1/2'	6-1/4" x 2 1/2' @ 6" c.c.	2-3/8" x 4'
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"	2 1/2"	2-3/8" x 3'	6-1/4" x 3' @ 6" c.c.	2-3/8" x 4'
21	0'-9"	3'-0"	3'-10"	6'-1"	3'-6"	2 3/4"	2 3/4"	2-3/8" x 3 1/2'	8-1/4" x 3 1/2' @ 6" c.c.	2-3/8" x 5'
24	0'-9"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	3"	2-1/2" x 4'	8-3/8" x 4' @ 8" c.c.	2-3/8" x 6'
27	0'-10 1/2"	4'-1 1/2"	2'-0"	6'-1 1/2"	4'-6"	3 1/2"	3 1/2"	2-1/2" x 5'	8-3/8" x 5' @ 9" c.c.	2-3/8" x 6'
30	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	3 1/2"	2-1/2" x 5'	12-3/8" x 5' @ 8" c.c.	2-1/2" x 6'
36	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	4"	4"	2-1/2" x 6'	12-3/8" x 6' @ 6" c.c.	2-1/2" x 8'
42	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4 1/2"	4 1/2"	2-1/2" x 7'	12-1/2" x 7' @ 6" c.c.	2-1/2" x 8'
48	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	5"	5"	2-1/2" x 8'	16-1/2" x 8' @ 8" c.c.	2-1/2" x 8'
54	2'-3"	5'-5"	2'-9 1/2"	8'-2 1/2"	7'-6"	5 1/2"	5 1/2"	2-1/2" x 8'	16-1/2" x 8' @ 7" c.c.	2-1/2" x 8'
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	6"	6"	2-1/2" x 9'	16-1/2" x 9' @ 6" c.c.	2-1/2" x 9'
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	6 1/2"	6 1/2"	2-1/2" x 9'	22-1/2" x 9' @ 6" c.c.	2-1/2" x 9'
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	7"	7"	2-1/2" x 10'	24-1/2" x 10' @ 6" c.c.	2-1/2" x 9'
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	7 1/2"	7 1/2"	2-1/2" x 10'	28-1/2" x 10' @ 6" c.c.	2-1/2" x 10'
84	3'-0"	7'-6"	1'-9"	9'-3"	10'-0"	8"	8"	4-1/2" x 10'	28-1/2" x 10' @ 6" c.c.	4-1/2" x 10'
90	3'-5"	7'-3 1/2"	2'-0"	9'-3 1/2"	11'-0"	8 1/2"	8 1/2"	4-1/2" x 11'	28-1/2" x 11' @ 6" c.c.	4-1/2" x 10'

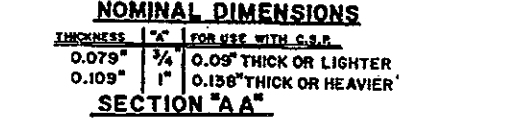
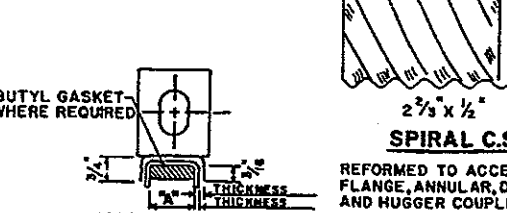
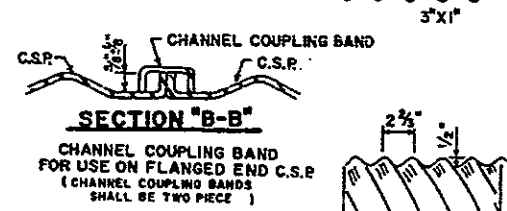
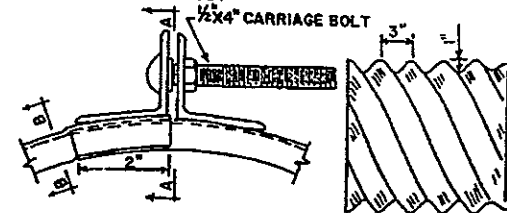
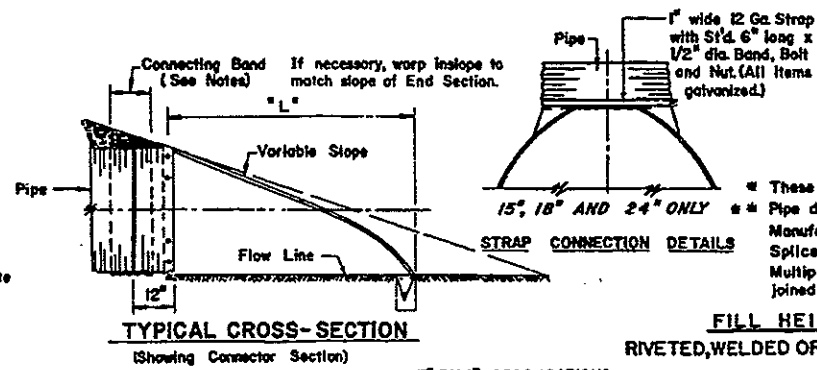
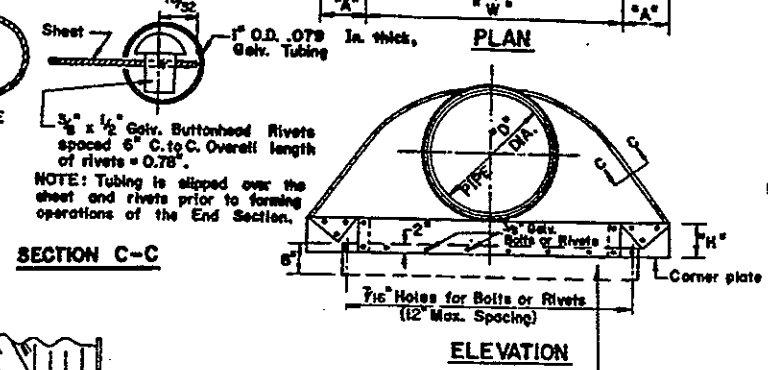
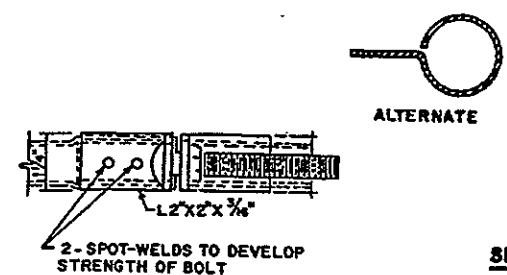
PIPE SIZE	REINFORCED CONCRETE PIPE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	CLASS I				CLASS II				CLASS III				CLASS IV				CLASS IV ALTERNATE				CLASS V				CLASS V ALTERNATE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
	D-LOAD TO PRODUCE A 0.01 INCH CRACK				D-LOAD TO PRODUCE ULTIMATE LOAD				D-LOAD TO PRODUCE A 0.01 INCH CRACK				D-LOAD TO PRODUCE ULTIMATE LOAD				D-LOAD TO PRODUCE A 0.01 INCH CRACK				D-LOAD TO PRODUCE ULTIMATE LOAD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
12	0.79	1.23	1.77	2.40	3.14	3.90	4.91	5.94	7.07	9.62	12.57	15.90	19.63	23.76	28.27	33.18	38.48	44.18	50.27	56.75	63.62	70.89	78.56	86.64	95.12	104.00	113.28	122.96	133.04	143.52	154.40	165.68	177.36	189.44	201.92	214.80	228.08	241.76	255.84	270.32	285.20	299.48	314.16	329.24	344.72	360.60	376.88	393.56	410.64	428.12	445.92	464.04	482.48	501.24	520.32	539.72	559.44	579.48	599.84	620.52	641.52	662.84	684.48	706.44	728.72	751.32	774.24	797.48	821.04	844.92	869.12	893.64	918.48	943.64	969.12	994.92	1021.04	1047.48	1074.24	1101.32	1128.72	1156.44	1184.48	1212.84	1241.52	1270.52	1299.84	1329.48	1359.44	1389.72	1420.32	1451.24	1482.48	1513.92	1545.64	1577.64	1609.92	1642.48	1675.32	1708.44	1741.84	1775.52	1809.48	1843.72	1878.32	1913.24	1948.44	1983.92	2019.64	2055.64	2091.92	2128.44	2165.24	2202.32	2239.68	2277.32	2315.24	2353.44	2391.92	2430.64	2469.64	2508.92	2548.44	2588.12	2628.04	2668.16	2708.48	2749.04	2789.84	2830.88	2872.16	2913.68	2955.44	2997.44	3039.68	3082.16	3124.96	3168.04	3211.44	3255.12	3299.12	3343.44	3388.04	3432.92	3478.04	3523.44	3569.12	3615.12	3661.44	3708.04	3754.92	3802.04	3849.44	3897.12	3945.12	3993.44	4042.04	4090.92	4140.04	4189.44	4239.12	4289.04	4339.24	4389.64	4440.32	4491.24	4542.44	4593.84	4645.44	4697.24	4749.24	4801.44	4853.84	4906.44	4959.24	5012.32	5065.64	5119.24	5173.12	5227.24	5281.64	5336.32	5391.24	5446.44	5501.84	5557.44	5613.24	5669.24	5725.44	5781.84	5838.44	5895.24	5952.32	6009.64	6067.24	6125.12	6183.24	6241.64	6300.32	6359.24	6418.44	6477.84	6537.44	6597.24	6657.24	6717.44	6777.84	6838.44	6899.24	6960.32	7021.64	7083.24	7145.04	7207.04	7269.24	7331.64	7394.24	7457.04	7520.04	7583.24	7646.64	7710.24	7774.04	7838.04	7902.24	7966.64	8031.24	8096.04	8161.04	8226.24	8291.64	8357.24	8423.04	8489.04	8555.24	8621.64	8688.24	8755.04	8822.04	8889.24	8956.64	9024.24	9092.04	9160.04	9228.24	9296.64	9365.24	9434.04	9503.04	9572.24	9641.64	9711.24	9781.04	9851.04	9921.24	9991.64	10062.24	10133.04	10204.04	10275.24	10346.64	10418.24	10490.04	10562.04	10634.24	10706.64	10779.24	10852.04	10925.04	10998.24	11071.64	11145.24	11219.04	11293.04	11367.24	11441.64	11516.24	11591.04	11666.04	11741.24	11816.64	11892.24	11968.04	12044.04	12120.24	12196.64	12273.24	12350.04	12427.04	12504.24	12582.04	12660.04	12738.24	12816.64	12895.24	12974.04	13053.04	13132.24	13211.64	13291.24	13371.04	13451.04	13531.24	13611.64	13692.24	13773.04	13854.04	13935.24	14016.64	14098.24	14180.04	14262.04	14344.24	14426.64	14509.24	14592.04	14675.04	14758.24	14841.64	14925.24	15009.04	15093.04	15177.24	15261.64	15346.24	15431.04	15516.04	15601.24	15686.64	15772.24	15858.04	15944.04	16030.24	16116.64	16203.24	16290.04	16377.04	16464.24	16551.64	16639.24	16727.04	16815.04	16903.24	16991.64	17080.24	17169.04	17258.04	17347.24	17436.64	17526.24	17616.04	17706.04	17796.24	17886.64	17977.24	18068.04	18159.04	18250.24	18341.64	18433.24	18525.04	18617.04	18709.24	18801.64	18894.24	18987.04	19080.04	19173.24	19266.64	19360.24	19454.04	19548.04	19642.24	19736.64	19831.24	19926.04	20021.04	20116.24	20211.64	20307.24	20403.04	20499.04	20595.24	20691.64	20788.24	20885.04	20982.04	21079.24	21176.64	21274.24	21372.04	21470.04	21568.24	21666.64	21765.24	21864.04	21963.04	22062.24	22161.64	22261.24	22361.04	22461.04	22561.24	22661.64	22762.24	22863.04	22964.04	23065.24	23166.64	23268.24	23370.04	23472.04	23574.24	23676.64	23779.24	23882.04	23985.04	24088.24	24191.64	24295.24	24399.04	24503.04	24607.24	24711.64	24816.24	24921.04	25026.04	25131.24	25236.64	25342.24	25448.04	25554.04	25660.24	25766.64	25873.24	25980.04	26087.04	26194.24	26301.64	26409.24	26517.04	26625.04	26733.24	26841.64	26950.24	27059.04	27168.04	27277.24	27386.64	27496.24	27606.04	27716.04	27826.24	27936.64	28047.24	28158.04	28269.04	28380.24	28491.64	28603.24	28715.04	28827.04	28939.24	29051.64	29164.24	29277.04	29390.04	29503.24	29616.64	29730.24	29844.04	29958.04	30072.24	30186.64	30301.24	30416.04	30531.04	30646.04	30761.24	30876.64	30992.24	31108.04	31224.04	31340.24	31456.64	31573.24	31690.04	31807.04	31924.24	32041.64	32159.24	32277.04	32395.04	32513.24	32631.64	32750.24	32869.04	32988.04	33107.24	33226.64	33346.24	33466.04	33586.04	33706.24	33826.64	33947.24	34068.04	34189.04	34310.24	34431.64	34553.24	34675.04	34797.04	34919.24	35041.64	35164.24	35287.04	35410.04	35533.24	35656.64	35780.24	35904.04	36028.04	36152.24	36276.64	36401.24	36526.04	36651.04	36776.24	36901.64	37027.24	37153.04	37279.04	37405.24	37531.64	37658.24	37785.04	37912.04	38039.24	38166.64	38294.24	38422.04	38550.04	38678.24	38806.64	38935.24	39064.04	39193.04	39322.24	39451.64	39581.24	39711.04	39841.04	39971.24	40101.64	40232.24	40363.04	40494.04	40625.24	40756.64	40888.24	41020.04	41152.04	41284.24	41416.64	41549.24	41682.04	41815.04	41948.04	42081.24	42214.64	42348.24	42482.04	42616.04	42750.24	42884.64	43019.24	43154.04	43289.04	43424.24	43559.64	43695.24	43831.04	43967.04	44103.24	44239.64	44376.24	44513.04	44650.04	44787.24	44924.64	45062.24	45200.04	45338.04	45476.24	45614.64	45753.24	45892.04	46031.04	46170.24	46309.64	46449.24	46589.04	46729.04	46869.24	47009.64	47150.24	47291.04	47432.04	47573.24	47714.64	47856.24	47998.04	48140.04	48282.24	48424.64	48567.24	48710.04	48853.04	48996.24	49139.64	49283.24	49427.04	49571.04	49715.24	49859.64	50004.24	50148.84	50293.64	50438.64	50583.84	50729.24	50874.84	51020.64	51166.64	51312.84	51459.24	51605.84	51752.64	51899.64	52046.84	52194.24	52341.84	52489.64	52637.64	52785.84	52934.24	53082.84	53231.64	53380.64	53529.84	53679.24	53828.84	53978.64	54128.64	54278.84	54429.24	54579.84	54730.64	54881.64	55032.84	55184.24	55335.84	55487.64	55639.64	55791.84	55944.24	56096.84	56249.64	56402.64	56555.84	56709.24	56862.84	57016.64	57170.64	57324.84	57479.44	57634.24	57789.24	57944.44	58099.84	58255.44	58411.24	58567.24	58723.44	58879.84	59036.44	59193.24	59350.24	59507.44	59664.84	59822.44	59980.24	60138.24	60296.44	60454.84	60613.44	60772.24	60931.24	61090.44	61250.04	61409.84	61569.84	61729.84	61890.04	620

CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS (ROUND PIPE)

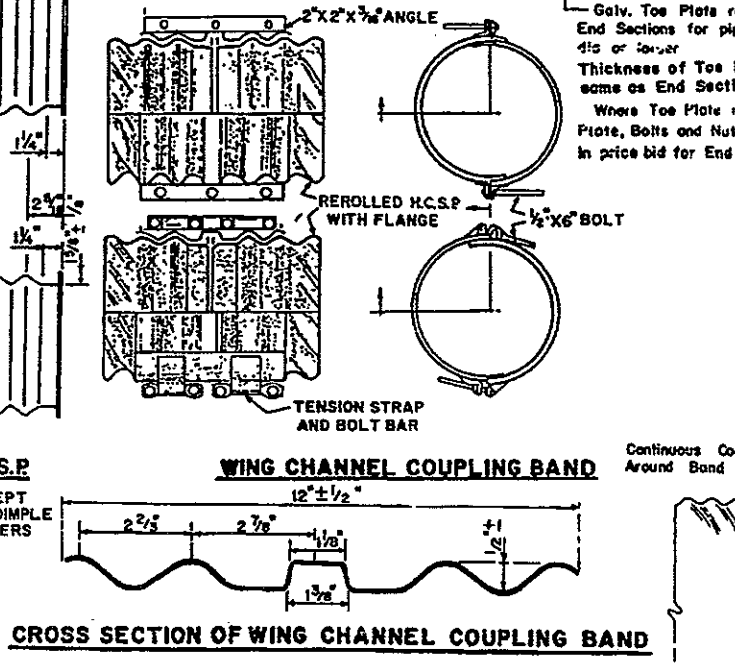
NOTES:
 Pipe and Connecting Bands shall conform to applicable sections of I'DSHD Standard Specifications and to AASHTO M-36.
 Top edge of all End Sections to have tubing reinforcement or rolled tubing reinforcement (See Section A-A). The tubing is to be supplemented with 2"x2"x1/4" Galv. Angle for 60" thru 72" Dia. and 2 1/2"x2 1/2"x1/4" Galv. Angle for 78" and 84" Dia. Angles to be attached by Gal. 3/8" bolts and nuts. Angles are to extend from Pipe to the corner wing band.
 Elongated pipe shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
 Fill Height Tables are based on the following criteria:
 1. Embankment weight = 120 lb./ft.³
 2. Max. pipe deflection = 5%
 3. Bedding - Class C
 4. Compaction = 95% Proctor Density
 5. Modulus of passive soil resistance (E') = 1400 psi
 6. H-20 Live Load



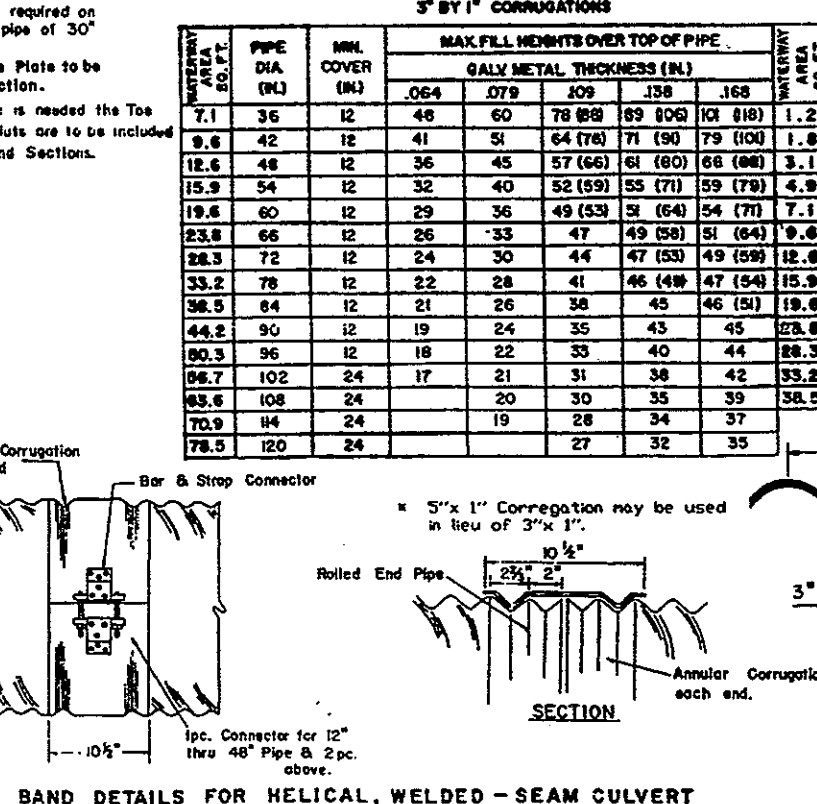
END SECTIONS								
PIPE DIA. (In.)	GALV. THICK.	DIMENSIONS					Approx. Slope Rate	Body Piece
		A	B	H	L	W		
15	.064	7	8	6	26	30	2-1/2:1	1
18	.064	8	10	6	31	36	2-1/2:1	1
24	.064	10	13	6	41	48	2-1/2:1	1
30	.079	12	16	8	51	60	2-1/2:1	1 OR 2
36	.079	14	19	9	60	72	2-1/2:1	2
42	.109	16	22	11	69	84	2-1/2:1	2
48	.109	18	27	12	78	90	2-1/4:1	2
54	.109	18	30	12	84	102	2:1	2
*60	.109	18	33	12	87	114	1-3/4:1	3
*66	.109	18	36	12	87	120	1-1/2:1	3
*72	.109	18	39	12	87	126	1-1/3:1	3
*78	.109	18	42	12	87	132	1-1/4:1	3
*84	.109	18	45	12	87	138	1-1/5:1	3



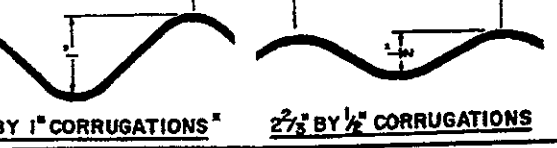
CORRUGATED STEEL PIPE FLANGE BAND DETAILS



WING CHANNEL COUPLING BAND FOR ANNULAR C.S.P. OR REFORMED H.C.S.P.



MINIMUM AREA SQ. FT.	PIPE DIA. (IN.)	MIN. COVER (IN.)	MAX. FILL HEIGHTS OVER TOP OF PIPE					MIN. COVER (IN.)	MAX. FILL HEIGHTS OVER TOP OF PIPE						
			GALV. METAL THICKNESS (IN.)						MIN. COVER (IN.)	GALV. METAL THICKNESS (IN.)					
			.064	.079	.109	.138	.168			.064	.079	.109	.138	.168	
7.1	36	12	48	60	78 (89)	89 (80)	101 (118)	1.2	15	12	67	73			
9.6	42	12	41	51	64 (76)	71 (90)	79 (100)	1.8	18	12	56	61			
12.6	48	12	36	45	57 (66)	61 (80)	68 (88)	3.1	24	12	42	46	59		
15.9	54	12	32	40	52 (59)	55 (71)	59 (79)	4.9	30	12	34	36	47		
19.6	60	12	29	36	49 (53)	51 (64)	54 (71)	7.1	36	12	28	30	39	41	
23.8	66	12	26	33	47	49 (58)	51 (64)	9.6	42	12	31	43	46 (67)	48 (70)	50 (73)
28.3	72	12	24	30	44	47 (53)	49 (59)	12.6	48	12	27	37	45 (58)	46 (60)	47 (64)
33.2	78	12	22	28	41	46 (48)	47 (54)	15.9	54	12		33	43 (52)	44 (54)	45 (57)
38.5	84	12	21	26	38	45	46 (51)	19.6	60	12			43 (47)	43 (49)	44 (51)
44.2	90	12	19	24	35	43	45	23.8	66	12			42	43	43 (47)
50.3	96	12	18	22	33	40	44	28.3	72	12				41	43
56.7	102	24	17	21	31	38	42	33.2	78	12					39
63.6	108	24		20	30	35	39	38.5	84	12					35
70.9	114	24		19	28	34	37								
78.5	120	24			27	32	35								

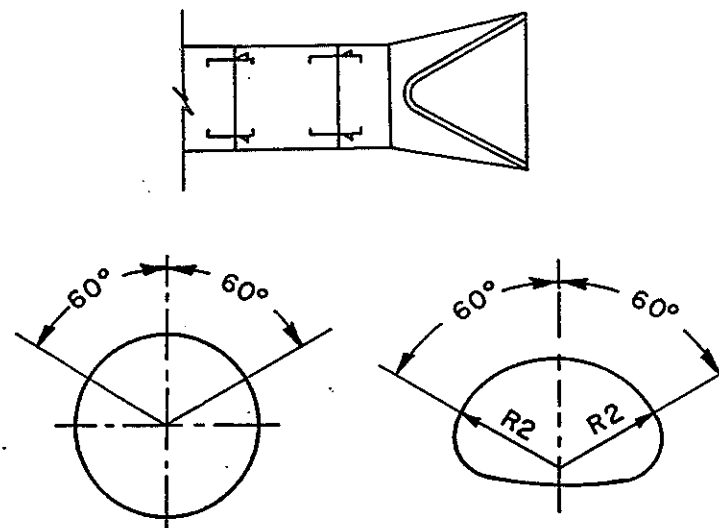
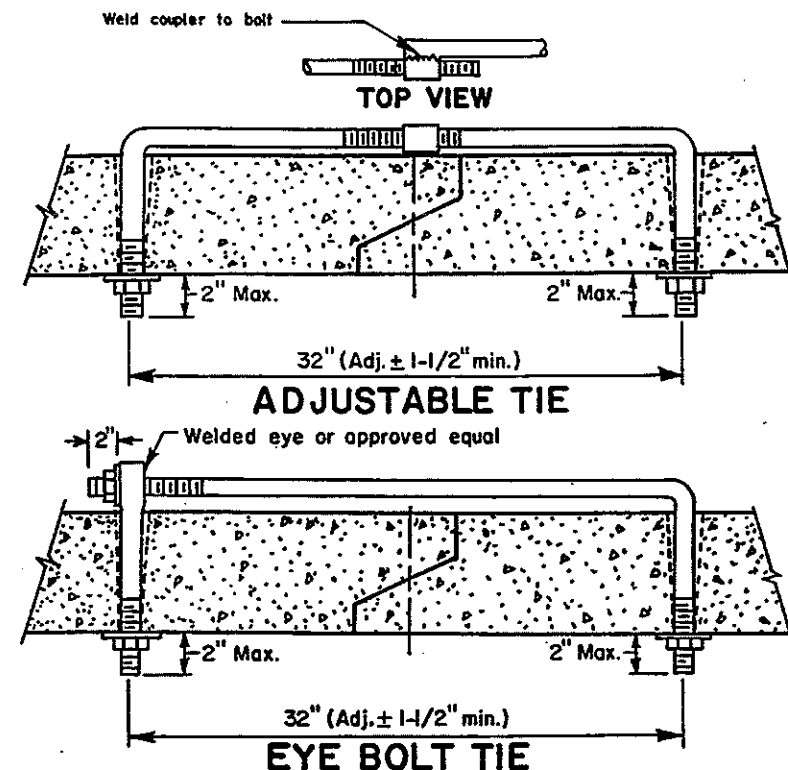


VALUES FOR ELONGATED PIPE ARE SHOWN IN PARENTHESES

10-1-85 REVISIONS
 DATE CHANGE
 4-28-89 TOE PLATE NOTE
 12-6-95 CORRUGATIONS

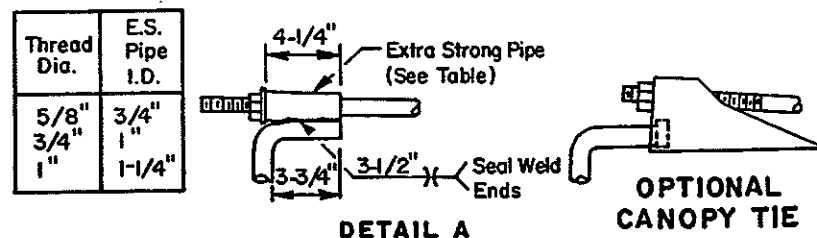
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
 APPROVED: *David K. O. Lee*
 DESIGN ENGINEER

CONCRETE PIPE TIES

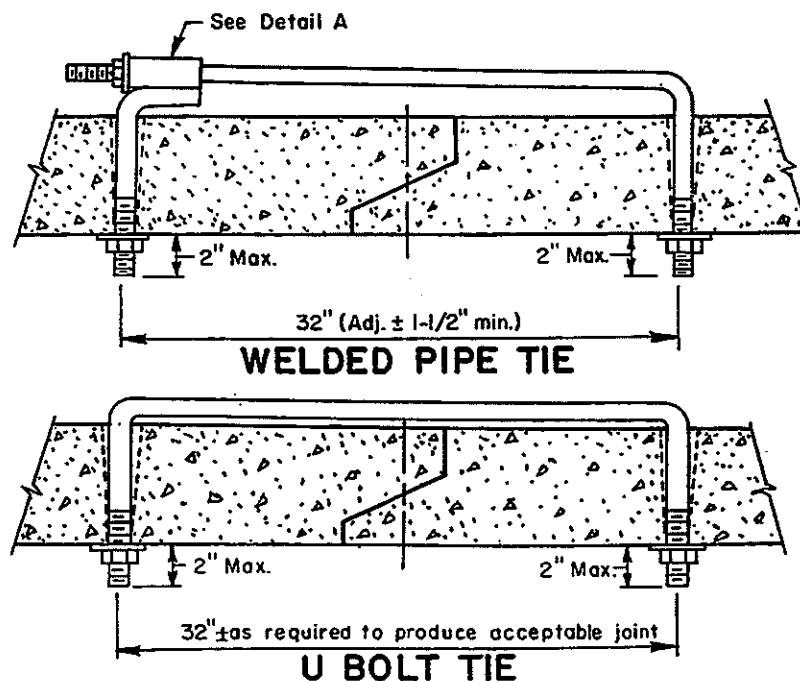


NOTES:

1. PIPE SIZE LISTED IS INSIDE DIAMETER OF ROUND PIPE OR EQUIVALENT DIAMETER OF PIPE ARCH.
2. NUTS AND WASHERS ARE NOT REQUIRED ON INSIDE OF 21" DIAMETER PIPE OR LESS.
3. TIES TO BE USED ONLY TO HOLD PIPE SECTIONS TOGETHER, NOT FOR PULLING SECTIONS TIGHT.
4. TIE BOLTS SHALL BE PAINTED AFTER FABRICATION WITH ONE COAT OF ZINC CHROMATE IRON OXIDE PAINT. THREADED PORTION OF RODS DO NOT HAVE TO BE PAINTED.
5. HOLES IN PIPE TO ACCOMMODATE THE TIE BOLTS CAN BE PRECAST OR DRILLED. TAPERED HOLES WILL BE PERMITTED WHEN PRECAST. WHEN EXISTING PIPE ARE EXTENDED OR SALVAGED AND RELAYED, THE CONTRACTOR WILL BE REQUIRED TO DRILL THE NECESSARY HOLES.
6. THE CONTRACTOR HAS THE OPTION OF SELECTING THE TYPE OF TIE BOLT TO BE USED. THE TYPE SELECTED SHALL BE APPROVED BY THE ENGINEER.
7. THE COST OF PRECASTING OR DRILLING THE REQUIRED HOLES AND FURNISHING AND INSTALLING THE TIE BOLTS SHALL BE INCLUDED IN THE PRICE BID FOR REINFORCED CONCRETE PIPE CULVERTS.
8. ALL CONCRETE PIPE JOINTS WILL BE TIED INCLUDING THE END SECTION JOINTS. TIE BOLTS ARE NOT REQUIRED ON STORM SEWER PIPE UNLESS SPECIFICALLY NOTED IN THE PLANS.



REQUIRED SIZE OF TIE BOLTS					
Pipe Size (Inches)	Thread Dia.	Pipe Size (Inches)	Thread Dia.	Pipe Size (Inches)	Thread Dia.
12	5/8" (See Note 2)	30	3/4"	72	1"
15		33		78	
18		36		84	
21		42		90	
24		48		96	
27		54		102	
		60		108	
		66	120		
			132		

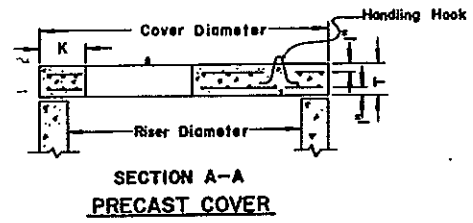
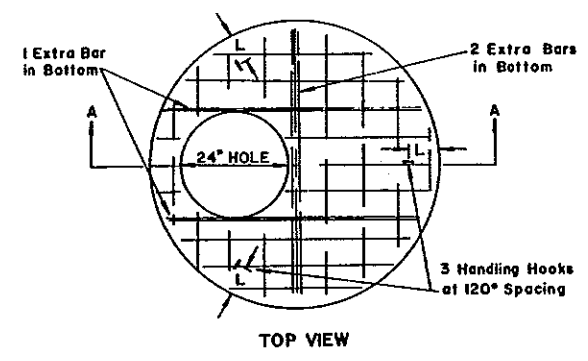
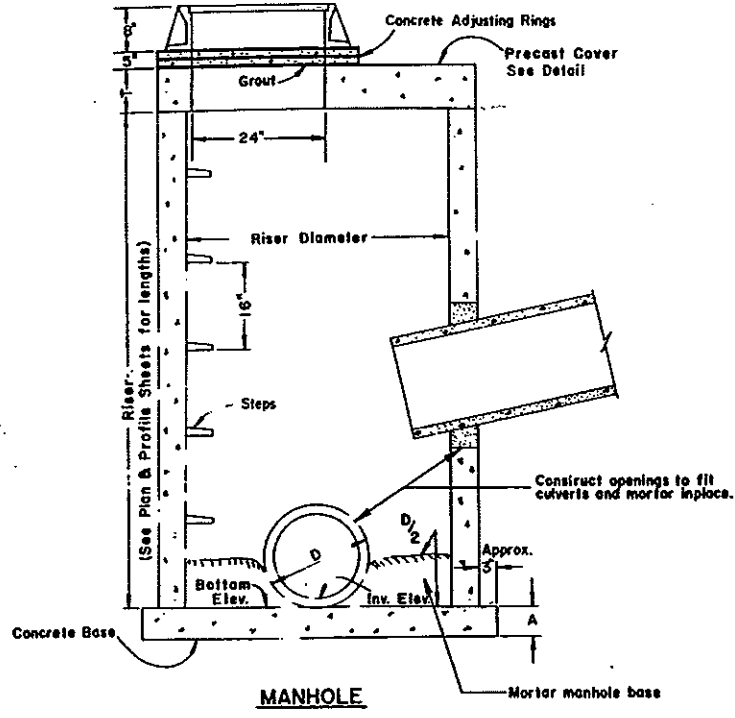


10-1-86	
REVISIONS	
DATE	CHANGE
12-9-94	NOTES

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

APPROVED: *David K. O. Lee*
DESIGN ENGINEER

MANHOLE DETAILS



PIPE DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM BARS	TOP BARS
42"	51"	800#	6"	6"	7"	#4 AT 6"	
48"	58"	1110#	6"	6"	8"	#4 AT 6"	
54"	65"	1950#	8"	6"	8"	#4 AT 6"	
60"	72"	2470#	8"	7"	9"	#4 AT 6"	#3 AT 6"
66"	79"	3050#	8"	7"	9"	#4 AT 6"	#3 AT 6"
72"	86"	3680#	8"	8"	10"	#4 AT 6"	#3 AT 6"
78"	93"	4360#	8"	8"	10"	#4 AT 4"	#3 AT 4"
84"	100"	5100#	8"	9"	11"	#4 AT 4"	#3 AT 4"
90"	107"	5890#	8"	9"	11"	#4 AT 4"	#3 AT 4"
96"	114"	6730#	8"	9"	11"	#4 AT 4"	#3 AT 4"
102"	121"	7630#	8"	9"	12"	#4 AT 4"	#3 AT 4"
108"	128"	12460#	12"	10"	12"	#4 AT 4"	#3 AT 4"
120"	140"	15500#	12"	11"	13"	#4 AT 4"	#3 AT 4"

Top and Bottom Bars run in both directions.

PIPE DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A	BARS
42"	58"	1380#	6"	#3 AT 6"
48"	66"	1785#	6"	#3 AT 6"
54"	72"	2125#	6"	#3 AT 6"
60"	78"	3320#	8"	#3 AT 6"
66"	86"	4030#	8"	#3 AT 6"
72"	92"	4610#	8"	#3 AT 6"
78"	100"	5460#	8"	#3 AT 6"
84"	107"	6250#	8"	#3 AT 6"
90"	114"	7070#	8"	#3 AT 6"
96"	120"	7850#	8"	#3 AT 6"
102"	127"	13200#	12"	#3 AT 6"
108"	132"	14270#	12"	#3 AT 6"
120"	148"	17925#	12"	#3 AT 6"

NOTES: BOTTOMS OF MANHOLES SHALL BE CUT OR PRECAST SQUARE TO FIT THE BASE GROUT JOINT BETWEEN BASE AND WALL WITH CEMENT MORTAR. THE CONTRACTOR MAY, IF HE SO DESIRES, CONSTRUCT THE MANHOLES LOWER THAN PLAN GRADE AND BRING THE CASTING TO GRADE USING PRECAST ADJUSTING RINGS IN A MANNER SATISFACTORY TO THE ENGINEER IN THE FIELD.

THE CONTRACTOR SHALL HAVE THE OPTION OF USING PRECAST OR POURED IN PLACE BASES.

PRECAST BASES SHALL BE REINFORCED AS SHOWN IN LISTING FOR EACH SIZE BASE.

THE AGGREGATE SIZE SHALL BE APPROVED BY THE ENGINEER.

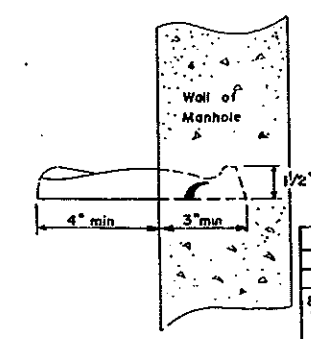
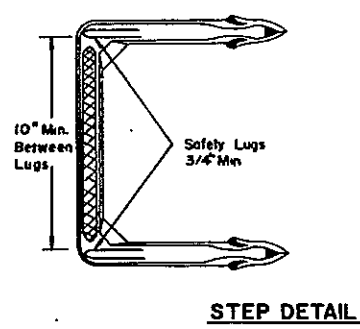
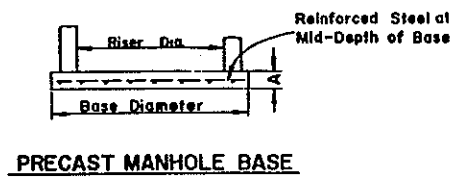
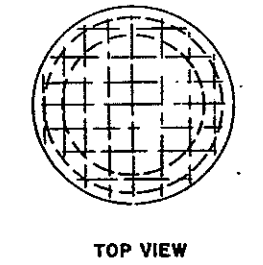
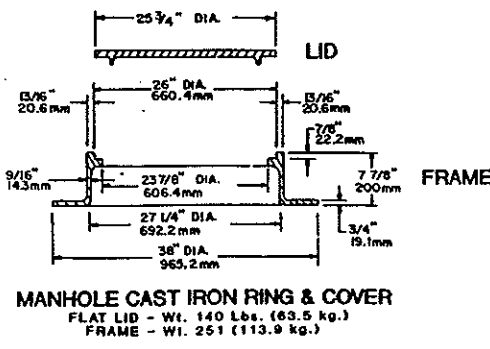
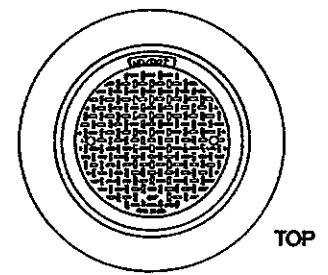
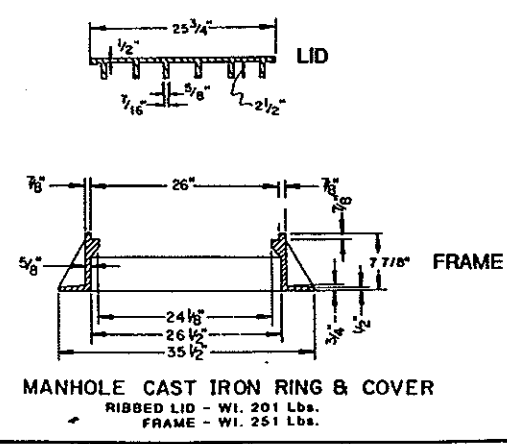
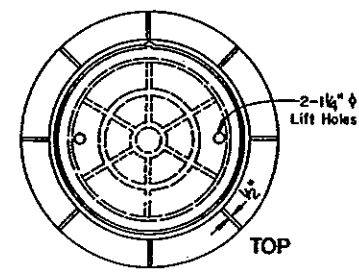
PRECAST BARRELS AND RISERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199.

NOTE: METHOD OF MEASUREMENT FOR MANHOLES SHALL BE AS FOLLOWS: THE CONTRACT UNIT PRICE BID FOR MANHOLES SHALL INCLUDE THE FURNISHING AND INSTALLING THE FOLLOWING:

1. CAST IRON RING AND COVER OR BEEHIVE CASTING & COVER
2. PRECAST COVER
3. CONCRETE BASE
4. CONCRETE ADJUSTING RINGS

THE ITEM "MANHOLE RISER" SHALL INCLUDE THE FURNISHING & INSTALLING OF THE REQUIRED LENGTH OF RISER & CAST IRON STEPS.

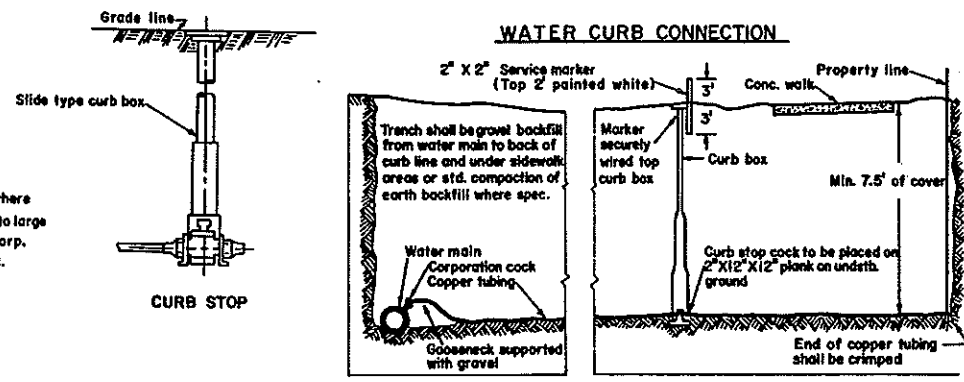
MORTAR TO BE INCLUDED IN THE PRICE BID FOR MANHOLES.



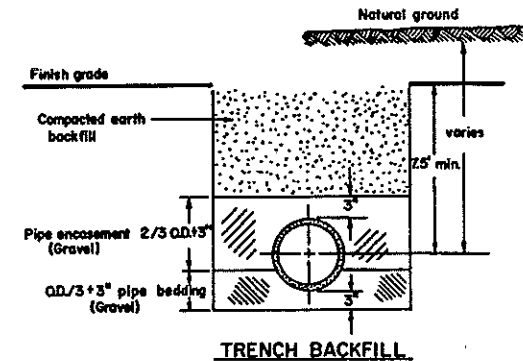
10-1-88		NORTH DAKOTA STATE HIGHWAY DEPARTMENT APPROVED: <i>David K. Lee</i> DESIGN ENGINEER
REVISIONS		
DATE	CHANGE	
8-3-87		
8-10-83	NOTE MANHOLE FRAME & COVER	

WATERWORKS

WATER CURB CONNECTION

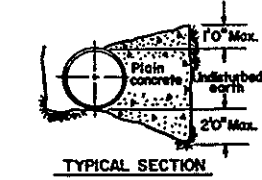
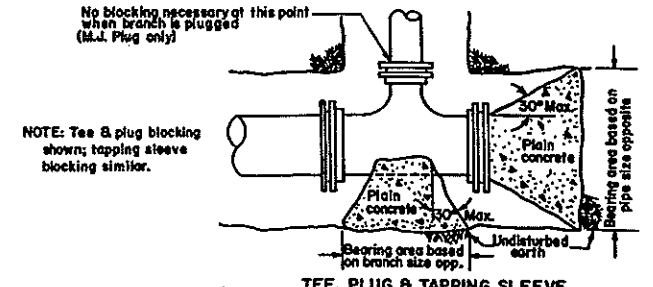


NOTE: Service clamp not required where small size service lines connect to large C.I.P. and three threads of the corp. stop make contact with the wall.



TRENCH BACKFILL

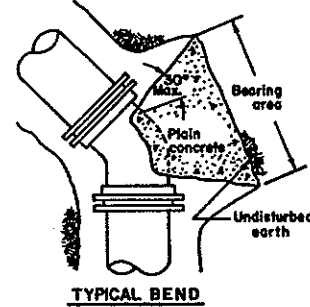
WATERMAIN THRUST BLOCK DETAILS



TYPICAL SECTION

SIZE OF PIPE	90° BEND	45° BEND	22.5° BEND	11.25° BEND	TEES, PLUGS & TAPPING SLEEVE
4"	2' SQ.	2' SQ.	2' SQ.	2' SQ.	2' SQ.
6"	3' SQ.	2' SQ.	2' SQ.	2' SQ.	3' SQ.
8"	4' SQ.	3' SQ.	2' SQ.	2' SQ.	4' SQ.
10"	5' SQ.	4' SQ.	3' SQ.	2' SQ.	5' SQ.
12"	6' SQ.	5' SQ.	4' SQ.	2' SQ.	6' SQ.
16"	8' SQ.	6' SQ.	5' SQ.	4' SQ.	8' SQ.
18"	10' SQ.	7' SQ.	6' SQ.	4' SQ.	10' SQ.

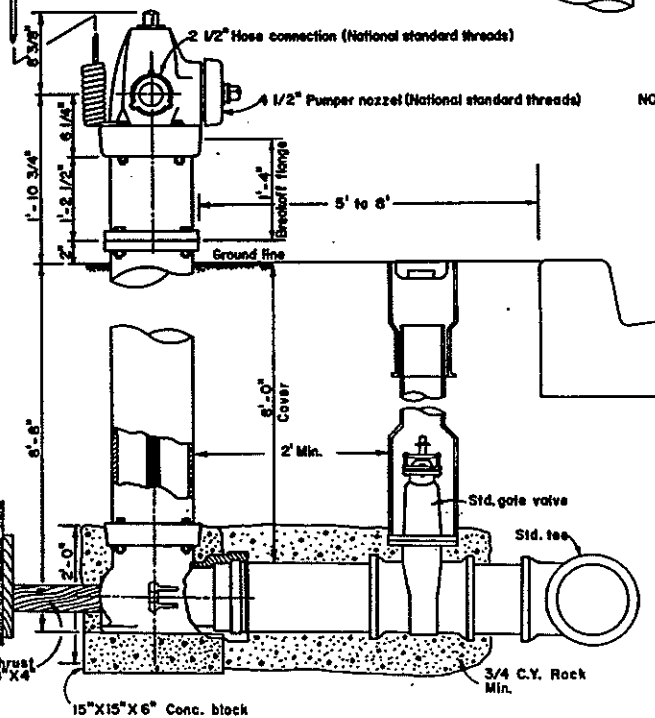
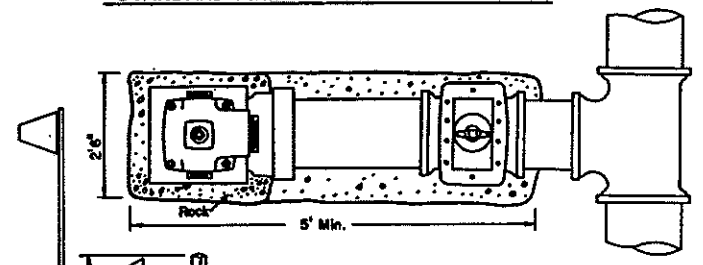
NOTE: Concrete blocking to be poured against undisturbed earth, keep bells and bolts free of concrete. Concrete in place to be included in price bid for water main.



THRUST BLOCK DETAIL

No Scale

STANDARD FIRE HYDRANT & CONNECTION

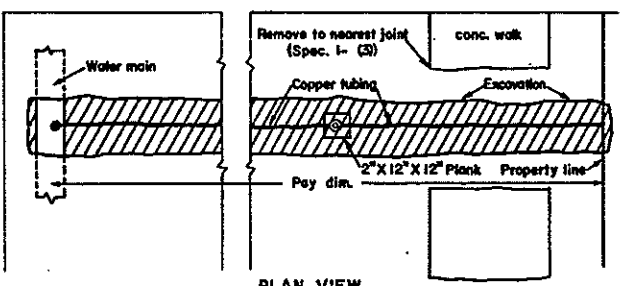


- NOTES:
- Operating & Cap nuts: city standards
 - Supplier will furnish and install hydrant marker. Cost will be included with the unit bid price for the hydrant. The hydrant marker shall be the Nordic Flexi-Flag as manufactured by Nordic Fiberglass, Inc. or approved equal. marker will be rust resistant.

TYPICAL CORPORATION STOP AND CURB STOP

No Scale

SECTIONAL ELEVATION



PLAN VIEW

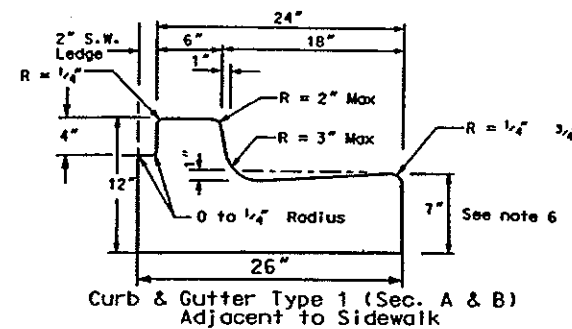
LAYOUT FOR RELOCATION OF HYDRANTS

- TYPICAL SEQUENCE OF INSTALLATION
- Remove existing hydrant.
 - Install long solid sleeve mech. joint, Cl. 150 C.I.P.
 - Install 6" or 8" Cl. 150 C.I. Pipe (length as needed).
 - Install salvaged hydrant at new location.

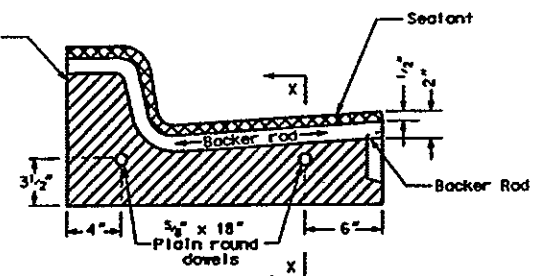
All materials necessary for the Relocation of the Hydrant to be included in price bid for "Relocate Hydrant". Existing water main valve to be adjusted as necessary and paid for as "Adjusted Utility Appurtenances."

10-1-88		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
DATE	REVISIONS	
	CHANGE	APPROVED: <i>Dan K. Olson</i> DESIGN ENGINEER

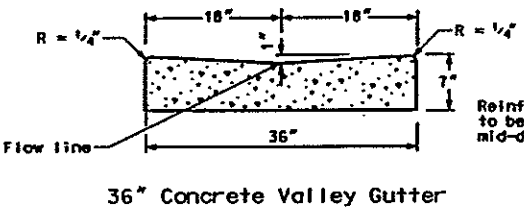
VALLEY GUTTER AND CURB & GUTTER



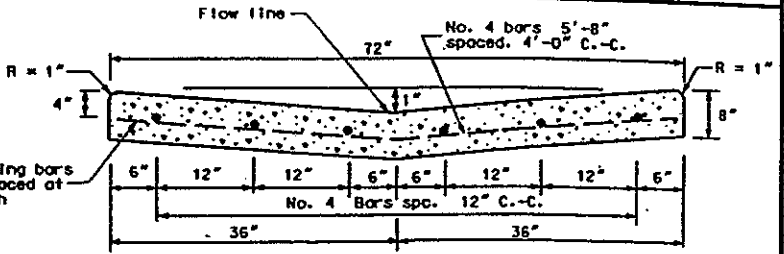
Curb & Gutter Type 1 (Sec. A & B) Adjacent to Sidewalk



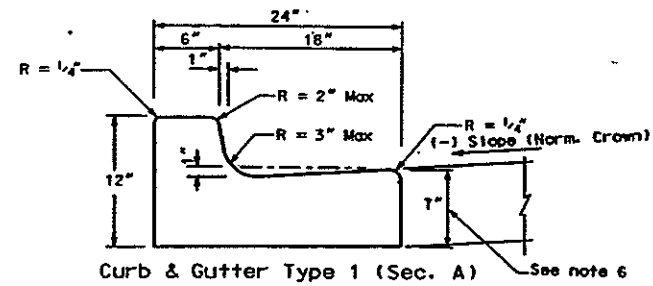
Isolation Joint Detail



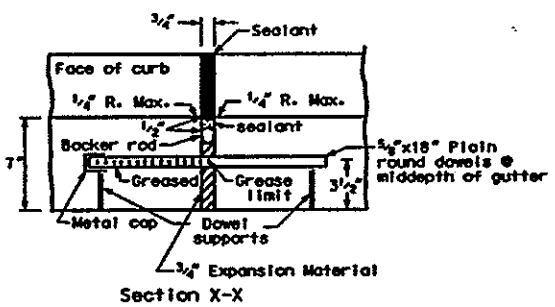
36" Concrete Valley Gutter



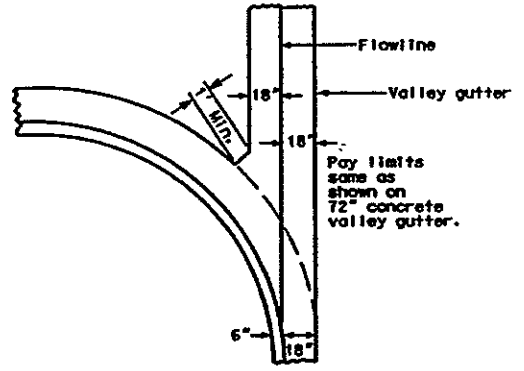
72" Concrete Valley Gutter



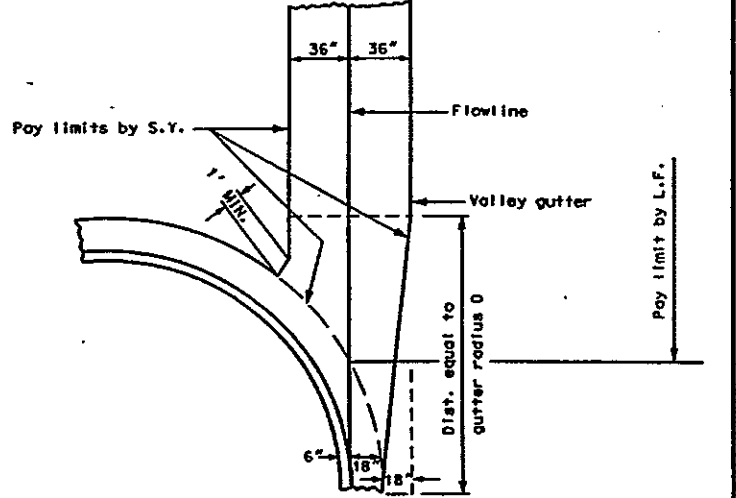
Curb & Gutter Type 1 (Sec. A)



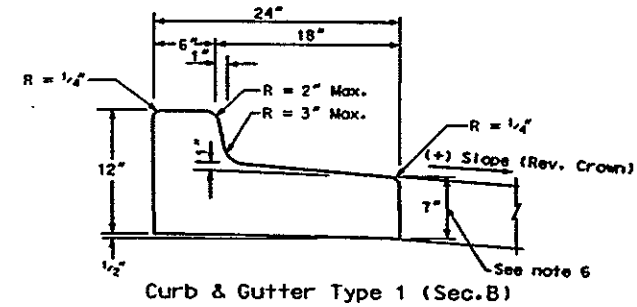
Section X-X



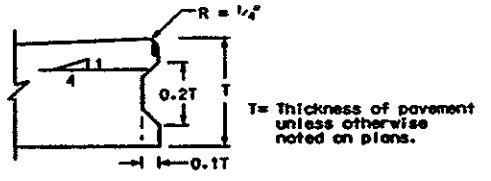
36" Concrete Valley Gutter



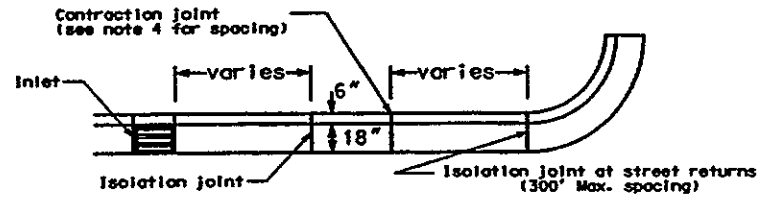
72" Concrete Valley Gutter



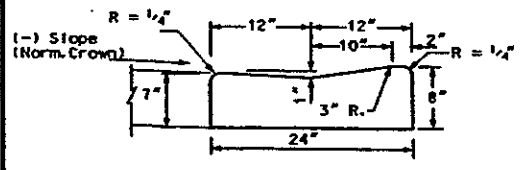
Curb & Gutter Type 1 (Sec. B)



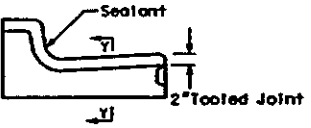
Keyway Detail For Curb & Gutter (To be used with P.C.C. Pavement and Drives.)



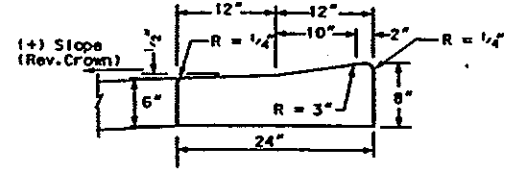
Joint Location Detail



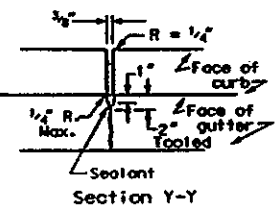
Mountable Curb & Gutter Type 1 (Sec. A)



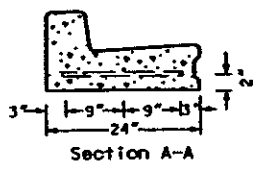
Contraction Joint Detail (10' Max. Spacing)



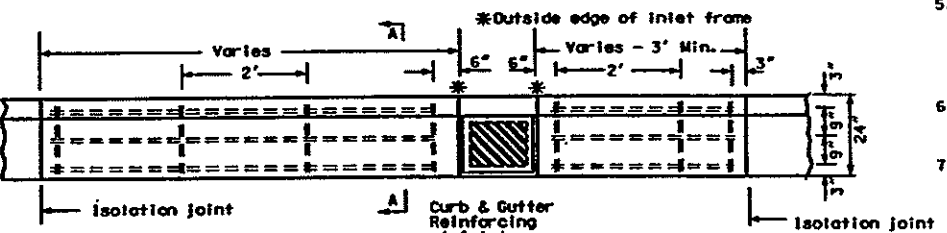
Mountable Curb & Gutter Type 1 (Sec. B)



Section Y-Y



Section A-A



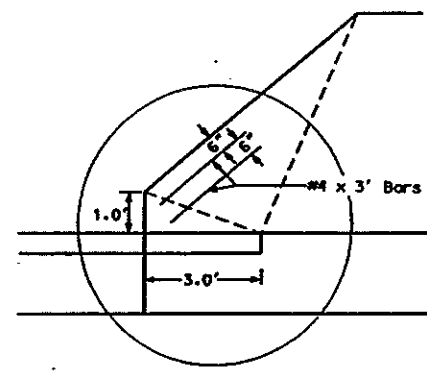
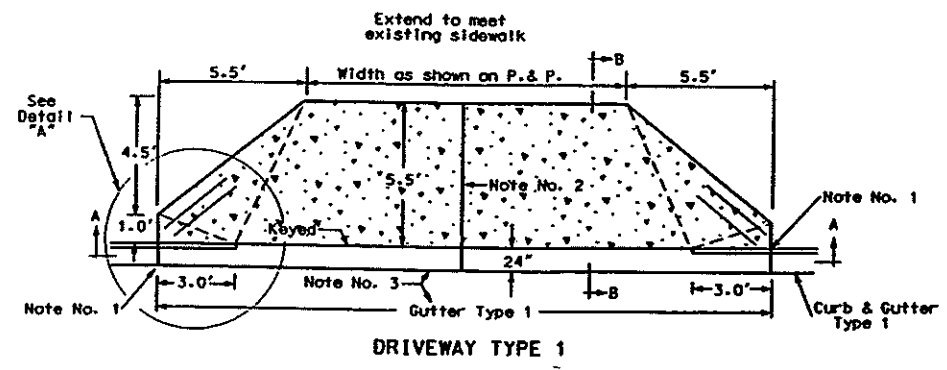
NOTE: All bars shall be #4 deformed reinforcing bars. Splices will not be permitted. Reinforcing bars at inlet locations will not be paid for separately, but shall be included in the price bid for "Curb and Gutter - Type 1." This includes inlets located on radii. The reinforcement shall be extended to the second joint (rebar placed through the first joint) in cases where the 3' min. panel length cannot be obtained.

- NOTES:
1. Curb and Gutter Type 1 to be used. Section "A" to be used with (-) pavement slopes and section "B" to be used with (+) pavement slopes.
 2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
 3. Isolation Joints: Isolation joint material shall be 3/4" preformed conforming to section 825.02C or D of the standard specifications. The opening for the backer rod and joint sealant shall be formed by a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour of a cold joint, metal caps and greased dowels shall be installed in the cold joint for the second pour.
 4. Joint Spacing: For hot bituminous pavements the joint spacing for the curb and gutter shall be 10' max. with the panels on each side of the inlets. For concrete pavements the joint spacing for the curb and gutter shall match the pavement joint on PCC Pavements.
 5. Joint sealings: All contraction and isolation joints shall be sealed as shown in the details. The joint sealant for contraction joints shall conform to section 826.02B. The sealant for expansion joints shall be as specified in note 3 above. The sealant shall be tooled and installed in accordance with the manufacturer's recommendations.
 6. Depth of Face of Gutter: For hot bituminous pavement the depth of gutter shall be as shown. For PCC pavements the depth of gutter shall match the adjacent PCC pavement.
 7. The cost for all labor, equipment, and material necessary to construct contraction & isolation joints shall be included in the price bid for curb and gutter.

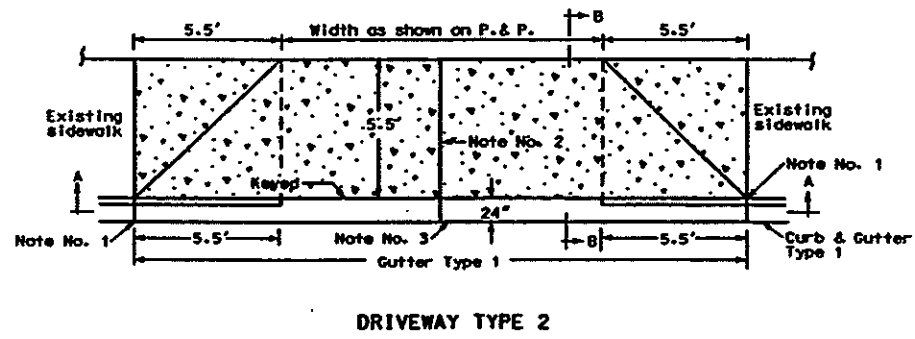
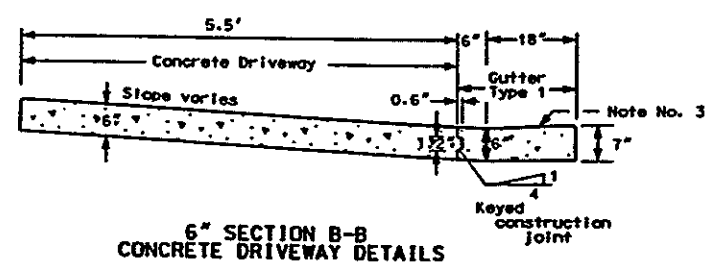
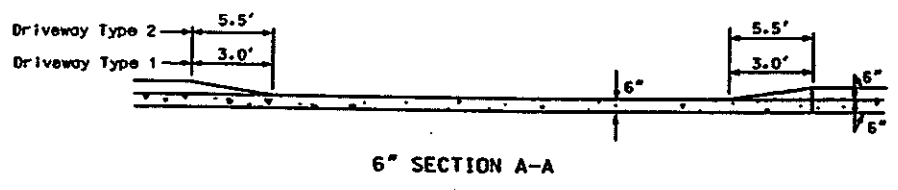
10-1-85	
REVISIONS	
DATE	CHANGE
10-17-97	GENERAL REVISIONS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPROVED: *K. H. Bil*
DESIGN ENGINEER

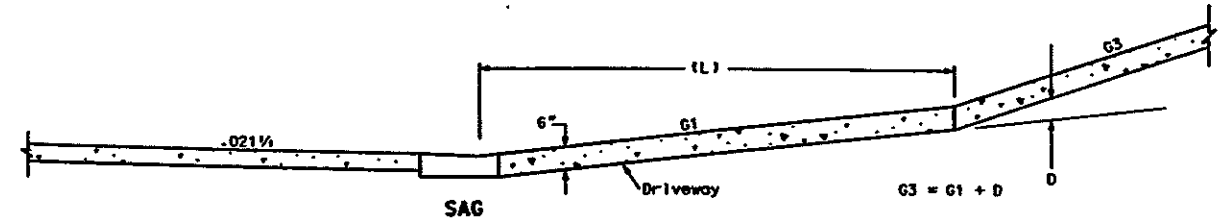
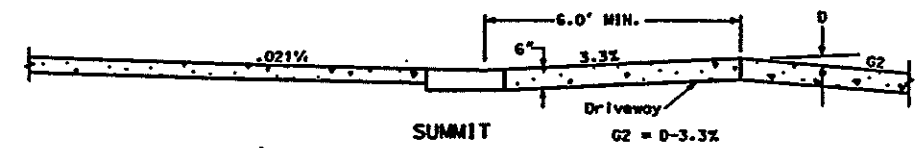
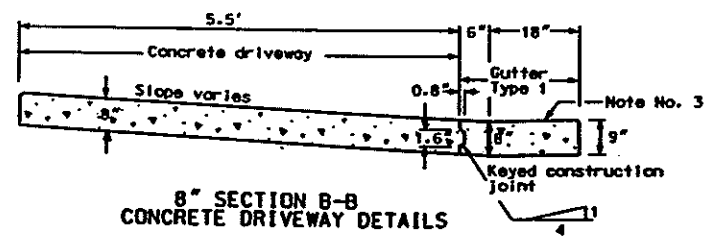
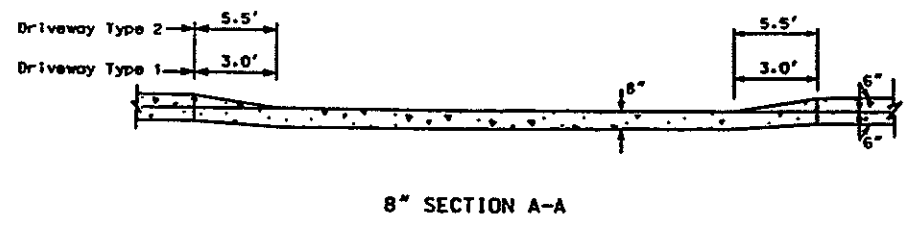
CONCRETE DRIVEWAY (URBAN)



- NOTES:
1. On bituminous pavements place a 3/4" isolation joint full depth and the same shape as the curb and gutter. On PCC Pavements the curb and gutter joints match those of the pavement.
 2. Joint spacing: The driveway joint spacing shall match the curb and gutter or P.C.C. Pavement joint spacing. (See Standard Drawing D-748-1). The joint may be a keyed construction joint, a sawed, or a grooved joint. The joint depth shall be a minimum of 1/3 the depth of the concrete.
 3. Gutter-Type 1 shall be paid for at the unit price bid for "Curb and Gutter-Type 1".
 4. 6" Driveway to be used unless otherwise specified.
 5. All joints shall be sealed. The joint sealant shall be low modulus silicone. The sealant shall be installed and tooled in accordance with the manufacturer's recommendations.
 6. All costs for labor, equipment, and material necessary to construct and seal joints shall be included in the price bid for the driveway.



DRIVEWAY QUANTITIES (S.Y.)		
WIDTH	TYPE 1	TYPE 2
10'	10.1	12.8
12'	11.3	14.1
14'	12.5	15.3
16'	13.8	16.5
18'	15.0	17.7
20'	16.2	18.9
22'	17.4	20.2
24'	18.6	21.4
26'	19.9	22.6
28'	21.1	23.8
30'	22.3	25.1



Driveway ADT	Grade G1		Dimension (L) ft.		Grade Changes (D)	
	Desirable	Maximum	Desirable	Minimum	Desirable	Maximum
(0-500)	5% ①	12% ② or controlled by vehicle clearance	12	6	+6%	15% or controlled by vehicle clearance
(500-1500)	3% ①	8% ②	20	20	±3%	±6%
(>1500)	2%	5%	40	40	0%	±3%

① 2% at sidewalk locations ② 6% at sidewalk locations

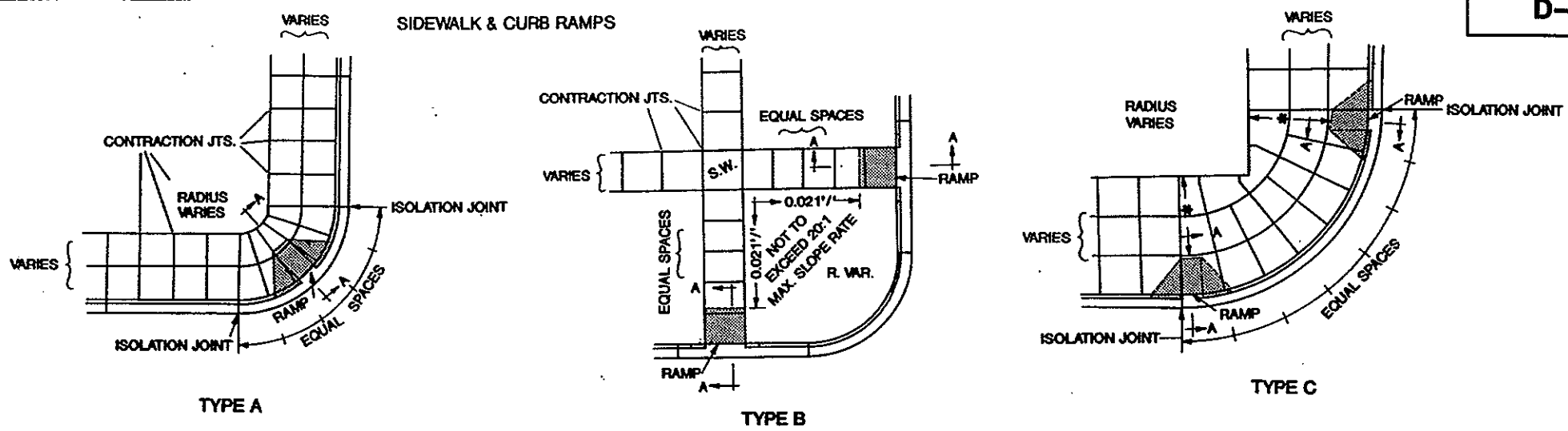
10-1-86 REVISIONS	
DATE	CHANGE
3/1/88	Keyed Jt. Dimension
7/1/88	Type 1 Tapers
7/1/88	Type 1 Quantities
5/1/91	Note 2, 5, and 6
6/8/92	Note 1
9/15/93	Note 5
11/15/93	Isolation Joint
10/24/94	Rev. Summit & Sag
09/19/97	Rev. note 5.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

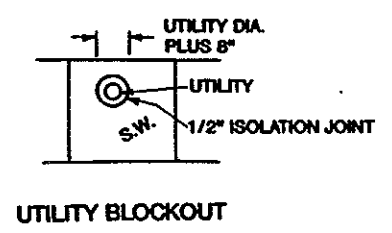
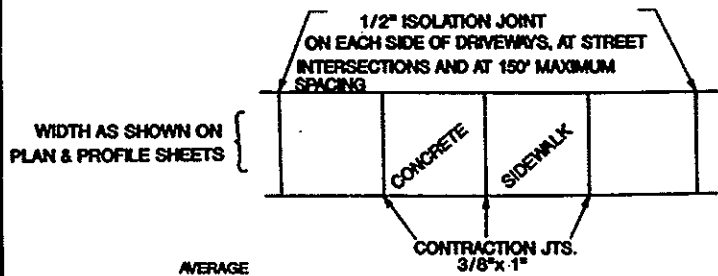
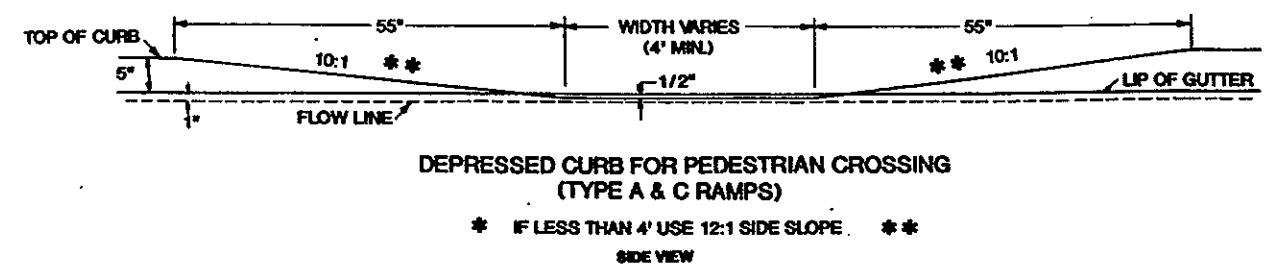
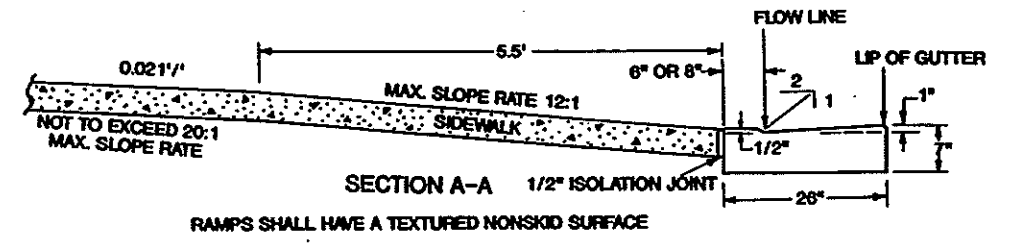
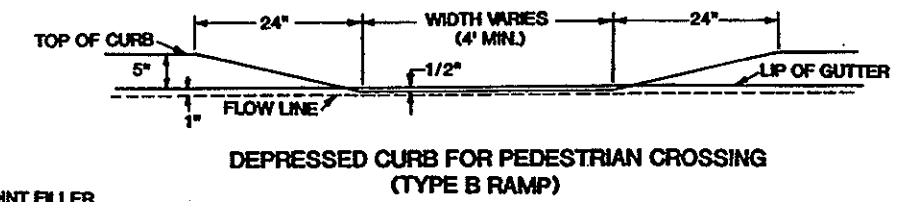
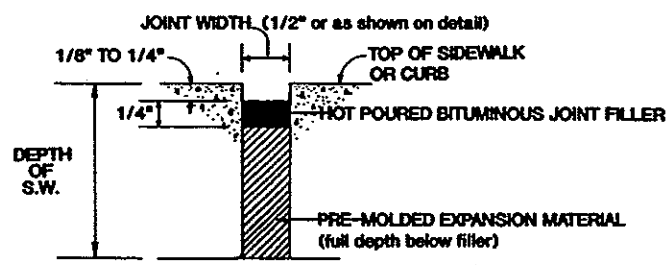
APPROVED: *K. H. B. J.*
DESIGN ENGINEER

NOTES

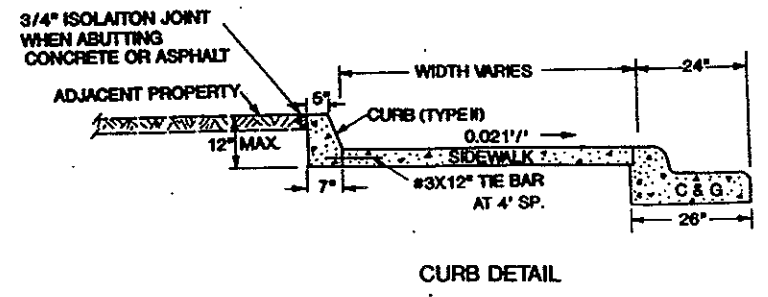
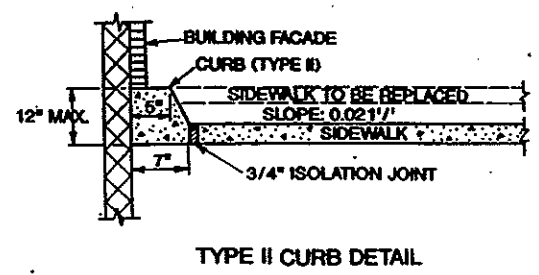
1. THE EXACT LOCATION & TYPE OF RAMP SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD AFTER CONSULTATION WITH THE CITY ENGINEER & CHANGES MADE ACCORDINGLY.
2. THE RAMP SHALL HAVE A SLIP RESISTANT SURFACE
3. METHOD OF PAYMENT: THE CURB RAMP WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE QUANTITIES & PAID FOR AT THE UNIT PRICE FOR CONCRETE SIDEWALK AND CURB & GUTTER.
4. THE COST FOR ALL LABOR, EQUIPMENT, AND MATERIAL (Pre-molded Expansion Material & Hot Bituminous Joint Filler) NECESSARY TO CONSTRUCT CONTRACTION AND ISOLATION JOINTS SHALL BE INCLUDED IN THE PRICE BID FOR SIDEWALK.



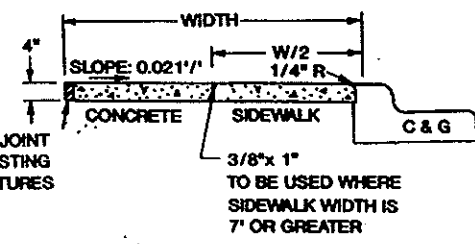
TYPE II CURB
AS SHOWN ON THE PLANS OR AT THE DIRECTION OF THE ENGINEER, A CURB SHALL BE CONSTRUCTED WHERE THE EXISTING SIDEWALK, ABUTTING A BUILDING OR ADJACENT PROPERTY, IS TO BE LOWERED. THE CURB WILL BE PAID FOR AT THE UNIT PRICE BID FOR CURBS (TYPE-1) PER LINEAL FOOT.



WHEN THE SIDEWALK IS ADJACENT TO THE CURB & GUTTER THE SIDEWALK JOINTS SPACING SHALL BE VARIED SO THAT THE SIDEWALK JOINTS MATCH UP WITH THE CURB & GUTTER JOINTS



3/4" ISOLATION JOINT WHEN ABUTTING EXISTING CONCRETE OR STRUCTURES

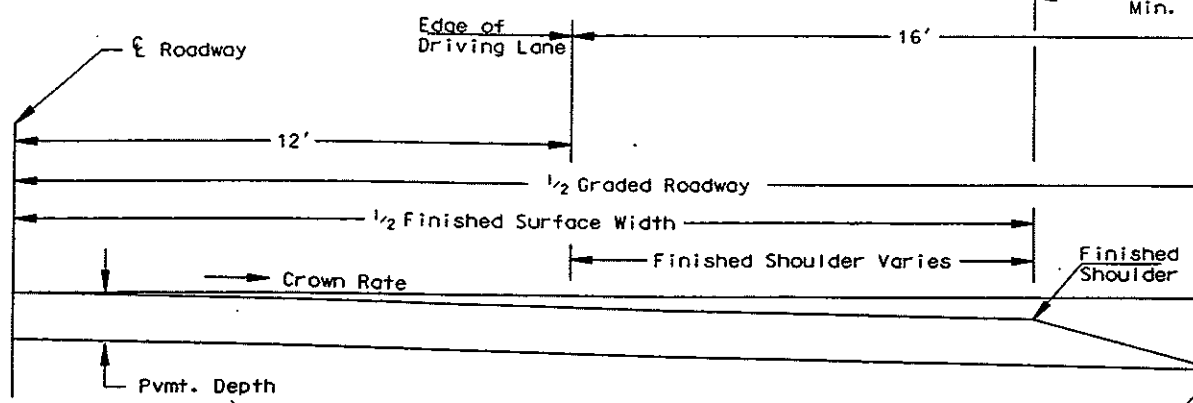


3-19-92	
REVISIONS	
DATE	CHANGE
9-1-92	REMOVE DETECTABLE WARNING
9-23-92	REMOVED EXPANSION JOINT
12-4-92	ISOLATION JOINT
2-10-04	GENERAL REVISIONS

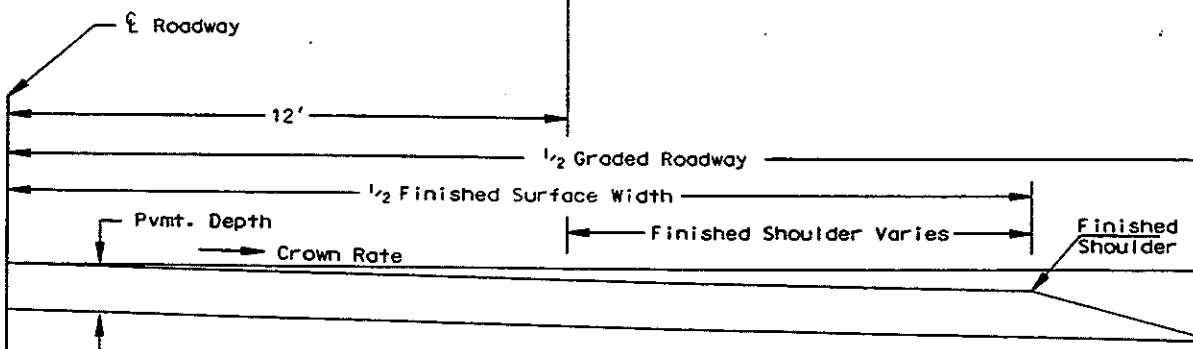
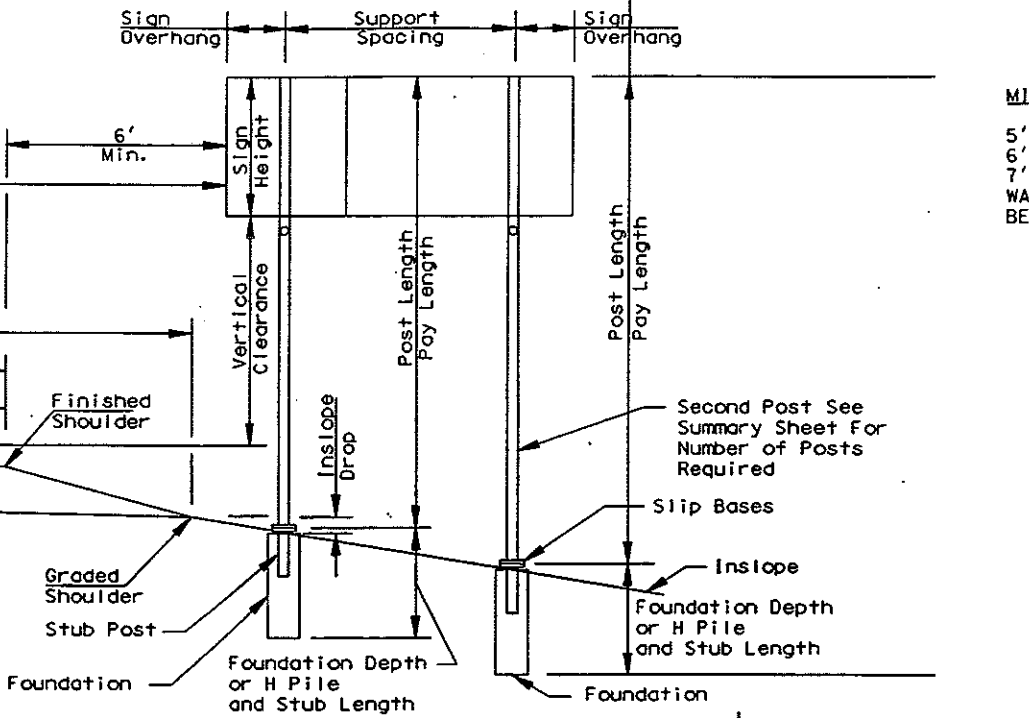
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED *David M. Lee*
DESIGN ENGINEER

ASSEMBLY DETAILS
(PIPE OR W SHAPE)

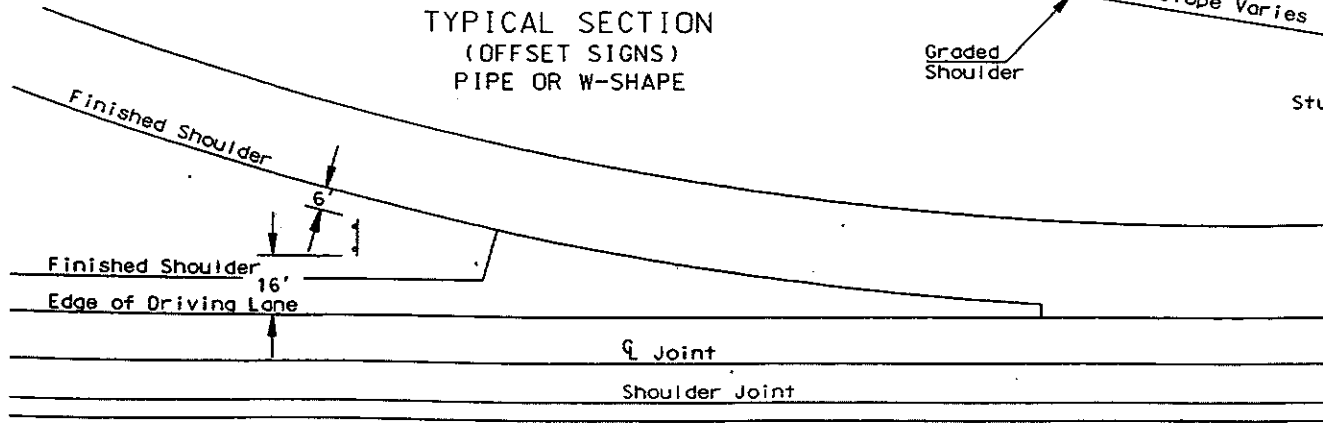
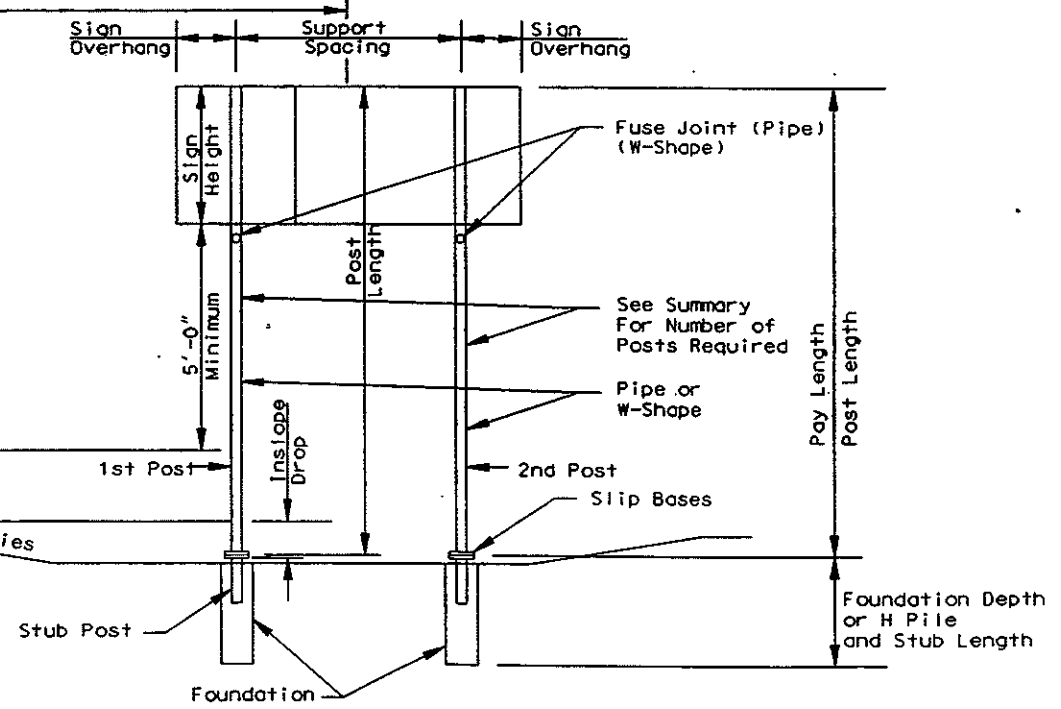
MINIMUM VERTICAL CLEARANCE
 5' RURAL ROADWAYS
 6' ON RURAL OR URBAN EXPRESSWAYS
 7' ON FREEWAYS EXCEPT ROUTE MARKERS.
 WARNING AND REGULATORY SIGNS SHALL BE 6'



TYPICAL SECTION
(INSLOPE SIGNS)
PIPE OR W-SHAPE



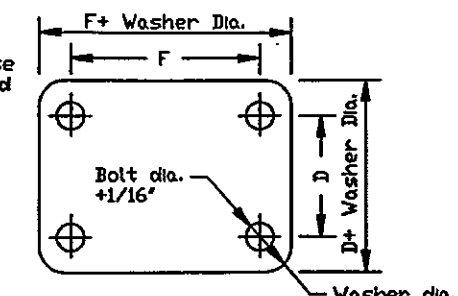
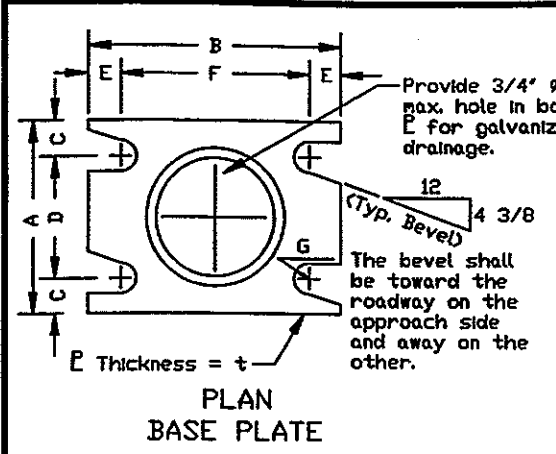
TYPICAL SECTION
(OFFSET SIGNS)
PIPE OR W-SHAPE



EXIT RAMP
GORE SIGN PLACEMENT

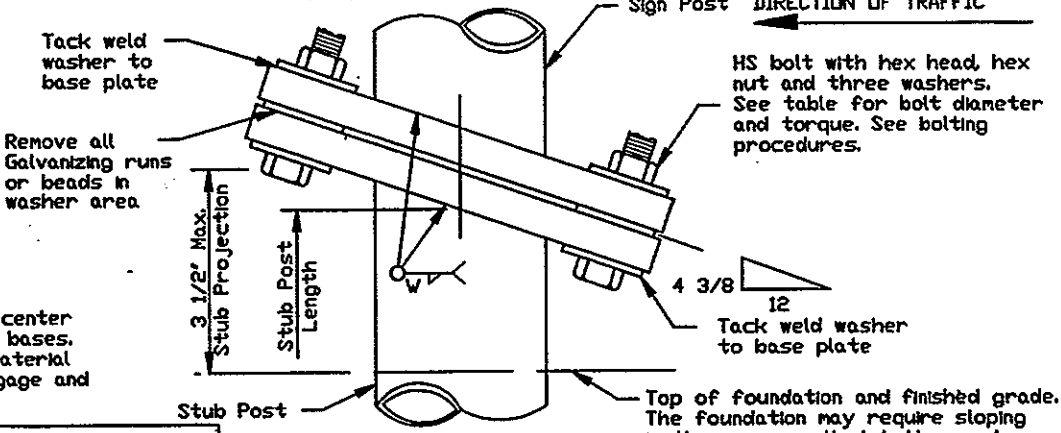
7-15-94 REVISIONS	
DATE	CHANGE
9-22-94	Vertical Clearance
9-8-95	Pay Length
1-31-97	Pay Length

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
David K. Lopez
 APPROVED: DESIGN ENGINEER

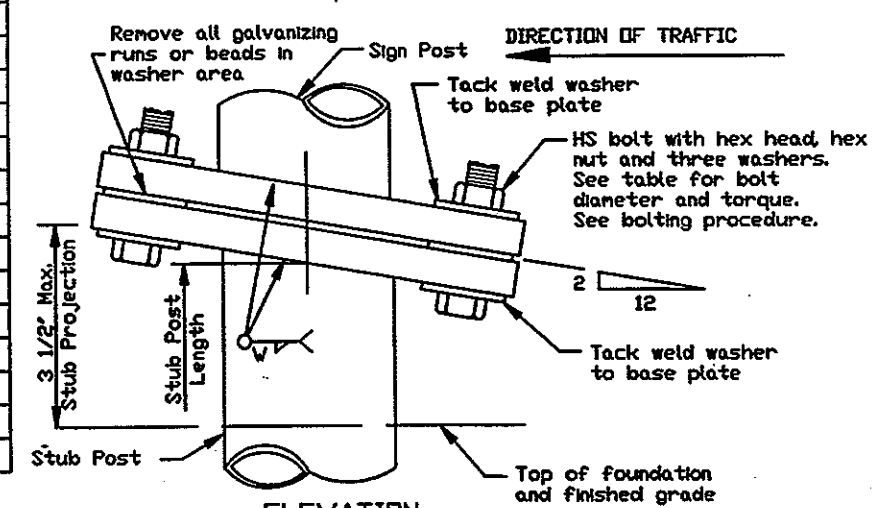


KEEPER PLATE DETAIL
Keeper plate shall be placed above the center washer between the top and bottom slip bases. Keeper plate shall be fabricated from material conforming to ASTM A-446 grade "A" 28 gage and galvanized after fabrication.

BREAK-AWAY BASE STUB POST

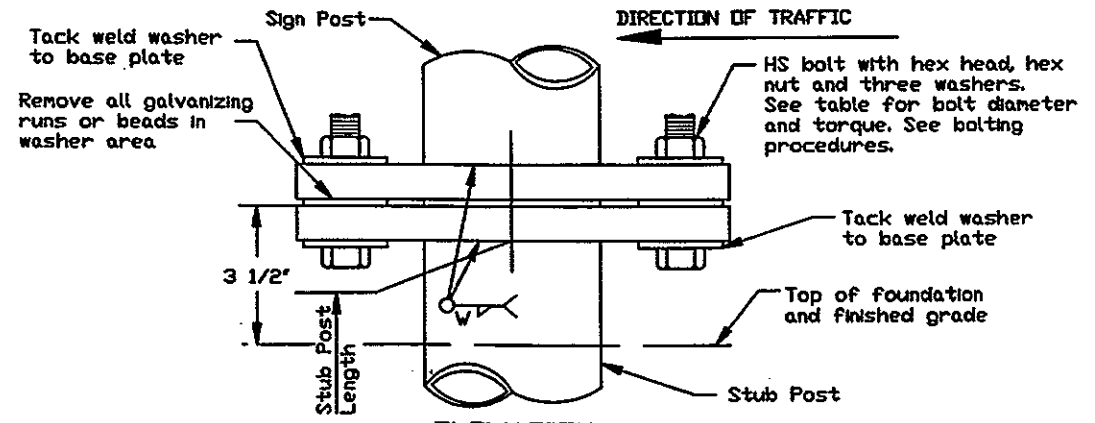


ELEVATION SINGLE POST SIGN AND STUB POST Type A

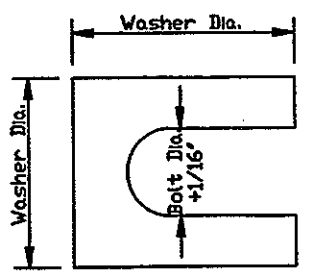


ELEVATION TWO POST SIGN AND STUB POST FOR SIGNS WITH LESS THAN 8' POST SPACING Type B

DIMENSION NOM. PIPE SIZE	BOLT SIZE	TORQUE SIZE	BASE DATA TABLE										STUB POST LENGTH
			A	B	C	D	E	F	G	t	W		
STEEL													
3 1/2"	1/2" x 2-1/2"	12	5-1/2"	8-3/8"	13/16"	3-7/8"	13/16"	6-3/4"	9/32"	3/4"	3/8"	1'-6"	
4"	5/8" x 2-3/4"	29	5-1/2"	8-3/4"	1"	3-1/2"	1"	6-3/4"	11/32"	3/4"	3/8"	1'-6"	
5"	3/4" x 3-1/2"	46	6-1/2"	10"	1-1/8"	4-1/4"	1-1/8"	7-3/4"	13/32"	1"	7/16"	2'-0"	
6"	1" x 4-1/4"	61	7-1/2"	11-3/4"	1-3/8"	4-3/4"	1-3/8"	9"	17/32"	1-1/4"	7/16"	2'-0"	
8"	1" x 4-1/4"	61	9-1/2"	13-1/4"	1-3/8"	6-3/4"	1-3/8"	10-1/2"	17/32"	1-1/4"	7/16"	2'-6"	
10"	1" x 4-1/4"	61	11-3/4"	15-1/4"	1-3/8"	9"	1-3/8"	12-1/2"	17/32"	1-1/4"	1/2"	3'-0"	
12"	1-1/4" x 5"	135	13-3/4"	18"	1-5/8"	10-1/2"	1-5/8"	14-3/4"	21/32"	1-1/2"	1/2"	3'-0"	
ALUMINUM													
3 1/2"	1/2" x 2-1/2"	12	5-1/2"	8-3/8"	13/16"	3-7/8"	13/16"	6-3/4"	9/32"	3/4"	3/8"	1'-6"	
4"	5/8" x 2-3/4"	29	5-1/2"	8-3/4"	1"	3-1/2"	1"	6-3/4"	11/32"	1"	7/16"	1'-6"	
5"	3/4" x 3-1/2"	46	6-1/2"	10"	1-1/8"	4-1/4"	1-1/8"	7-3/4"	13/32"	1"	1/2"	2'-0"	
6"	1" x 4-1/4"	61	7-1/2"	11-3/4"	1-3/8"	4-3/4"	1-3/8"	9"	17/32"	1-1/4"	1/2"	2'-0"	
8"	1" x 4-1/4"	61	9-1/2"	13-1/4"	1-3/8"	6-3/4"	1-3/8"	10-1/2"	17/32"	1-1/4"	1/2"	2'-6"	
10"	1" x 4-3/4"	61	11-3/4"	15-1/4"	1-3/8"	9"	1-3/8"	12-1/2"	17/32"	1-1/2"	7/16"	3'-0"	
12"	1-1/4" x 5-1/2"	135	13-3/4"	18"	1-5/8"	10-1/4"	1-5/8"	14-3/4"	21/32"	1-3/4"	11/16"	3'-0"	

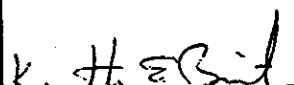


ELEVATION TWO OR MORE POST SIGN AND STUB POST FOR TWO POST SIGNS WITH 8' OR MORE POST SPACING POST SPACING AND ALL THREE OR MORE POST SIGNS Type C



SHIM DETAIL
Furnish 2 ea. .012"± thick and 2 ea. .032"± shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM-B36.

- NOTES:**
- KEEPER PLATE - A KEEPER PLATE MAY BE USED IN LIEU OF TACK WELDING WASHER TO THE BASE PLATE.
 - ALUMINUM BASE PLATE WASHERS - WHEN THE BASE PLATE IS FABRICATED FROM ALUMINUM, THE WASHERS SHOWN AS TACK WELDED TO BASE SHALL BE ALUMINUM.
 - FUSE JOINT CUTS - STEEL POSTS MAY BE CUT AFTER GALVANIZING AND CUT SURFACE TREATED WITH AN APPROVED ZINC SOLDER MEETING THE FEDERAL SPEC. 0.G-93 (STICK ONLY) OR THE CUT MAY BE GALVANIZED AFTER FABRICATION. ALUMINUM POSTS WILL NEED NO TREATMENT.
- ASSEMBLY PROCEDURE**
- ASSEMBLE POST TO STUB WITH BOLTS AND WITH ONE FLAT WASHER BETWEEN BASE PLATES AND KEEPER PLATE.
 - SHIM AS REQUIRED TO PLUMB POST.
 - TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 12" TO 15" WRENCH TO BED WASHERS AND SHIMS AND TO CLEAN BOLT THREADS, THEN LOOSEN.
 - RETIGHTEN BOLTS IN A SYSTEMATIC ORDER TO PRESCRIBED TORQUE. (SEE TABLE)
 - LOOSEN EACH BOLT AND APPLY THREAD LOCKING LIQUID RESIN. THE LIQUID LOCKING RESIN SHALL BE "LOCTITE" MANUFACTURED BY LOCKTITE CORPORATION OR EQUAL. THE THREAD LOCKER SHALL SECURE THE ENTIRE ASSEMBLY FROM VIBRATION, PRESSURE AND CORROSION. THE THREAD LOCKER SHALL FILL THE GAPS BETWEEN THE THREAD AND THE MATING SURFACE TO FORM SOLID ONE PART ASSEMBLIES.
 - RETIGHTEN EACH BOLT TO PRESCRIBED TORQUE IN THE SAME ORDER AS INITIAL RETIGHTENING.

7-15-94		REVISIONS	DATE	CHANGE
		NOTES	STUB POST DIMENSION	
		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION  APPROVED: DESIGN ENGINEER		

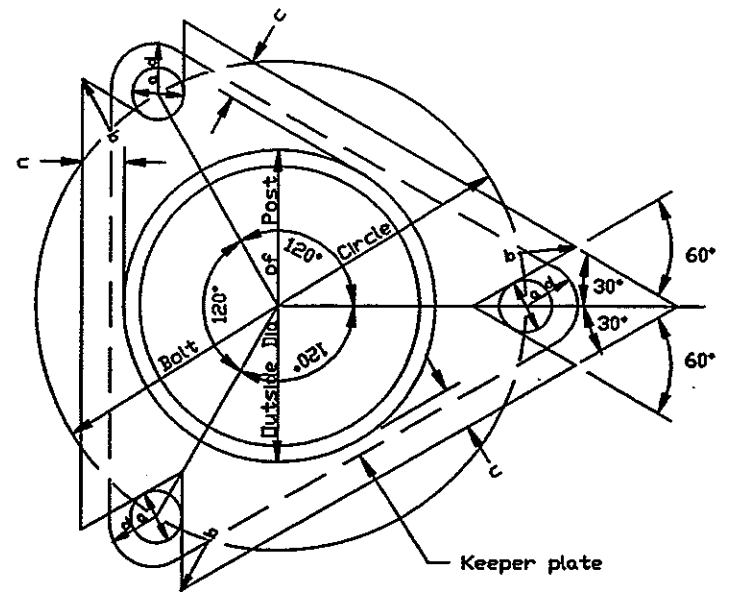
MULTI-DIRECTIONAL BREAK AWAY BASE

NOTES:

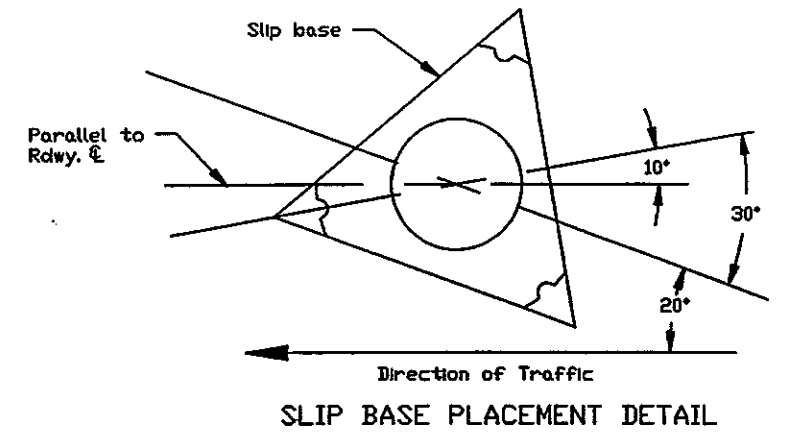
FOUNDATIONS SHALL BE SIMILAR TO THOSE SHOWN ON THE BREAK AWAY AND FOUNDATION DETAILS EXCEPT FOR THE TYPE OF SLIP BASE. IN LIEU OF STUB POST SHOWN, THE ANCHOR BOLT CONNECTION SHOWN ON THE BREAK AWAY AND FOUNDATION DETAILS MAY BE USED.

ASSEMBLY PROCEDURE

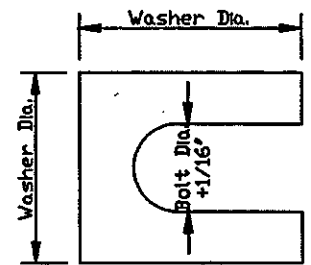
1. ASSEMBLE POST TO STUB WITH BOLTS AND WITH ONE FLAT WASHER BETWEEN BASE PLATES AND KEEPER PLATE.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 12" TO 15" WRENCH TO BED WASHERS AND SHIMS AND TO CLEAN BOLT THREADS, THEN LOOSEN.
4. RETIGHTEN BOLTS IN A SYSTEMATIC ORDER TO PRESCRIBED TORQUE. (SEE TABLE)
5. LOOSEN EACH BOLT AND APPLY THREAD LOCKING LIQUID RESIN. THE LIQUID LOCKING RESIN SHALL BE "LOCTITE" MANUFACTURED BY LOCKTITE CORPORATION OR EQUAL. THE THREAD LOCKER SHALL SECURE THE ENTIRE ASSEMBLY FROM VIBRATION, PRESSURE AND CORROSION. THE THREAD LOCKER SHALL FILL THE GAPS BETWEEN THE THREAD AND THE MATING SURFACE TO FORM SOLID ONE PART ASSEMBLIES.
6. RETIGHTEN EACH BOLT TO PRESCRIBED TORQUE IN THE SAME ORDER AS INITIAL RETIGHTENING.



PLAN

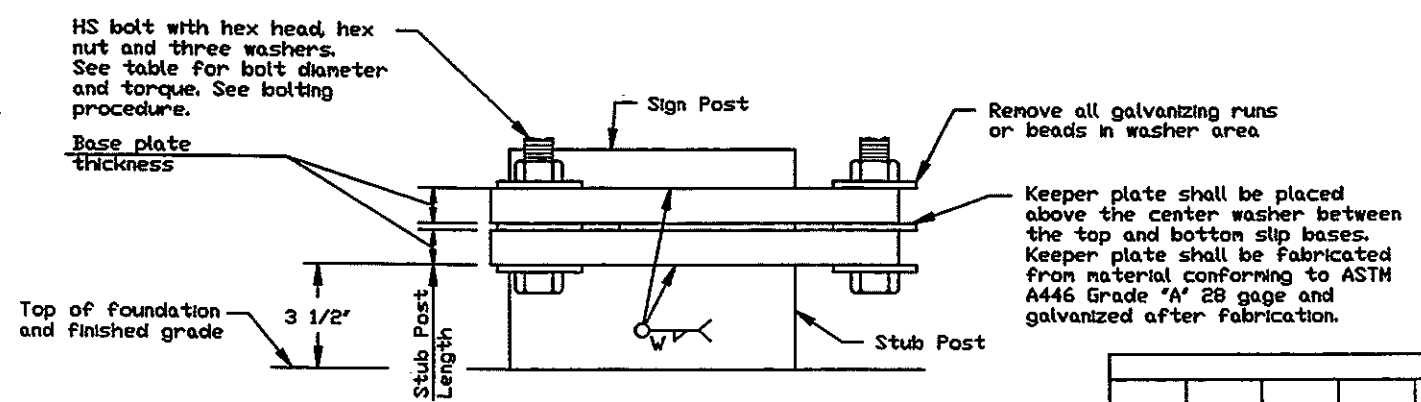


SLIP BASE PLACEMENT DETAIL



Furnish 2 ea. .012 \pm thick and 2 ea. .032 \pm thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM-B36.

SHIM DETAIL



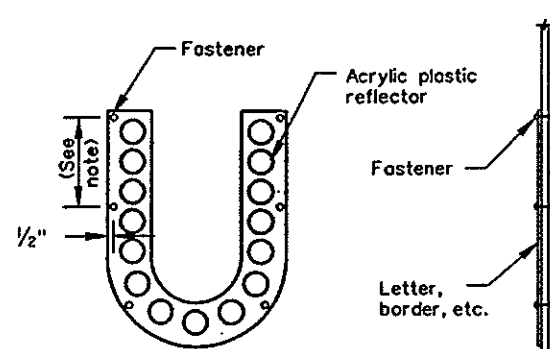
ELEVATION
MULT. DIRECTION SIGN POST
TYPE D

MULTI-DIRECTIONAL SLIP BASE											
NOMINAL POST DIA.	OUTSIDE POST DIA.	BOLT CIRCLE	a Radius	b Radius	c Radius	BOLT SIZE	BASE PLATE THICKNESS	W	BASE BOLT TORQUE Ft. lbs.	d Radius	STUB POST LENGTH
STEEL											
3 1/2"	4"	7"	1 1/16"	1/8"	1 1/8"	3/4" x 4"	1 1/4"	5/16"	55	1 1/8"	1'-6"
4"	4.5"	7 1/2"	1 1/16"	1/8"	1 1/8"	1" x 4 1/2"	1 1/2"	3/8"	98	1 1/8"	1'-6"
5"	5.563"	9 1/2"	1 5/16"	1/8"	1 1/8"	1 1/4" x 5"	1 1/2"	3/8"	167	1 3/8"	2'-0"
ALUMINUM											
3 1/2"	4"	7"	13/16"	1/8"	7/8"	3/4" x 3 1/2"	1"	5/16"	43	7/8"	1'-6"
4"	4.5"	7 1/2"	13/16"	1/8"	3/4"	3/4" x 4"	1 1/4"	5/16"	76	7/8"	1'-6"
5"	5.563"	9 1/2"	1 1/16"	1/8"	1 1/8"	1" x 4"	1 1/4"	5/16"	98	1 1/8"	2'-0"
6"	6.625"	10 1/4"	1 1/16"	1/8"	3/4"	1" x 4 1/2"	1 1/2"	3/8"	134	1 1/8"	2'-0"
8"	8.625"	12 1/2"	1 5/16"	1/8"	3/4"	1 1/4" x 5"	1 1/2"	1/2"	189	1 3/8"	2'-6"

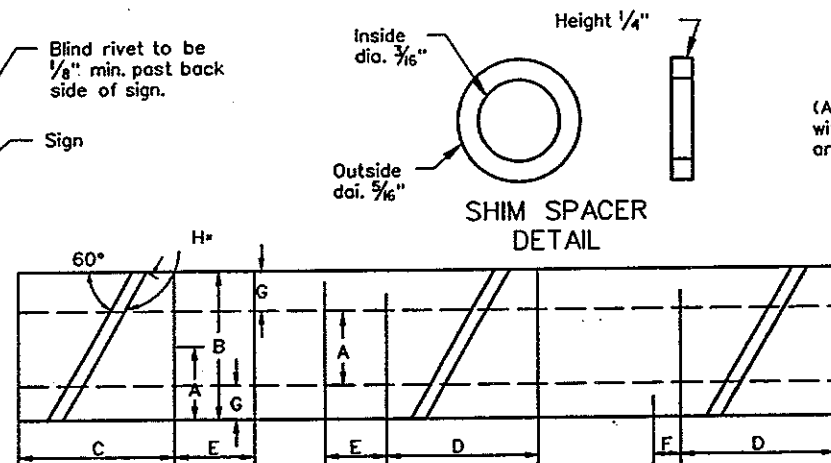
7-15-94	
DATE	REVISIONS
6-20-95	NOTES
8-14-95	STUB POST DIMENSION
9-8-95	TYPE D

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *Kent H. Rief*
DESIGN ENGINEER

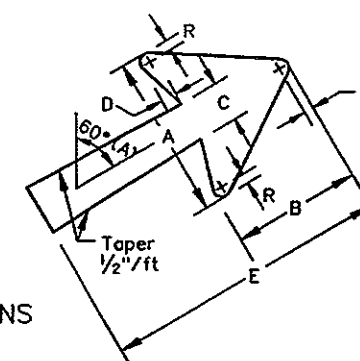
LETTER AND ARROW DETAILS FOR VARIABLE LENGTH SIGNS



Pre-drill holes in sign face, letters, borders, numerals and symbols as specified by the manufacturer.

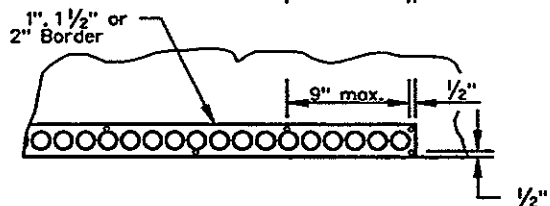
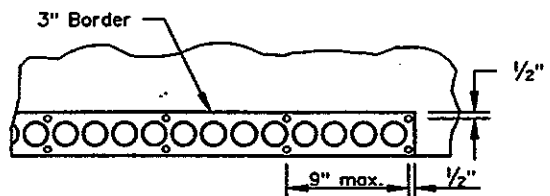


(A) When exit number is within the sign face, the arrow shall be at 45°.



GORE SIGNS

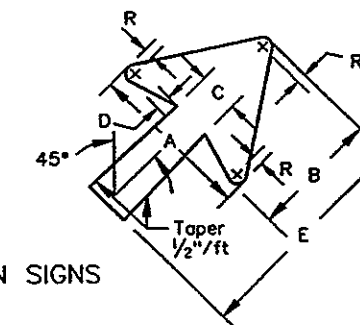
LETTERSIZE (Upper Case)	A	B	C	D	E	R
8"	15-1/8"	11-9/16"	3-3/4"	1-5/16"	25"	3/16"
10" - 13-1/3"	18-1/4"	14"	4-1/2"	1-1/2"	30"	3/4"



SIZE OF THE FRACTION RECTANGLE IS DETERMINED AS FOLLOWS:

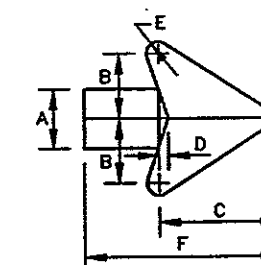
SYMBOL	TITLE	RATIO TO HEIGHT OF CAPITAL OR UPPER CASE
A	Letter height	1.0 of capital or upper case
B	Height of rectangle	1.5 X A
C	Width of rectangle	.3 X A
D	Width of rectangle	20 X A
E	Space to next character	1 to 1.5 X A
F	Whole number to a fraction	.50 to .75 X A
G	Space to top or bottom of rectangle	.25 X A
H	Length of diagonal	1.75 X A

*Diagonal stroke of fraction is to be centered optically.



EXIT DIRECTION SIGNS

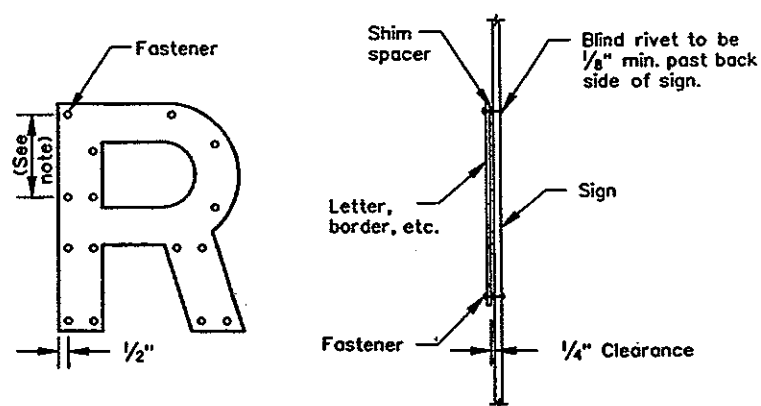
LETTERSIZE (Upper Case)	A	B	C	D	E	R
8"	15-1/8"	11-9/16"	3-3/4"	1-5/16"	17"	3/16"
10" - 13-1/3"	18-1/4"	14"	4-1/2"	1-1/2"	20"	3/4"
16"	22-1/4"	17"	5-3/8"	1-3/4"	25"	1"



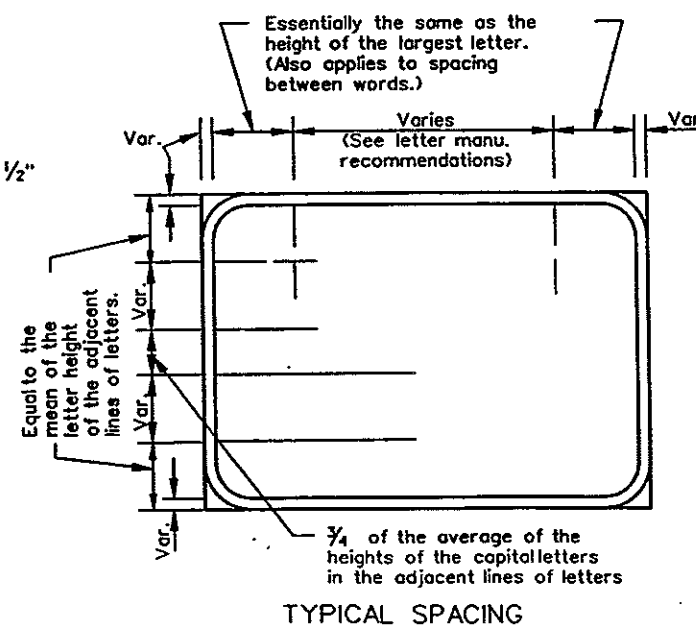
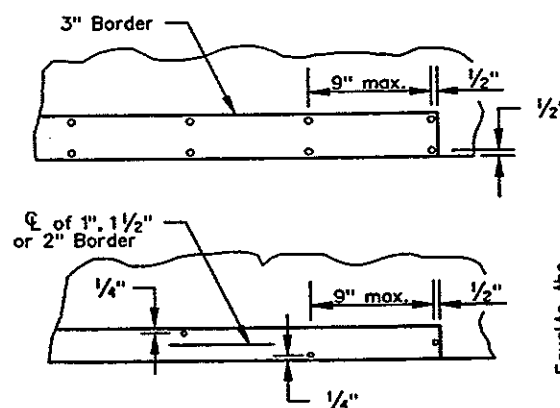
DISTANCE & DESTINATION SIGNS

LETTERSIZE (Upper Case)	A	B	C	D	E	F
6"	2-3/4"	3"	5-9/16"	7/16"	7/16"	9"
8"	3-1/2"	4"	7-1/8"	7/16"	1/16"	12"

ATTACHMENT DETAILS OF CUT OUT LETTERS, BORDERS, NUMERALS AND SYMBOLS USING ACRYLIC PLASTIC REFLECTORS



ATTACHMENT DETAILS OF CUT OUT TYPE LETTERS, BORDERS, NUMERALS AND SYMBOLS USING REFLECTIVE SHEETING



TYPICAL SPACING

NOTES:

Letters, Borders, etc.: The contractor may choose either cut out using acrylic plastic reflectors, cut out, or direct-applied using reflective sheeting letter, borders etc. unless shown otherwise on the plans, however the type selected shall prevail throughout the project.

Fasteners: (Prescribe blind rivet) or other suitable non rust fasteners.

Cut out using reflective sheeting, letters, numerals, and symbols (symbols used with these letter heights) from 4" through 12" heights shall have an aluminum backing .040" thick and heights of more than 12" shall have an aluminum backing .064" thick. Borders shall have an aluminum backing .032" thick.

Cut out using acrylic plastic reflector letters, numerals and symbols frames shall be fabricated from .040" thick aluminum sheet. Borders shall be fabricated from .032" aluminum sheet.

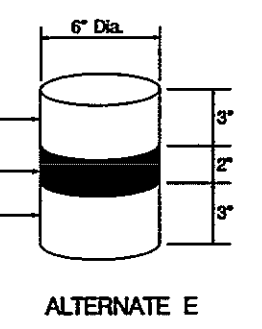
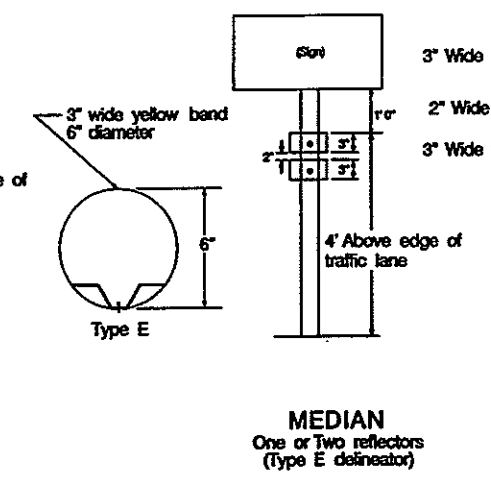
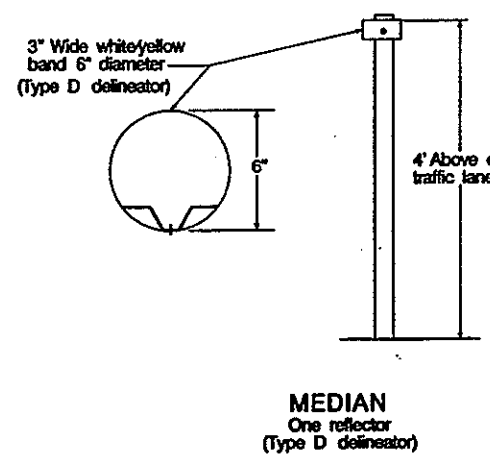
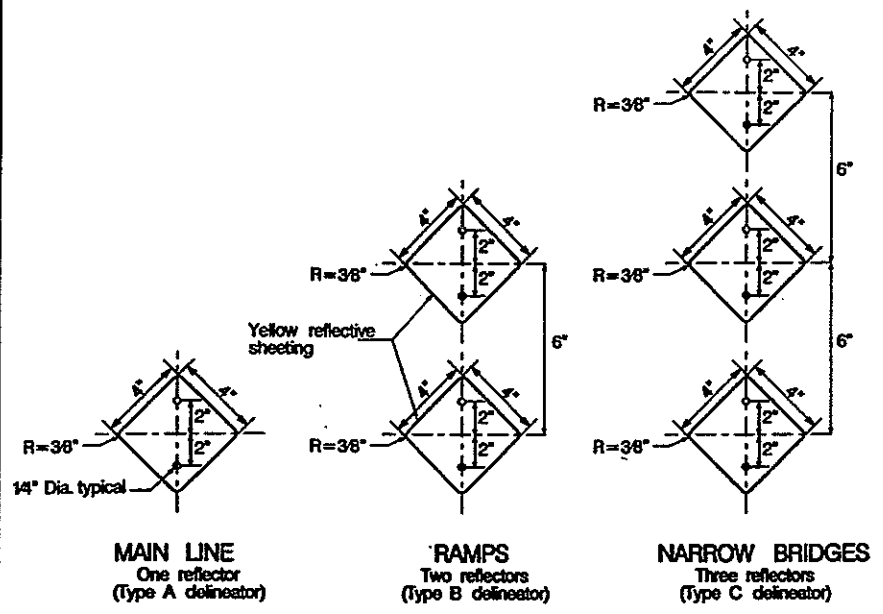
Mounting holes shall be uniformly spaced around character and shall be spaced not more than 8" on center except for 8" height or less. Characters of 8" or less shall be spaced a maximum of 4".

7-15-94		REVISIONS	
DATE	CHANGE	DATE	CHANGE
11-8-94	Arrows		
9-18-95	Exit arrow orientation		
2-2-98	Typical spacing detail		

APPROVED: *K.E.B.*
DESIGN ENGINEER

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

REFLECTORIZED DELINEATORS



DELINEATOR DETAILS
TYPE A, B, & C

Delineator fabrication: Delineator backing material shall conform to the requirements of section 894.01 of the Standard Specifications. Delineator faces shall be fabricated in conformance to the requirements of Section 754 & 894 of the Standard Specifications.

Delineator backing: Backing shall be .040 aluminum plates or 18 ga. steel plates. Backing shall be aluminum alloy conforming to A.S.T.M. designation B209 (AA-6061-T6) with mill finish.

Reflectors: Reflector shall be the same color as the adjacent pavement marking.

Installation: Posts are to be installed along right shoulder line unless shown otherwise on the plans.

Spacing: Delineator spacing along main line shall be at 528' centers on tangent and curves less than 0° 30' and 264' centers on curves 0° 30' and greater.

Posts: Posts shall conform to Sec. 894.06 of the Standard Specifications. Steel posts shall be galvanized.

Fasteners: Reflector shall be attached to the post by a non rust tension pin type fastener or a round unslotted head aluminum machine screw fabricated of aluminum alloy 2024-T4 and vandal resistant nut fabricated of aluminum alloy 2011-T3.

TYPE D

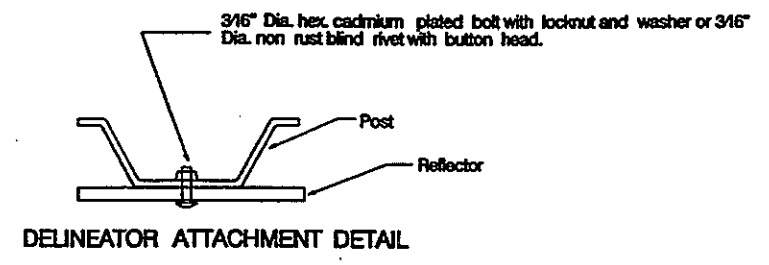
Material: 3" wide backing of .063" aluminum shall be used. Reflective material shall be flexible Type 3A or 3B reflective sheeting.

TYPE E

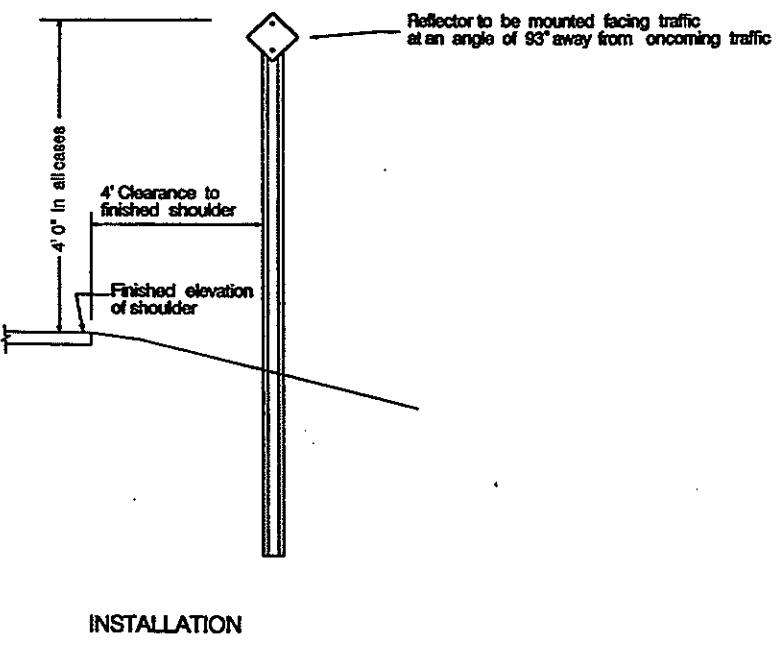
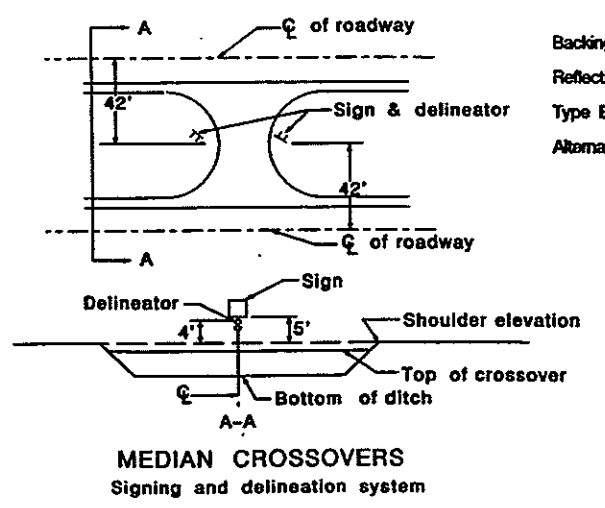
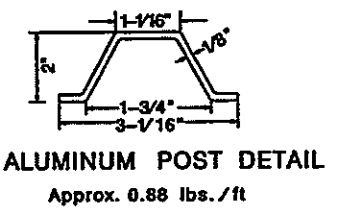
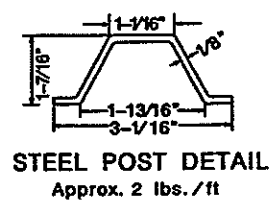
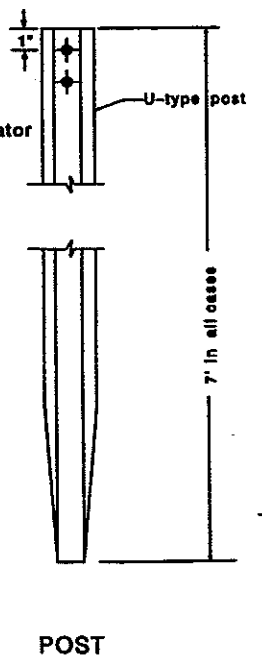
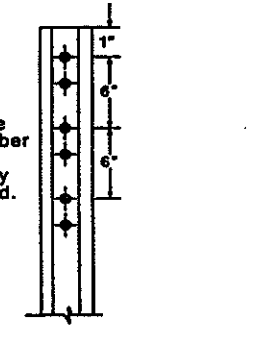
Backing of .063" aluminum shall be used. Reflective material shall be flexible Type 3A or 3B reflective sheeting.

Type E - is a two band system with 2" spacing between bands.

Alternate E - is a one unit delineator consisting of two yellow bands separated by a 2" black band.



NOTE:
The contractor may drill only those holes required to attach the number of reflectors on that post, or drill all the posts the same so that any number of reflectors may be added.



10-1-86	
REVISIONS	
DATE	CHANGE
8-15-86	Remove anchor plate
1-27-87	Posts note
4-30-87	Notes, Post Detail, and Remove Table
10-6-87	Median Delineators

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

APPROVED: *K. H. B. Bit*
DESIGN ENGINEER

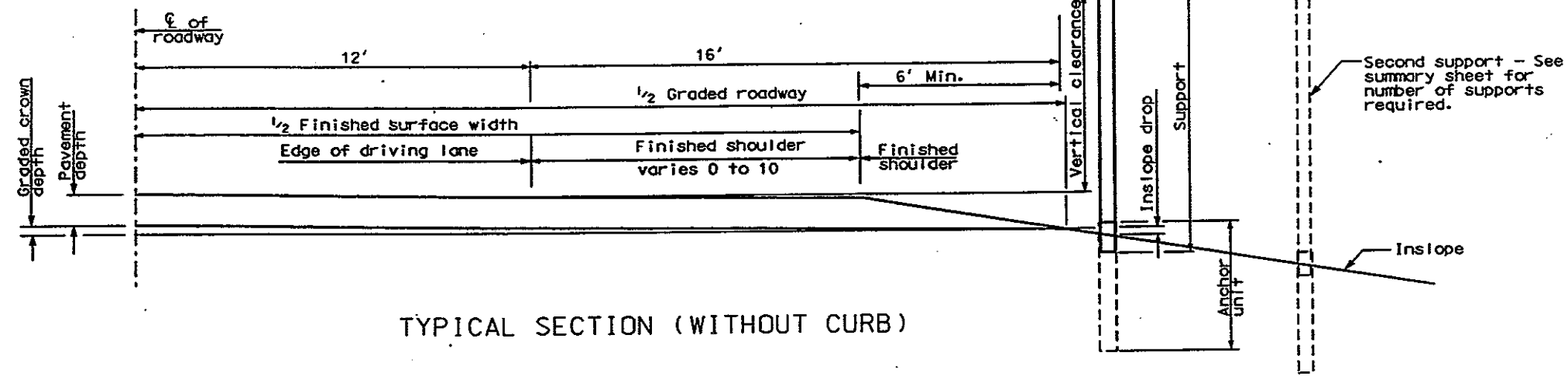
ASSEMBLY DETAILS

MINIMUM HORIZONTAL CLEARANCE:

The 16' clearance from the edge of the driving lane to the edge of the sign shall be for all roadways without curbs. All curbed roadways shall have 3' horizontal clearance from the face of the curb to the edge of the sign unless noted otherwise on the plans. All bike routes shall have a 3' minimum horizontal clearance from the edge of the bike route to the edge of the sign.

MINIMUM VERTICAL CLEARANCE:

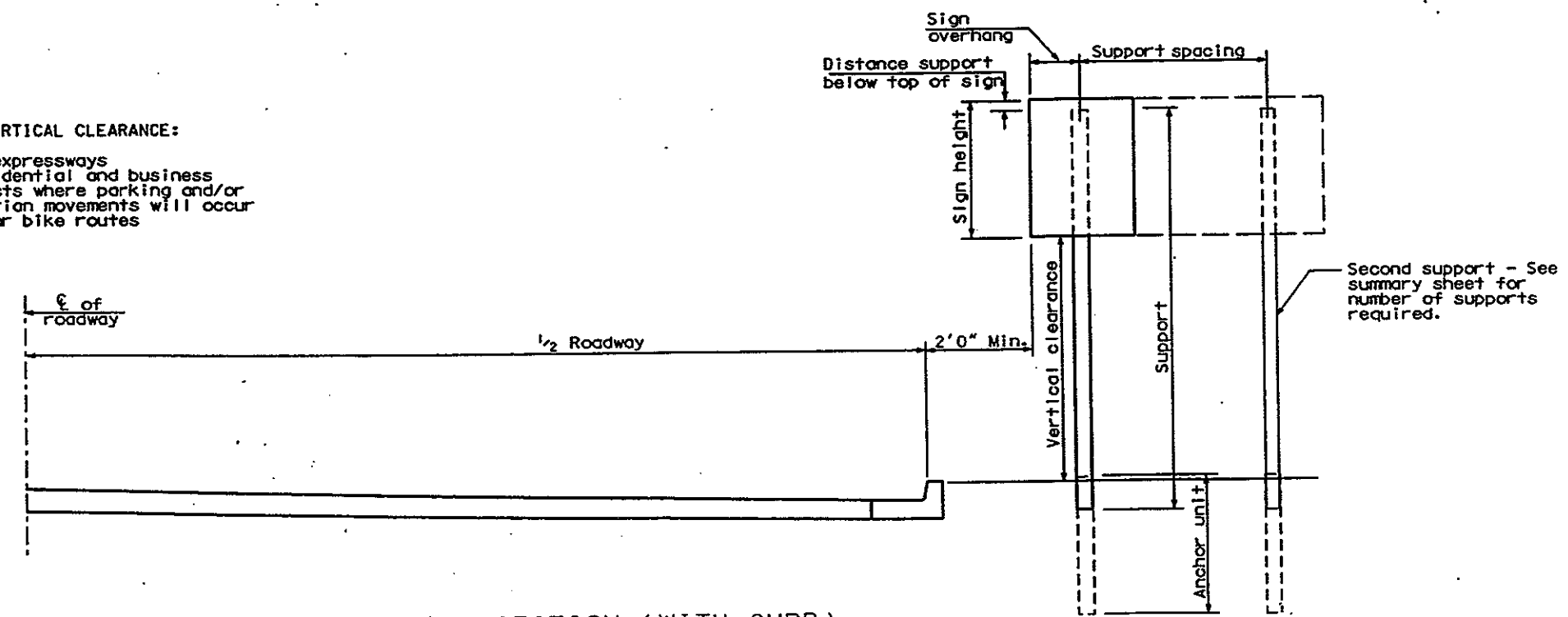
- 5' Rural roadways
- 6' On rural or urban expressways
- 7' On freeways



TYPICAL SECTION (WITHOUT CURB)

MINIMUM VERTICAL CLEARANCE:

- 6' Urban expressways
- 7' In residential and business districts where parking and/or pedestrian movements will occur
- 4' Min. for bike routes



TYPICAL SECTION (WITH CURB)

NOTES:

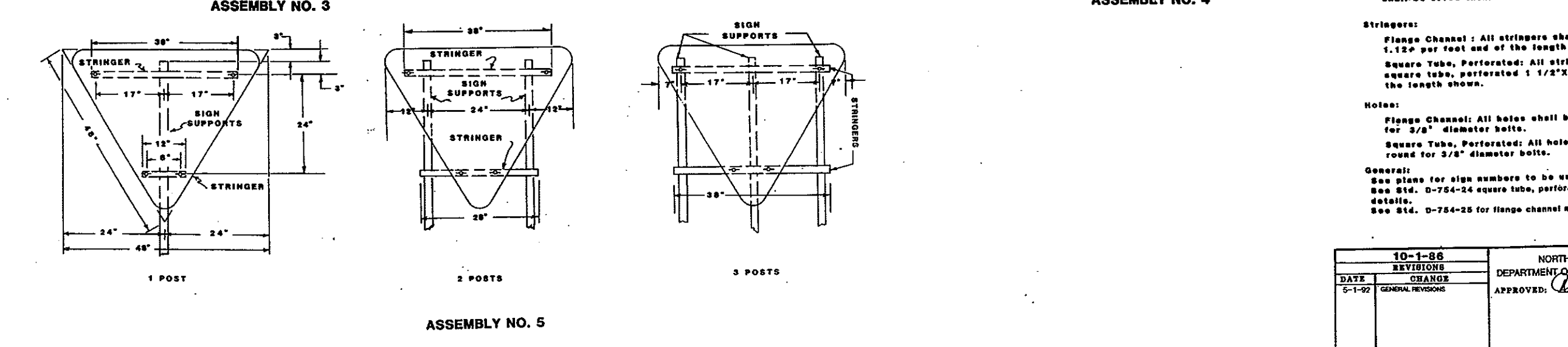
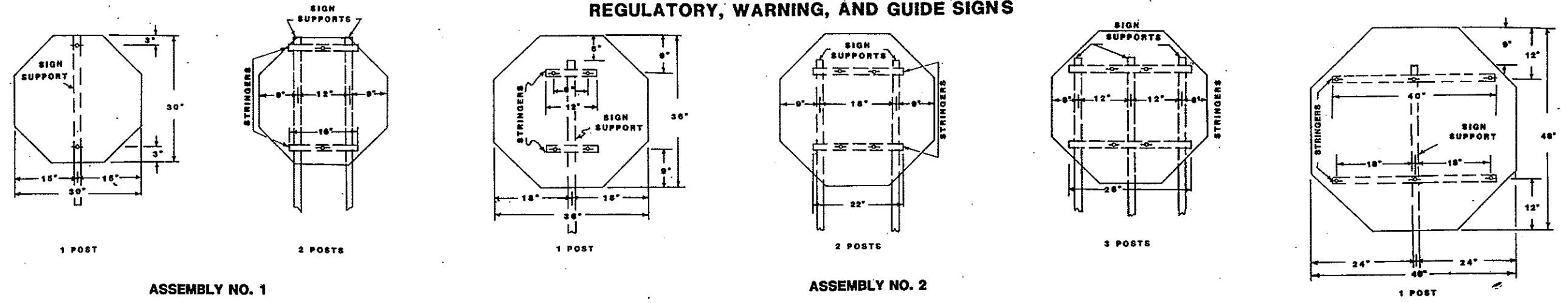
Pavement Depth: The pavement depth used to develop summary sheets should be the ultimate pavement depth. See plans for sign numbers and assembly numbers. Sign punching and stringers shall be as shown on standards.

Horizontal Clearance: The support lengths have been computed using a horizontal clearance of 16 feet between the edge of the driving lane and the edge of the sign. For an ultimate shoulder width of 10 feet, the districts have the option of setting the signs out to 18 feet clearance. If the clearance is to be increased to 18 feet, the necessary adjustment in support length shall be made in the field.

10-1-86	
REVISIONS	
DATE	CHANGE
8-1-88	Freeways
9-4-90	Min. overhang from shoulder
5-1-92	General revisions
9-3-92	Min. clearance
9-8-95	Post length
2-2-98	General revisions
11-5-98	Vert. cl.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *K. H. B. J.*
DESIGN ENGINEER

**SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING, AND GUIDE SIGNS**



NOTE:
Material:
Signaling Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 6062 -H38 shall have the following minimum thickness. All signs shall be 0.100 inch.

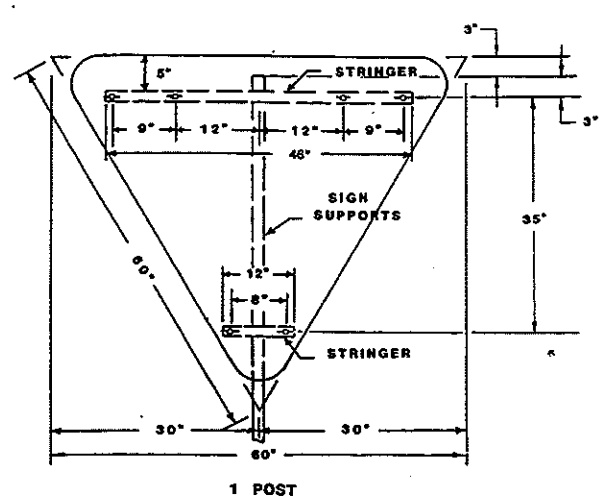
Stringers:
Flange Channel: All stringers shall be flange channel 1.12" per foot and of the length shown.
Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" X 1 1/2" and of the length shown.

Holes:
Flange Channel: All holes shall be punched round for 3/8" diameter bolts.
Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

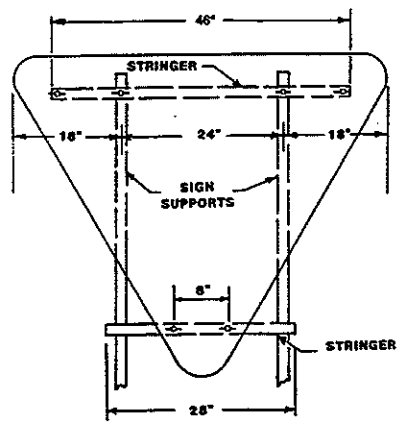
General:
See plans for sign numbers to be used at each location.
See Std. D-754-24 square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.

10-1-86		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVISIONS		
DATE	CHANGE	APPROVED: <i>Edward H. B...</i> DESIGN ENGINEER
5-1-92	GENERAL REVISIONS	

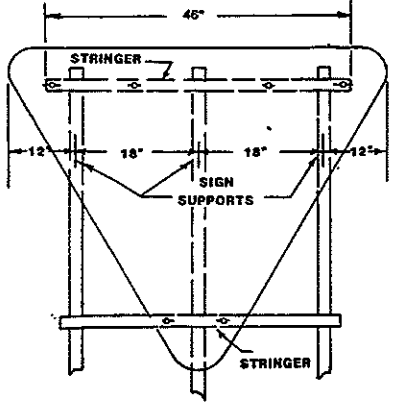
**SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING, AND GUIDE SIGNS**



1 POST

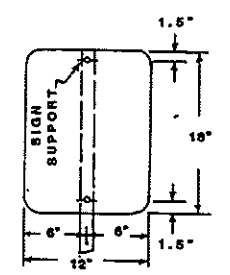


2 POSTS



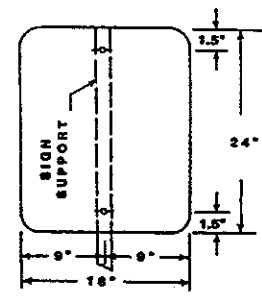
3 POSTS

ASSEMBLY NO. 6



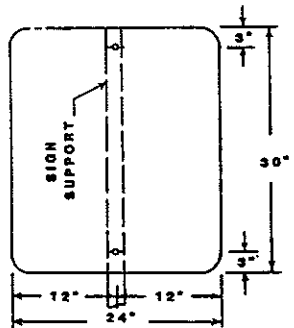
1 POST

ASSEMBLY NO. 7



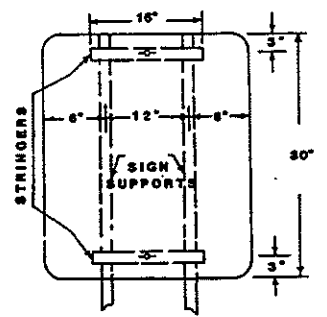
1 POST

ASSEMBLY NO. 8

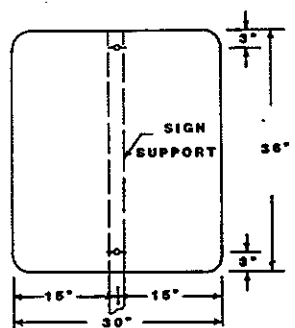


1 POST

ASSEMBLY NO. 9

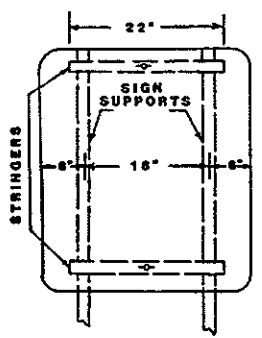


2 POSTS

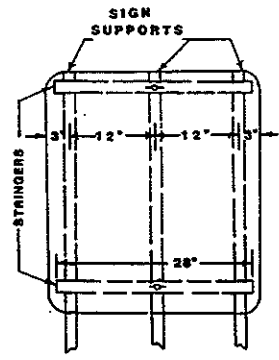


1 POST

ASSEMBLY NO. 10



2 POSTS



3 POSTS

NOTE:

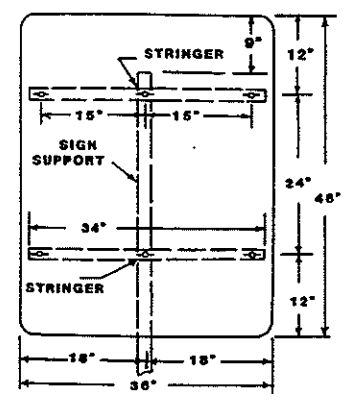
Material:
Sign Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 5052-H38 shall have the following minimum thickness: All signs shall be 0.100 inch.

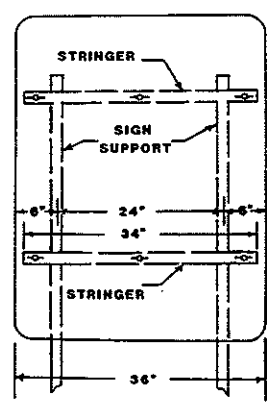
Stringers:
Flange Channel: All stringers shall be flange channel 1.125 per foot and of the length shown.
Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" x 1 1/2" and of the length shown.

Holes:
Flange Channel: All holes shall be punched round for 3/8" diameter bolts.
Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

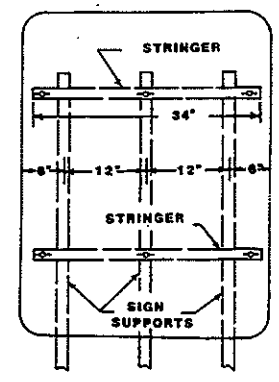
General:
See plans for sign numbers to be used at each location.
See Std. D-754-24 square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.



1 POST



2 POSTS



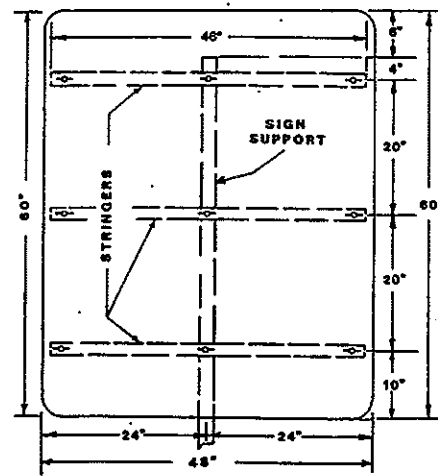
3 POSTS

ASSEMBLY NO. 11

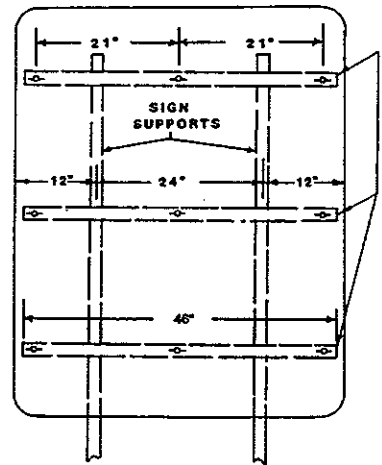
10-1-86	
REVISIONS	
DATE	CHANGE
5-1-92	GENERAL REVISIONS
7-14-95	46" Stringer

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *David K. Olson*
DESIGN ENGINEER

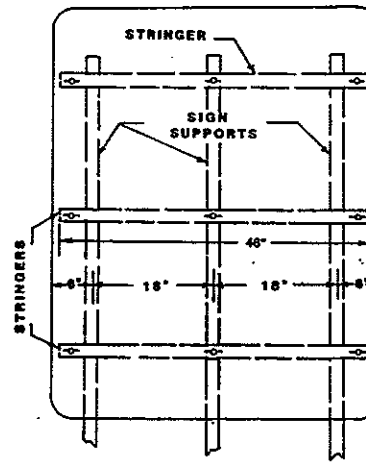
**SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING, AND GUIDE SIGNS**



1 POST

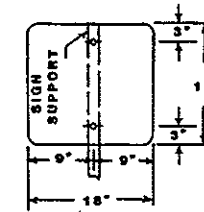


2 POSTS



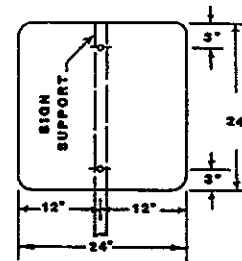
3 POSTS

ASSEMBLY NO. 12



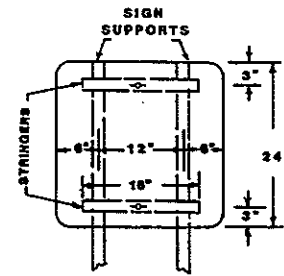
1 POST

ASSEMBLY NO. 13

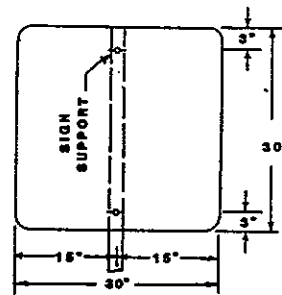


1 POST

ASSEMBLY NO. 14

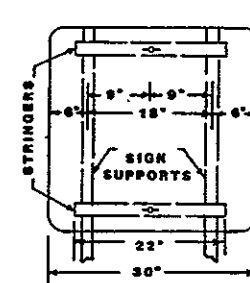


2 POSTS

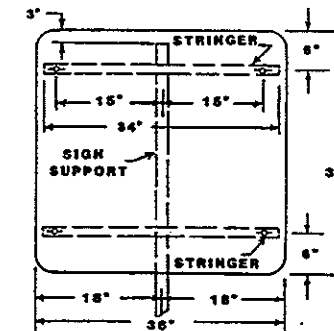


1 POST

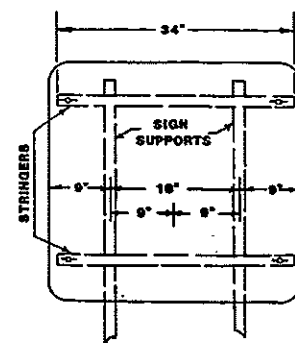
ASSEMBLY NO. 15



2 POSTS

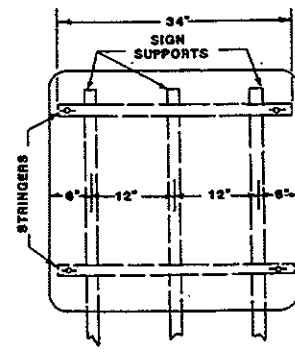


1 POST

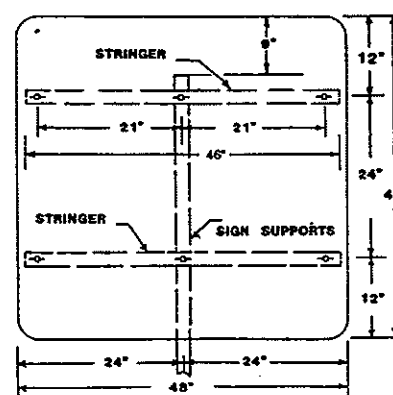


2 POSTS

ASSEMBLY NO. 16

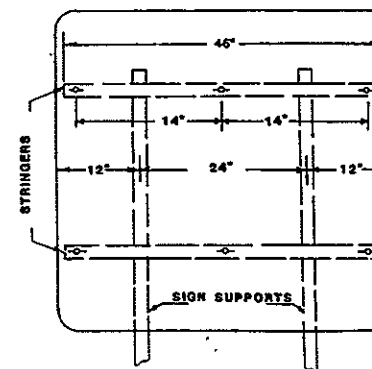


3 POSTS



1 POST

ASSEMBLY NO. 17



2 POSTS

NOTE:

Material
Sign Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 5052-H38 shall minimum thickness: All signs shall be 0.100 inch.

Stringers:
Flange Channel: All stringers shall be flange channel 1.12" per foot and of the length shown.
Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" X 1 1/2" and of the length shown.

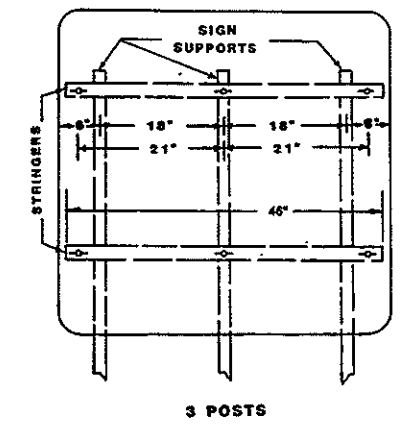
Holes:
Flange Channel: All holes shall be punched round for 3/8" diameter bolts.
Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

General:
See plans for sign numbers to be used at each location.
See Std. D-754-24 for square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.

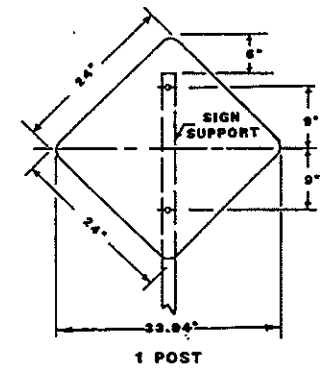
10-1-86	
REVISIONS	
DATE	CHANGE
5-1-92	GENERAL REVISIONS
7-14-95	46" Stringer

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED: *David K. Olson*
DESIGN ENGINEER

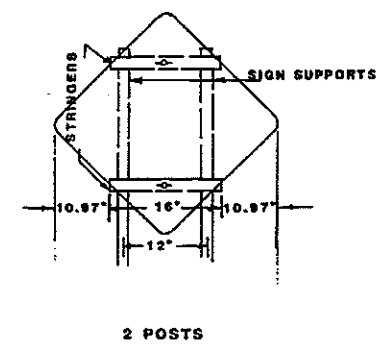
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING, AND GUIDE SIGNS



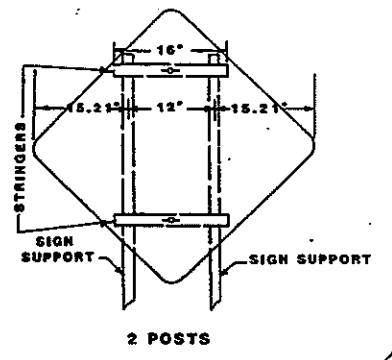
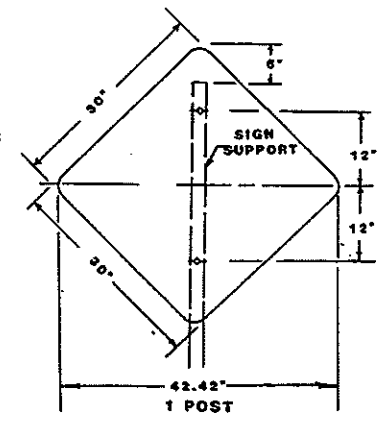
ASSEMBLY NO. 17



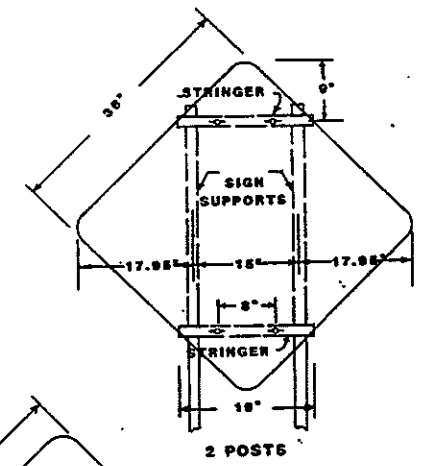
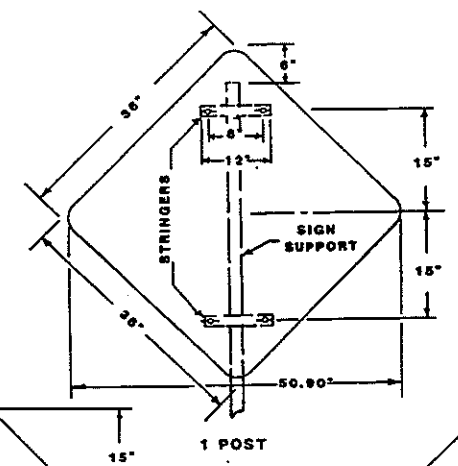
ASSEMBLY NO. 18



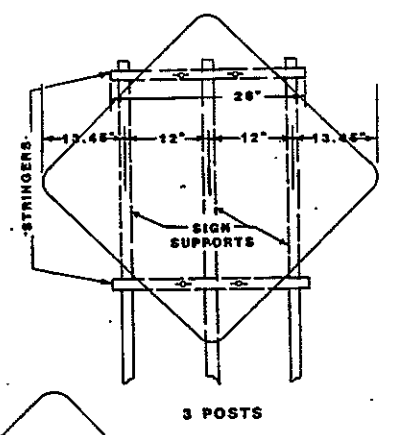
ASSEMBLY NO. 19



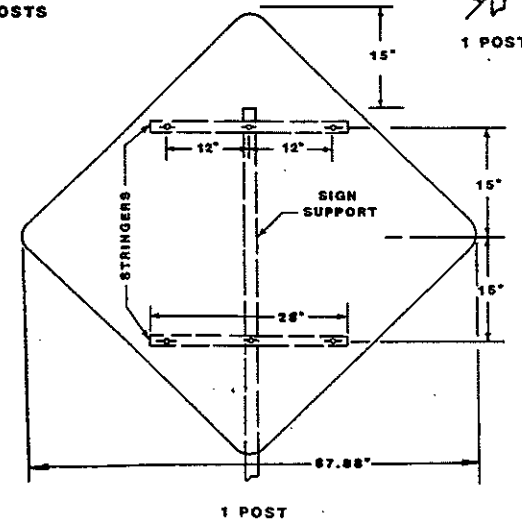
ASSEMBLY NO. 21



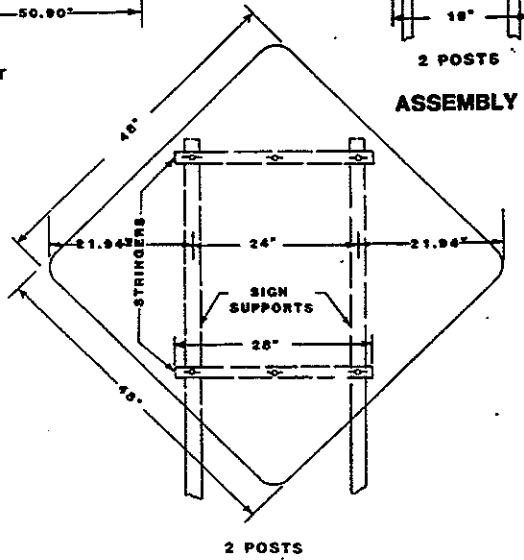
ASSEMBLY NO. 20



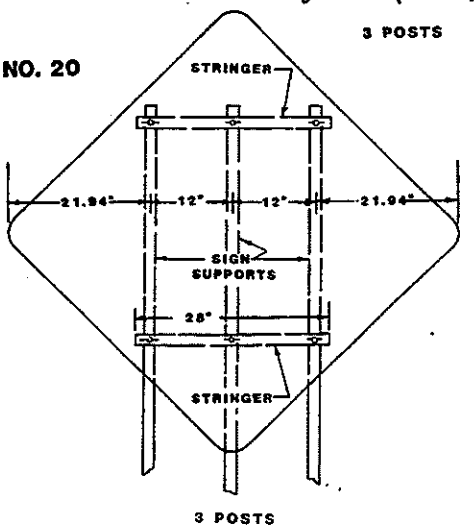
ASSEMBLY NO. 24



ASSEMBLY NO. 25



ASSEMBLY NO. 26



ASSEMBLY NO. 27

NOTE:

Material:
Sign Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 5052-H38 shall have the following minimum thickness: All signs shall be 0.100 inch.

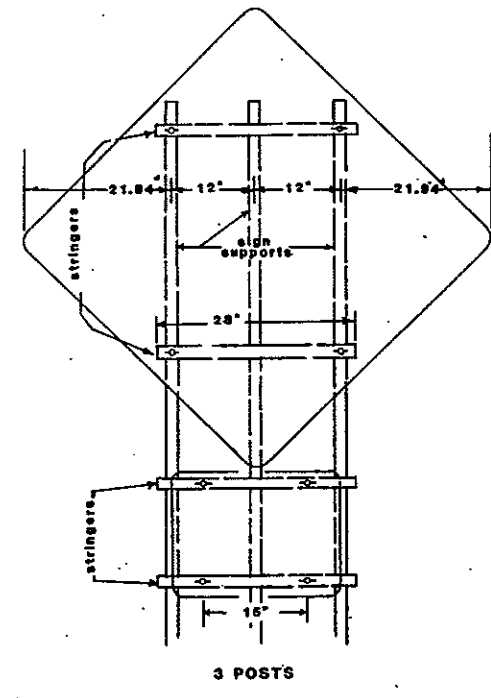
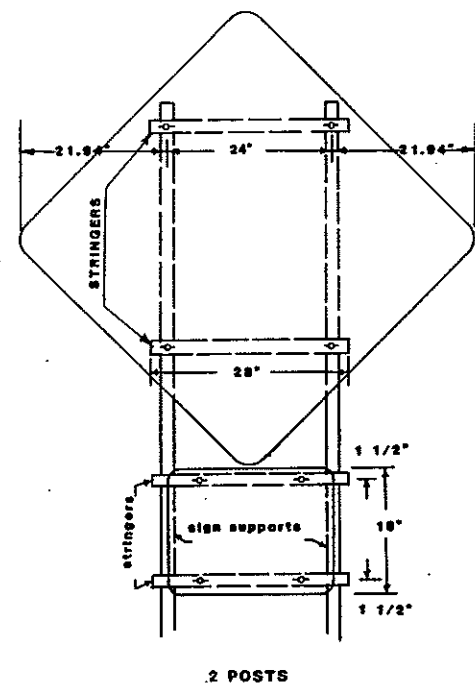
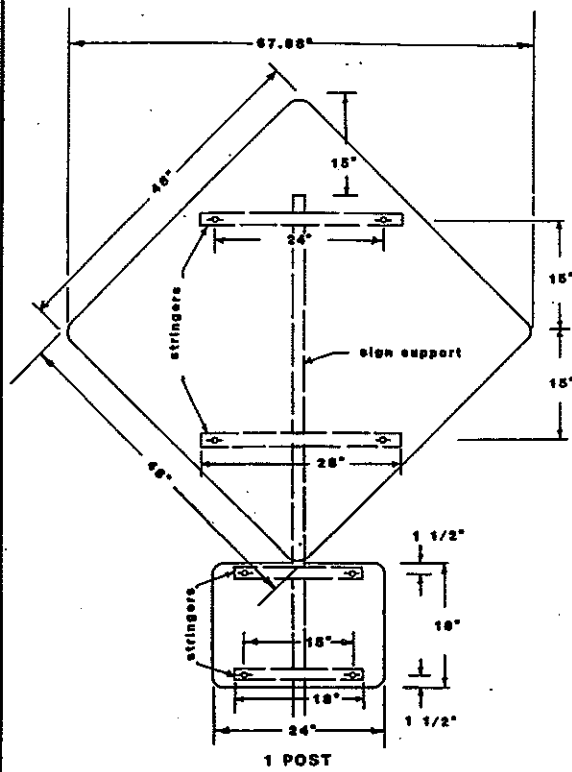
Stringers:
Flange Channel: All stringers shall be flange channel 1.12" per foot and of the length shown.
Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" x 1 1/2" and of the length shown.

Note:
Flange Channel: All holes shall be punched round for 3/8" diameter bolts.
Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

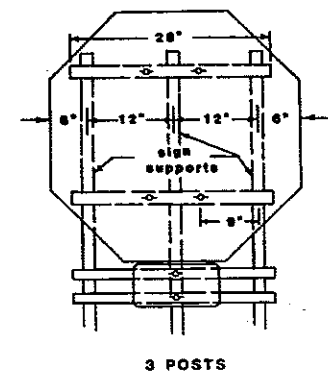
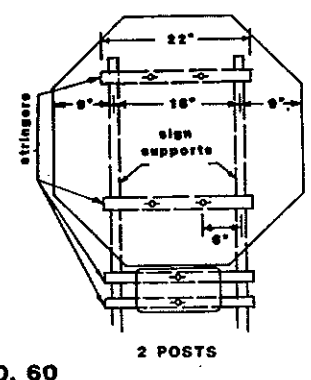
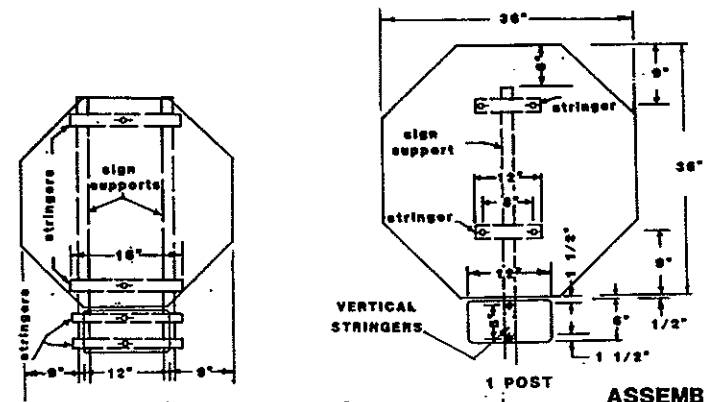
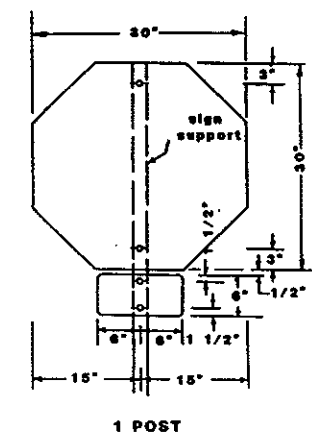
General:
See plans for sign numbers to be used at each location.
See Std. D-754-24 for square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.

10-1-86		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION APPROVED: <i>David H. Jones</i> DESIGN ENGINEER
DATE	REVISIONS	
5-1-82	CRANGE	
7-14-85	GENERAL REVISIONS 46" Stringer	

**SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS
REGULATORY, WARNING, AND GUIDE SIGNS**

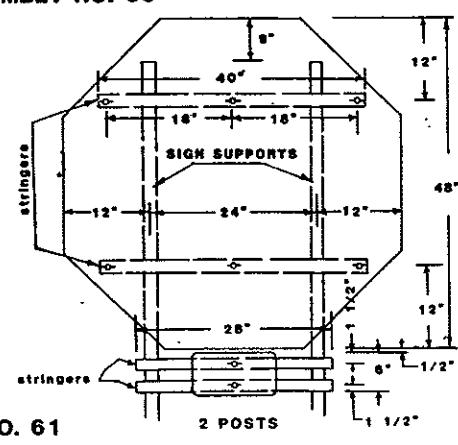
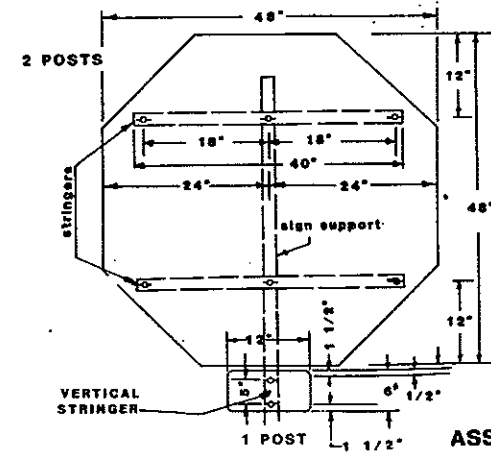


ASSEMBLY NO. 58



ASSEMBLY NO. 60

ASSEMBLY NO. 59



ASSEMBLY NO. 61

NOTE:

Material:
Sign Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 6062-H38 shall have the following minimum thickness: All signs shall be 0.100 inch.

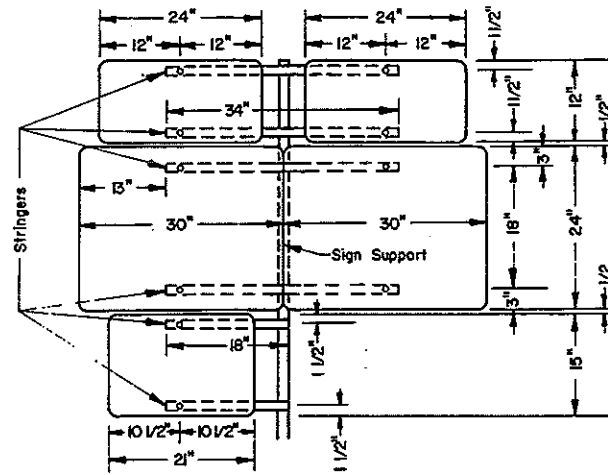
Stringers:
Flange Channel: All stringers shall be flange channel 1.12¢ per foot and of the length shown.
Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" x 1 1/2" and of the length shown.

Holes:
Flange Channel: All holes shall be punched round for 3/8" diameter bolts.
Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

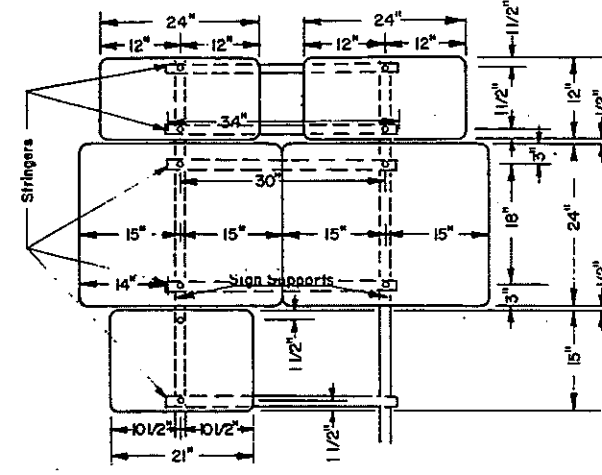
General:
See plans for sign numbers to be used at each location.
See Std. D-754-24 for square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.

10-1-88		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVISIONS		
DATE	CHANGE	APPROVED: <i>David K. ...</i> DESIGN ENGINEER
5-11-87	GENERAL REVISIONS	

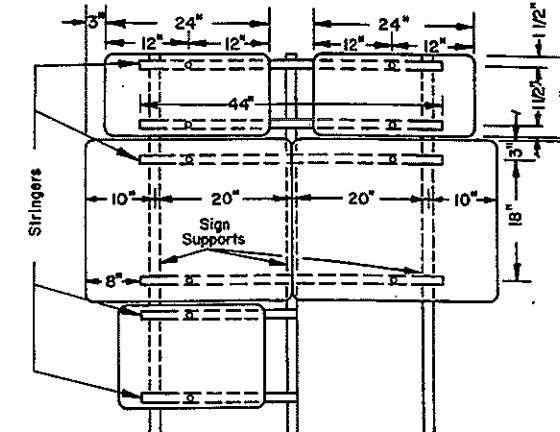
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS



1 POST

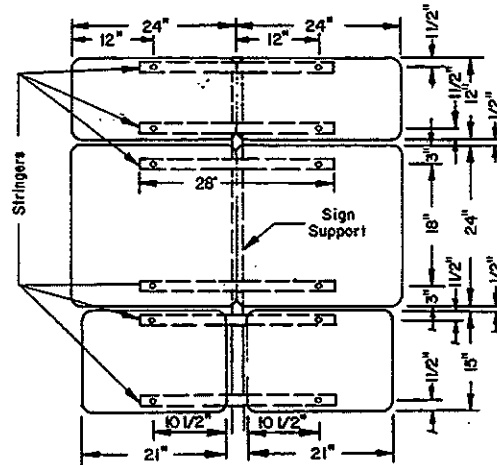


2 POSTS

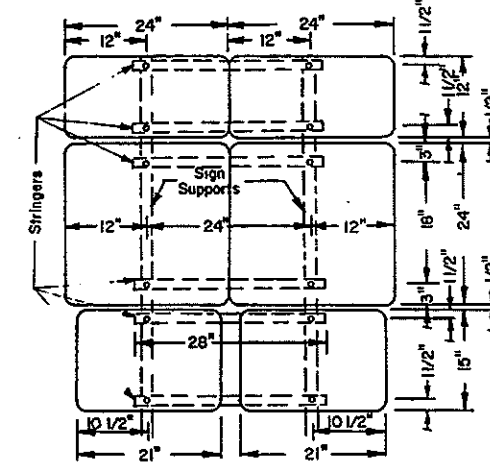


3 POSTS

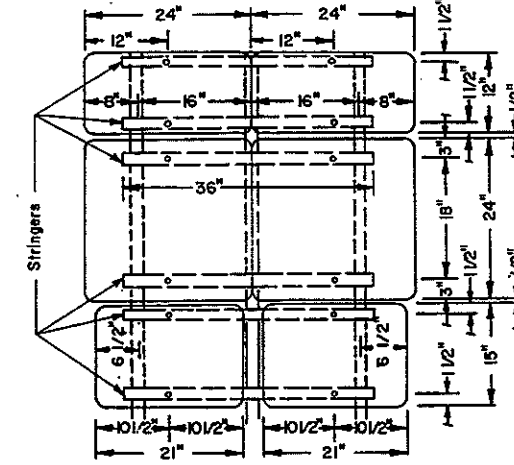
ASSEMBLY 386



1 POST

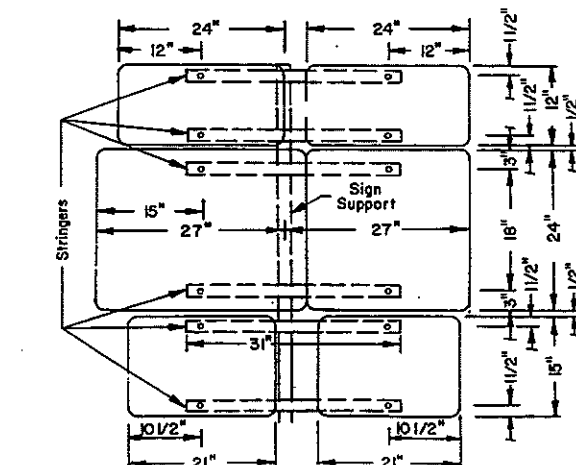


2 POSTS

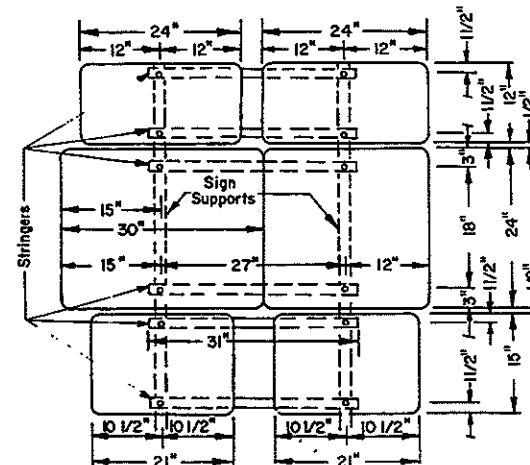


3 POSTS

ASSEMBLY 387



1 POST



2 POSTS

ASSEMBLY 388

NOTE:

Material:

Sign Backing: The sign backing material thickness shall be as follows.

Aluminum: Aluminum Alloy 6061-T6 and 5052-H38 shall have the following minimum thickness: All signs shall be 0.100 inch.

Stringers: Flange Channel: All stringers shall be flange channel 1.12# per foot and of the length shown.

Square Tube, Perforated: All stringers shall be square tube, perforated 1 1/2" x 1 1/2" and of the length shown.

Note: Flange Channel: All holes shall be punched round for 3/8" diameter bolts.

Square Tube, Perforated: All holes shall be punched round for 3/8" diameter bolts.

General: See plans for sign numbers to be used at each location.

See Std. D-754-25 for flange channel mounting details.

See Std. D-754-24 for square tube, perforated mounting details.

10-1-86		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVISIONS		
DATE	CHANGE	APPROVED <i>David K. Ben</i> DESIGN ENGINEER
5-1-82	GENERAL REVISIONS	
7-18-85	General Revisions	

STREET NAME SIGN ASSEMBLY DETAILS

MAXIMUM SUPPORT LENGTH POSSIBLE - PERFORATED TUBE

SIGN SIZE	Assemblies 438, 439, 440, 441 and 442						
	2"	2 1/2"	2 3/4"	3"	3 1/2"	4"	4 1/2"
36x6	284	379	-	-	-	-	-
42x6	244	326	-	-	-	-	-
48x6	215	286	337	-	-	-	-
54x6	191	255	300	327	-	-	-
60x6	173	230	271	294	357	-	-
66x6	157	209	246	268	325	-	-
72x6	180	192	226	246	299	332	-
78x6	166	186	209	228	276	306	400
84x6	154	186	195	211	257	285	372
90x6	144	186	186	198	240	266	347
96x6	135	180	186	186	225	250	326

SIGN SIZE	Assemblies 443, 444						
	2"	2 1/2"	2 3/4"	3"	3 1/2"	4"	4 1/2"
36x6	193	206	241	262	315	349	-
42x6	167	195	209	226	272	301	390
48x6	148	194	195	200	240	265	343
54x6	134	174	195	195	215	231	307
60x6	119	155	180	195	195	210	271
66x6	109	147	165	178	195	195	248
72x6	-	131	152	165	185	195	228
78x6	-	122	142	153	183	195	222
84x6	-	114	132	143	171	189	197
90x6	-	107	124	134	161	177	195
96x6	-	-	117	126	151	167	195

MAXIMUM SUPPORT LENGTH POSSIBLE - FLANGE CHANNEL

SIGN SIZE	Assemblies 438, 439, 440, 441 and 442						
	2"	2 1/2"	2 3/4"	3"	3 1/2"	4"	4 1/2"
36x6	256	288	327	-	-	-	-
42x6	218	246	280	319	-	-	-
48x6	190	215	245	279	342	-	-
54x6	184	191	218	248	304	422	-
60x6	184	184	195	222	273	37	-
66x6	171	184	184	202	247	345	-
72x6	155	176	184	184	226	316	-
78x6	141	161	184	184	208	2-1	-
84x6	128	148	171	184	192	269	-
90x6	117	135	158	181	184	251	-
96x6	106	124	146	168	184	234	-

SIGN SIZE	Assemblies 443, 444						
	2"	2 1/2"	2 3/4"	3"	3 1/2"	4"	4 1/2"
36x6	173	193	193	201	243	343	-
42x6	149	167	179	193	210	288	-
48x6	130	146	166	188	193	251	-
54x6	115	130	148	167	193	225	-
60x6	-	113	129	147	179	199	-
66x6	-	-	107	133	162	193	-
72x6	-	-	106	121	148	193	-
78x6	-	-	-	110	136	189	-
84x6	-	-	-	-	124	175	-
90x6	-	-	-	-	114	163	-
96x6	-	-	-	-	105	151	-

NOTE: The ground mounted street name sign areas have been calculated using a 6"x36" sign panel. The city shall determine the size needed and inform the contractor of the exact length required to accommodate the message in accordance with following legend.

Size and Series: Street name signs 24", 30", or 36" standard length shall be fabricated using the following size and series capital letters:

LENGTH	STREET NAME OR NUMBER
24" Length	4" B,C,D Series
30" Length	4" B,C,D Series
36" Length	4" A,B,C,D Series

To provide maximum legibility, the widest letter shall be used whenever possible for each of the standard lengths specified. A minimum distance of 1/2" shall be allowed between legend and ends of the sign. The actual area shall be paid for at the contract unit price.

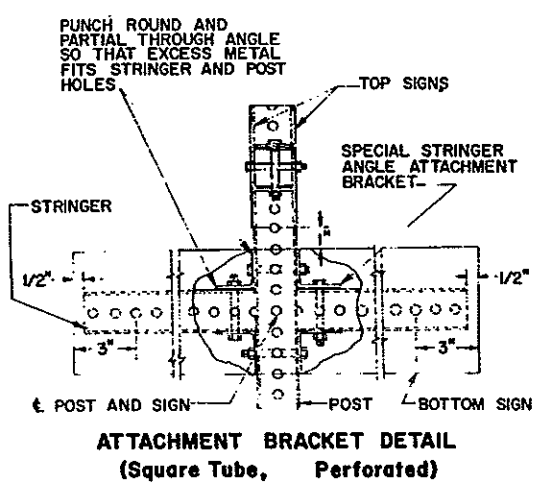
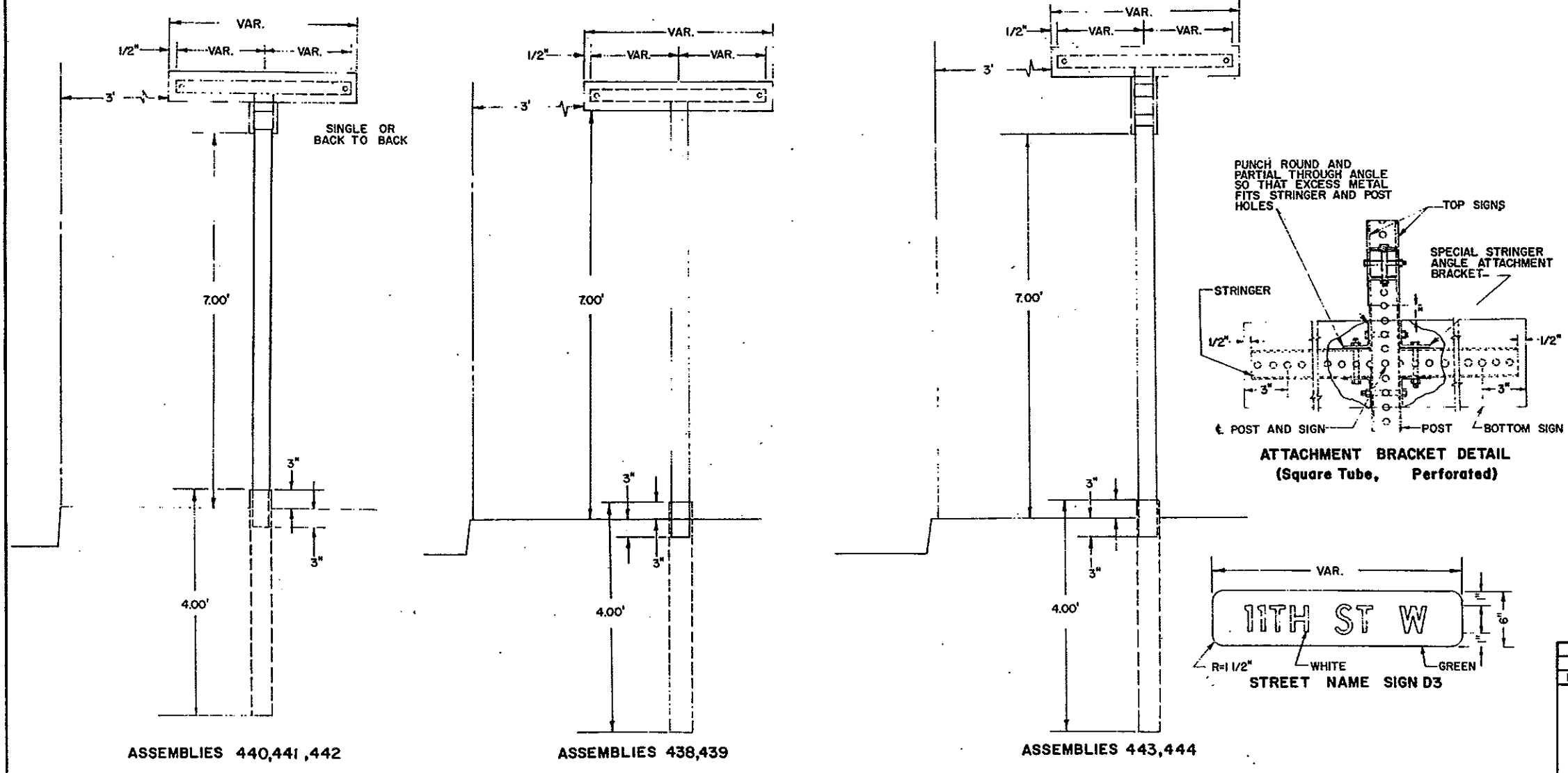
Material: Sign Backing: The sign backing material thickness shall be as follows:

Aluminum: Aluminum Alloy 6061-T6 shall have a minimum thickness of 0.080 inch.

Stringers: Perforated Tube: All stringers shall be square tube perforated, the same size as support post.
Flange Channel: All stringers shall be flange channel, 1.12" per foot.
Holes: All holes shall be punched round for 3/8" diameter bolts.
General: See Std. D-754-24 for square tube, perforated mounting details.
See Std. D-754-25 for flange channel mounting details.

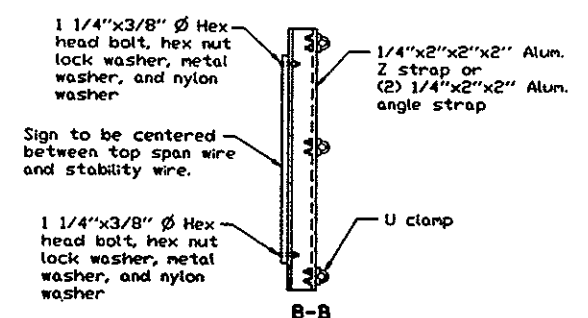
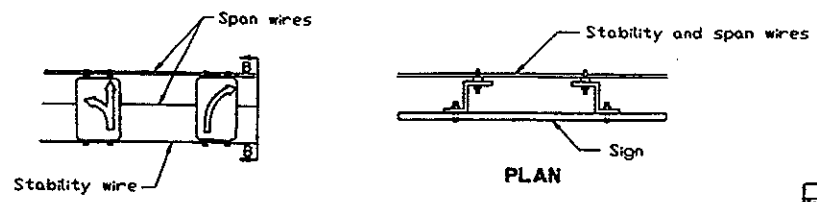
* 10 gauge material has been used in the manufacturing of these support.

- Assembly: 438 Single sign
- 439 Back to Back
- 440 Single sign each direction
- 441 Single sign one direction back to back other direction
- 442 Back to Back both directions
- 443 Back to Back single other direction
- Assembly: 444 Back to Back all directions

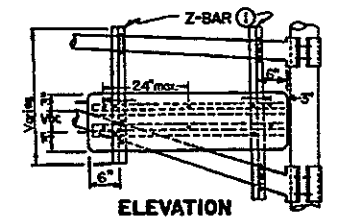
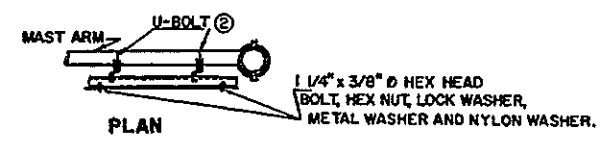
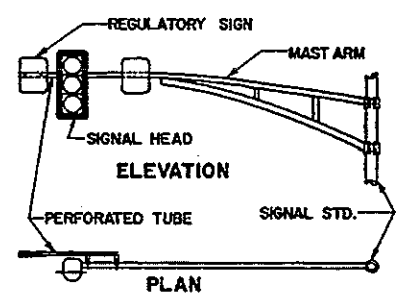


10-1-86		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
DATE	REVISIONS	
5-1-92	GENERAL REVISIONS	Approved: <i>[Signature]</i> Design Engineer

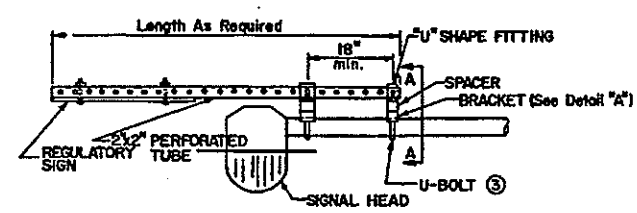
LIGHT STANDARD, SIGNAL STANDARD AND SPAN WIRE MOUNTED SIGN ASSEMBLY DETAIL



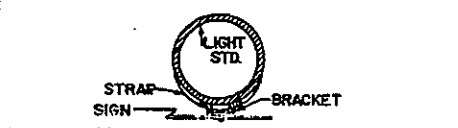
SPAN WIRE MOUNTED SIGN DETAIL



MAST ARM MOUNTED STREET NAME SIGN DETAIL

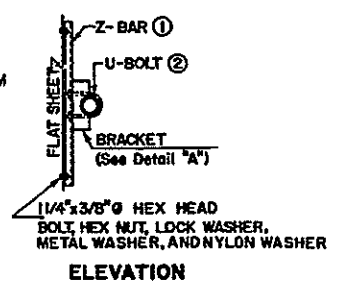
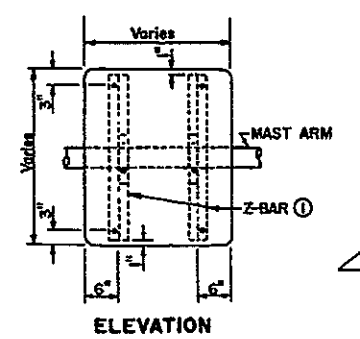
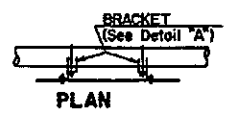
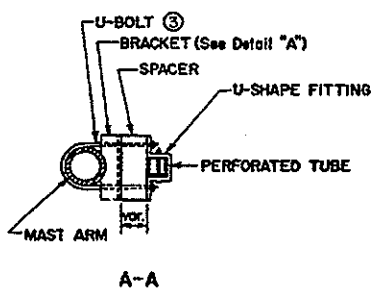


SIGN MOUNTED BEYOND END OF MAST ARM DETAIL

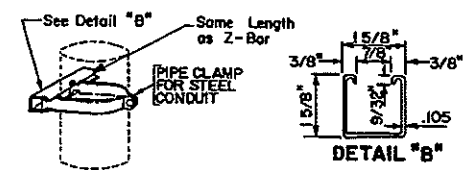


LT. STD. MOUNTED SIGN BRACKET DETAIL (MAX. 24" x 30" SIGNS)

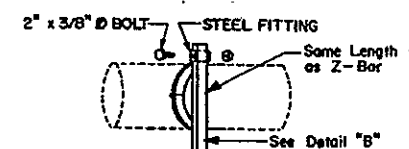
Bracket shall be of galv. steel consisting of strap & sign attachment bracket similar to the one shown in the detail. Cost of the bracket assembly to be included in the price bid for flat sheet signs. Punching shall be as shown on the Standard Drawings. The Engineer in the field shall determine the exact location of the light standard for sign attachment. There shall be a 7" vertical clearance to the bottom of all signs mounted on light standards.



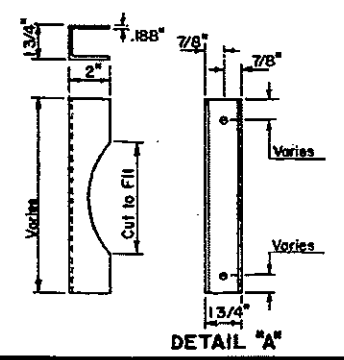
MAST ARM MOUNTED REGULATORY SIGN DETAIL



VERTICAL MOUNTING
Two (2) Clamps Required Per Sign



HORIZONTAL MOUNTING
Two (2) Clamps Required Per Sign
ALTERNATE CLAMP MOUNTING

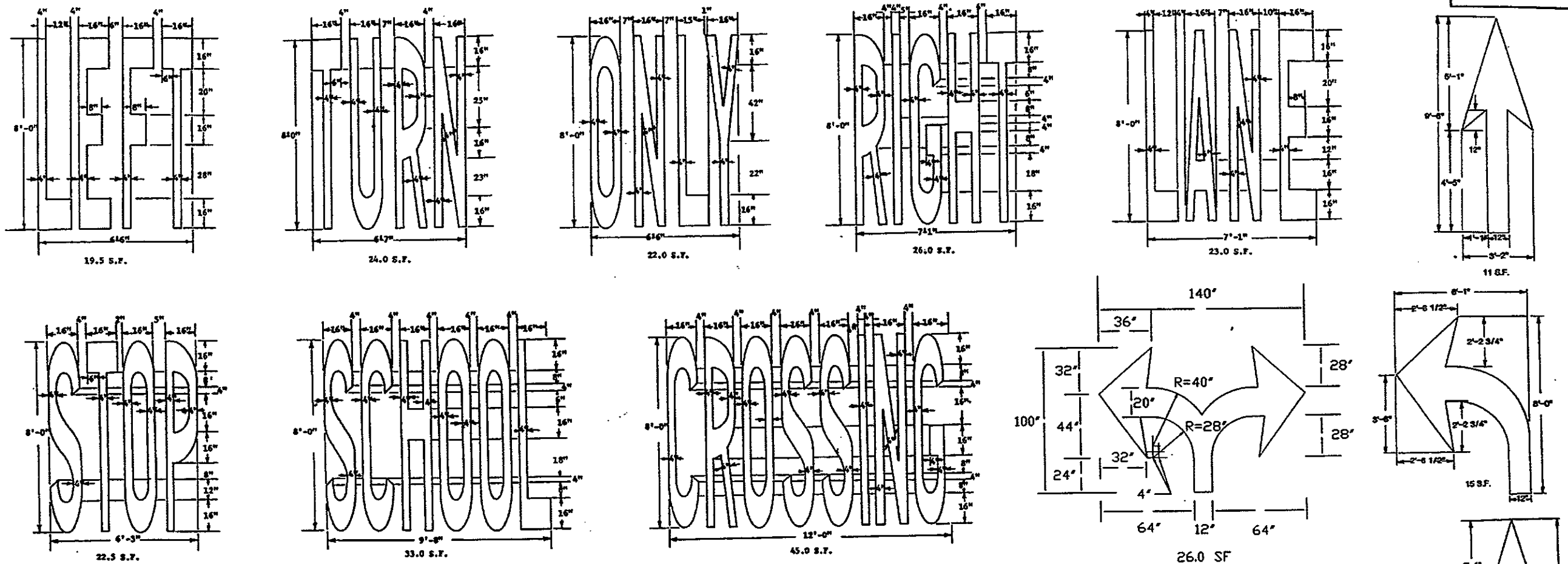


- ① Z-Bar - Use 1 3/4" x 3/16" Thick 108 Lbs./Fl Aluminum Alloy in lieu of Z-Bar, two angles bolted together may be used or a channel (1 3/4" x 1 3/4" x 3/16" angles) (1 3/4" x 2" x .188" Channels)
- ② 3/8" U-Bolt, Hex Nut, Lock Washer & Length depends on Dia. of Mast Arm
- ③ 3/8" U-Bolt, Hex Nut, Lock Washer & Length depends on Dia. of Mast Arm. Paint Perforated Tube the same color and specification as Mast Arm.
2" x 2" Maximum support length 99ft.
2 1/4" x 2 1/4" Maximum support length 12.6ft.
2 1/2" x 2 1/2" Maximum support length 15.7ft.

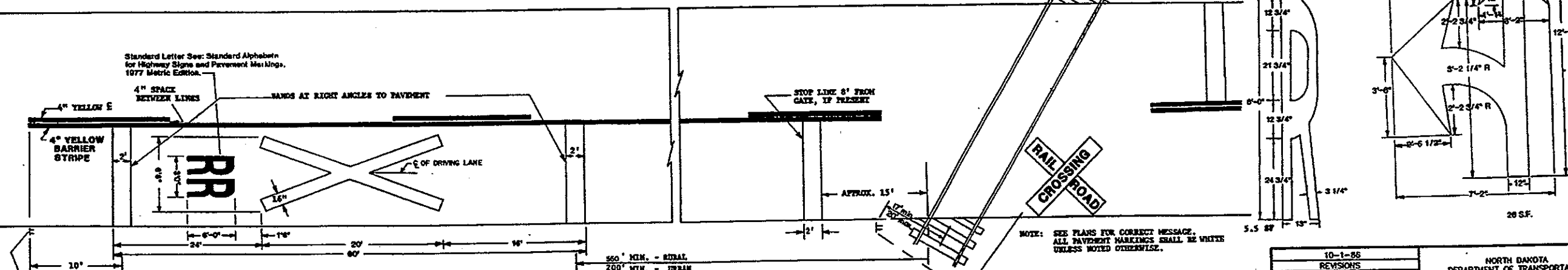
NOTE:
Metal washers and Nylon washers used on sign face shall have a minimum outside dia. of 15/16 inch ± 1/16 inch and 10 gauge thickness.

10-1-86	
DATE	REVISIONS
5-1-92	GENERAL REVISIONS
11-24-95	SPAN WIRE MOUNTING SIGN DETAIL

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
APPROVED *David K. Johnson*
DESIGN ENGINEER



PAVEMENT MARKING MESSAGE DETAILS



W10-1-36 SHALL BE PLACED WITHIN 10' ± OF LOCATION SHOWN

A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING. ON MULTI-LANE ROADS, THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL R X R SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.

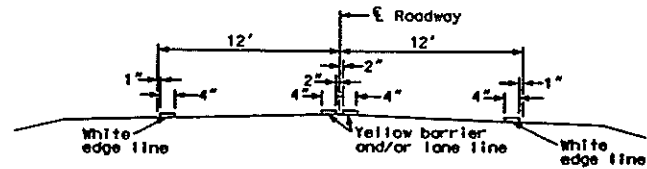
560' MIN. - RURAL
200' MIN. - URBAN
50' MIN. - LOW VOLUME BUSINESS OR RESIDENTIAL AREAS

RAILROAD CROSS & 2 R'S 65.0 S.F.
3 BANDS 72.0 S.F.

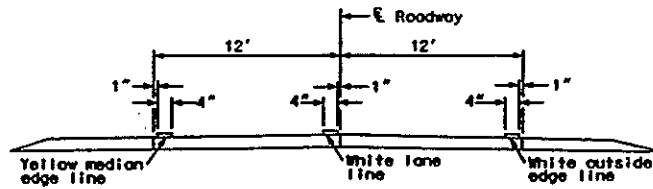
10-1-85 REVISIONS	
DATE	CHANGE
3-1-89	Arrows
7-2-90	Rail Road X & R
3-2-92	Arrows
7-21-93	RAILROAD R
8-1-94	GENERAL REVISIONS
11-27-95	DUAL ARROWS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPROVED *David K. O. Lane*
DESIGN ENGINEER

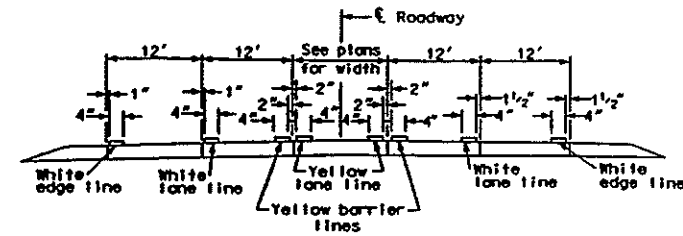
PAVEMENT MARKING



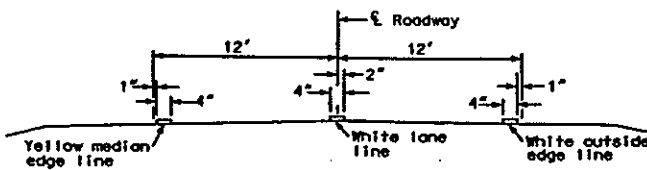
Two Lane Two Way
RURAL ROADWAY



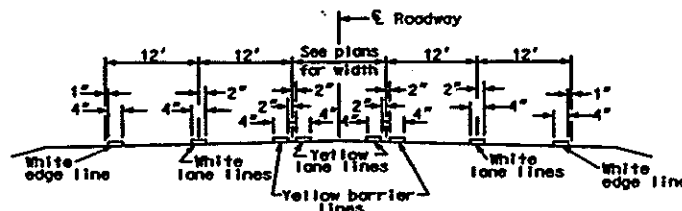
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



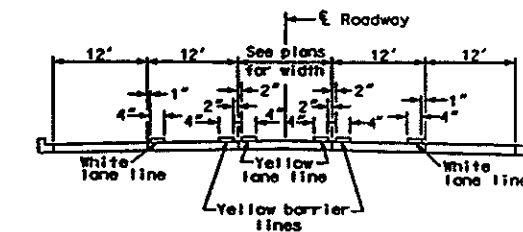
RURAL FIVE LANE ROADWAY
Concrete Section



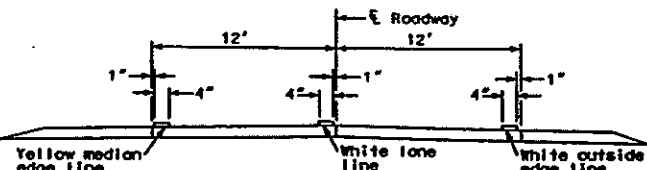
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



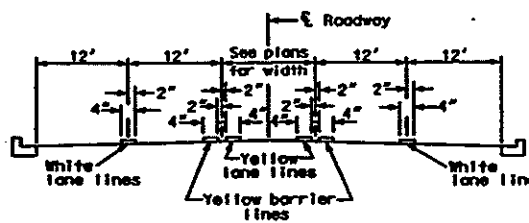
RURAL FIVE LANE ROADWAY
Asphalt Section



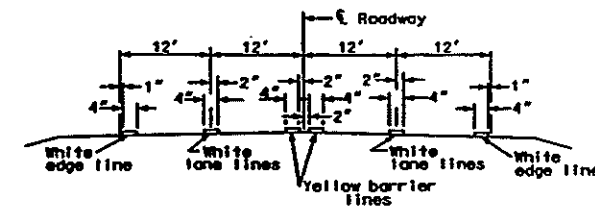
URBAN FIVE LANE SECTION
Concrete Section



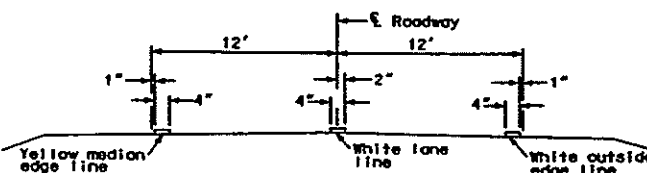
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



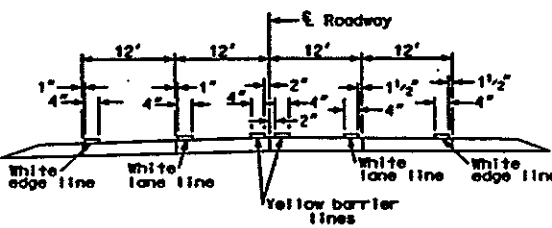
URBAN FIVE LANE SECTION
Asphalt Section



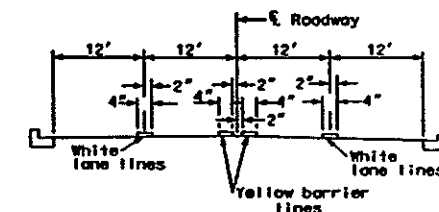
RURAL FOUR LANE ROADWAY
Asphalt Section



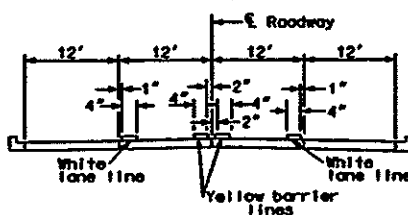
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



RURAL FOUR LANE ROADWAY
Concrete Section

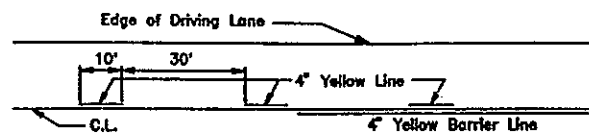


URBAN FOUR LANE SECTION
Asphalt Section

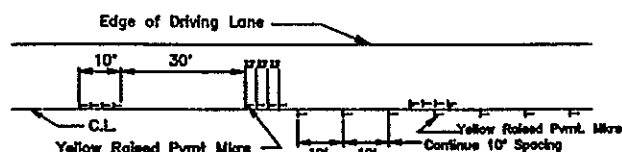


URBAN FOUR LANE SECTION
Concrete Section

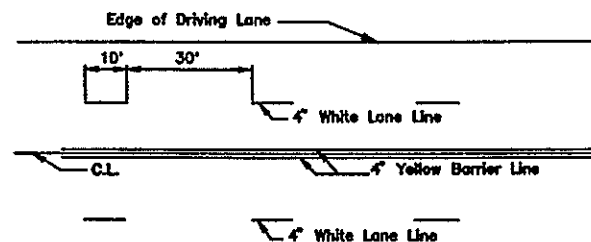
10-1-86		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
DATE	CHANGE	
3-1-88	Edge line	APPROVED: <i>K.H.S.B.</i> DESIGN ENGINEER
8-1-84	Gen. rev.	
11-26-97	Revised border	



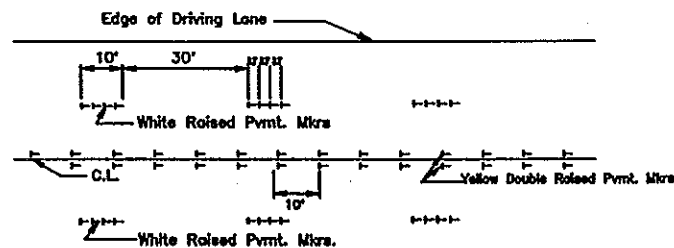
Painted or Tape Lines



Raised Pavement Markers
TWO-LANE TWO-WAY ROADWAY

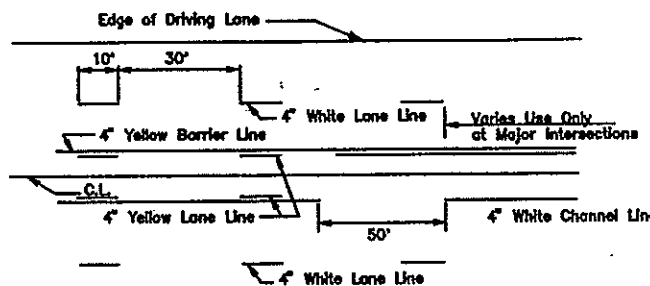


Painted or Tape Lines

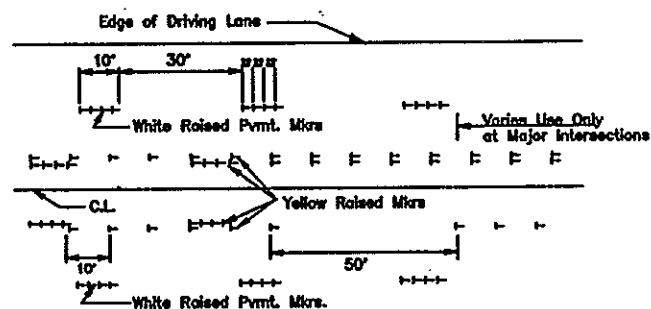


Raised Pavement Markers
FOUR LANE ROADWAY

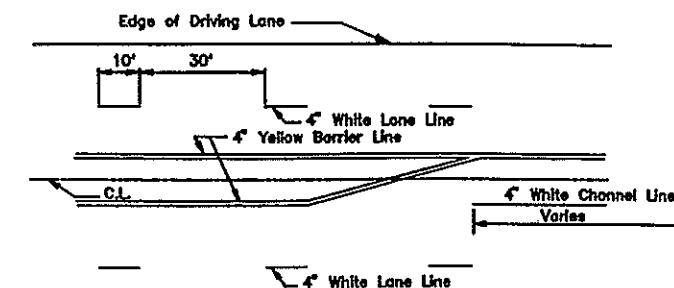
SHORT-TERM PAVEMENT MARKING



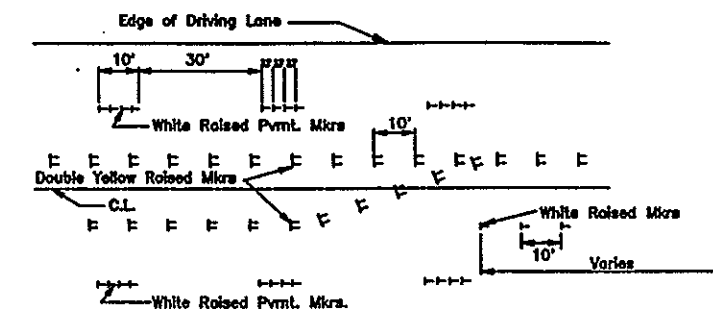
Painted or Tape Lines



Raised Pavement Markers
FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers
FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTE:

Two-lane two-way roadways shall have no passing zones (all barrier lines) placed as shown. No passing zone signs may be placed in lieu of short term markings but these signs will be allowed to remain in place for three days at which time the short term no passing zone pavement marking must be placed.

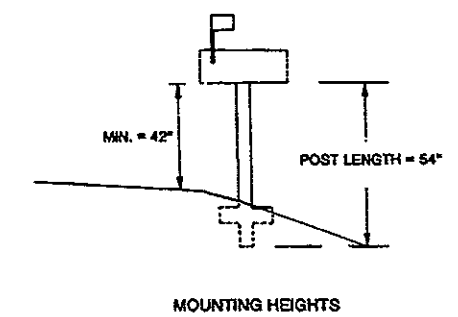
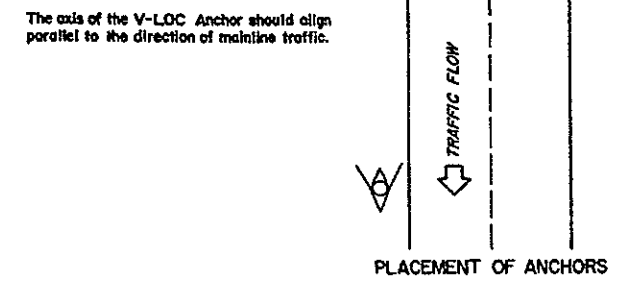
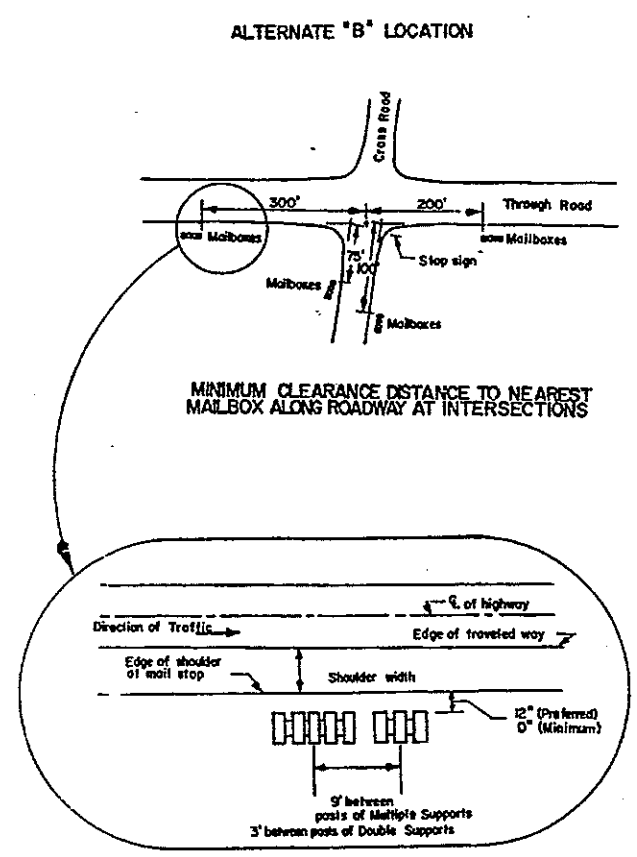
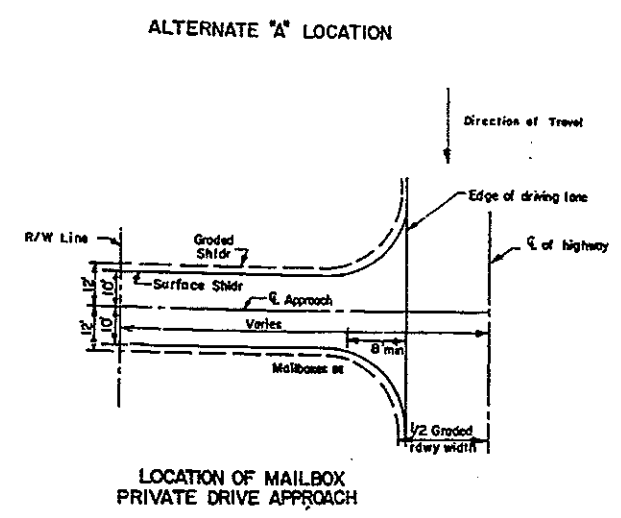
Short term center line stripes (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripes will match when applied.

Raised and tape markings shall be removed after permanent marking has been installed. Removed marking shall become the property of the contractor and shall be disposed of outside the highway right of way.

All other types of roadways shall be marked with short term markings as shown.

4-1-93		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVISIONS		
DATE	CHANGE	APPROVED: <i>Kenneth S. Birt</i> DESIGN ENGINEER

MAILBOX LOCATION DETAILS



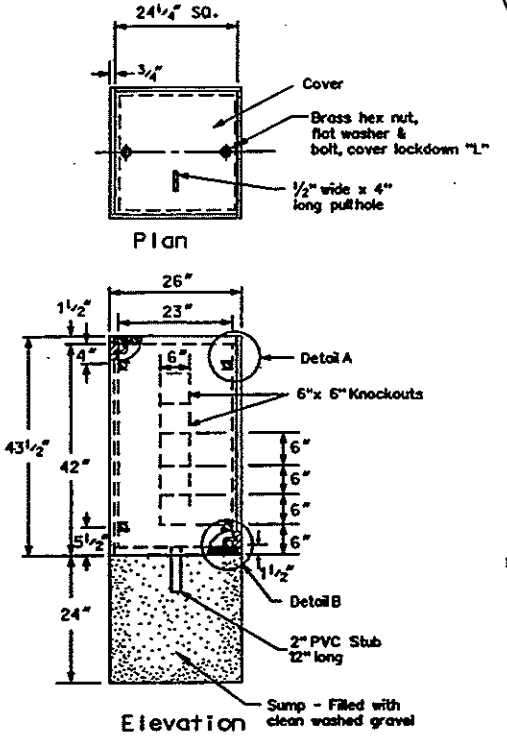
- NOTE:
1. The mailbox support and hardware details shall consist of the "V-LOC Mailbox Support System" manufactured by: Foresight Products, Inc. 10780 Irma Drive-Unit 22 Northglenn, Colo. 80233 Any other equal support system which has been crash tested and approved by the Federal Highway Administration may be used.
 2. The preferred location for all mailboxes is the Alternate "A" location. However, the Engineer may approve the Alternate "B" location if warranted by existing field conditions.
 3. Postal regulations require that mailboxes must be located on the right-hand side of the road in the direction traveled by the carrier. Therefore the project engineer shall contact the local carrier or postmaster before installing new mailboxes to verify the direction of travel.
 4. Mailboxes installed on private drive approaches must always be located on the downstream side of the approach.

10-1-95 REVISIONS		APPROVED <i>David K. W. Lee</i> DESIGN ENGINEER
DATE	CHANGE	

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

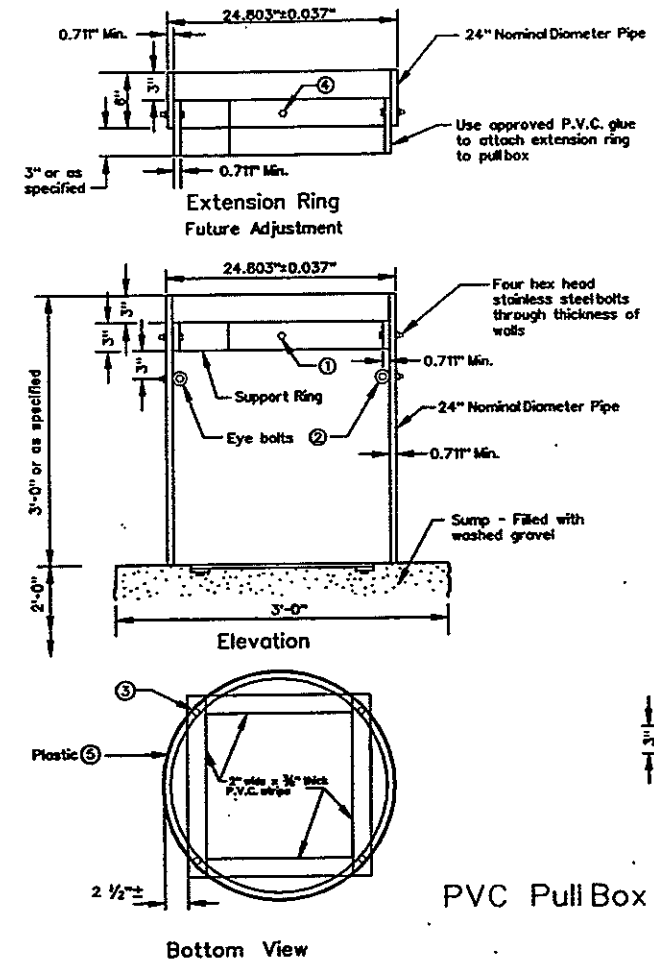
D766-01 P-1*

NOTE: Fiberglass pull box is composed of fiberglass slabs and reinforced mortar structural elements in combination with polyurethane foam cells.



Fiberglass Pull Box

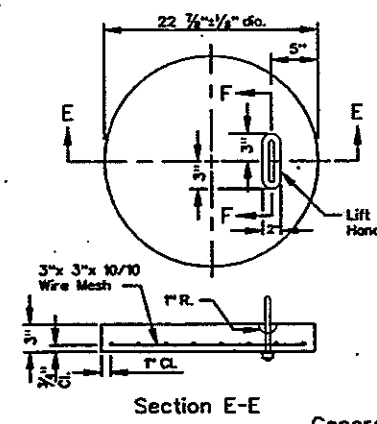
PULL BOX DETAILS



PVC Pull Box

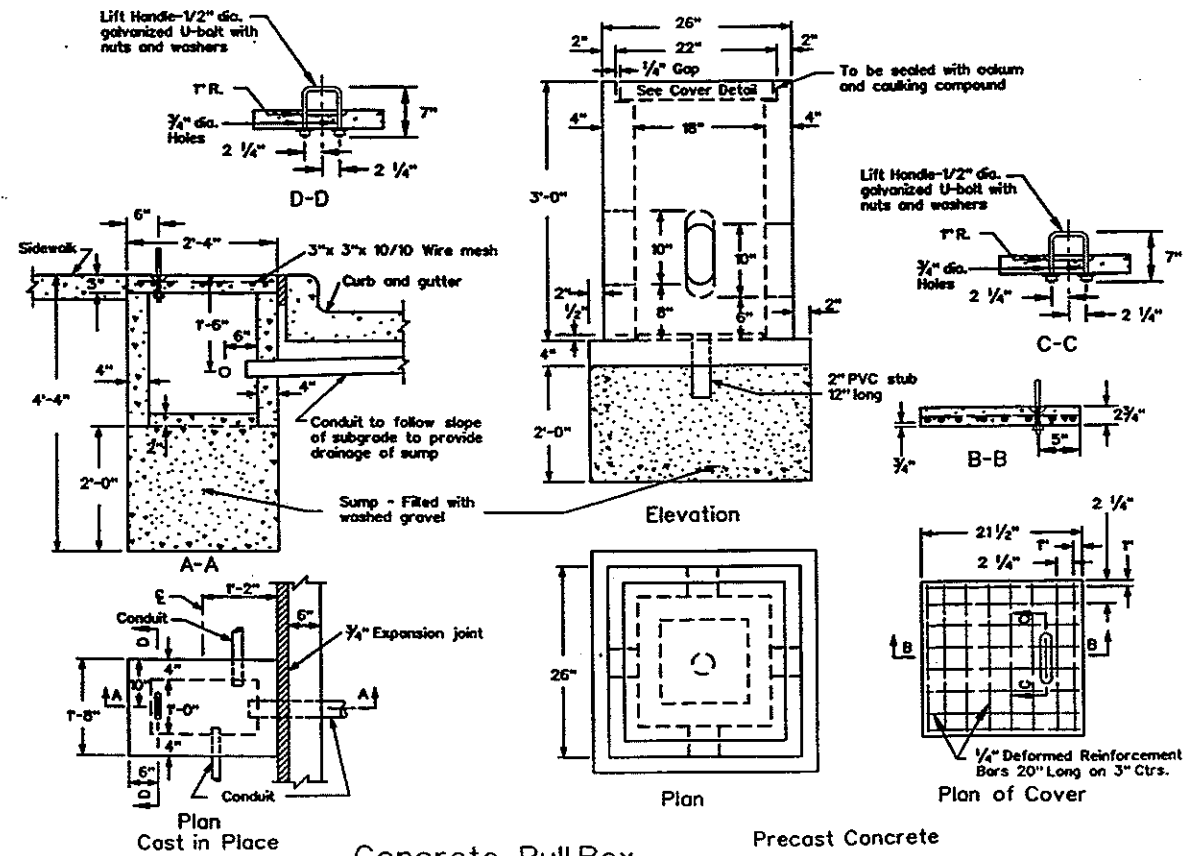
PVC PULL BOX NOTES:

1. Attach split 24" nominal diameter P.V.C. cover support ring with four 3/8" dia. x 2" long stainless steel hex head bolts with nuts at 90° apart.
2. Two Type 2 Shoulder Eye bolts, 3/8" dia. x 1 1/4" shank length, with hex nuts 180° apart (for lifting pullbox and supporting electric cable).
3. Four 1/4" x 1 1/4" long galvanized lag screws. Screw assembly together.
4. Attach split 24" nominal diameter P.V.C. cover support extension ring with four 3/8" dia. x 2" long stainless steel hex. head bolts with nuts at 90° apart.
5. Bolt assembly together.
6. Conduit holes located in barrel section shall be sized no more than 1" larger than size of conduit being used.
7. After pullbox & conduit installation, all inside walls & cover shall be made water tight to the satisfaction of the Engineer.
8. P.V.C. pipe to meet requirements of ASTM F679T-1 or equal.
9. Hex head bolts and nuts shall be austenitic stainless steel. Other fasteners to be galvanized as per AASHTO M-232.



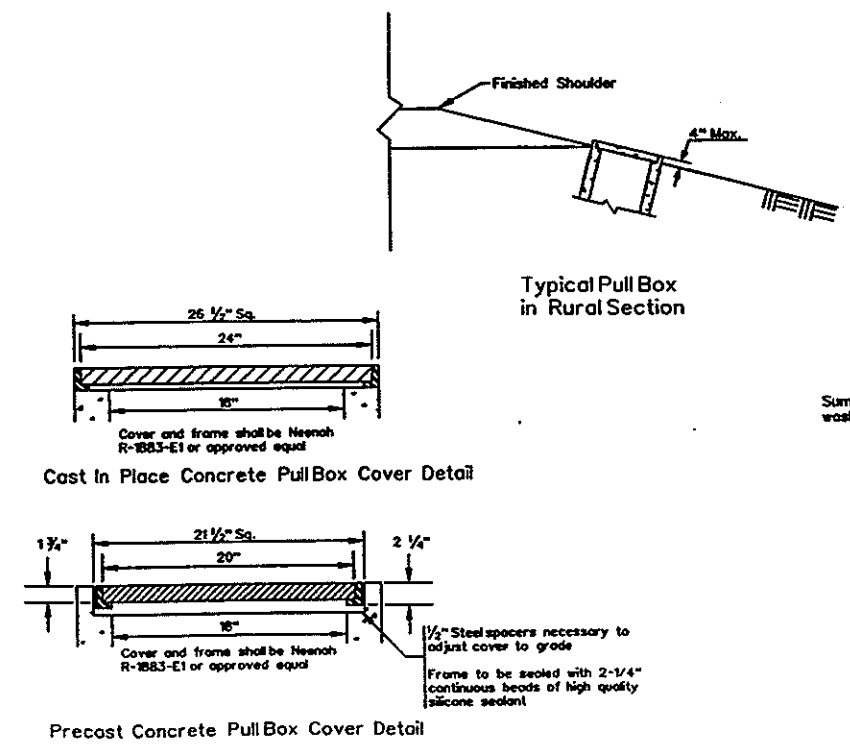
PVC PULL BOX NOTES:
Concrete cover shall be coated on top and sides with an approved epoxy coating. The epoxy protective coating shall be light gray, clear, or neutral in color and shall be applied as recommended by the manufacturer. The surfaces of the concrete to which the epoxy protective coating is applied, shall be cleaned by wire brush and shall be dry before application.

Concrete Cover

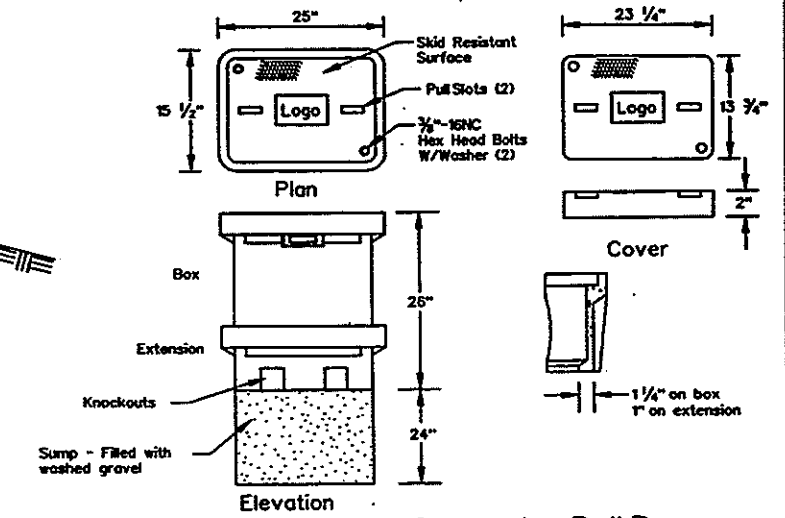


Concrete Pull Box

Precast Concrete



Precast Concrete Pull Box Cover Detail



Polymer Concrete Pull Box
(Polymer concrete reinforced by a heavy weave fiberglass)

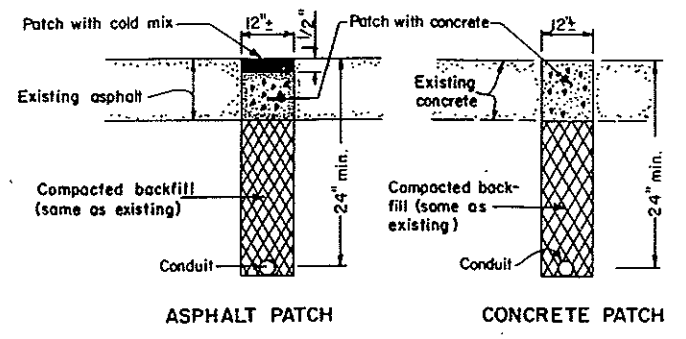
10-1-86 REVISIONS	
DATE	CHANGE
4-26-94	Add NEENAH cover
10-11-94	Lift handle & polymer concrete pull box
3-20-95	Add PVC pull box
5-28-99	Pull box cover thickness
6-8-99	Rural pull box detail

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
APPROVED: *K. H. B. J.*
DESIGN ENGINEER

FHWA REGION	STATE	FED. AID PROJ. NO.	SHEET NO.
8	N.D.		

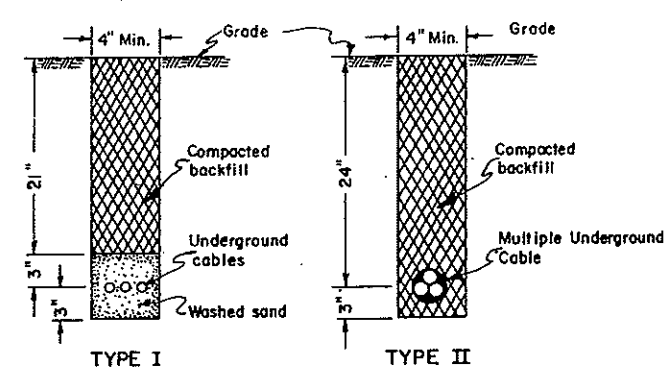
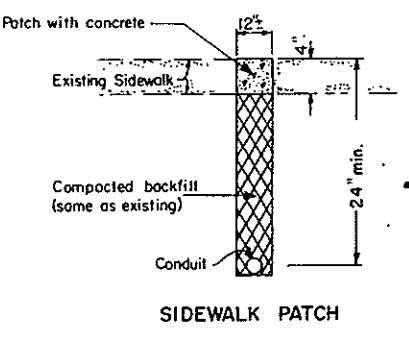
D-770-4

LIGHTING & SIGNAL DETAILS



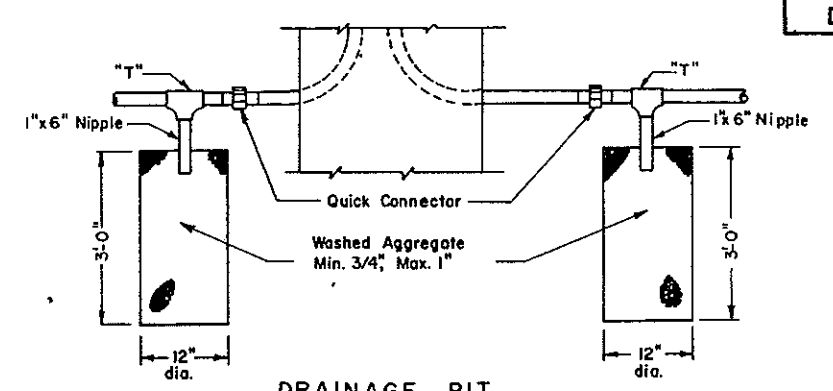
SURFACE PATCH DETAILS

NOTE:
PATCHES: All trenches shall be saw-cut. The replacement concrete shall be P.C.C. pavement and the coarse aggregate gradation, maximum size and method of curing shall be as approved by the Engineer. The cost shall be included in the price bid for Conduit.
 Immediately prior to pouring replacement concrete, all surfaces shall be painted with an approved epoxy compound.



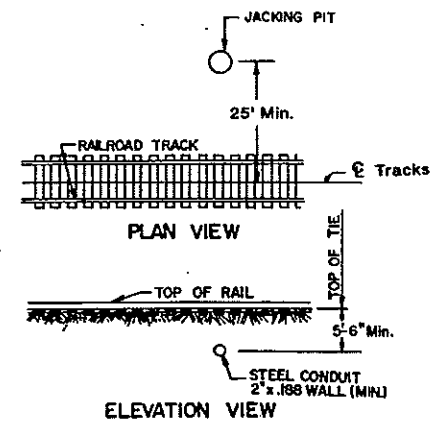
CABLE TRENCH

The entire area which is disturbed by the trenching shall be sodded or as directed by the Engineer. The cost shall be included in the price bid for "Cable Trench".

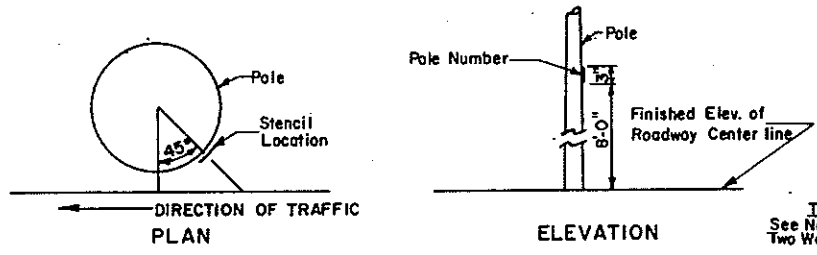


DRAINAGE PIT

Drainage pits shall be installed in both ends of the conduit runs. Except where conduit slopes enough for drainage to one end. (To be used for Traffic Signal Conduit Runs Only)

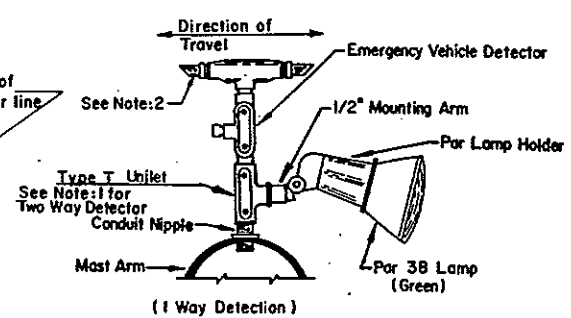


RAILROAD TRACK CONDUIT PLACEMENT



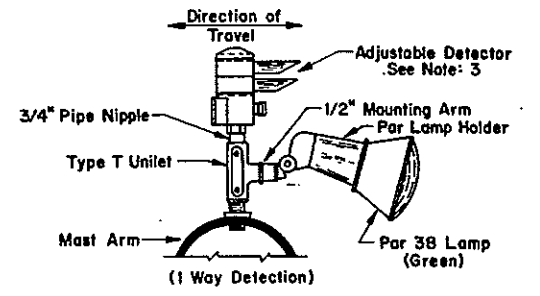
LIGHT STANDARD NUMBERING

NOTE:
POLE NUMBERING: The contractor shall stencil on each light standard the pole number in black paint on the roadway side of the pole or adhesive coated plastic such as Scotch-coat, manufactured by 3M as approved by the Engineer. See layout sheets for pole numbers.



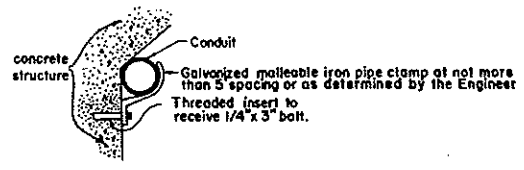
EMERGENCY VEHICLE DETECTOR DETAIL (Location As Shown in Plans)

Notes:
 1. Two-way Detector shall have Type X Unilet with two Par lamp holders and lamps (one in each direction).
 2. One-Way Detector shall have the unused end plugged with metal pipe plug.

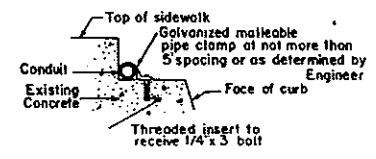


ALTERNATE EMERGENCY VEHICLE DETECTOR DETAIL (Adjustable) (Location As Shown in Plans)

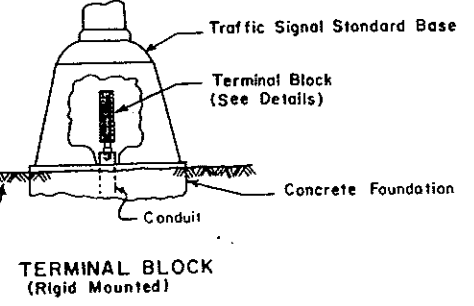
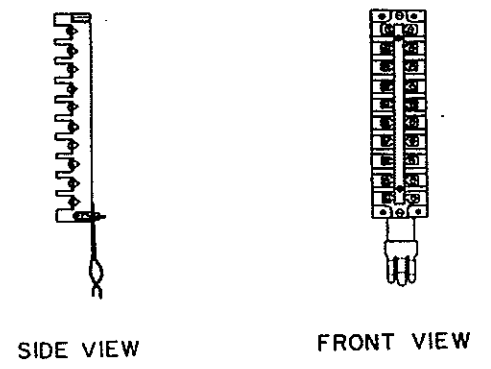
Notes:
 3. Two-way Detector shall have the detector lens rotated to face the direction of travel, and shall have Type X Unilet with two Par lamp holders and lamps (one in each direction).



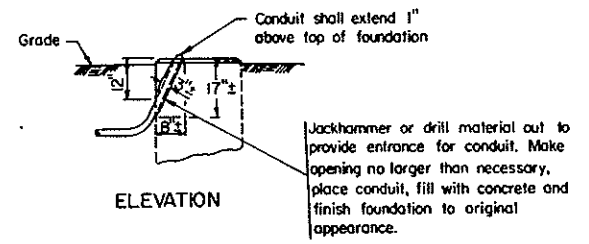
BRIDGE MOUNTED CONDUIT HANGER



CURB MOUNTED CONDUIT



TERMINAL BLOCK (Rigid Mounted)



REVISE CONCRETE FOUNDATION

10-1-86		REVISIONS		NORTH DAKOTA STATE HIGHWAY DEPARTMENT	
DATE	CHANGES			APPROVED: <i>David K. Lane</i> DESIGN ENGINEER	
11-7-90	Track Clearance				

