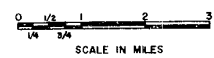
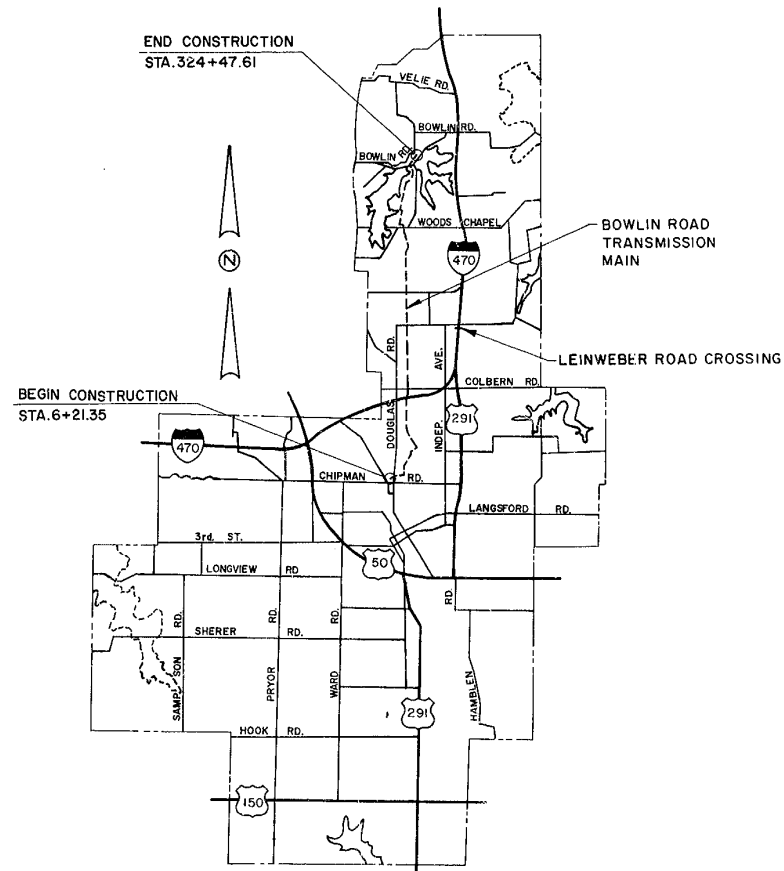


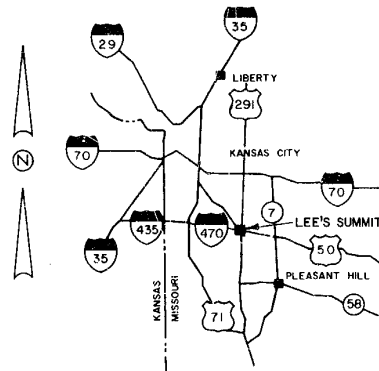
# CITY OF LEE'S SUMMIT, MISSOURI

## WATER SYSTEM IMPROVEMENTS

### CONTRACT NO. 15 - BOWLIN ROAD TRANSMISSION MAIN



PROJECT LOCATION MAP



AREA LOCATION MAP  
SCALE: 1" = 15 MILES

#### SCHEDULE OF DRAWINGS

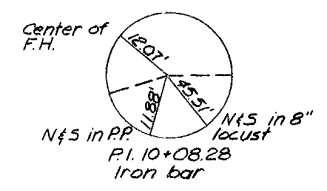
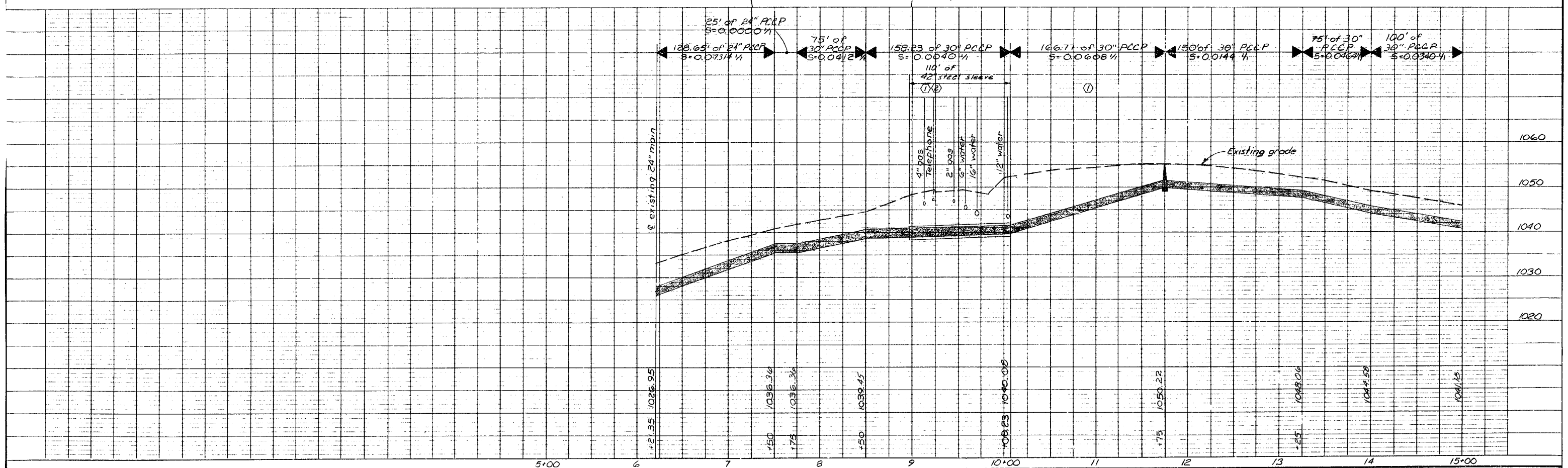
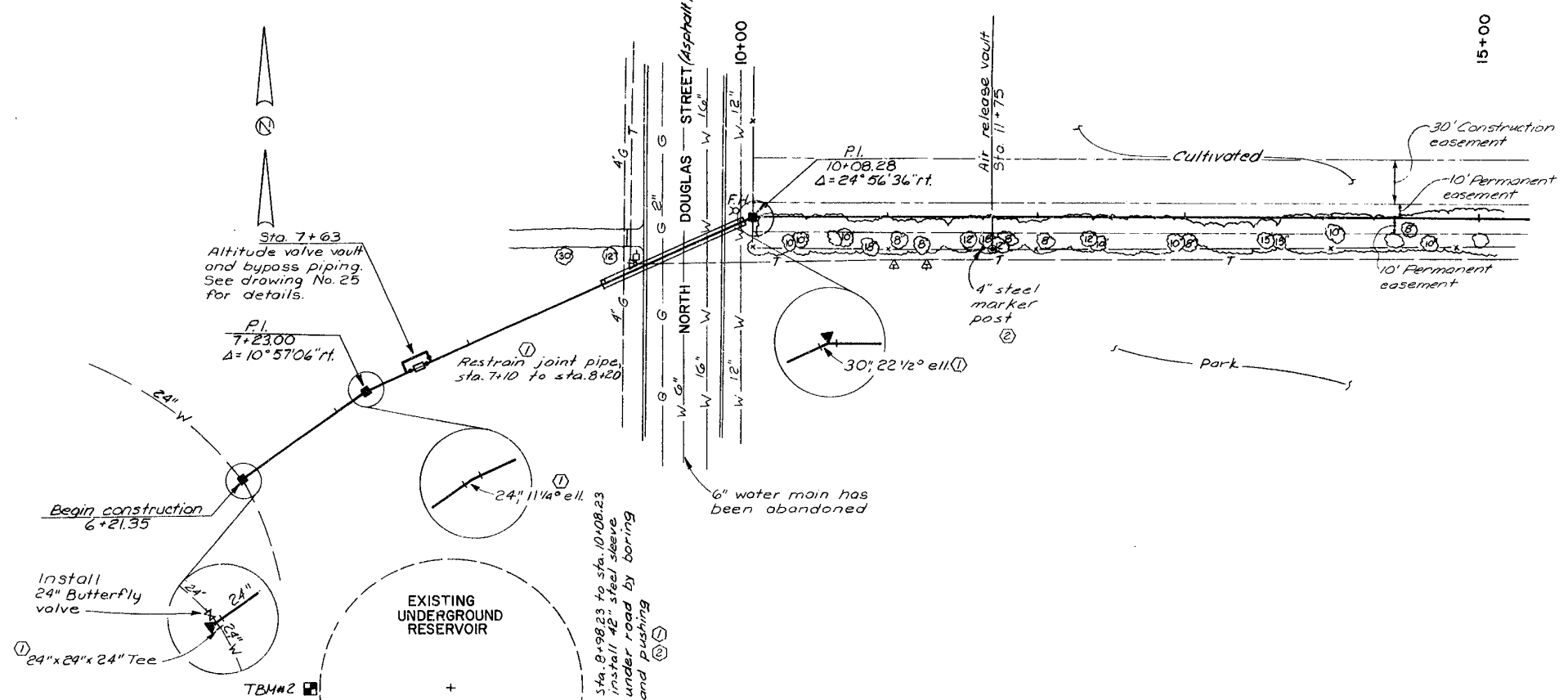
NO.	TITLE
1.	TITLE SHEET
2.	BOWLIN ROAD TRANSMISSION MAIN — STA. 6+21.35 TO STA. 15+00
3.	BOWLIN ROAD TRANSMISSION MAIN — STA. 15+00 TO STA. 30+00
4.	BOWLIN ROAD TRANSMISSION MAIN — STA. 30+00 TO STA. 45+00
5.	BOWLIN ROAD TRANSMISSION MAIN — STA. 45+00 TO STA. 60+00
6.	BOWLIN ROAD TRANSMISSION MAIN — STA. 60+00 TO STA. 75+00
7.	BOWLIN ROAD TRANSMISSION MAIN — STA. 75+00 TO STA. 90+00
8.	BOWLIN ROAD TRANSMISSION MAIN — STA. 90+00 TO STA. 105+00
9.	BOWLIN ROAD TRANSMISSION MAIN — STA. 105+00 TO STA. 120+00
10.	BOWLIN ROAD TRANSMISSION MAIN — STA. 120+00 TO STA. 135+00
11.	BOWLIN ROAD TRANSMISSION MAIN — STA. 135+00 TO STA. 150+00
12.	BOWLIN ROAD TRANSMISSION MAIN — STA. 150+00 TO STA. 165+00
13.	BOWLIN ROAD TRANSMISSION MAIN — STA. 165+00 TO STA. 180+00
14.	BOWLIN ROAD TRANSMISSION MAIN — STA. 180+00 TO STA. 195+00
15.	BOWLIN ROAD TRANSMISSION MAIN — STA. 195+00 TO STA. 210+00
16.	BOWLIN ROAD TRANSMISSION MAIN — STA. 210+00 TO STA. 225+00
17.	BOWLIN ROAD TRANSMISSION MAIN — STA. 225+00 TO STA. 240+00
18.	BOWLIN ROAD TRANSMISSION MAIN — STA. 240+00 TO STA. 255+00
19.	BOWLIN ROAD TRANSMISSION MAIN — STA. 255+00 TO STA. 270+00
20.	BOWLIN ROAD TRANSMISSION MAIN — STA. 270+00 TO STA. 285+00
21.	BOWLIN ROAD TRANSMISSION MAIN — STA. 285+00 TO STA. 300+00
22.	BOWLIN ROAD TRANSMISSION MAIN — STA. 300+00 TO STA. 315+00
23.	BOWLIN ROAD TRANSMISSION MAIN — STA. 315+00 TO STA. 324+47.61 AND LEINWEBER ROAD CROSSING
24.	BOWLIN ROAD TRANSMISSION MAIN — BRIDGE CROSSING DETAILS
25.	BOWLIN ROAD TRANSMISSION MAIN — PIPING DETAILS
26.	BOWLIN ROAD TRANSMISSION MAIN — MISCELLANEOUS DETAILS

#### NOTES:

1. ALL PIPE ELEVATIONS ARE CENTERLINE ELEVATIONS.
2. AT THE CONTRACTOR'S OPTION, REINFORCED CONCRETE CYLINDER PIPE MAY BE USED IN LIEU OF DUCTILE IRON PIPE
3. EXCESS EXCAVATION MAY BE WASTED AT THE CITY AIRPORT, IN THE POND APPROXIMATELY 60 FEET RIGHT OF STA. 112+00, AND IN LOW AREAS ALONG AND ON EITHER SIDE OF THE LINE FROM STA. 117+75 TO STA. 119+80. ARRANGEMENTS WITH THE PROPERTY OWNER OR PROPER AUTHORITY ARE THE CONTRACTOR'S RESPONSIBILITY.

#### LEGEND

---	EXISTING WATER LINE
---	EXISTING GAS LINE
---	EXISTING SANITARY SEWER
---	EXISTING STORM SEWER
---	EXISTING UNDERGROUND TELEPHONE CABLE
---	EXISTING UNDERGROUND ELECTRIC CABLE
---	PROPERTY LINE
---	RIGHT OF WAY
---	STATE BOUNDARY, CITY LIMITS
---	FENCE
---	OPEN DITCH
---	CREEK CENTERLINE
⊕	POWER POLE
⊙	TELEPHONE POLE
⊕	LIGHT POLE
⊕	FIRE HYDRANT
⊕	WATER METER
⊕	WATER VALVE
⊕	GAS METER
⊕	GAS VALVE
⊕	BURIED TELEPHONE MARKER
⊕	AIR RELEASE VAULT
⊕	MANHOLE
⊕	CURB INLET
⊕	POLE GUY
⊕	CULVERT
⊕	TREE
⊕	BUSH
⊕	STUMP
⊕	BACKING BLOCK
⊕	TEMPORARY BENCH MARK (T.B.M.)
⊕	POINT OF INTERSECTION (P.I.), POINT OF CURVATURE (P.C.), POINT ON TANGENT (P.O.T.)
⊕	POINT OF TANGENCY (P.T.)



TBM #2 Elev. 1054.30  
 Chiseled 'D' on the northeast corner of 6'x6' concrete vault @ west side of reservoir @ northwest corner of Chipman Rd. and Douglas Rd.

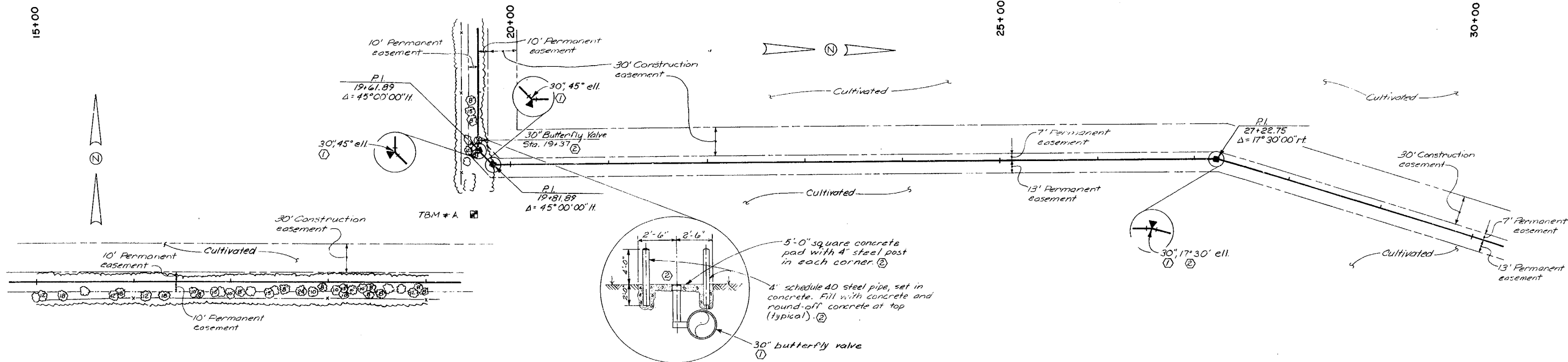
No.	Revisions	By	Date
①	Revised per Addendum no. 1, restrained joint pipe, steel sleeve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-28-81
②	Final revision per construction records.	RAL	8-28-81

Designed By SDS  
 Drawn By MHM  
 Checked By HB  
 Scale 1"=50'H, 1"=10'V  
 Job No. 7820  
 Contract No. 15  
 Approved By *Harry Bond*  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Prof. Engineer

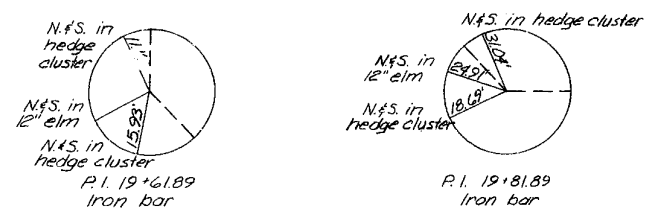
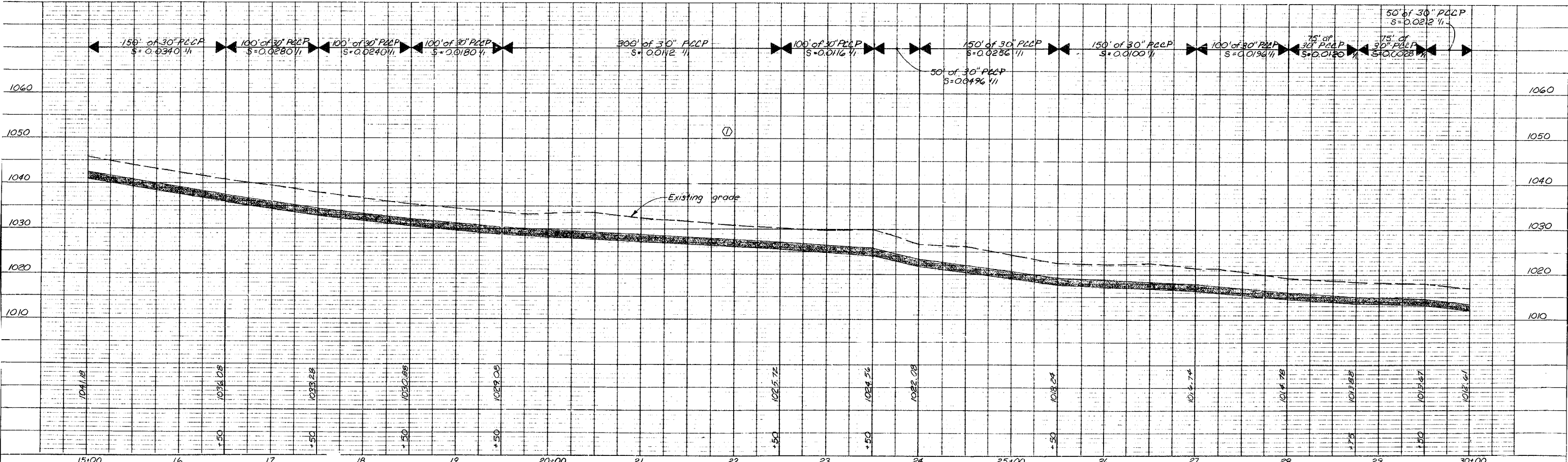
CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN DWG. NO. 2  
 STA 6+21.35 TO STA 15+00



Note: Pipe shall be wire-brushed, primed and coated with two coats of orange enamel paint.



TBM # A ELEV. 1033.22  
 Railroad spike in west side of 12" Elm ±1000' east of Douglas and ±450' north of Chipman, 50' east and 20' south of P.I. 19+81.89

No.	Revisions	By	Date
①	Revised per Addendum no. 1, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-23-81

Designed By SDS  
 Drawn By RAL  
 Checked By HB  
 Scale 1"=50'H, 1"=10'V  
 Job No. 7820  
 Contract No. 15  
 Approved By Harry Bond  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 15+00 TO STA. 30+00

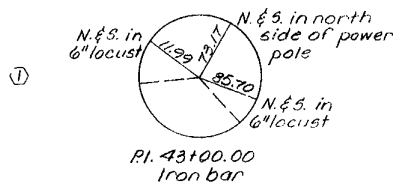
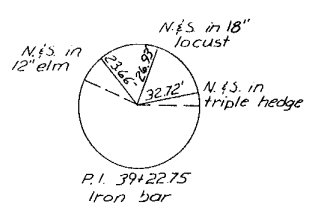
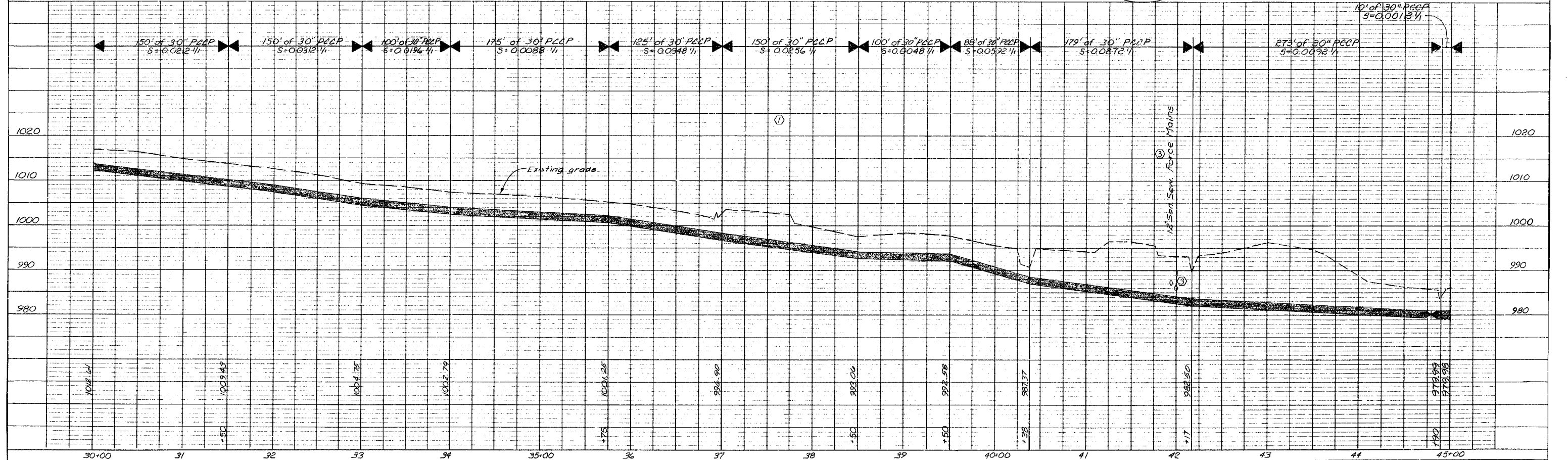
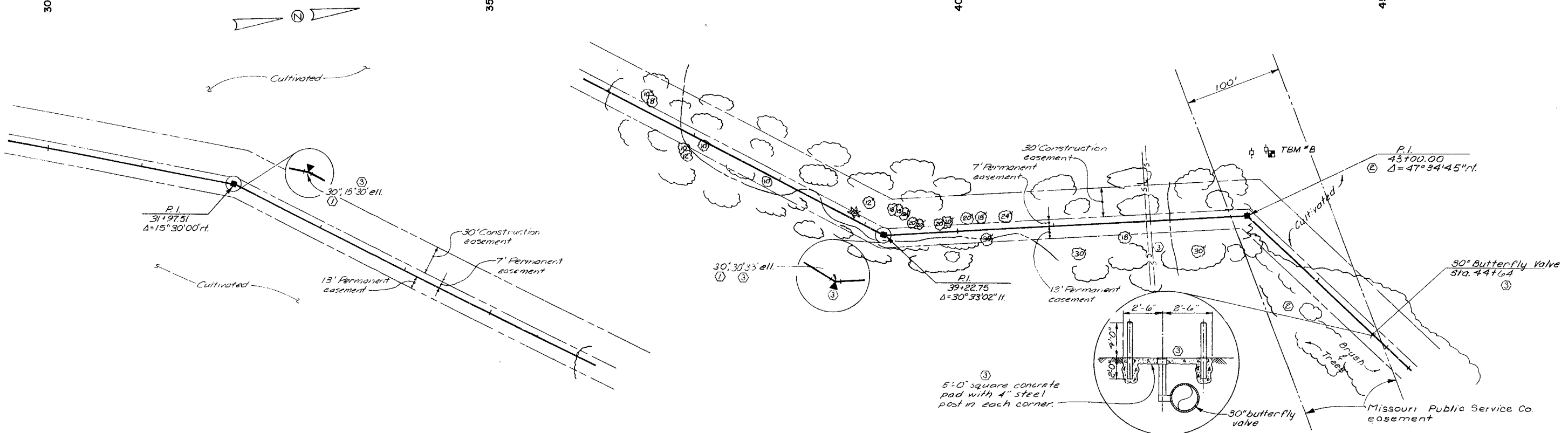
DWG. NO. 3

30+00

35+00

40+00

45+00



TBM "B" E1.1000.75  
 Railroad spike in east side  
 of power pole @ sta. 43+25,  
 69' ft.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, pipe size, pipe material, and pipe center-line elevation. Realignment Sta. 43+00.00 to Sta. 45+00.00.	RAL	3-23-81
②			4-15-81
③	Final revision per construction records	RAL	8-28-81

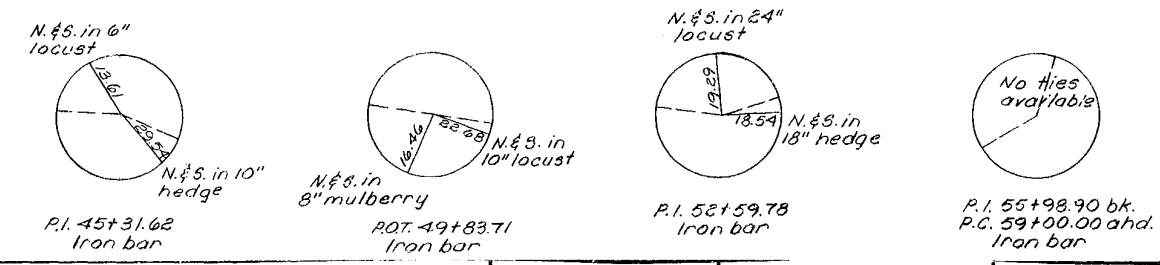
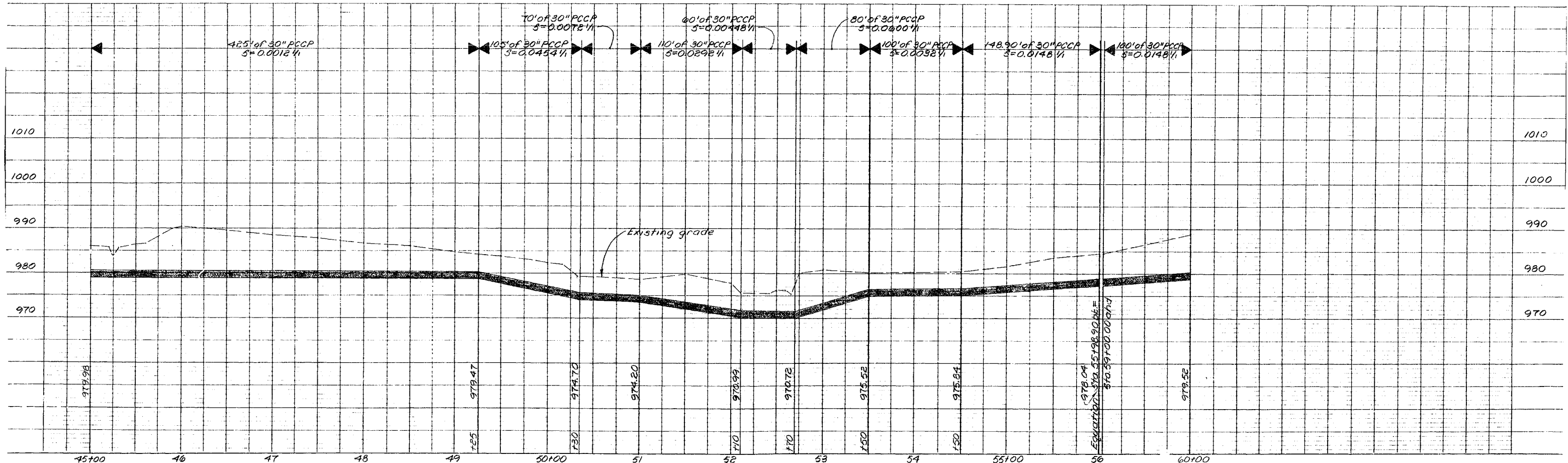
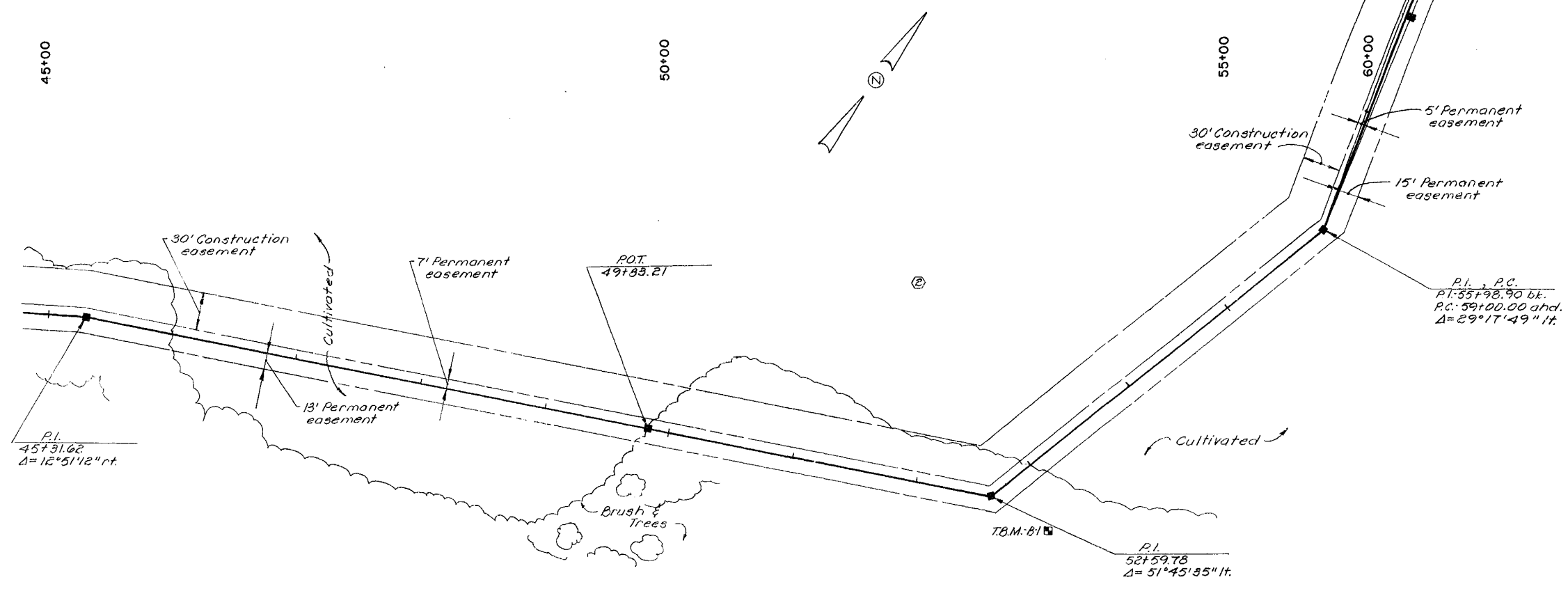
Designed By: SDS  
 Drawn By: RAL  
 Checked By: HB  
 Scale: 1"=50' H, 1"=100' V  
 Job No.: 7820  
 Contract No.: 15  
 Approved By: Harry Bond  
 PROJECT ENGINEER  
 Date: Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 30+00 TO STA. 45+00

DWG. NO. 4



T.B.M.-B-1  
 Railroad spike in west side of 30" cottonwood.  
 (Sta. 52+75, 50 rt.)

No.	Revisions	By	Date
1	Realignment Sta. 45+00 to Sta. 60+00	B.K.	9-17-81

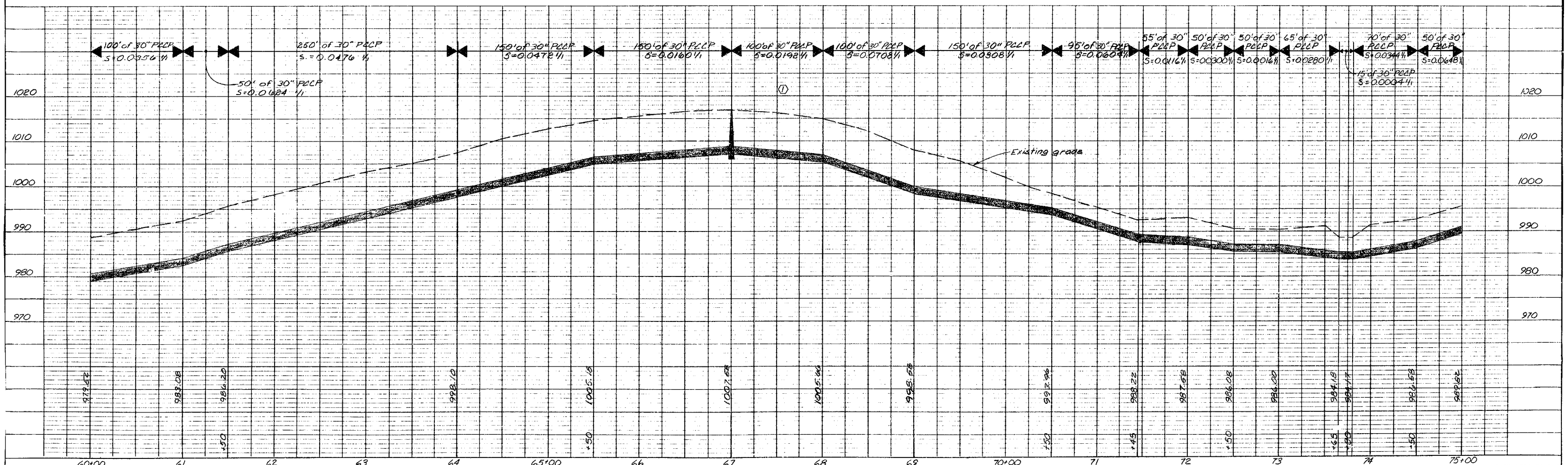
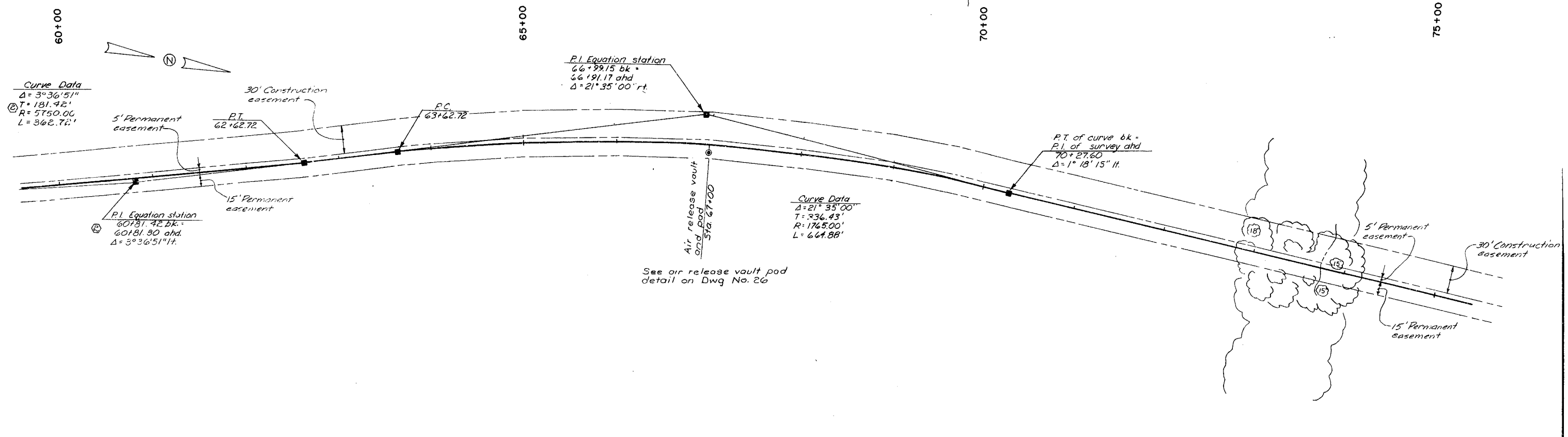
Designed By H.B.  
 Drawn By B.V.K.  
 Checked By H.B.  
 Scale 1"=50'H, 1"=10'V.  
 Job No. 7820  
 Contract No. 15  
 Approved By [Signature]  
 PROJECT ENGINEER  
 Date April 15, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

**CITY OF LEE'S SUMMIT, MISSOURI**  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 45+00 TO STA. 60+00

DWG. NO. 5



No.	Revisions	By	Date
①	Revised per Addendum no. 1, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Revised curve data & P.I. equation station.	B.J.K.	4-13-81

Designed By	SOS
Drawn By	RAL/MHM
Checked By	HR
Scale	1"=50'H, 1/4"=10'V
Job No.	7820
Contract No.	15
Approved By	<i>Harry Bond</i>
PROJECT ENGINEER	
Date	Feb. 9, 1981

**CITY OF LEE'S SUMMIT, MISSOURI**  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 60+00 TO STA. 75+00

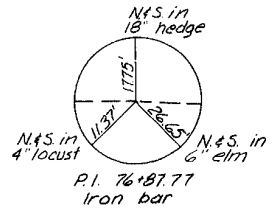
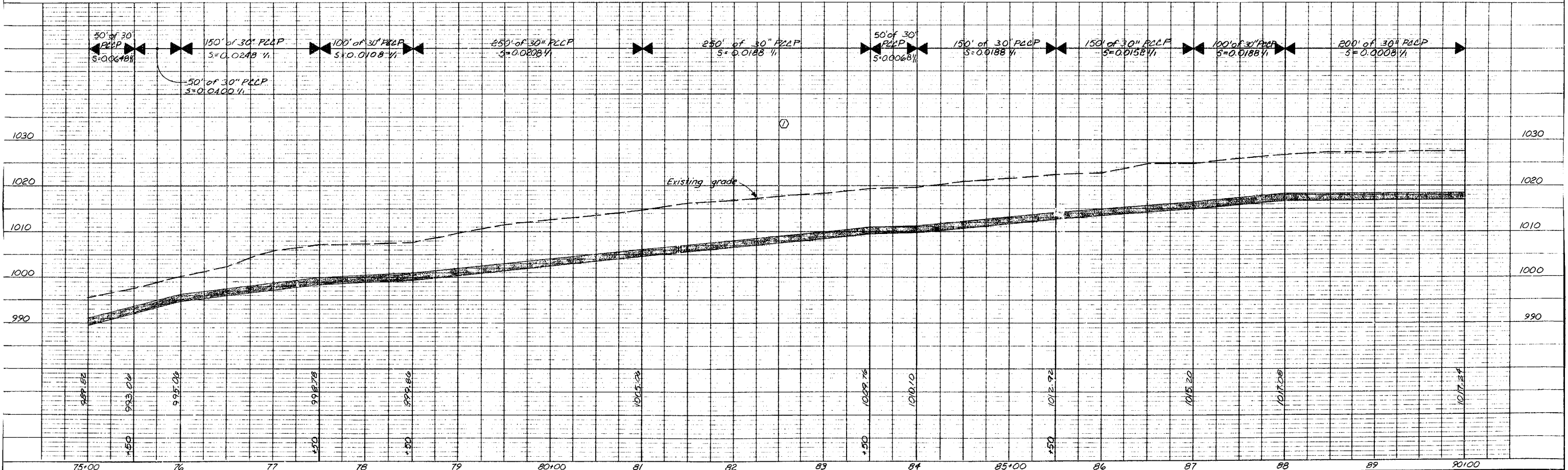
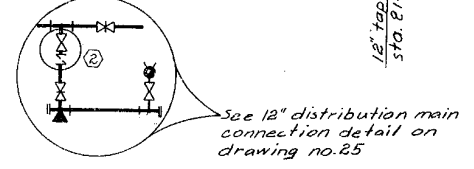
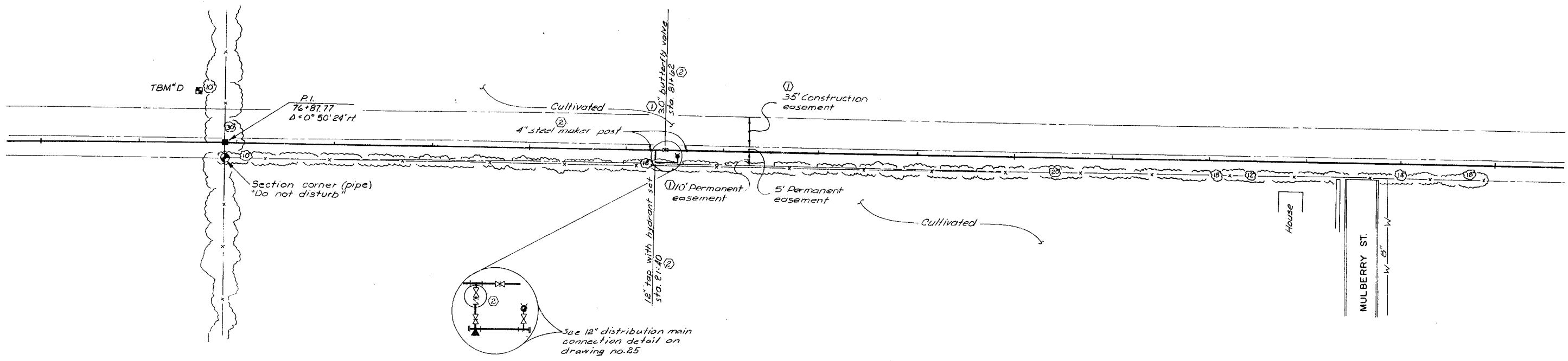
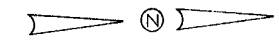
DWG. NO. 6

75+00

80+00

85+00

90+00



TBM "D" El. 1005.47  
Railroad spike in north side of 10"  
elm @ sta. 76+70, 57' 11".

No.	Revisions	By	Date
①	Revised per Addendum no. 1, easement width, valve size, pipe size, pipe material, pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By SDS  
 Drawn By RAL/MMM  
 Checked By HB  
 Scale 1" = 50'H, 1" = 10'V  
 Job No. 7820  
 Contract No. 15  
 Approved By Harry Bond  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 75+00 TO STA. 90+00

DWG. NO. **7**

90+00

95+00

100+00

105+00

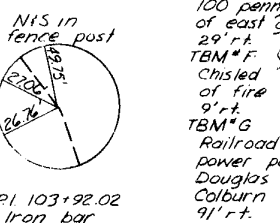
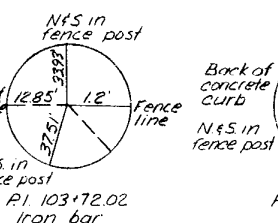
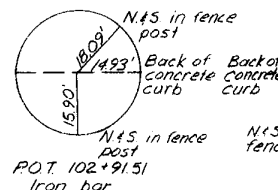
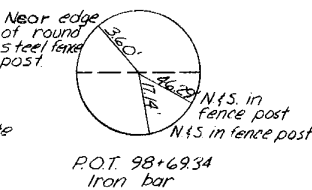
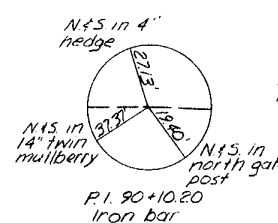
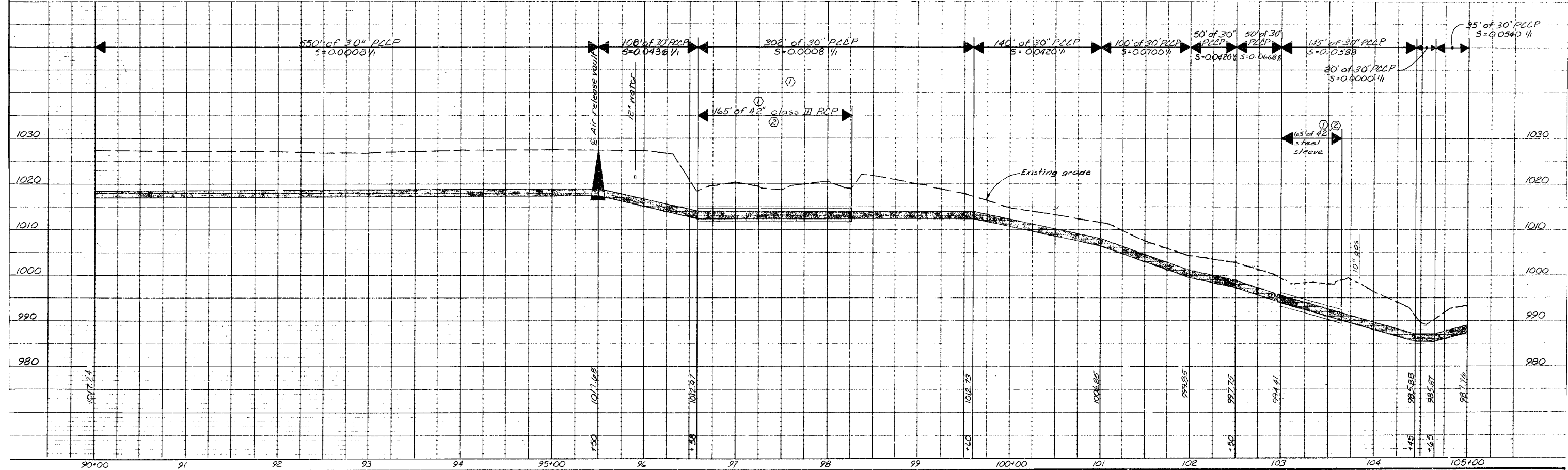
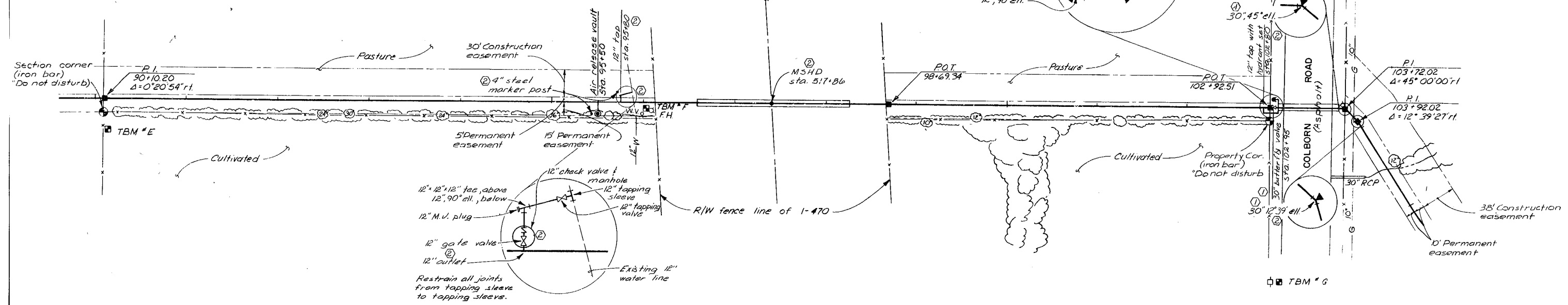
Construct temporary 3-strand barbed-wire fence along west edge of temporary construction easement from sta. 90+10.20 to sta. 96+14



Sta. 96+16 to Sta. 98+26  
Install 42" class III RCP  
under roadway by  
trenching

See 12" distribution main  
connection detail on  
drawing no. 25

Sta. 102+95 to Sta. 103+00  
Install 42" steel sleeve



TBM #E E1 1028.97  
100 penny nail in south side of east gate post @ sta. 90+09, 29' r.t.

TBM #F E1 1028.79  
Chisled "X" on north cap bolt of fire hydrant @ sta. 96+09, 9' r.t.

TBM #G E1 1002.58  
Railroad spike in west side of power pole, ± 1/2 mile east of Douglas on south side of Colburn Road @ sta. 102+95, 9' r.t.

No.	Revisions	By	Date
1	Revised per Addendum no. 1, construction fence, steel sleeve size, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
2	Final revision per construction records	RAL	8-28-81

**CITY OF LEE'S SUMMIT, MISSOURI**  
WATER SYSTEM IMPROVEMENTS

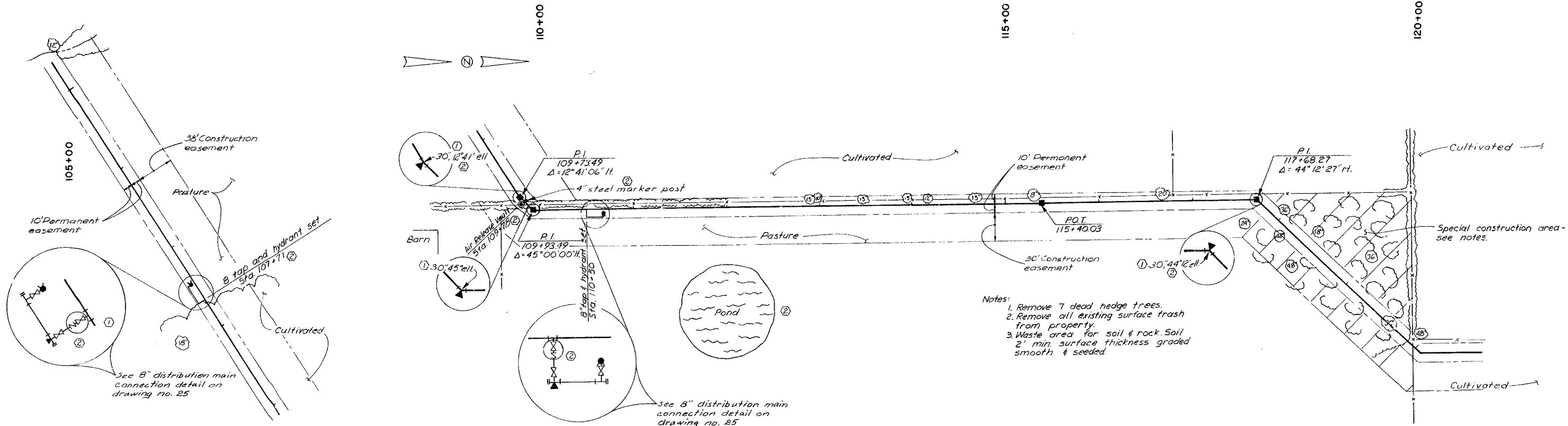
Designed By SDS  
Drawn By RAL/MAH  
Checked By HB  
Scale 1"=50' H, 1"=10' V  
Job No. 7820  
Contract No. 15  
Approved By Harry Bond  
PROJECT ENGINEER  
Date Feb. 9, 1981  
NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

**A C KIRKWOOD & ASSOCIATES**  
ENGINEERS CONSULTANTS  
KANSAS CITY, MISSOURI

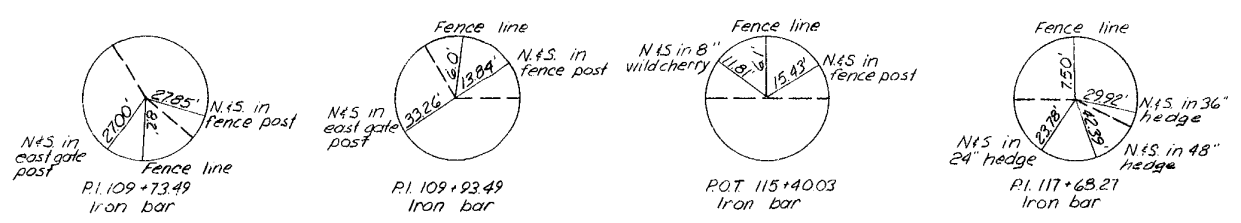
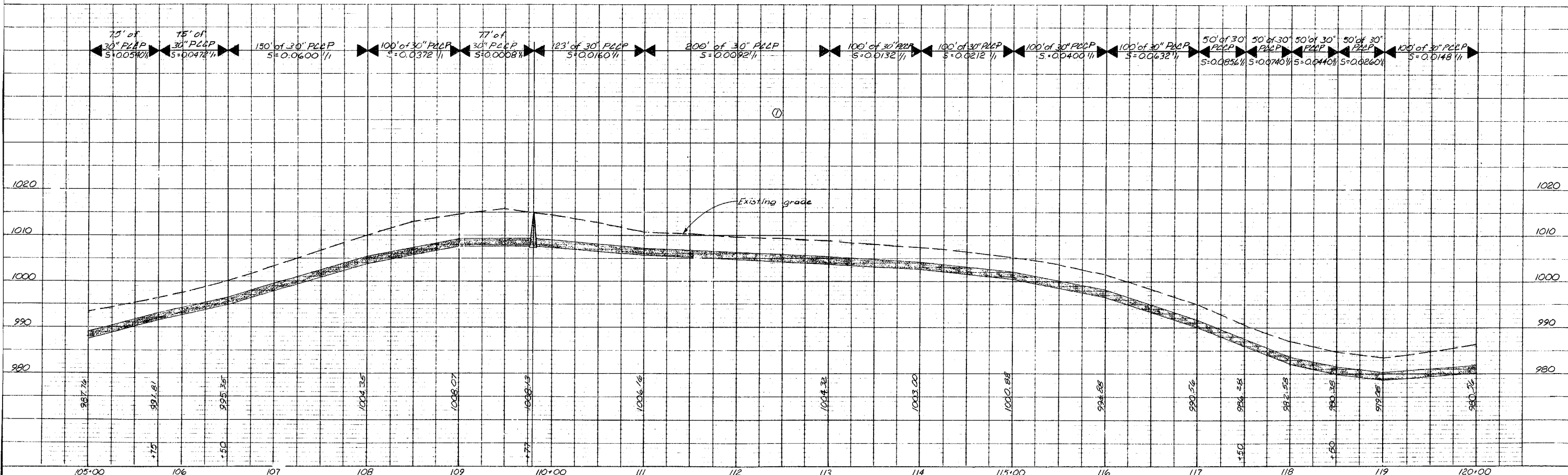
BOWLIN ROAD TRANSMISSION MAIN  
STA. 90+00 TO STA. 105+00

DWG. NO. 8





- Notes:
1. Remove 7 dead hedge trees.
  2. Remove all existing surface trash from property.
  3. Waste area for soil & rock. Soil 2' min. surface thickness graded smooth & seeded.



No.	Revisions	By	Date
①	Revised per Addendum no. 1, backing block location, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

**CITY OF LEE'S SUMMIT, MISSOURI**  
WATER SYSTEM IMPROVEMENTS

Designed By SOS  
 Drawn By RAL/INHM  
 Checked By HB  
 Scale 1"=50' H, 1"=10' V  
 Job No. 7820  
 Contract No. 15

Approved By Harry Bond  
 PROJECT ENGINEER  
 Date Feb. 9, 1981

NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

STATE OF MISSOURI  
HARRY BOND  
NUMBER  
E-8279  
REGISTERED PROFESSIONAL ENGINEER

**A C KIRKWOOD & ASSOCIATES**  
ENGINEERS CONSULTANTS  
KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
STA. 105+00 TO STA. 120+00

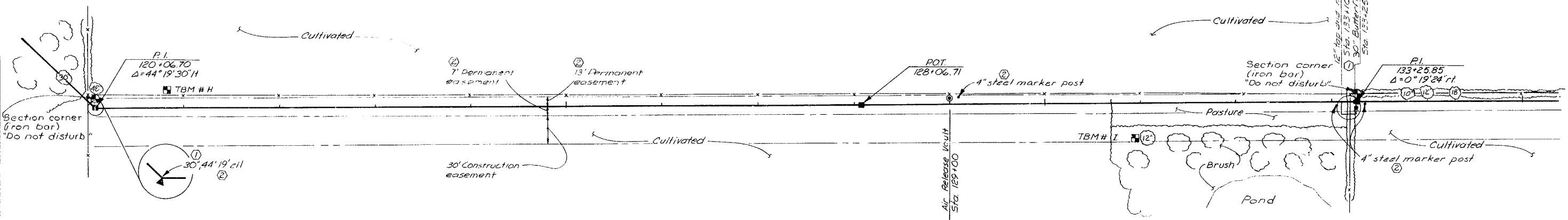
DWG. NO.  
9

120+00

125+00

130+00

135+00



TBM # H Elev. 992.36  
 (3) 20d nails in top of fence post @ sta. 120+68, 20' H.

TBM # I Elev. 1016.36  
 Railroad spike in west side of 12" cottonwood @ sta. 131+00, 32' H.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By: SOS  
 Drawn By: MHM  
 Checked By: HR  
 Scale: 1"=50'H, 1"=10'V  
 Job No.: 7820  
 Contract No.: 15  
 Approved By: Harry Bond  
 PROJECT ENGINEER  
 Date: Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

**CITY OF LEE'S SUMMIT, MISSOURI**  
 WATER SYSTEM IMPROVEMENTS

HARRY BOND  
 NUMBER E-8279

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

**BOWLIN ROAD TRANSMISSION MAIN**  
 STA. 120+00 TO STA. 135+00

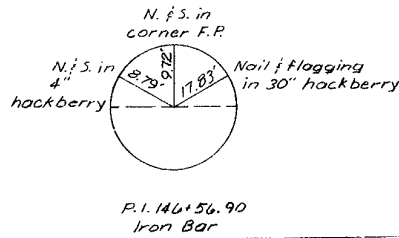
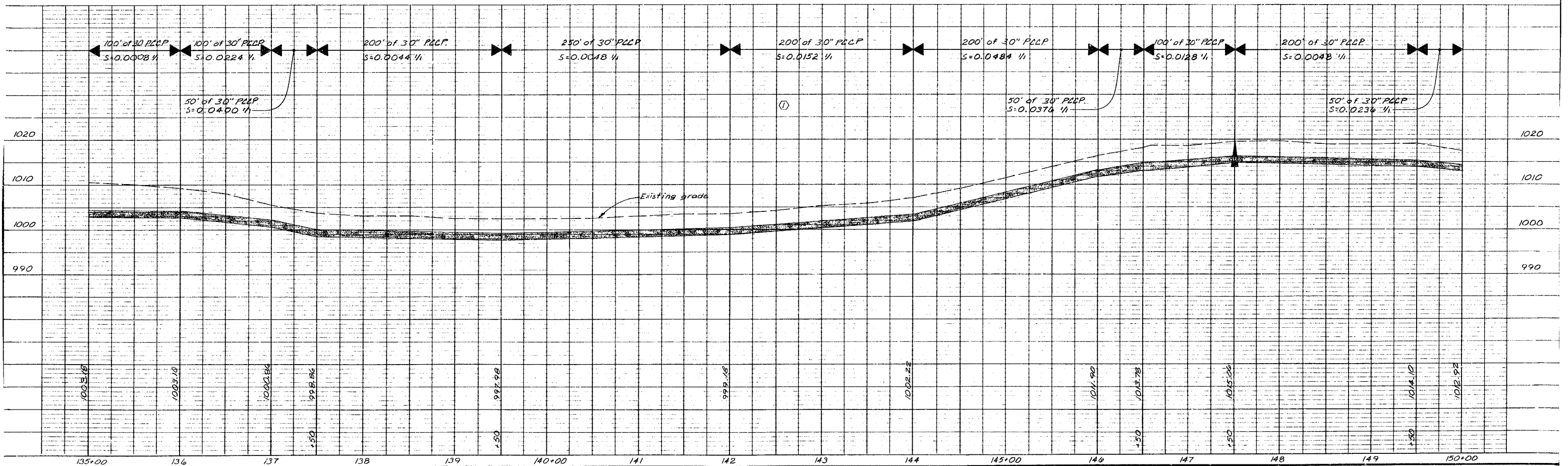
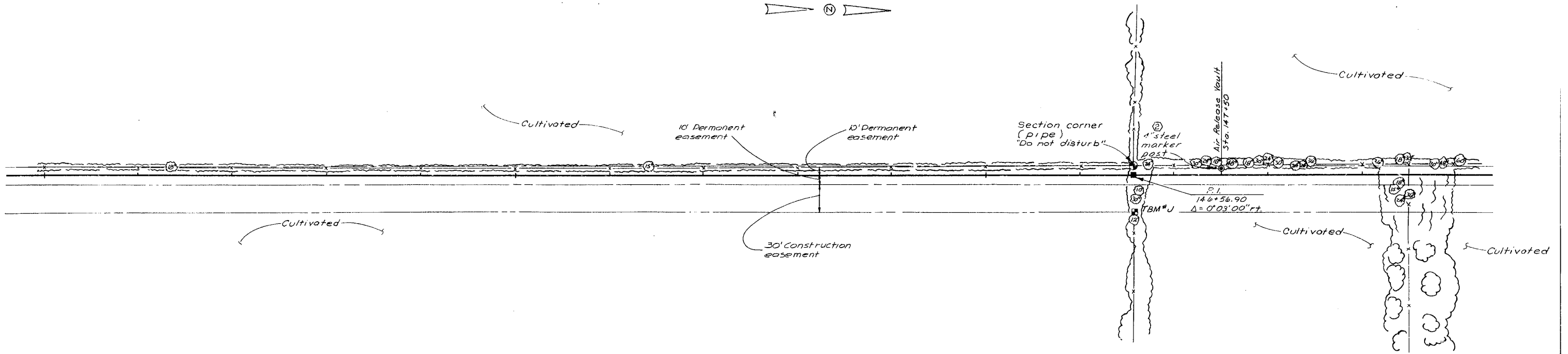
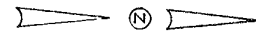
DWG. NO. 10

135+00

140+00

145+00

150+00



TBM # J El. 1021.41  
 Railroad spike in West side of 12\"/>

No.	Revisions	By	Date
①	Revised per Addendum no. 1, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By SDS  
 Drawn By RAL  
 Checked By HB  
 Scale 1" = 50'H, 1" = 10'V  
 Job No. 7820  
 Contract No. 15  
 Approved By [Signature]  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer



CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 135+00 TO STA. 150+00

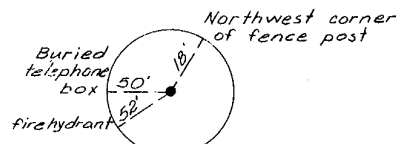
DWG. NO. 11

150+00

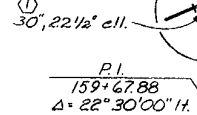
155+00

160+00

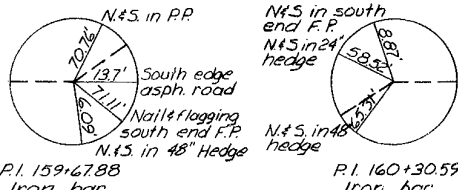
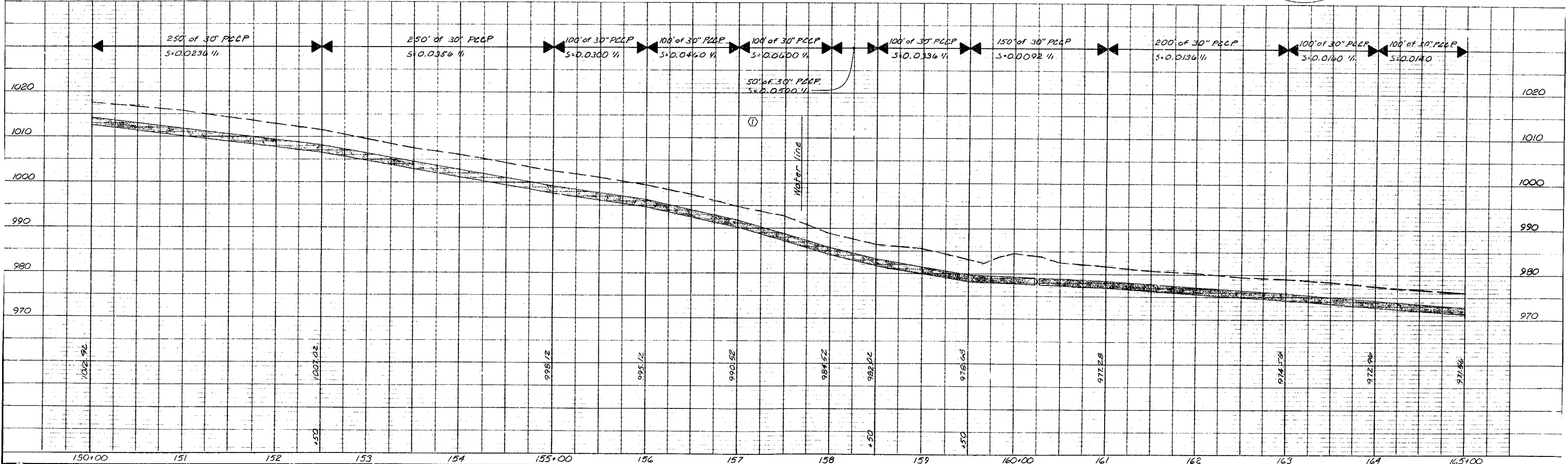
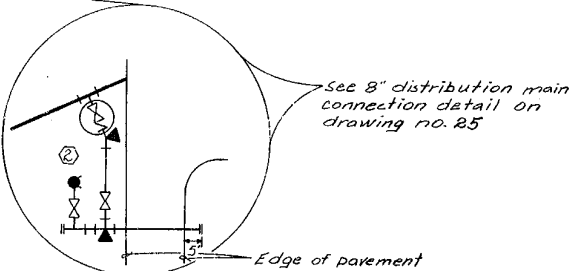
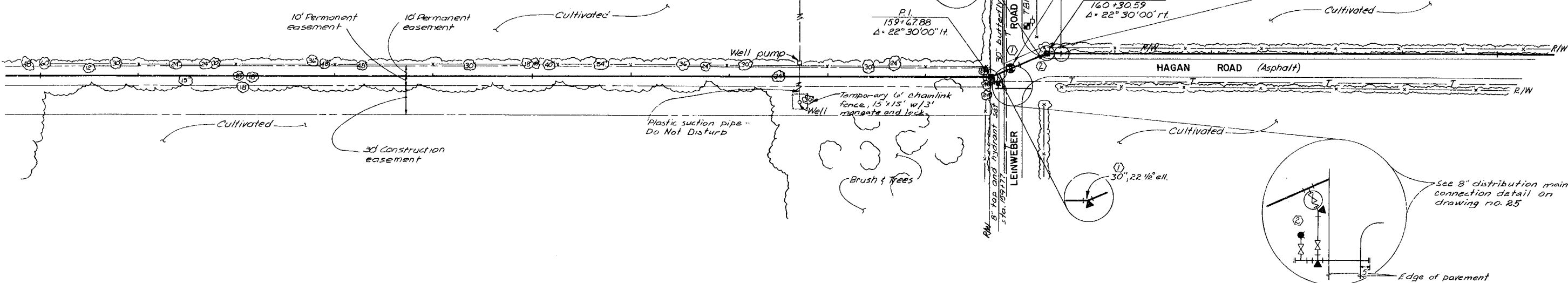
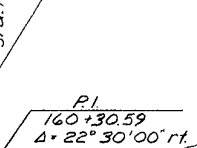
165+00



Location of butterfly valve @ sta. 160+25



Section corner (bolt below grade)



TBM "K" E1. 926.43  
R.R. spike in east side of R.P. @ the north west corner of Lienweber & Hagan Road @ sta. 160+29.37' H.

No.	Revisions	By	Date	Designed By
1	Revised per Addendum no. 1, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81	SDS
2	Final revision per construction records	RAL	8-28-81	MHM

Drawn By **MHM**  
 Checked By **HE**  
 Scale 1" = 50' H, 1" = 10' V  
 Job No. 7820  
 Contract No. 15  
 Approved By **Harry Bond**  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

**CITY OF LEE'S SUMMIT, MISSOURI**  
**WATER SYSTEM IMPROVEMENTS**

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

HARRY BOND  
 NUMBER E-8278  
 MISSOURI PROFESSIONAL ENGINEER

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 150+00 TO STA. 165+00

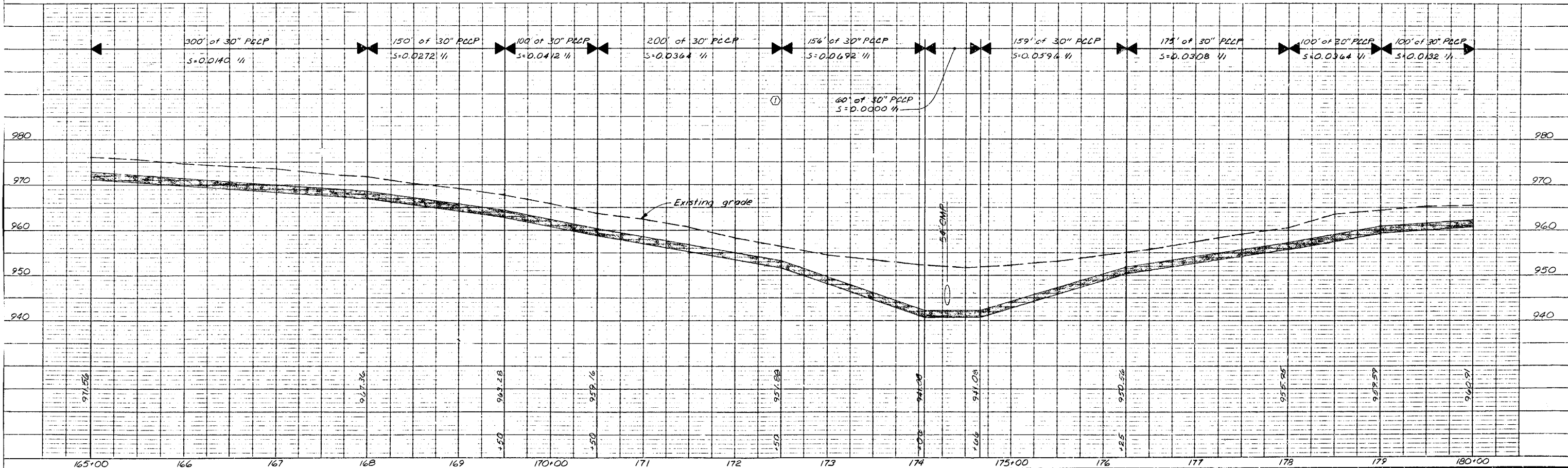
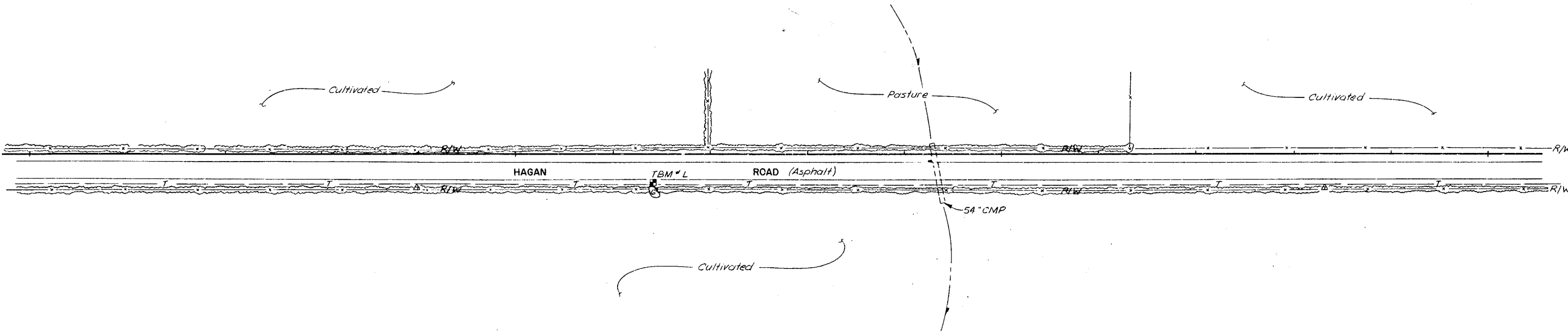
DWG. NO. 12

165+00

170+00

175+00

180+00



TBM#L El. 961.88  
 R.R. spike in west side of 6"  
 Elm on the east side of Hagan  
 and ± 1200' north of Leinweber  
 Road @ sta. 171+40, 31' rt.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81

Designed By SDS  
 Drawn By MHM  
 Checked By HB  
 Scale 1"=50'H, 1"=10'V  
 Job No. 7820  
 Contract No. 15  
 Approved By  
*Harry Bond*  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

**CITY OF LEE'S SUMMIT, MISSOURI**  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 165+00 TO STA. 180+00

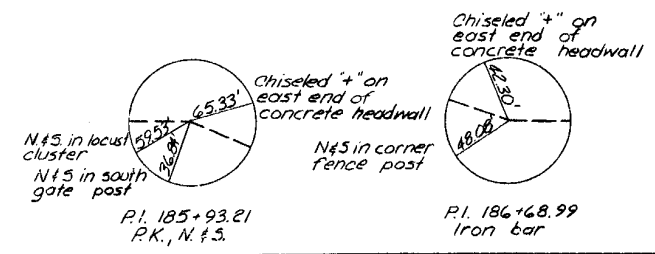
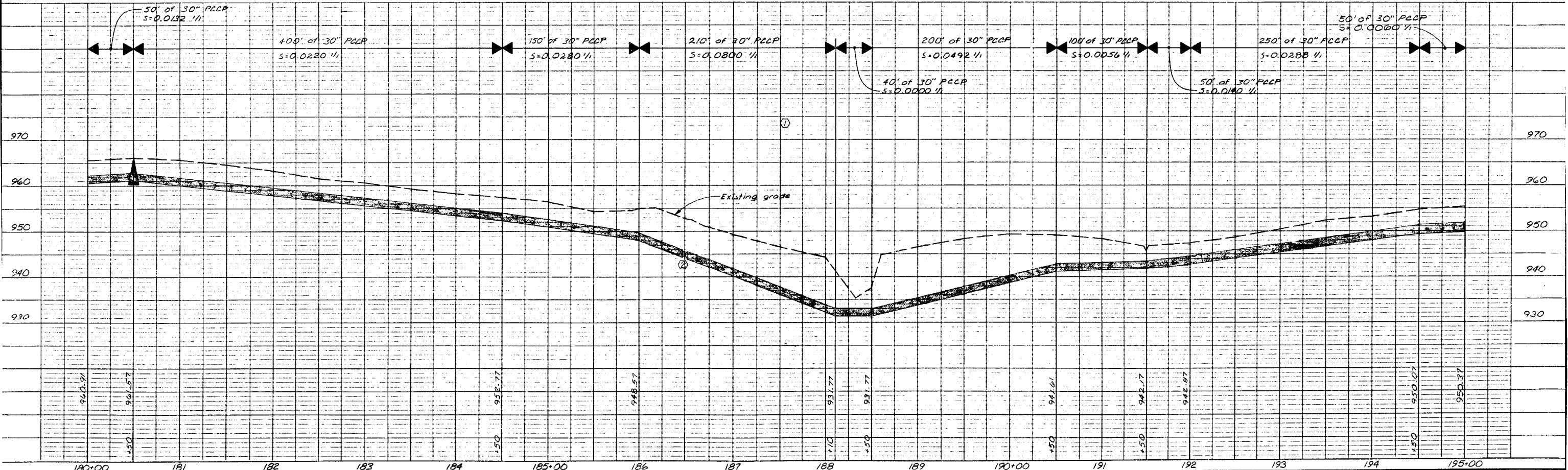
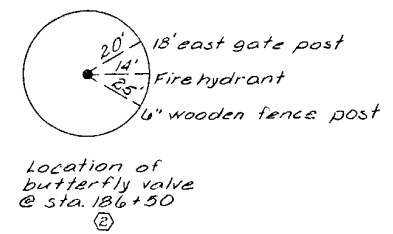
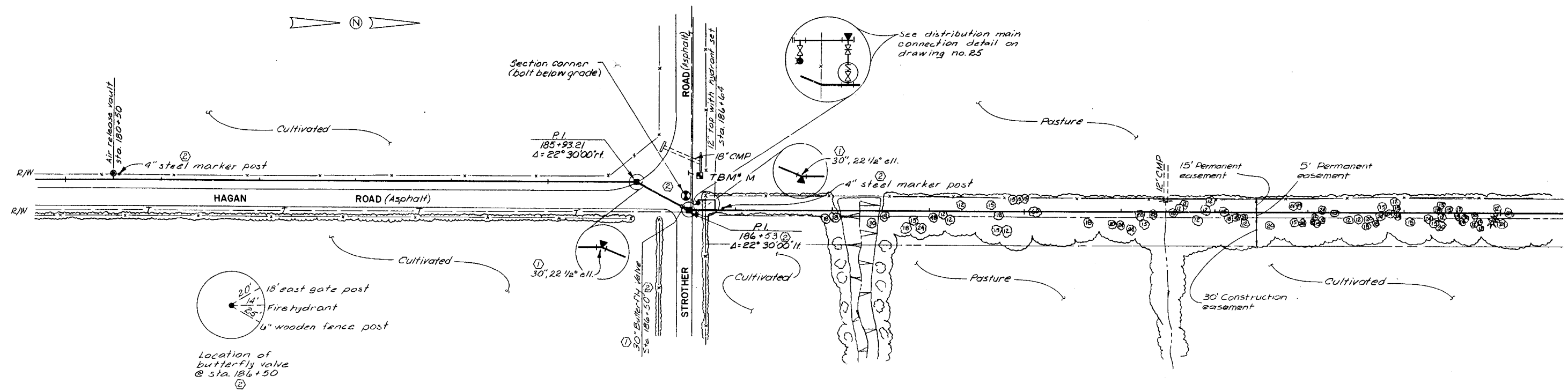
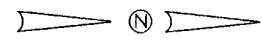
DWG. NO. 13

180+00

185+00

190+00

195+00



TBM # M  
 Chiseled '+' on southeast corner of 12" concrete headwall @ the northwest corner of Hagan & Strother Road @ sta. 186+60, 40' ft.  
 E.I. 955.39

No.	Revisions	By	Date
①	Revised per Addendum no. 1, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	5-28-81

Designed By: SD5  
 Drawn By: MHM  
 Checked By: HB  
 Scale: 1"=50', 1"=10'  
 Job No.: 7820  
 Contract No.: 15  
 Approved By: *[Signature]*  
 PROJECT ENGINEER  
 Date: Feb. 9, 1981

NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 180+00 TO STA. 195+00

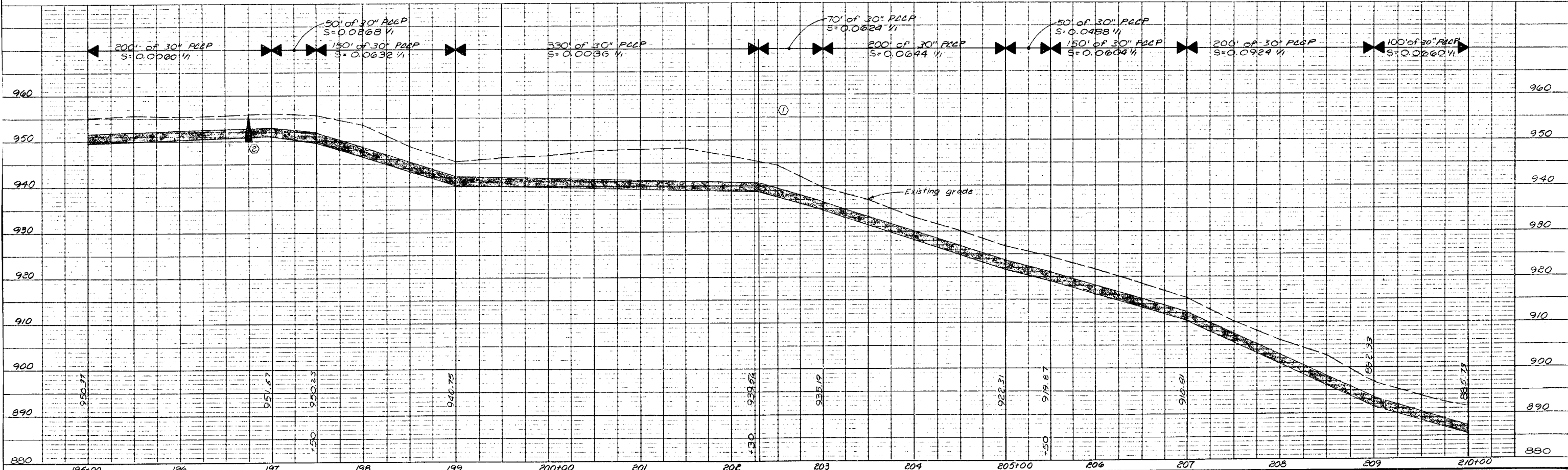
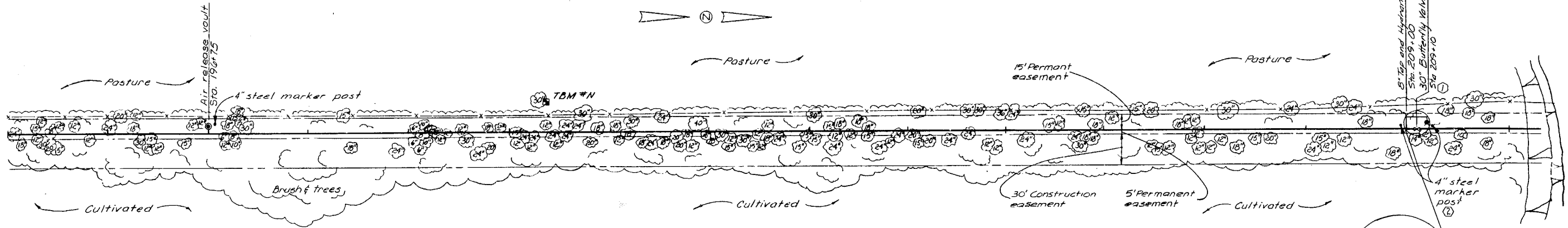
DWG. NO. 14

195+00

200+00

205+00

210+00



TBM #N El. 951.31  
 Railroad spike in northeast side of 30" oak, 1/4 mile north of Strother Road & Hagan Road @ sta. 200+31, 31" ft.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, valve size, pipe size, pipe material, and pipe centerline elevation.	RAL	5-23-81
②	Final revision per construction records	RAL	5-25-81

Designed By SOS  
 Drawn By BK  
 Checked By HB  
 Scale 1"=50' H/L = 10'  
 Job No. 7880  
 Contract No. 15  
 Approved By [Signature]  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 195+00 TO STA. 210+00

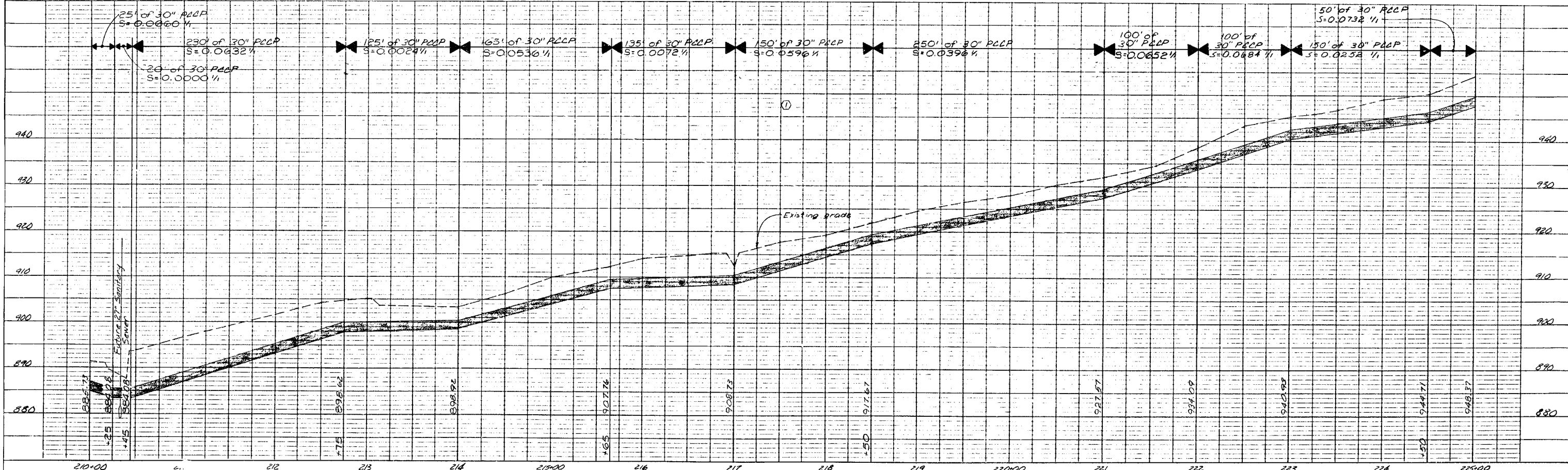
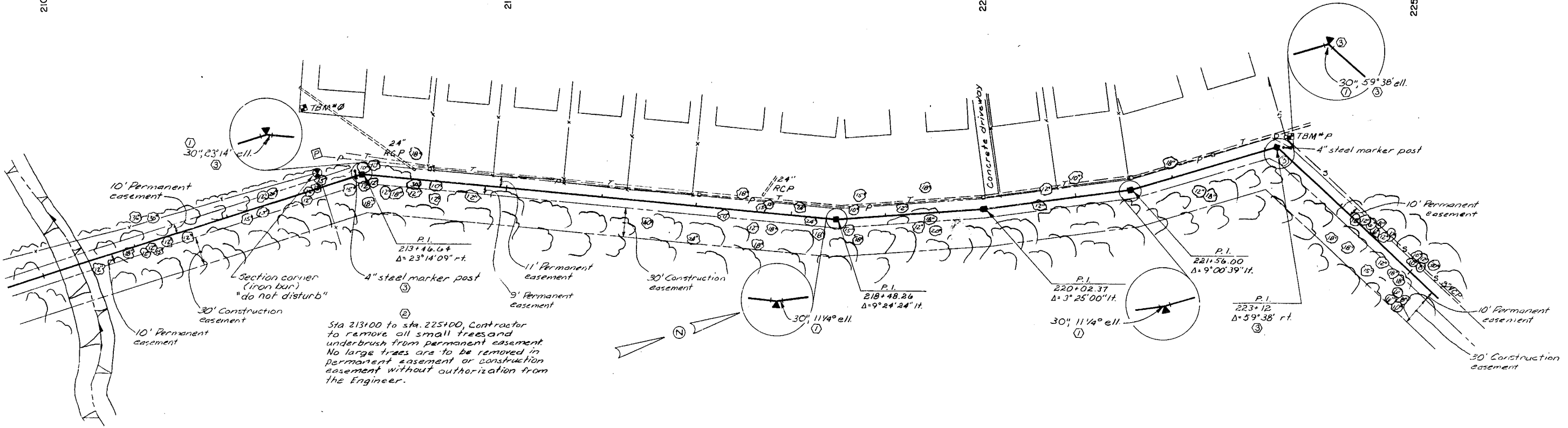
DWG. NO. 15

210+00

215+00

220+00

225+00



No.	Revisions	By	Date
①	Revised per Addendum no.1, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Revised per Addendum no.2, clearing of easement.	RAL	3-23-81
③	Final revision per construction records	RAL	8-28-81

Station	Description	Coordinates
210+00	N.E. corner S.E. corner of concrete driveway	885.73, 884.76
212	N.E. corner of concrete driveway	895.62
213	S.E. corner of concrete driveway	895.62
214	S.E. corner of concrete power transformer pad	898.92
215+00	N.E. corner of concrete patio	907.76
216	S.E. corner of concrete patio	908.72
217	N.E. corner of concrete patio	917.67
218	S.E. corner of concrete patio	917.67
219	N.E. corner of concrete patio	927.57
220+00	S.E. corner of concrete patio	927.57
221	N.E. corner of concrete patio	934.09
222	S.E. corner of concrete patio	934.09
223	N.E. corner of concrete patio	940.93
224	S.E. corner of concrete patio	940.93
225+00	N.E. corner of concrete patio	948.37

**CITY OF LEE'S SUMMIT, MISSOURI**  
**WATER SYSTEM IMPROVEMENTS**

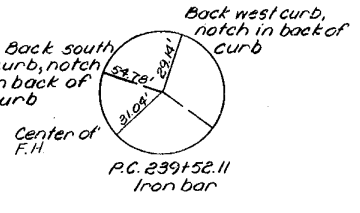
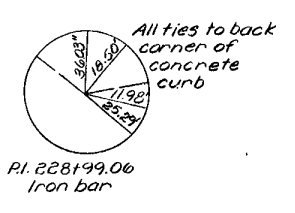
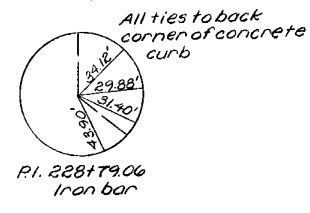
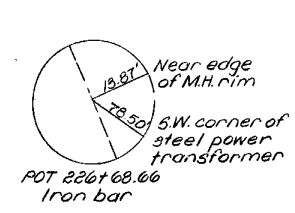
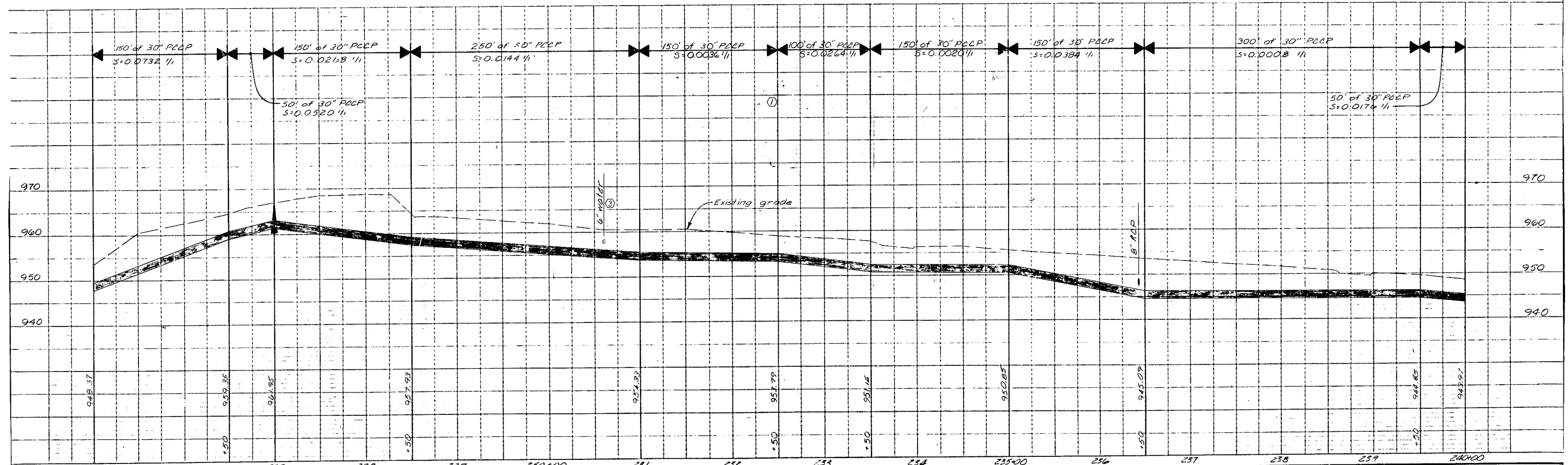
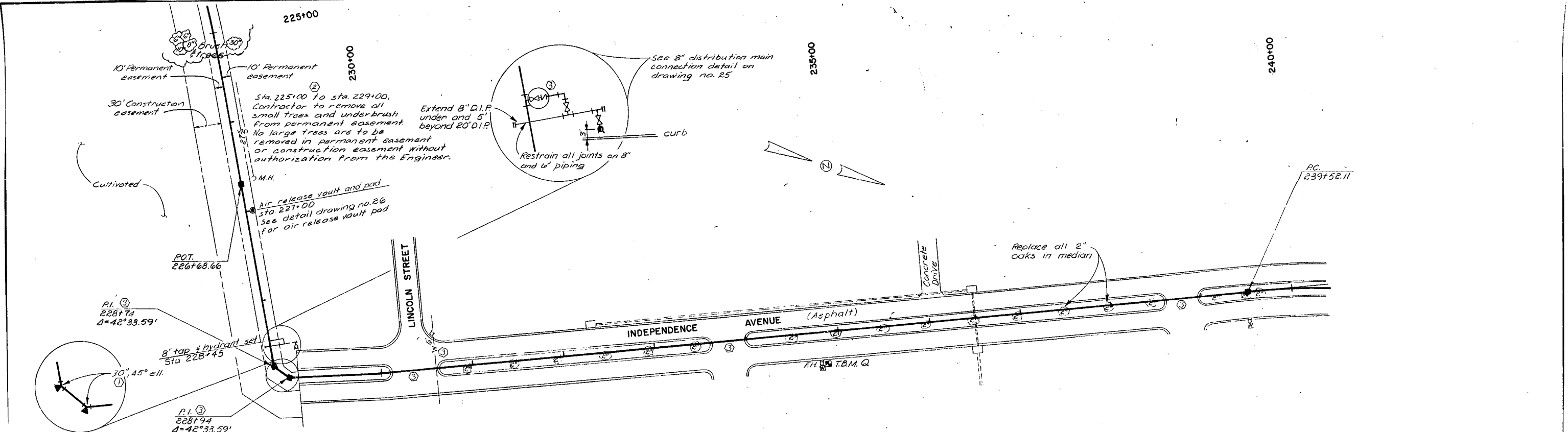
Designed By SDS  
 Drawn By RAL  
 Checked By HB  
 Scale 1"=30'H, 1"=10'V  
 Job No. 7920  
 Contract No. 15  
 Approved By John Paul  
 PROJECT ENGINEER  
 Date Feb 9, 1981

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 ST. 210+00 TO STA. 225+00

DWG. NO. 16





TBM Q Elev. 955.99  
Chiseled "Y" pointing north on northeast cap bolt of fire hydrant @ sta. 234+80.33' rt. on the east side of Independence Avenue and 1,000' south of Woods Chapel Rd.

No.	Revisions	By	Date
1	Revised per Addendum no. 1, steel sleeve size, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
2	Revised per Addendum no. 2, clearing of easement.	RAL	3-23-81
3	Final revision per construction records	RAL	8-28-81

Designed By SPJ  
 Drawn By BJK  
 Checked By HB  
 Scale 1"=20' H.S. 1"=20'  
 Job No. 7820  
 Contract No. 15  
 Approved By [Signature]  
 PROJECT ENGINEER  
 Date Feb. 9, 1981

NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

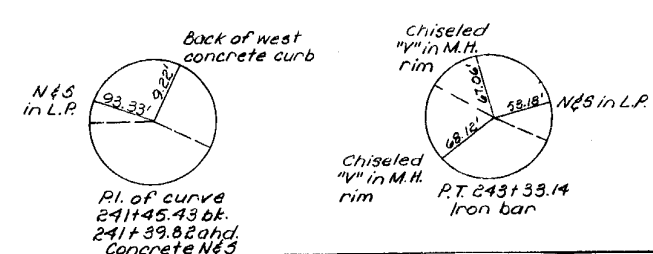
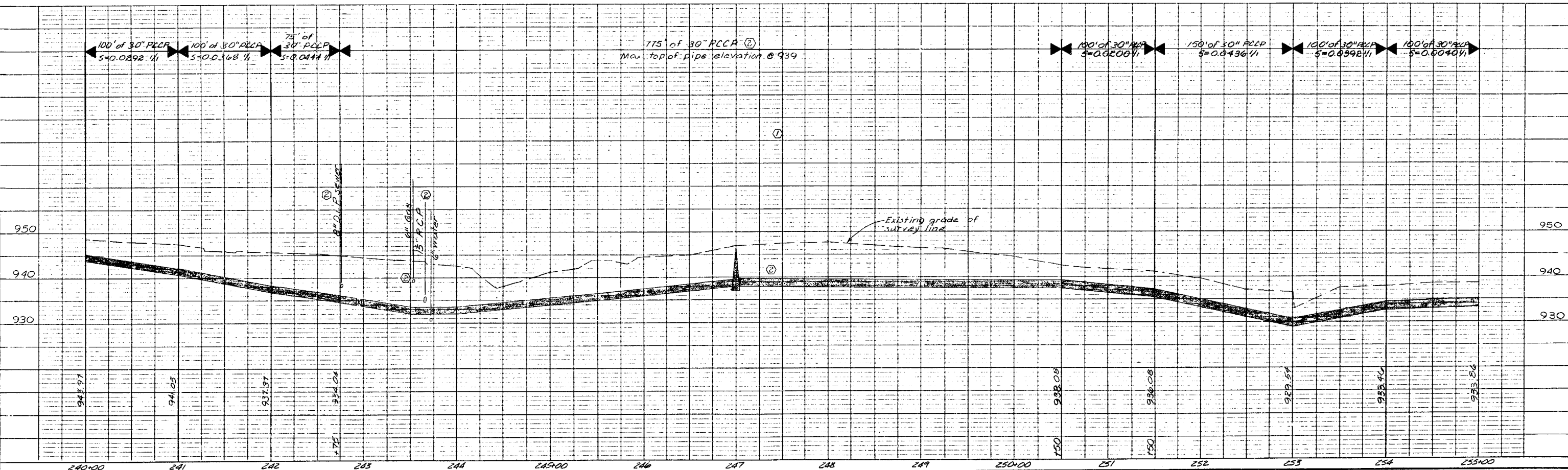
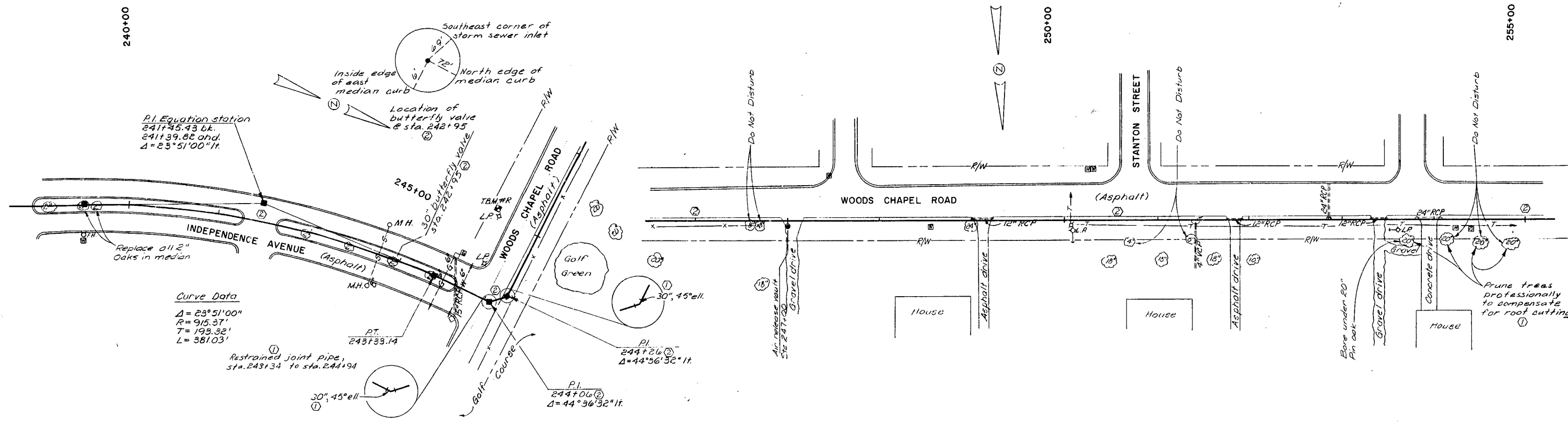
CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**K A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 225+00 TO STA. 240+00

DWG. NO. 17

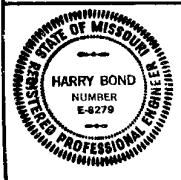
HARRY BOND  
 NUMBER 6-8279  
 MISSOURI PROFESSIONAL ENGINEER



TBM #R El. 945.05  
 Railroad spike in northeast of power pole at the southwest corner of Independence Avenue and Woods Chapel road @ sta. 245+19, 43' H.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, polyethylene encasement requirement, steel sleeve size, valve size, restrained joint pipe, tree pruning, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By *JDS*  
 Drawn By *AKK*  
 Checked By *HR*  
 Scale 1"=50' H.I.P. 1"=10'  
 Job No. 7820  
 Contract No. 15  
 Approved By *Johnny P. Bond*  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

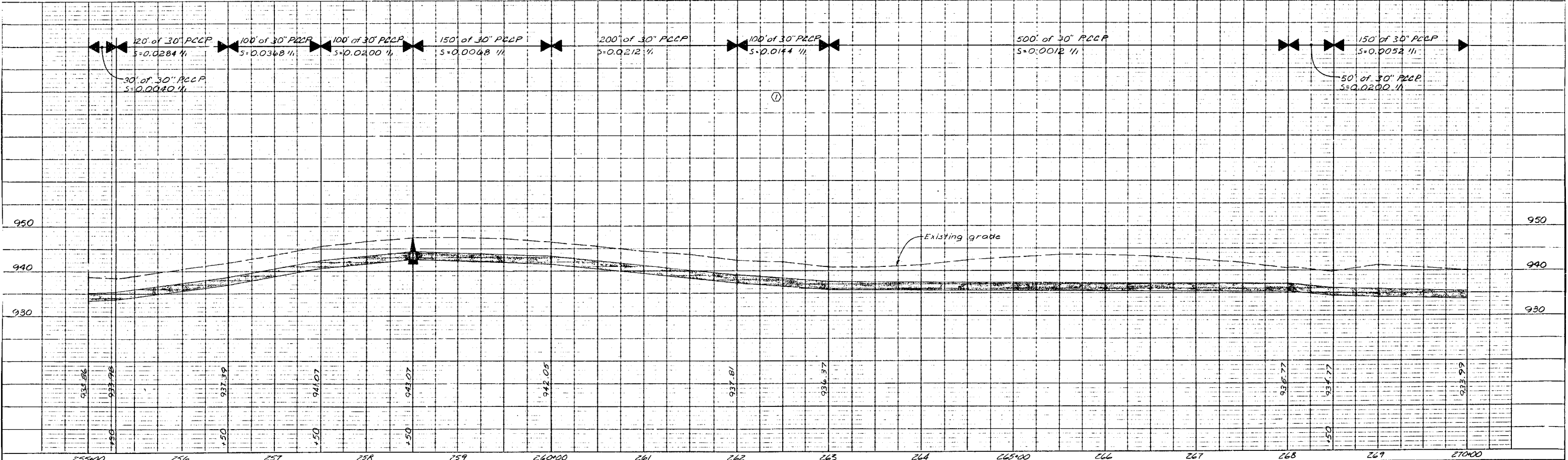
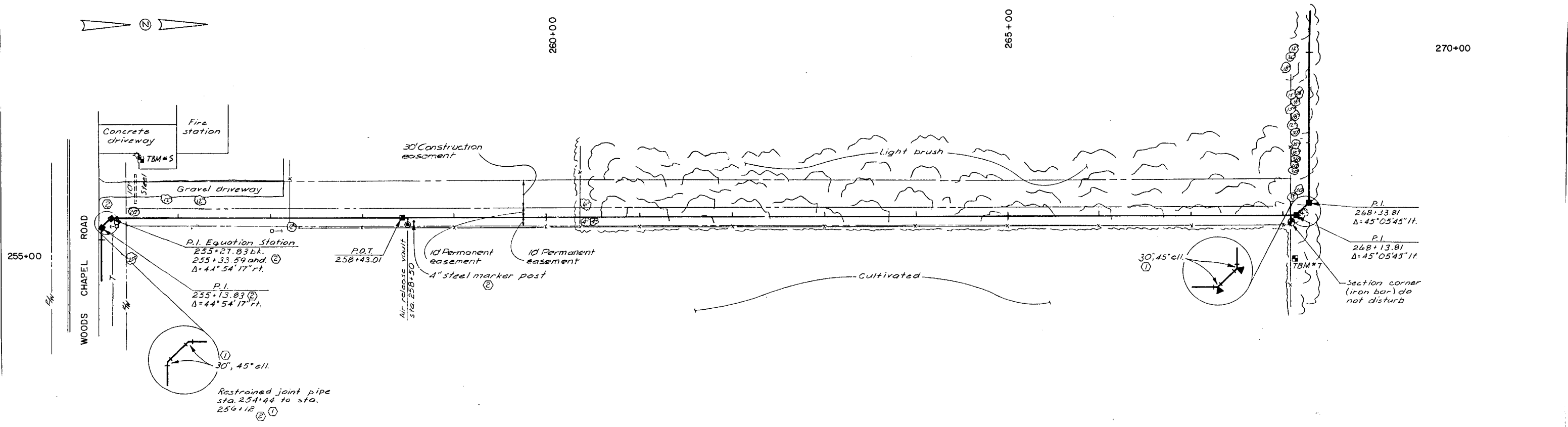


CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**K A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 240+00 TO STA. 255+00

DWG. NO. 18



N.S. in P.P. 4.25  
N.E. corner of concrete drive 87.43

P.I. 255+29.84  
Iron Bar

TBM #5 E1 940.47  
Chiseled "D" on round concrete light standard @ fire house parking lot, 414 Northwest Woods Chapel Road @ sta. 255+54, 67 ft.

TBM #T E1 937.03  
Railroad spike in southside of 12" twin hackberry @ sta. 268+08, 48 ft.

No.	Revisions	By	Date
1	Revised per Addendum no. 1, restrained joint pipe, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
2	Final revision per construction records	RAL	8-28-81

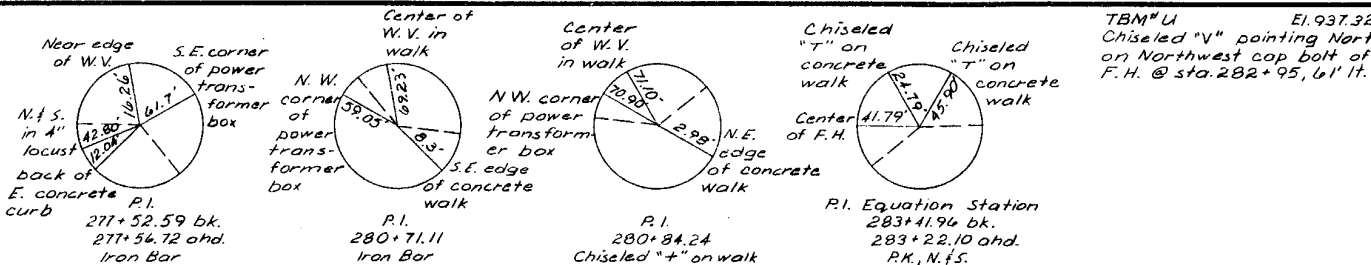
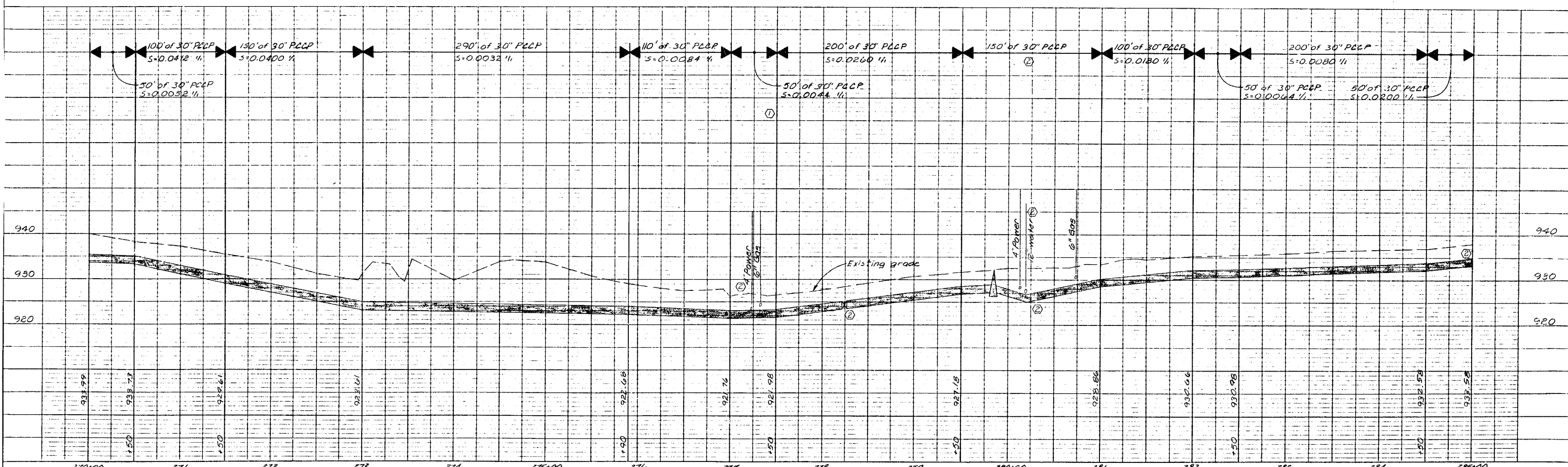
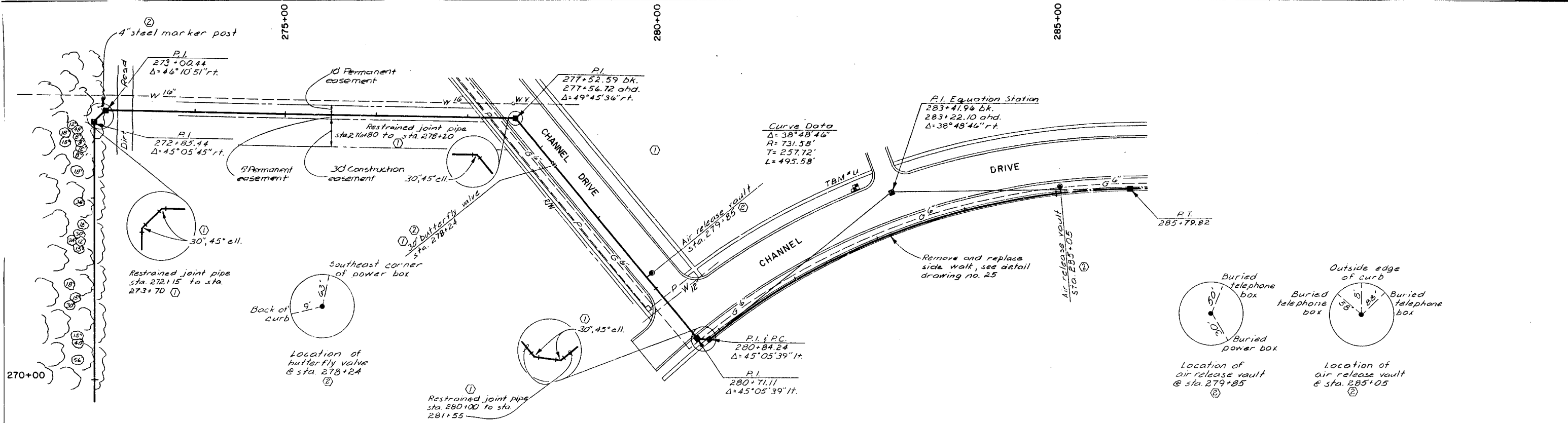
Designed By JDS  
Drawn By RAL  
Checked By HB  
Scale 1"=50' HORIZ  
Job No. 7820  
Contract No. 15  
Approved By *Harry Bond*  
PROJECT ENGINEER  
Date Feb. 9, 1981  
NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
ENGINEERS CONSULTANTS  
KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
STA. 255+00 TO STA. 270+00

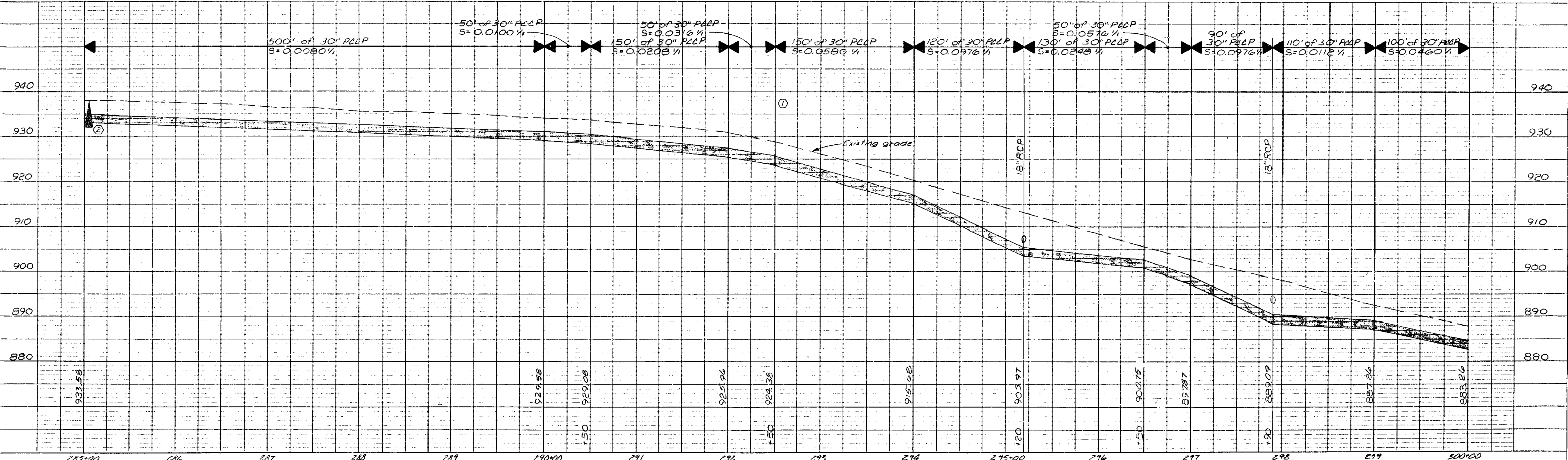
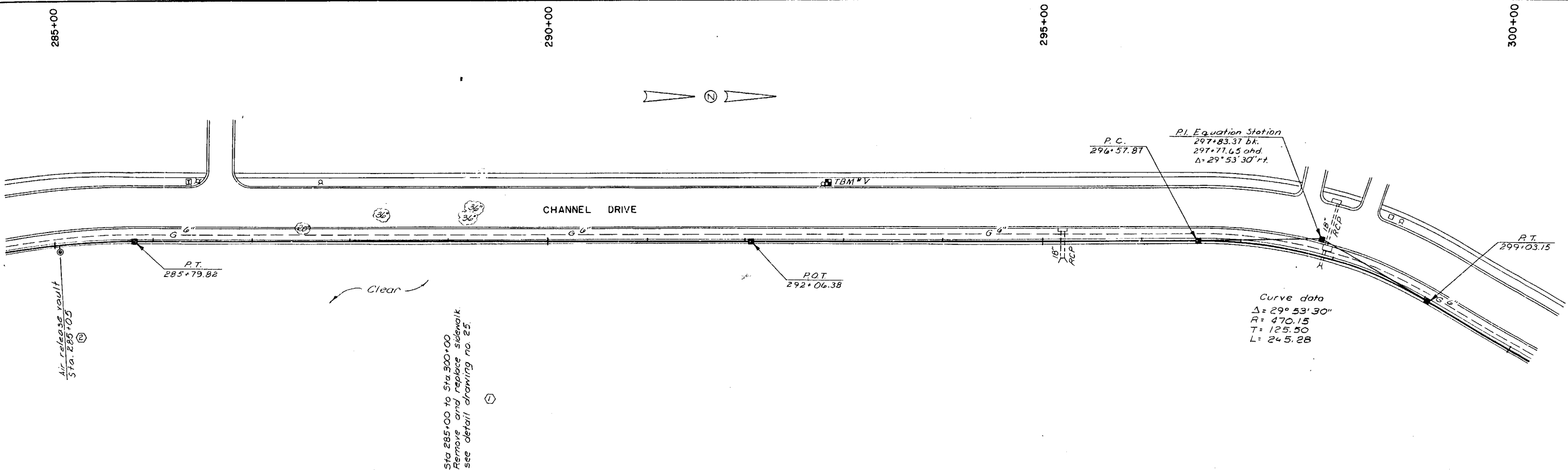
DWG. NO. 19



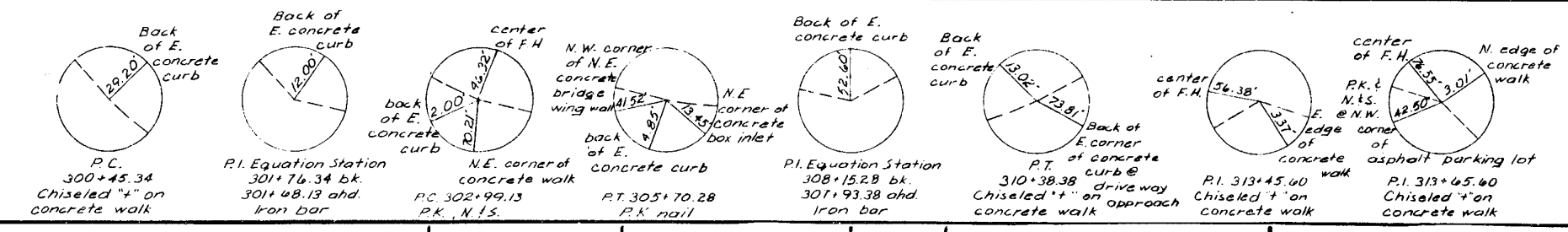
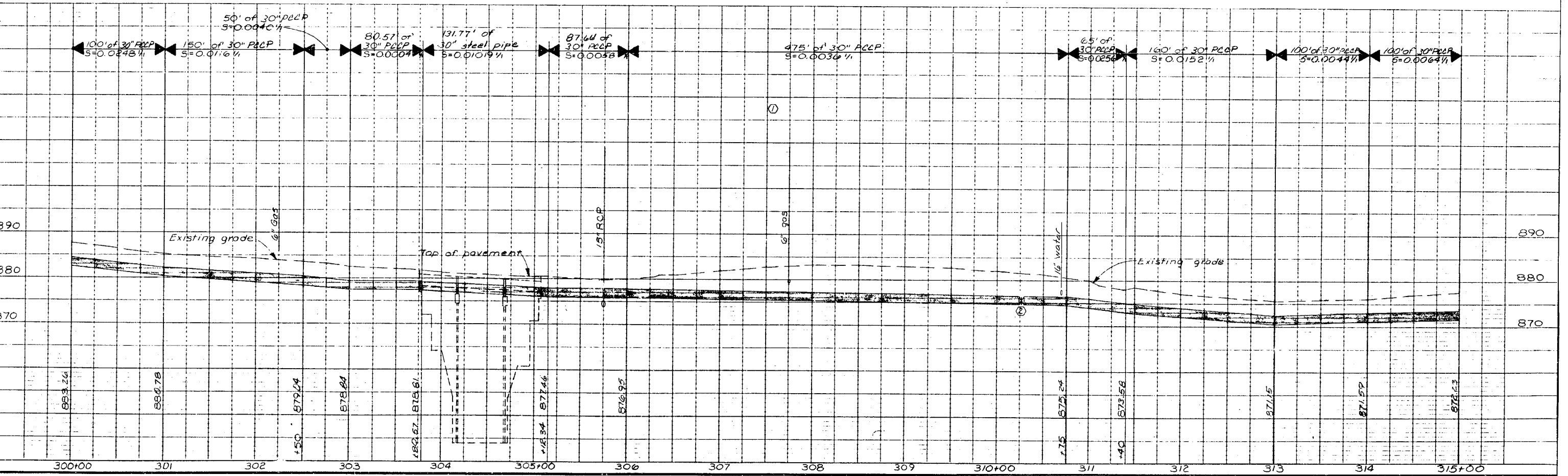
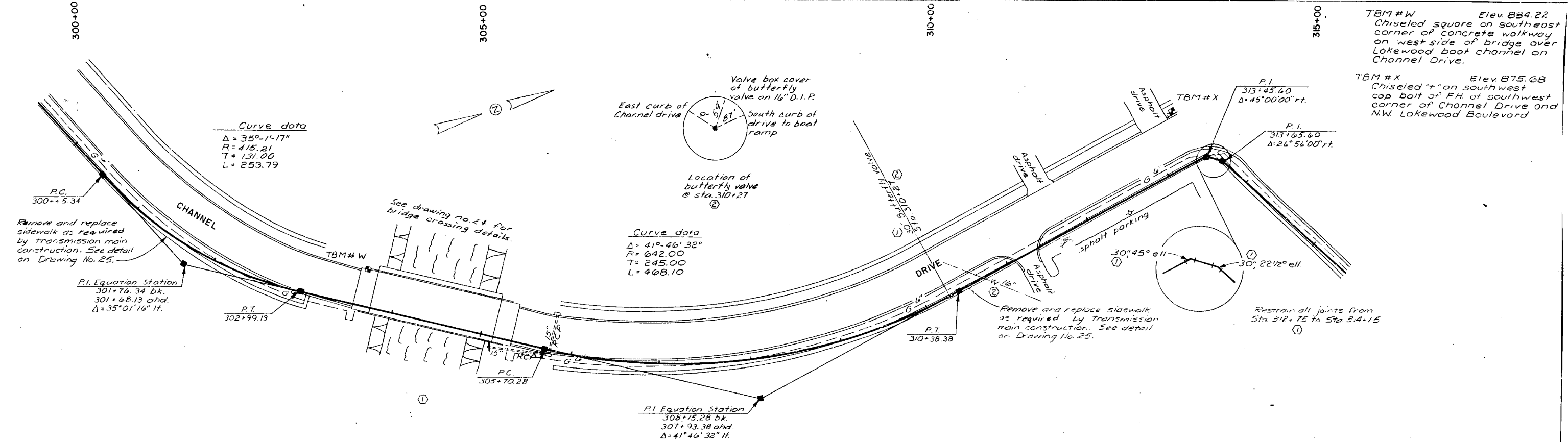
No.	Revisions	By	Date
1	Revised per addendum no.1, restrained joint pipe, polyethylene encasement requirement, valve size and class, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
2	Final revision per construction records	RAL	8-28-81

**CITY OF LEE'S SUMMIT, MISSOURI**  
WATER SYSTEM IMPROVEMENTS

Designed By <b>JDS</b> Drawn By <b>RAL</b> Checked By <b>HB</b> Scale <b>As Shown</b> Job No. <b>7820</b> Contract No. <b>15</b> Approved By <b>[Signature]</b> PROJECT ENGINEER Date <b>Feb. 9, 1981</b> NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer		<b>A C KIRKWOOD &amp; ASSOCIATES</b> ENGINEERS CONSULTANTS KANSAS CITY, MISSOURI	BOWLIN ROAD TRANSMISSION MAIN STA. 270+00 TO STA. 285+00	DWG. NO. <b>20</b>
---	--	--	---	-----------------------



<p>Back of east concrete curb N. &amp; penny in corner F.P.</p> <p>PT. 285+79.82 Chiseled "+" on walk</p>	<p>Back of east concrete curb Center of F.H.</p> <p>POT. 292+06.38 20d N&amp;S in concrete walk (opposite gravel drive)</p>	<p>Back of east concrete curb N&amp;S. in L.P.</p> <p>P.C. 296+57.87 Chiseled "+" in walk</p>	<p>S.E. corner of concrete box inlet N&amp;S. in L.P.</p> <p>P.I. Equation Station 297+83.37 bk. 297+77.65 and. P.K. N&amp;S (in street)</p>	<p>Center of F.H. Back of east concrete curb</p> <p>P.T. 299+03.15 Chiseled "+" in walk</p>	<p>TBM "V" 927.927 Chiseled "V" pointing North on Northwest cap bolt of fire hydrant @ sta. 292+80, 59' ft. On West side of Channel Drive and ± 500' South of Landing Drive.</p>	<table border="1"> <thead> <tr> <th>No.</th> <th>Revisions</th> <th>By</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>①</td> <td>Revised per Addendum no.1, polyethylene encasement requirement, pipe size, pipe material, and pipe centerline easement.</td> <td>RAL</td> <td>3-23-81</td> </tr> <tr> <td>②</td> <td>Final revision per construction records</td> <td>RAL</td> <td>8-28-81</td> </tr> </tbody> </table>	No.	Revisions	By	Date	①	Revised per Addendum no.1, polyethylene encasement requirement, pipe size, pipe material, and pipe centerline easement.	RAL	3-23-81	②	Final revision per construction records	RAL	8-28-81	<p>Designed By <i>JDS</i> Drawn By <i>RAL, MAL</i> Checked By <i>HB</i> Scale <i>1"=20'</i> Job No. <i>7820</i> Contract No. <i>15</i> Approved By <i>Harry Bond</i> PROJECT ENGINEER Date <i>Feb. 9, 1981</i></p> <p>NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer</p>	<p>CITY OF LEE'S SUMMIT, MISSOURI WATER SYSTEM IMPROVEMENTS</p> <p><b>A C KIRKWOOD &amp; ASSOCIATES</b> ENGINEERS CONSULTANTS KANSAS CITY, MISSOURI</p> <p>BOWLIN ROAD TRANSMISSION MAIN STA. 285+00 TO STA. 300+00</p>	<p>DWG. NO. 21</p>
No.	Revisions	By	Date																		
①	Revised per Addendum no.1, polyethylene encasement requirement, pipe size, pipe material, and pipe centerline easement.	RAL	3-23-81																		
②	Final revision per construction records	RAL	8-28-81																		



No.	Revisions	By	Date
①	Revised per Addendum no. 1, Polyethylene encasement requirement, valve size and class, restrained joint pipe, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By: SDS  
 Drawn By: RAL, MAL  
 Checked By: HB  
 Scale: 1"=50', 1"=100'  
 Job No.: 7820  
 Contract No.: 15

Approved By: *[Signature]*  
 PROJECT ENGINEER  
 Date: Feb. 9, 1981

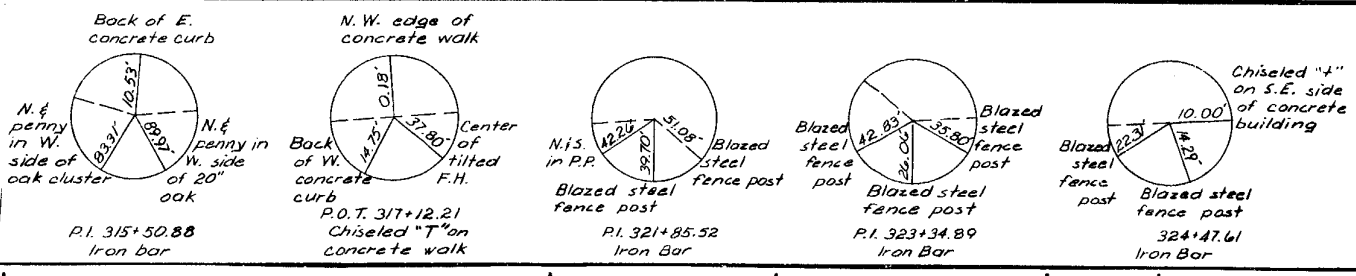
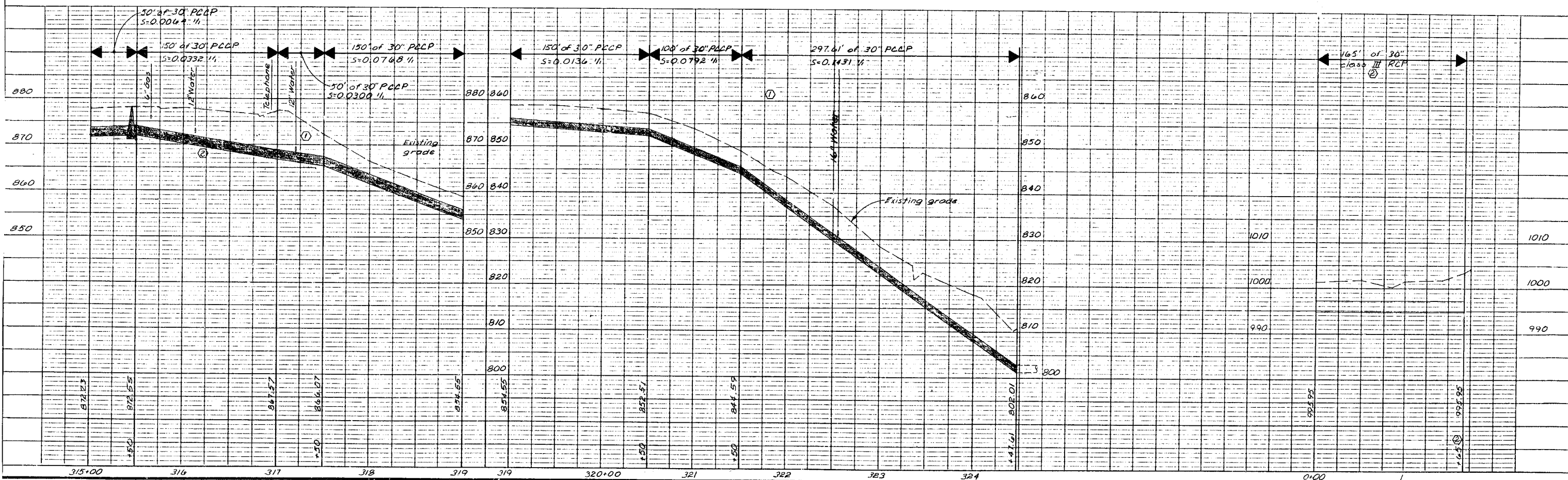
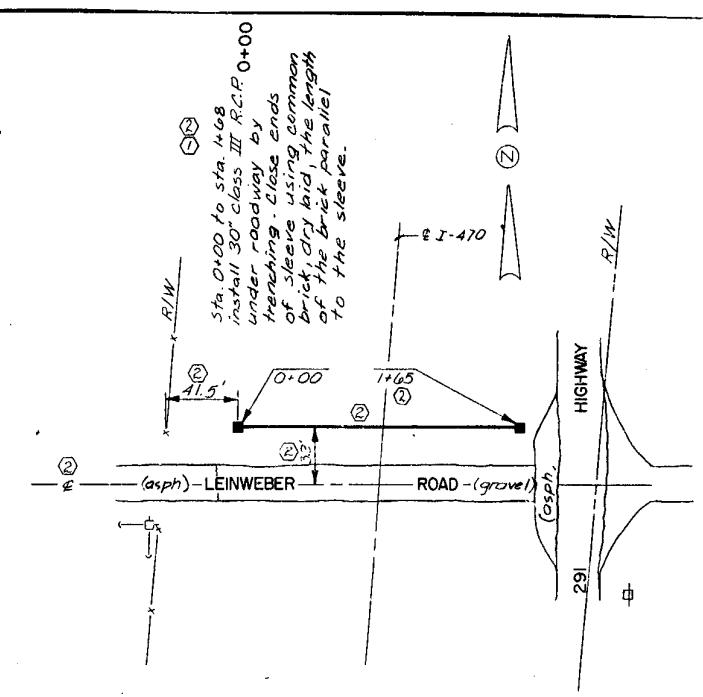
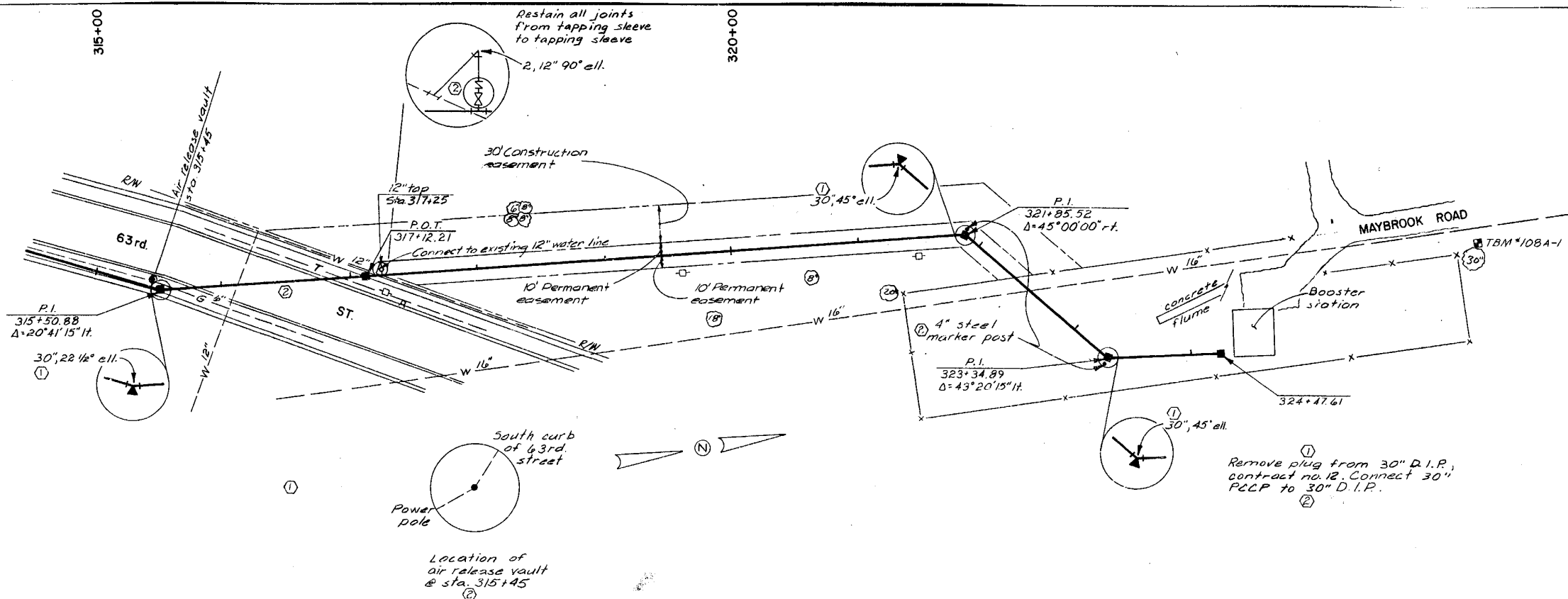
NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 STA. 300+00 TO STA. 315+00

DWG. NO. 22



T.B.M. #108-A-1 El. 783.94  
 Railroad spike in 50" hickory  
 on the east side of Maybrook Rd. 150' north of water booster station.

No.	Revisions	By	Date
1	Revised per Addendum no. 1, polyethylene encasement requirement, steel sleeve size, 30" steel sleeve installation, connection to existing pipe, pipe size, pipe material, and pipe centerline elevation.	RAL	3-23-81
2	Final revision per construction records	RAL	8-28-81

**CITY OF LEE'S SUMMIT, MISSOURI**  
**WATER SYSTEM IMPROVEMENTS**

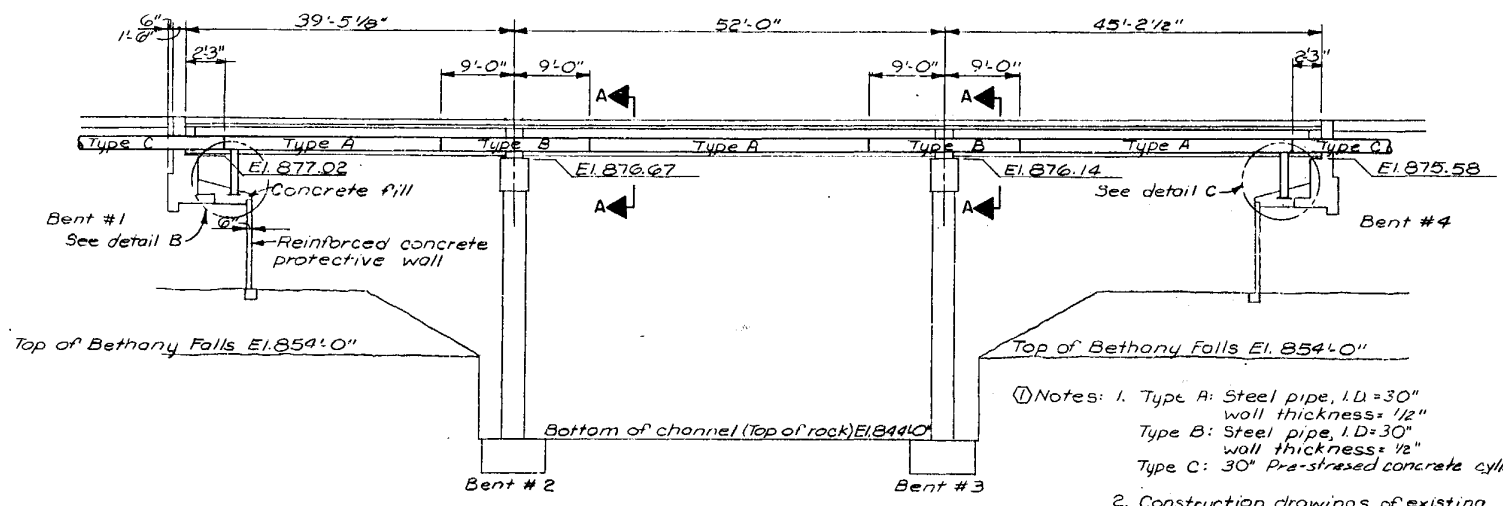
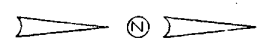
Designed By **305**  
 Drawn By **RAL**  
 Checked By **HB**  
 Scale **1"=50'H., 1/2"=10'V.**  
 Job No. **7820**  
 Contract No. **15**  
 Approved By **[Signature]**  
 PROJECT ENGINEER  
 Date **Feb. 9, 1981**

**HARRY BOND**  
 REGISTERED PROFESSIONAL ENGINEER  
 NUMBER E-8279

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

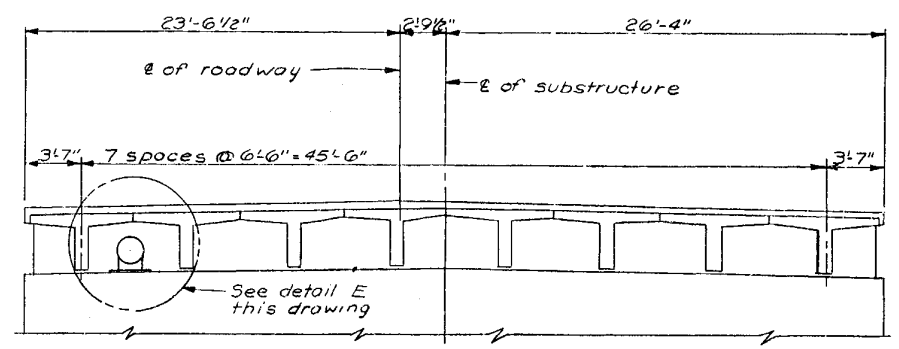
**BOWLIN ROAD TRANSMISSION MAIN**  
 STA. 315+00 TO STA. 324+47.61  
 AND LEINWEBER ROAD CROSSING

DWG. NO. **23**

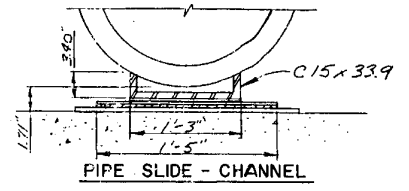


Notes: 1. Type A: Steel pipe, I.D.=30" wall thickness=1/2"  
 Type B: Steel pipe, I.D.=30" wall thickness=1/2"  
 Type C: 30" Pre-stressed concrete cylinder pipe

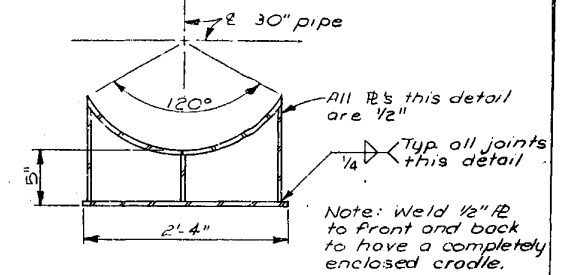
2. Construction drawings of existing bridge are on file at the City Engineer's office.  
 3. All joints except the southern most joint (steel pipe to PCCP) to be welded joints



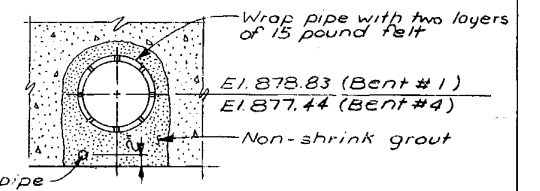
SECTION A-A



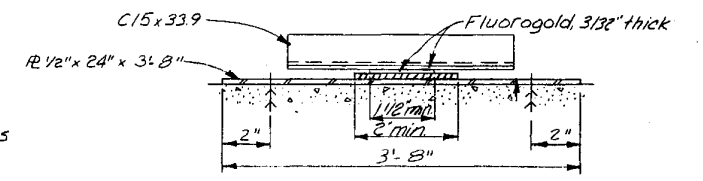
PIPE SLIDE - CHANNEL



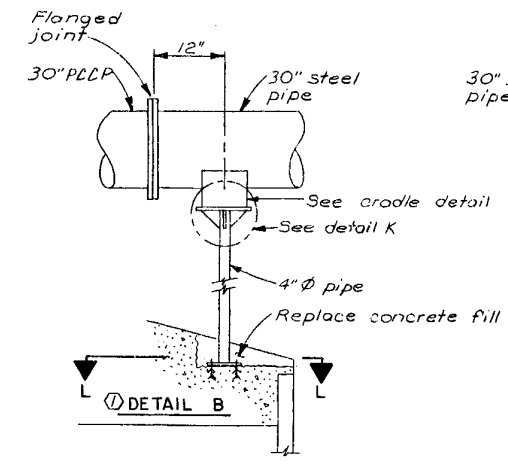
CRADLE DETAIL



DETAIL G

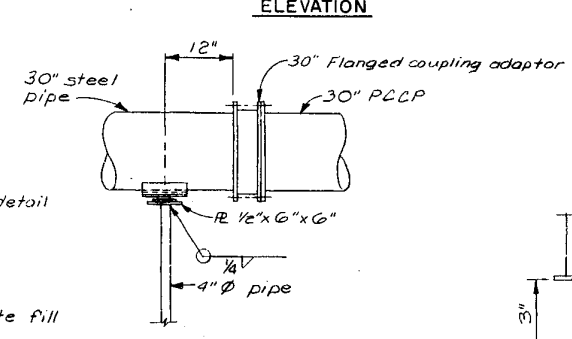


DETAIL H



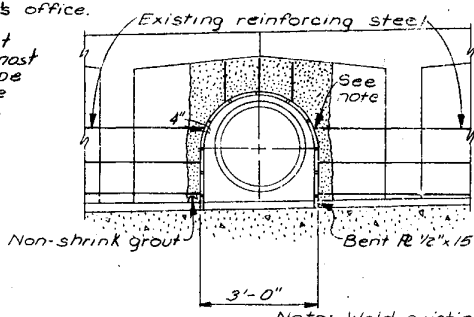
DETAIL B

Note: See section F-F for attaching cradle to 30" pipe

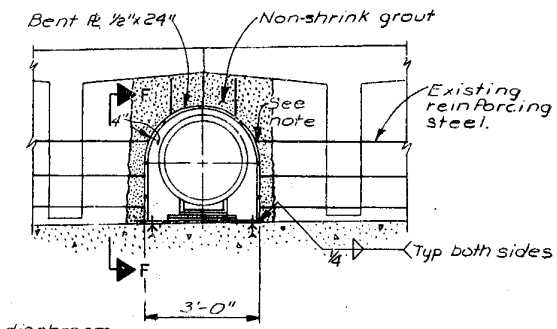


DETAIL C

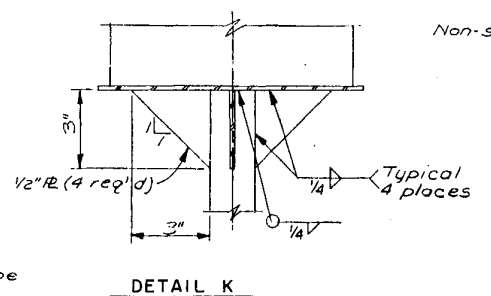
Notes: 1) Base is same as detail B  
 2) See section F-F for attaching cradle to 30" pipe  
 3) See detail H for teflon plate construction.



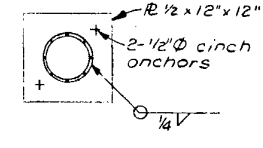
DETAIL D  
 Typical - Bents 1 & 4



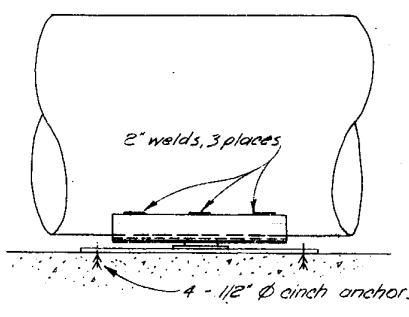
DETAIL E  
 Typical - Bents 2 & 3



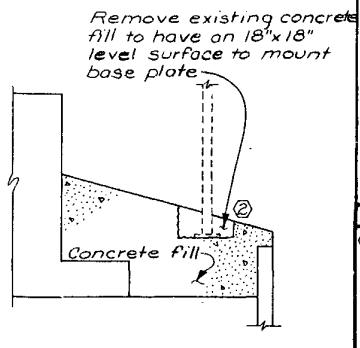
DETAIL K



SECTION L-L



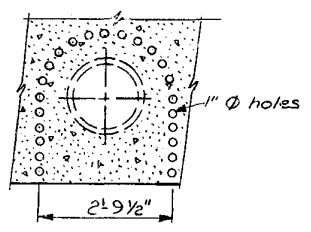
SECTION F-F



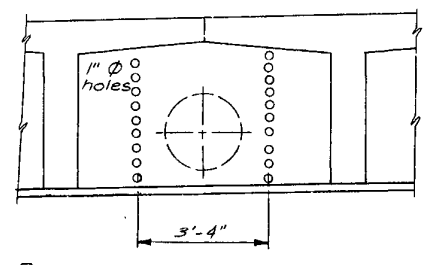
DETAIL J

Notes:  
 1. Drill a series of 1" holes at 3" centers as shown and remove concrete.  
 2. Cut and remove reinforcing steel flush with removed concrete.

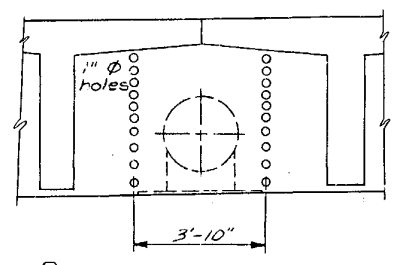
Notes:  
 1. Drill a series of 1" holes at 3" centers as shown and remove concrete.  
 2. Cut and remove reinforcing as required for installation of plate. See details D and E.



HEADWALL AT BENTS 1 & 4



DIAPHRAGM AT BENTS 1 & 4



DIAPHRAGM AT BENTS 2 & 3

DEMOLITION

No.	Revisions	By	Date
1	Revised per Addendum no. 1, elevation notes, details at bents, cradle detail, teflon bearing plate size, pipe size, pipe material, and pipe centerline elevations.	RAL	3-23-81
2	Final revision per construction records	RAL	8-28-81

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

Designed By RWB  
 Drawn By MAL  
 Checked By HB  
 Scale No scale  
 Job No. 7820  
 Contract No. 15

Approved By [Signature]  
 PROJECT ENGINEER  
 Date Feb. 9, 1981

NOTE: This drawing is PRELIMINARY until approved by Prof. Engineer

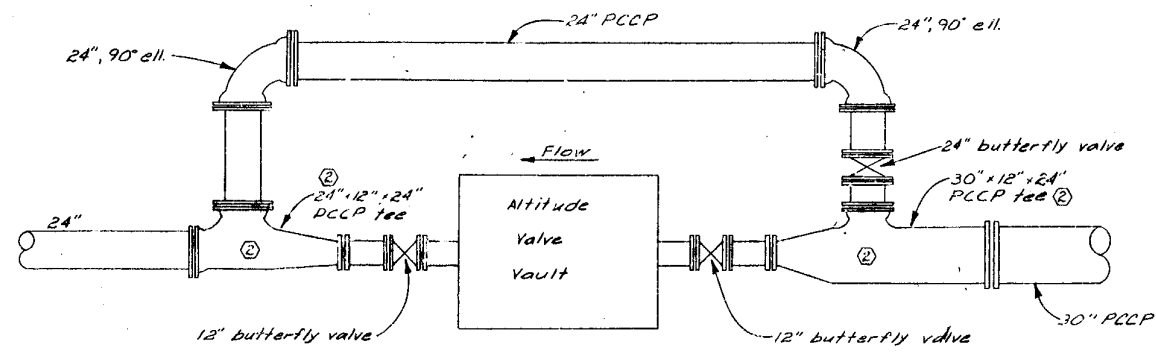
HARRY BOND  
 NUMBER  
 E-8279  
 REGISTERED PROFESSIONAL ENGINEER

**A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

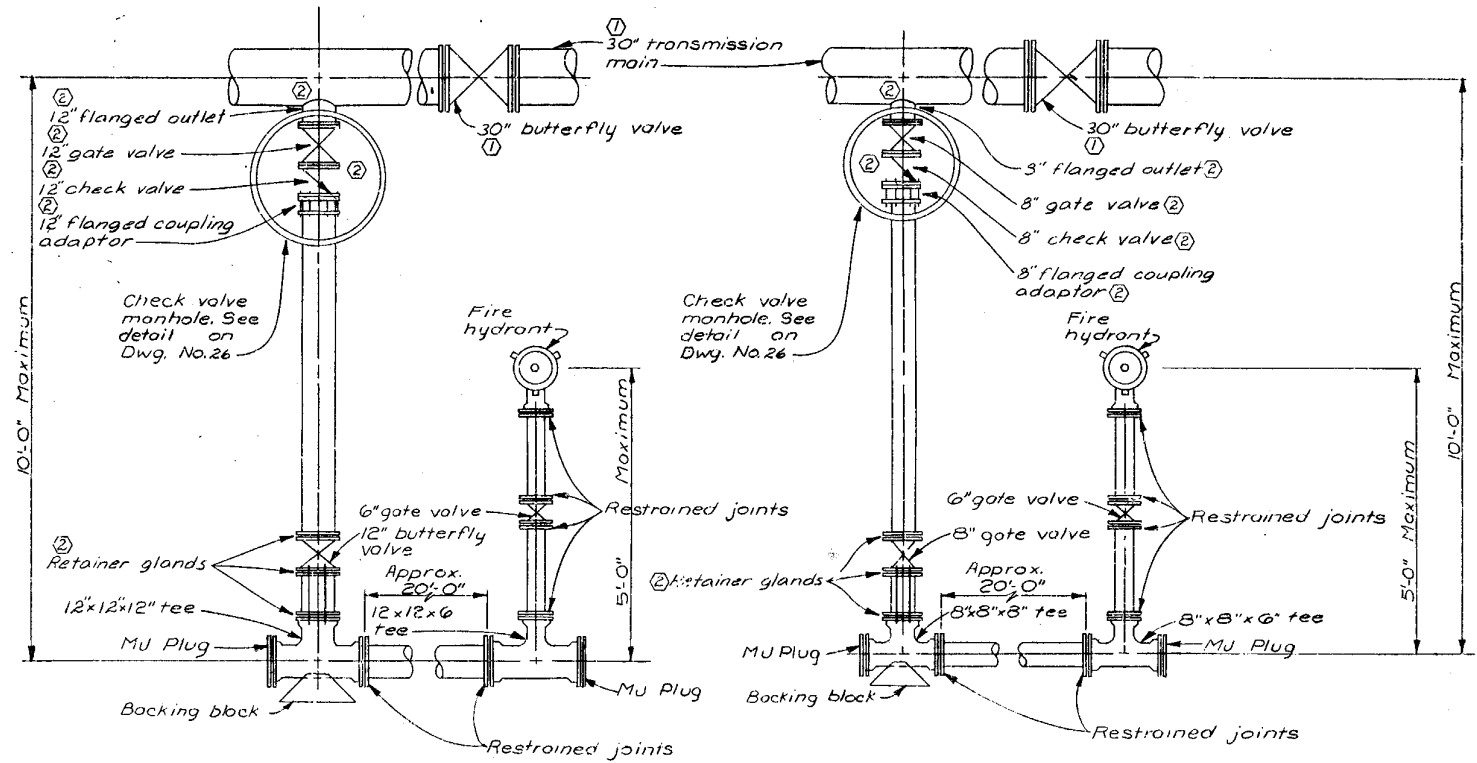
BOWLIN ROAD TRANSMISSION MAIN  
 BRIDGE CROSSING DETAILS

DWG. NO. 24





① ALTITUDE VALVE BYPASS PIPING DETAIL



12" DISTRIBUTION MAIN

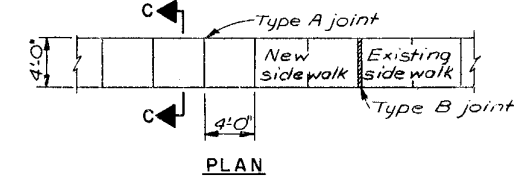
CONNECTION DETAIL  
(Typical)

8" DISTRIBUTION MAIN

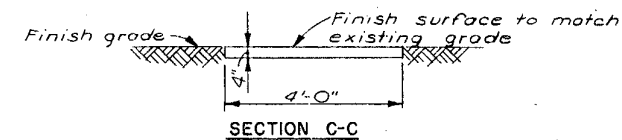
CONNECTION DETAIL  
(Typical)

Note: At contractor's option, MU tees may be used in lieu of tapping sleeves. MU 8" gate valves or 12" butterfly valves (as appropriate) are to be used in lieu of tapping valves if MU tees are used. MU valves must be rodded to the tee with 3/4" cadmium plate ready-rod at every other bolt hole with double nuts on each end.

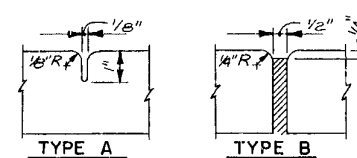
Note: Provide type B joint every 60' of length.



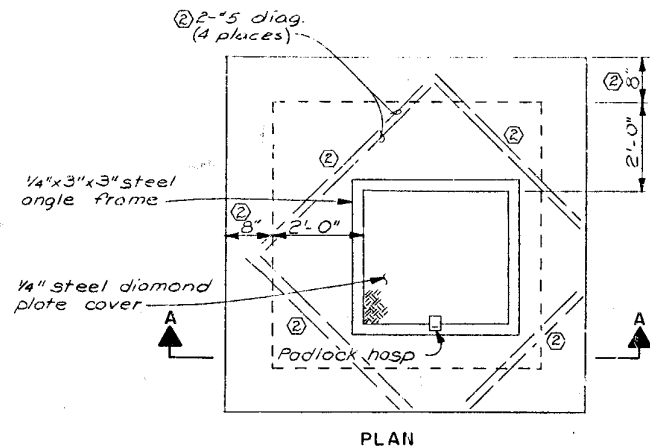
PLAN



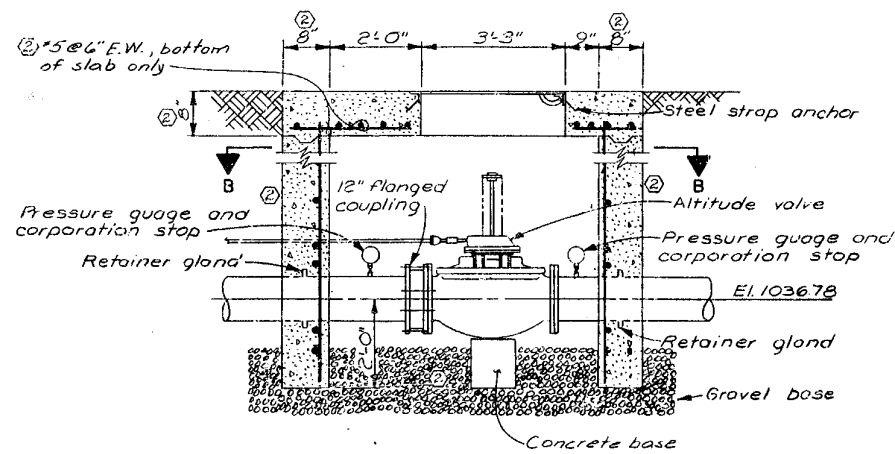
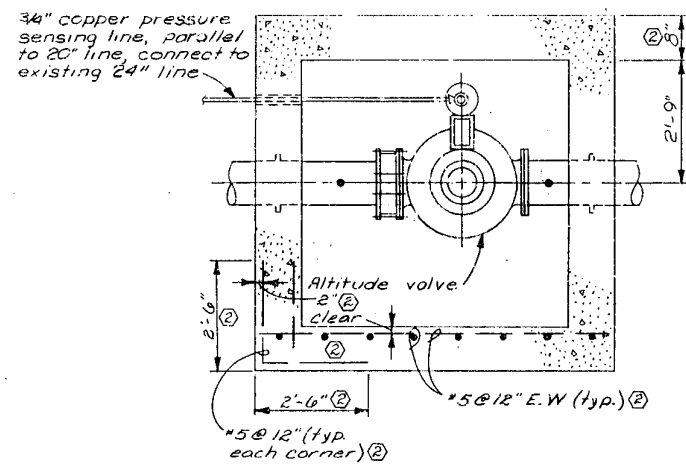
SECTION C-C



SIDEWALK DETAILS



PLAN



SECTION A-A

ALTITUDE VALVE VAULT DETAILS

Note: Grade the ground to top of altitude valve vault and provide positive drainage away from vault.

No.	Revisions	By	Date
①	Revised per Addendum no. 1, altitude valve bypass piping, tapping valve option, valve size and pipe size.	RAJ	3-23-81
②	Final revision per construction records	RAJ	5-28-81

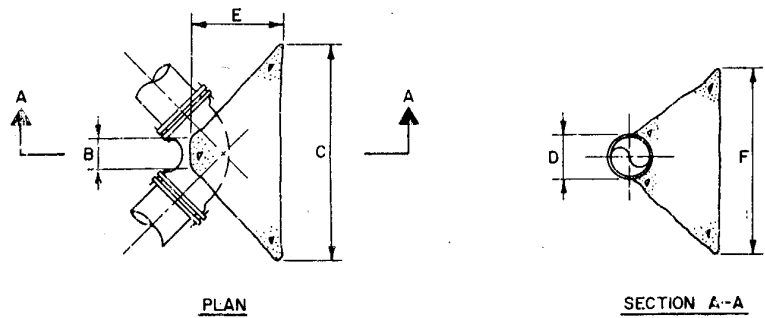
Designed By SOS  
 Drawn By MAL  
 Checked By HB  
 Scale No scale  
 Job No. 7B20  
 Contract No. \_\_\_\_\_  
 Approved By [Signature]  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**K A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 PIPING DETAILS

DWG. NO. 25



PLAN

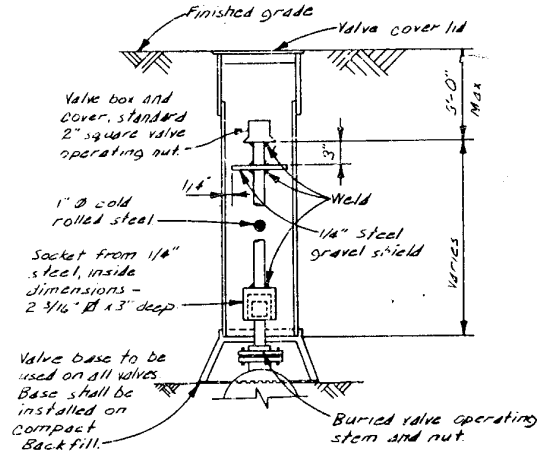
SECTION A-A

FROM STA.6+21.35 TO STA.165+00  
BACKING BLOCK SCHEDULE

ELBOWS	B	C	D	E	F
20" 1 1/4" ell.	18"	48"	20"	15"	30"
20" 2 1/2" ell.	18"	40"	20"	21"	49"
20" 4 1/2" ell.	18"	96"	20"	39"	60"
12" 90° ell.	12"	72"	15"	30"	48"
8" 22 1/2° ell.	8"	24"	8"	12"	21"
24" 1 1/4" ell.	21"	69"	24"	24"	30"
24" 2 1/2" ell.	21"	90"	24"	36"	45"
24" 4 1/2" ell.	21"	135"	24"	57"	60"
30" 1 1/4" ell.	27"	75"	30"	24"	42"
30" 2 1/2" ell.	27"	117"	30"	45"	54"
30" 4 1/2" ell.	27"	174"	30"	72"	72"

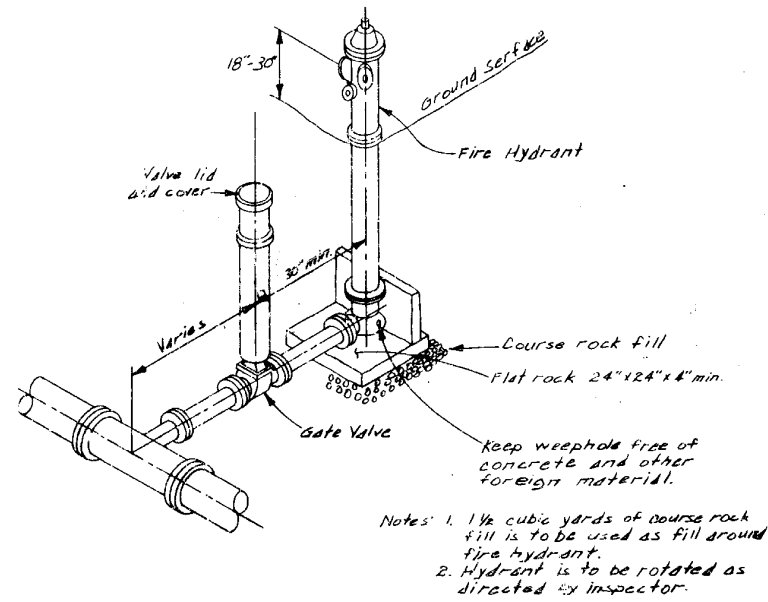
FROM STA.165+00 TO STA.324+47.61  
BACKING BLOCK SCHEDULE

ELBOWS	B	C	D	E	F
20" 1 1/4" ell.	18"	40"	20"	21"	36"
20" 2 1/2" ell.	18"	90"	20"	36"	48"
20" 4 1/2" ell.	18"	140"	20"	60"	60"
24" 1 1/4" ell.	21"	75"	24"	27"	42"
24" 2 1/2" ell.	21"	114"	24"	48"	54"
24" 4 1/2" ell.	21"	168"	24"	75"	72"
30" 1 1/4" ell.	27"	99"	30"	36"	48"
30" 2 1/2" ell.	27"	138"	30"	57"	69"
30" 4 1/2" ell.	27"	230"	30"	102"	81"



VALVE BOX AND EXTENSION STEM DETAIL

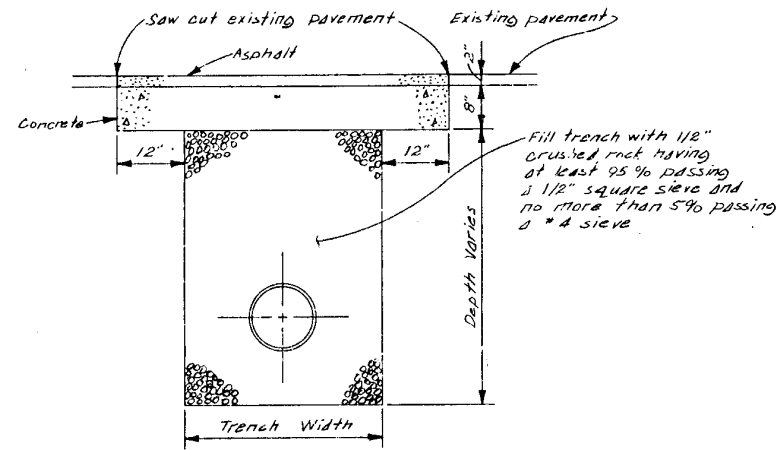
No Scale



FIRE HYDRANT ASSEMBLY DETAIL

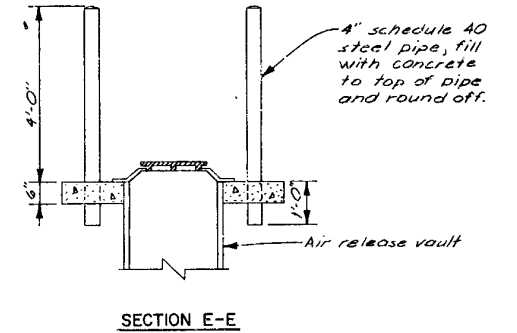
No Scale

Notes: 1. 1 1/2 cubic yards of course rock fill is to be used as fill around fire hydrant.  
2. Hydrant is to be rotated as directed by inspector.

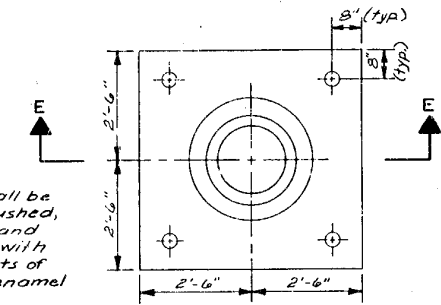


PAVEMENT REPLACEMENT DETAIL

No Scale



SECTION E-E

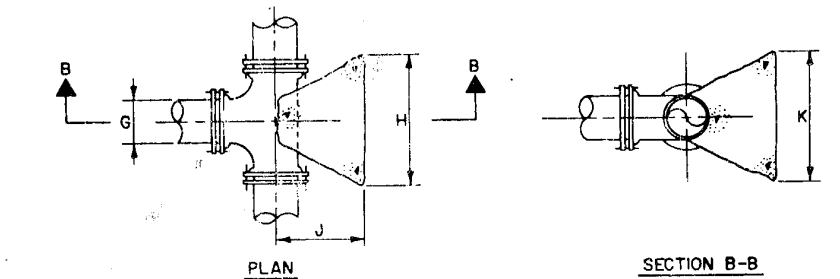


PLAN

AIR RELEASE VAULT PAD AT STA. 67+00  
AND STA. 227+00

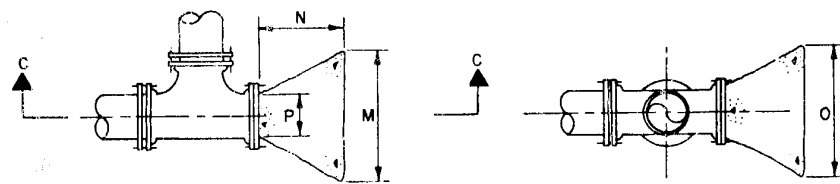
No scale

Note: Post shall be wire-brushed, primed and coated with two coats of orange enamel paint.



PLAN

SECTION B-B



PLAN

SECTION C-C

FROM STA.6+21.35 TO STA.165+00  
BACKING BLOCK SCHEDULE

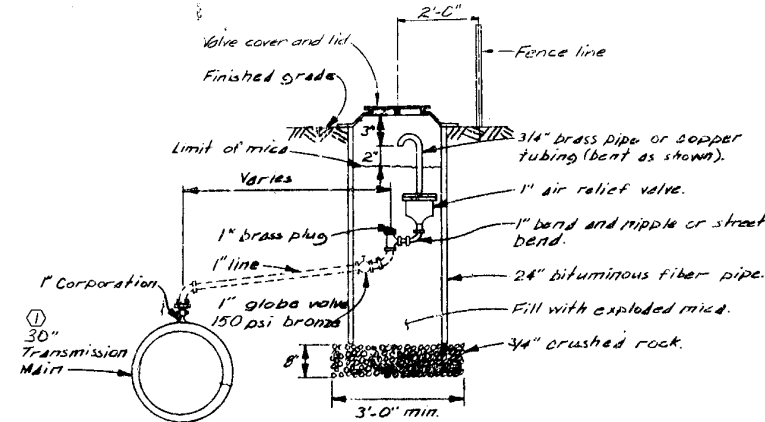
TEES	G	H	J	K	M	N	O	P
24" x 24" x 24"	24"	44"	40"	72"				
8" x 8" x 8"	8"	42"	18"	21"				
12" x 12" x 12"	12"	48"	28"	36"				

BACKING BLOCK DETAILS

No Scale

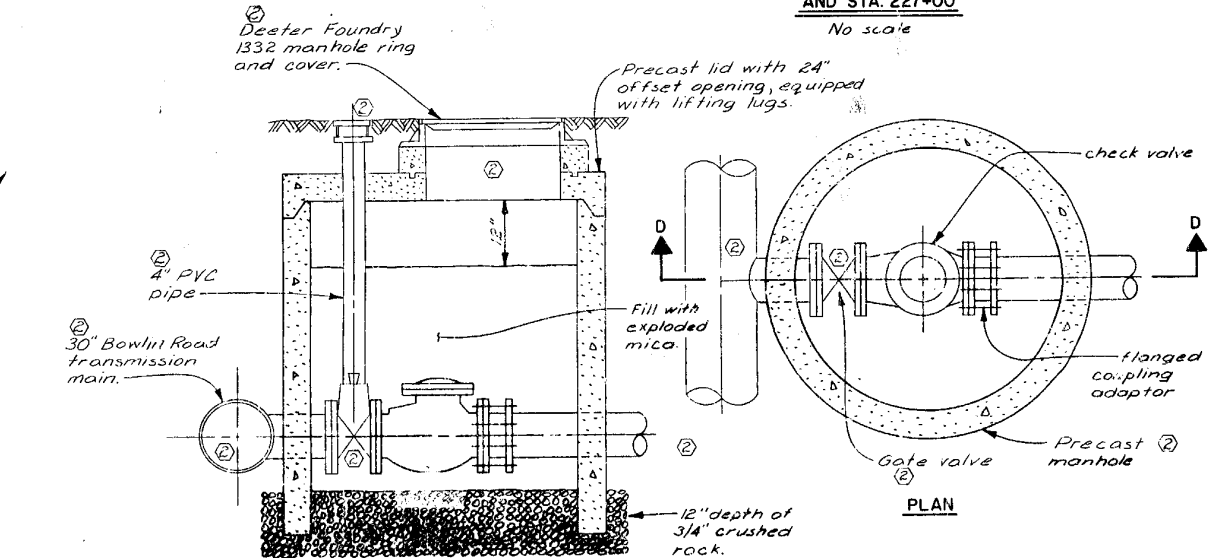
FROM STA.165+00 TO STA.324+47.61  
BACKING BLOCK SCHEDULE

TEES	G	H	J	K	M	N	O	P
R x B x B	8"	45"	18"	36"				
12" x 12" x 12"	12"	78"	33"	48"				



AIR RELEASE VAULT DETAIL

No Scale



SECTION D-D

CHECK VALVE MANHOLE DETAIL

No Scale

Note: Do not fill manhole with exploded mica in check valve manholes at Sta. 95+75 and Sta. 317+25.

No.	Revisions	By	Date
①	Revised per Addendum no.1, backing block size, and pipe size.	RAL	3-23-81
②	Final revision per construction records	RAL	8-28-81

Designed By *SDS*  
 Drawn By *RAL*  
 Checked By *HB*  
 Scale As Shown  
 Job No. 7820  
 Contract No. 15  
 Approved By  
*Harry Bond*  
 PROJECT ENGINEER  
 Date Feb. 9, 1981  
 NOTE: This drawing is PRELIMINARY until approved by Proj. Engineer

CITY OF LEE'S SUMMIT, MISSOURI  
 WATER SYSTEM IMPROVEMENTS

**K A C KIRKWOOD & ASSOCIATES**  
 ENGINEERS CONSULTANTS  
 KANSAS CITY, MISSOURI

BOWLIN ROAD TRANSMISSION MAIN  
 MISCELLANEOUS DETAILS

DWG. NO. 26