

**NOTES:**

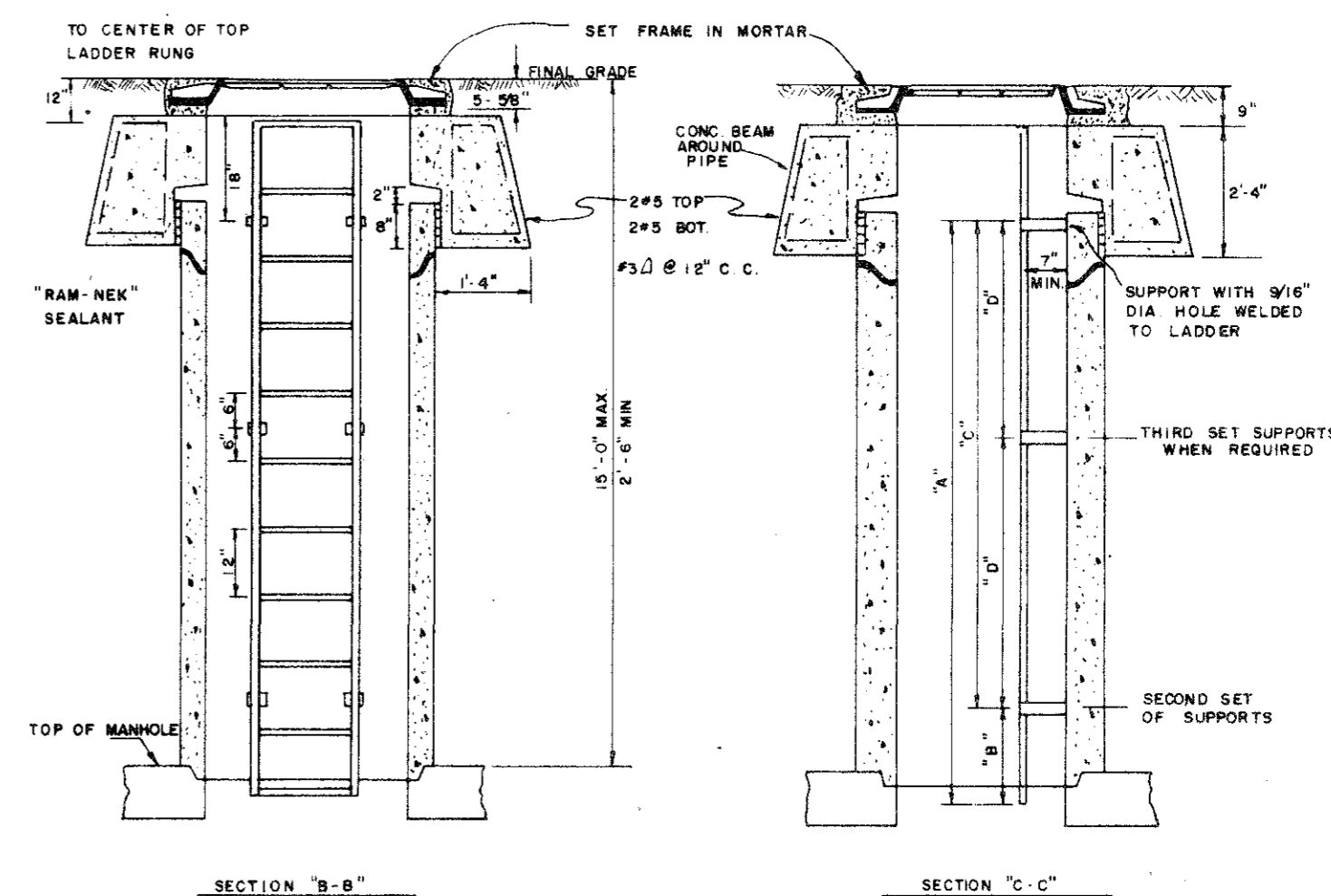
- ALL ELECTRIC DUCT SYSTEM MANHOLES SHALL BE PRECAST CONCRETE IN ACCORDANCE WITH TEXAS POWER & LIGHT CO. SPECIFICATIONS AS FURNISHED BY HEFNER PRECAST CONCRETE PRODUCTS, CLEBURNE, TX OR EQUAL AS APPROVED BY TEXAS POWER & LIGHT CO.
- THIS MANHOLE SHALL BE DESIGNED TO CARRY THE LOADING SHOWN IN THE LOADING DIAGRAM INCLUDING THE CONCRETE MANHOLE NECK SPECIFIED HEREIN AND 510 LB. MANHOLE FRAME AND COVER.
 

LOADING DIAGRAM
- JOINTS BETWEEN MANHOLE SECTIONS AND JOINT BETWEEN MANHOLE ROOF SECTION AND MANHOLE NECK SHALL BE PRIMED BY MANHOLE SUPPLIER WITH "RAM-NEK" PRIMER AS MANUFACTURED BY K.T. SYNDER CO. OR AN APPROVED EQUAL. JOINTS SHALL BE MADE WATERTIGHT WITH FLEXIBLE PLASTIC, PERMANENTLY ADHESIVE COMPOUND SEALANT SUCH AS "RAM-NEK" AS MANUFACTURED BY K.T. SYNDER CO. OR APPROVED EQUAL. PRIMER AND JOINT SEALANT SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- SEE SPECIFICATION FOR MANHOLE NECK INSTALLATION.
- DUCT TERMINATORS SHALL BE TWO-WAY TERMINATORS AS MANUFACTURED BY FORMEX MANUFACTURING, INC. AND SHALL HAVE WATERTIGHT MEMBRANE AND SHALL HAVE LOCKING DEVICE FOR EACH OPENING ON OUTSIDE FACE OF TERMINATOR.
 

DUCT TERMINATOR DETAIL
- DUCT TERMINATORS SHALL ACCEPT 4" PVC, TYPE EB WITH O.D. OF 4.500" OR 6" TYPE EB OR SCHEDULE 40 CONDUIT WITH O.D. OF 6.625" AS REQ.
- ON ALL DUCT TERMINATOR OPENINGS RECEIVING CONDUITS (USED), THE DUCT TERMINATOR MEMBRANE IS TO BE REMOVED, THE TERMINATOR DEBURRED, AND AN EXPANDABLE DUCT STOPPER INSTALLED IN THE TERMINATOR OPENING. ON ALL DUCT TERMINATOR OPENINGS NOT RECEIVING CONDUITS (UNUSED), THE DUCT TERMINATOR MEMBRANE IS TO REMAIN INTACT AND A TERMINATOR LOCKING CAP IS TO BE INSTALLED ON THE OUTSIDE TERMINATOR FACE. AN EXPANDABLE DUCT PLUG IS NOT NECESSARY IN DUCT TERMINATOR OPENINGS WHEN MEMBRANE SEAL IS IN PLACE.
- SEE SPECIFICATION FOR INTERFACE BETWEEN DUCT LINE, MANHOLE PULLING IRON AND DUCT TERMINATOR POSITION IN MANHOLE WALL.
- THIS MANHOLE SUPPLIED WITH 5 UNISTRUT P3200 SERIES CHANNEL WITH CONCRETE INSERTS OR EQUAL IN EACH WALL. CHANNEL IS 1-5/8" WIDE 1-3/8" DEEP, AND 5'-4" LONG. HOT DIP GALVANIZED BEFORE FABRICATION WITH ENDS CAPPED. CHANNEL EMBEDDED FLUSH WITH INSIDE OF MANHOLE WITH OPENING IN CHANNEL FACING OUTWARD.
- MANHOLES SHALL CONTAIN 4 GROUNDRODS 5/8" x 8" COPPERWELD INSTALLED SO AS TO PROVIDE A RESISTANCE OF LESS THAN 10 OHMS PER ROD.
- MANHOLES SUPPLIED BY HEFNER PRODUCTS REQUIRE 1-1/4" x 6" SQUARE HEAD COIL BOLT (4 EACH) AND 1-1/4" SWIVEL LIFT PLATE (4 EACH) FOR LIFTING.

**NOTES: LADDER INSTALLATION IN MANHOLE NECK**

- STACKS SHALL CONSIST OF PRECAST REINFORCED CONCRETE PIPE SECTIONS CONFORMING TO THE REQUIREMENTS OF ASTM DESIGNATIONS C76, HAVING A MINIMUM WALL THICKNESS OF 4" CLASS OF PIPE SHALL BE AS REQUIRED FOR LATERAL PRESSURES, RESULTING FROM EARTH LOADS IN COMBINATION WITH H2O HIGHWAY LOADING (MIN CLASS II). JOINTS SHALL CONSIST OF A MATCHING TONGUE AND GROOVE ARRANGEMENT WITH SEALANT AS SPECIFIED ABOVE. WHERE THE DISTANCE FROM THE BOTTOM OF THE MANHOLE ROOF SLAB TO FINISHED GRADES EXCEEDS 24' MANHOLE LADDER AS SPECIFIED SHALL BE PROVIDED AS REQUIRED.
- JOINT SEALANT SHALL BE A FLEXIBLE PLASTIC, PERMANENTLY ADHESIVE COMPOUND EQUAL TO "RAM-NEK" AS MANUFACTURED BY K.T. SYNDER CO., APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
- MANHOLE NECK CAN BE MADE TO TEXAS POWER & LIGHT CO. SPECIFICATIONS BY BROOKS PRODUCTS, INC., 2001 W. MAYFIELD ROAD, ARLINGTON, TEXAS 76015. BROOKS PRODUCTS, INC., PHONE NUMBER IS (817) 261-2783.
- LADDER SHALL BE DESIGNED TO THE SPECIFICATIONS IN THE LATEST REVISION OF AMERICAN NATIONAL STANDARDS INSTITUTE PUBLICATION A14.3 SAFETY REQUIREMENTS FOR FIXED LADDERS. LADDER CAN BE MADE TO TEXAS POWER & LIGHT COMPANY SPECIFICATIONS BY UNISTRUT TEXAS, INC., 625 GREAT SOUTHWEST PARKWAY, ARLINGTON, TEXAS 76011. UNISTRUT TEXAS, INC., PHONE NUMBER IS (214) 261-3491.
- LADDER TO BE FURNISHED WITH SUPPORTS. THE NUMBER AND SPACING OF SUPPORTS TO BE IN ACCORDANCE WITH TABLE ON PAGE C 5 OF THE SPECIFICATIONS.
- LADDER SHALL BE ATTACHED TO MANHOLE NECK BY THE USE OF STAINLESS STEEL KWIK-BOLT CONCRETE ANCHORS. THE BOLT SHALL BE 1/2" IN DIAMETER AND 3" 3/2" IN LENGTH. (KWIK-BOLT CATALOG NUMBER 12-354).
- LADDER TO HAVE ALL OPEN ENDS CAPPED AND ENTIRE LADDER ASSEMBLY INCLUDING SUPPORTS TO BE HOT DIP GALVANIZED AFTER FABRICATION BY MANUFACTURER.



LADDER LENGTH	1'-0"	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"	14'-0"
NO. OF SUPPORTS	2	3	4	4	4	4	5	6	6	6	6	6	6	6
DIMENSION A	0'-6"	1'-6"	2'-6"	3'-6"	4'-6"	5'-6"	6'-6"	7'-6"	8'-6"	9'-6"	10'-6"	11'-6"	12'-6"	13'-6"
DIMENSION B	0'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
DIMENSION C	1'-0"	1'-0"	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-0"
DIMENSION D	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	5'-6"	5'-6"

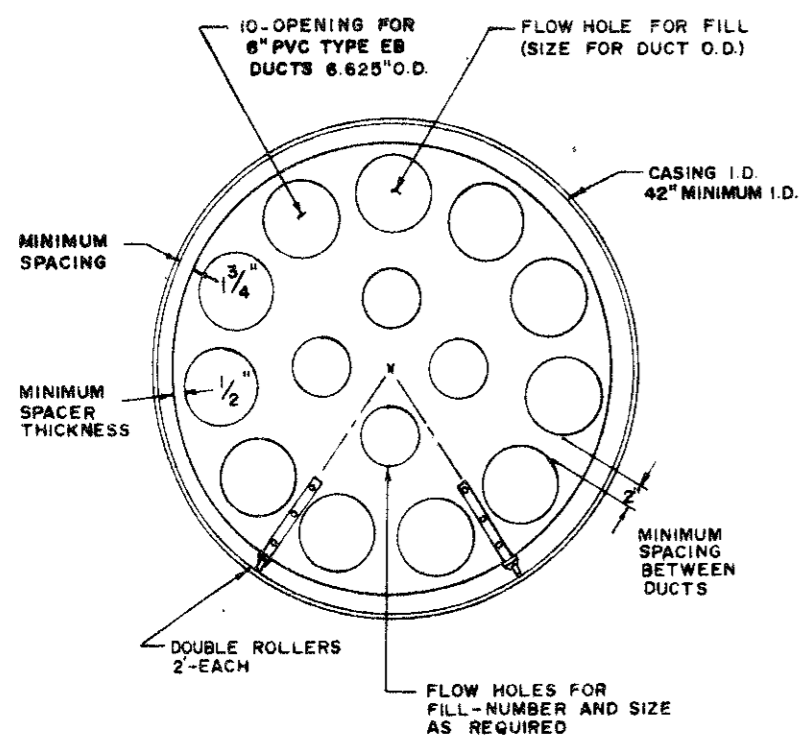
**LADDER INSTALLATION IN MANHOLE NECK**

**MANHOLE  
LARGE FOUR WAY  
PRECAST REINFORCED CONCRETE**

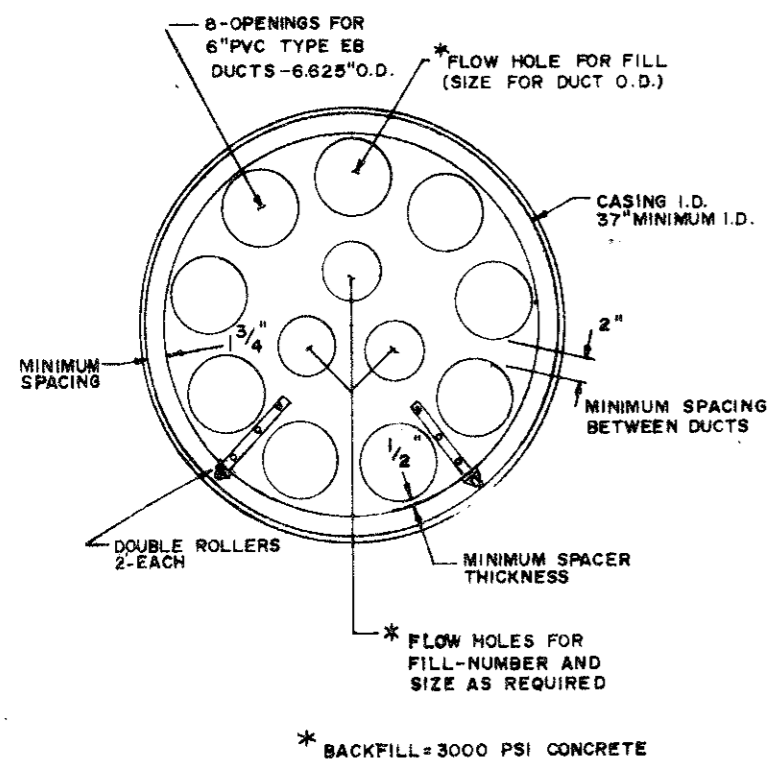
**BELTLINE RD. - BELTWOOD PUMP - ADDISON RD.  
UNDERGROUND DISTRIBUTION  
DETAIL SHEET**

REVISION  
BY  
CN  
DATE

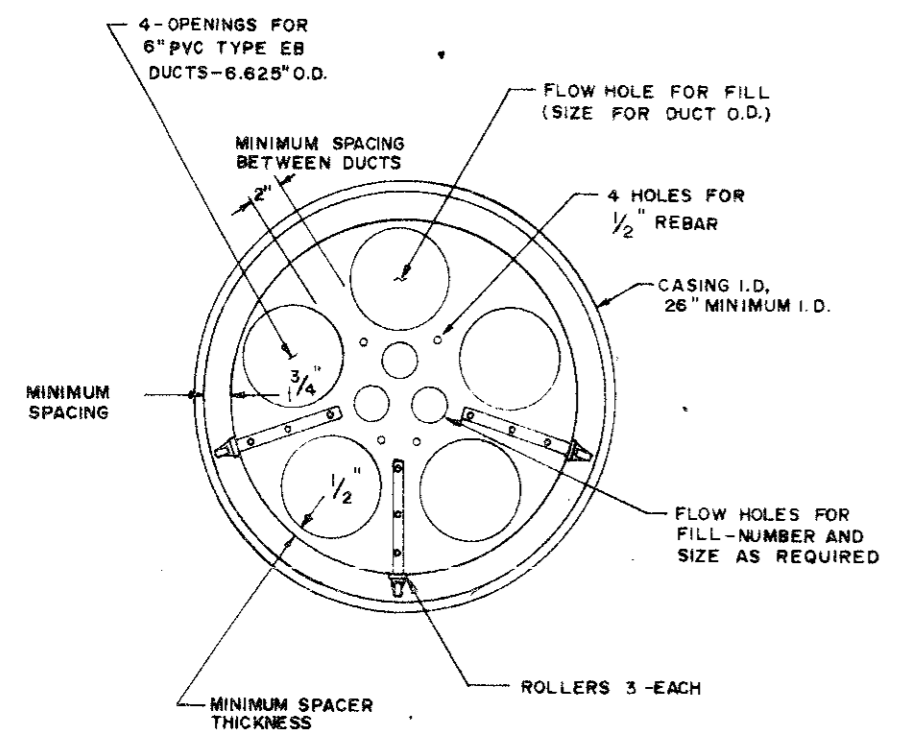
TEXAS POWER & LIGHT CO. DALLAS	DR. BRIAN B. APPROVED EM. H. S. G. I. C. CORR. 17-5 ENGR.	DATE 1-17-58	VICE PRESIDENT - ENGINEERING
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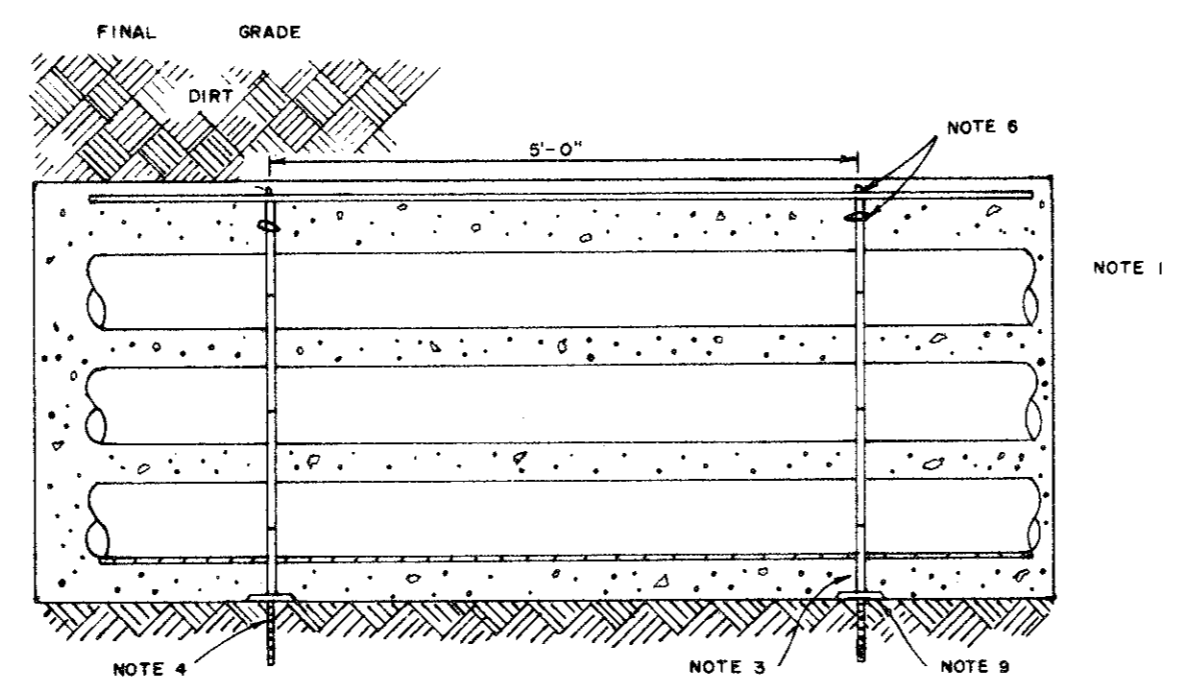
**BORE SPACER FOR 10-6" PVC DUCTS**



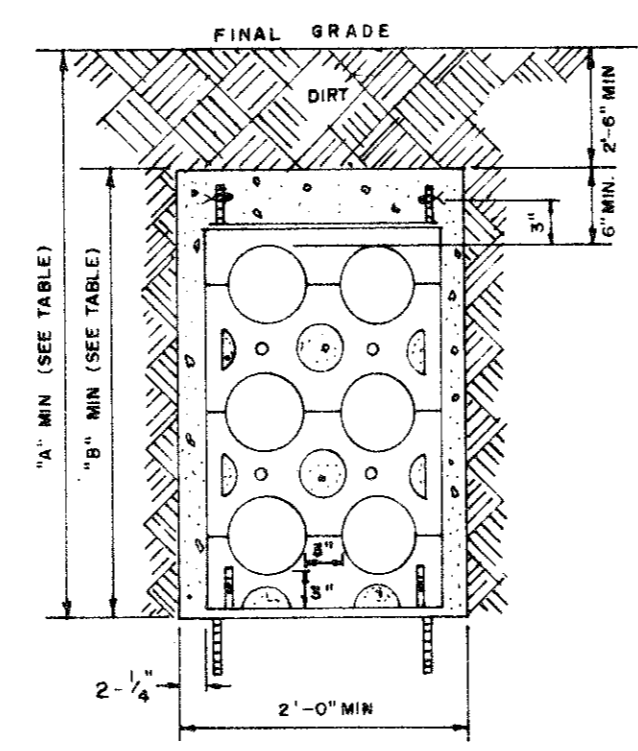
**BORE SPACER FOR 8-6" PVC DUCTS**



**BORE SPACER FOR 4-6" PVC DUCTS**



**SECTION OF TRENCH**

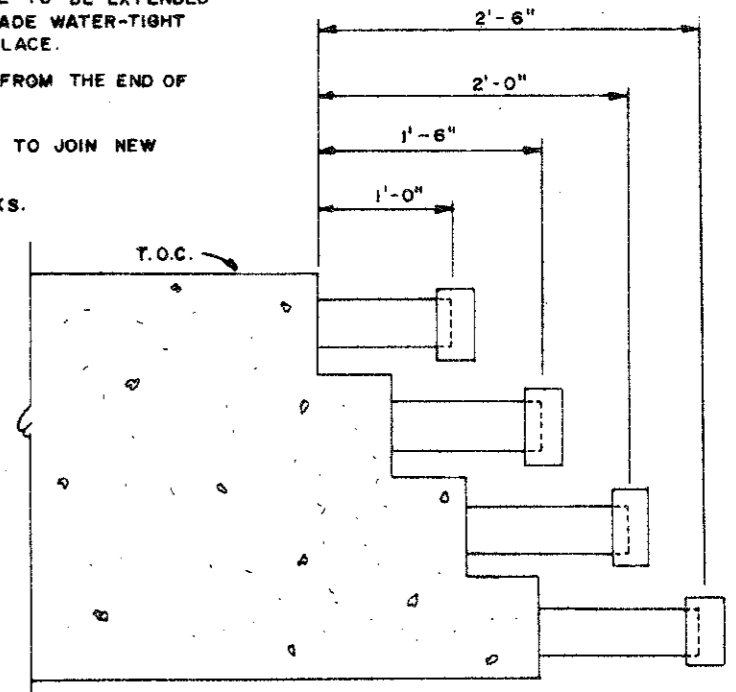


**END VIEW OF TRENCH**

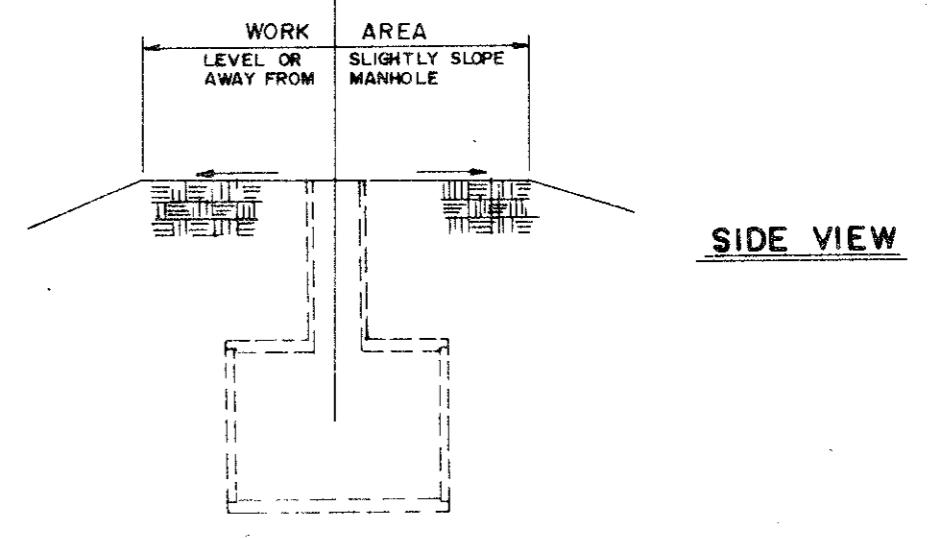
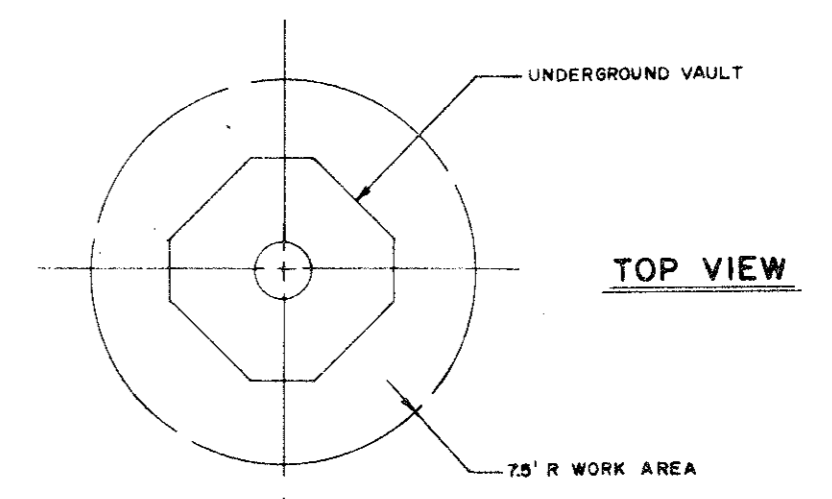
- NOTES:**
- CONDUIT TO BE 6" PVC TYPE EB OR SCHEDULE 40 WITH O.D. OF 6.625"
  - CONCRETE ENCASMENT—ALL CONCRETE TO HAVE A MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT TWENTY-EIGHT (28) DAYS.
  - INSTALL SPACER EVERY 5 FEET. ALL SPACERS TO PROVIDE 3" VERTICAL AND HORIZONTAL SEPARATION BETWEEN CONDUITS.
  - INSTALL #4 STEEL REINFORCING RODS THROUGH THE INTERNAL VERTICAL CHANNELS AT BOTH OUTER EDGES OF SPACERS AND DRIVE REINFORCING RODS INTO EARTH TO ANCHOR ASSEMBLY.
  - INSTALL #4 STEEL REINFORCING RODS ACROSS TOP OF CAP AND IN EACH CORNER OF THE ENCASMENT.
  - TIE HORIZONTAL AND VERTICAL RODS TOGETHER WITH #16 STEEL TIE WIRE.
  - CONDUIT RUN BETWEEN MANHOLES TO BE INSTALLED WITH A MINIMUM SLOPE OF 4" PER 100 FEET AND A MAXIMUM SLOPE OF 10 FT. PER 100 FEET TO DRAIN THROUGHOUT ITS ENTIRE LENGTH INTO MANHOLES.
  - INSTALL 6" GALV. CONDUIT BENDS AND ADAPTERS ON ANGLES GREATER THAN 15°.
  - BASE PADS FOR SPACERS ARE REQUIRED IN SANDY OR LOOSE SOIL.

DIMENSION	2E6	4E6	6E6	8E6	10E6
A (MIN)	3'-10"	4'-8"	5'-6"	6'-4"	7'-2"
B (MIN)	1'-4"	2'-2"	3'-0"	3'-10"	4'-8"

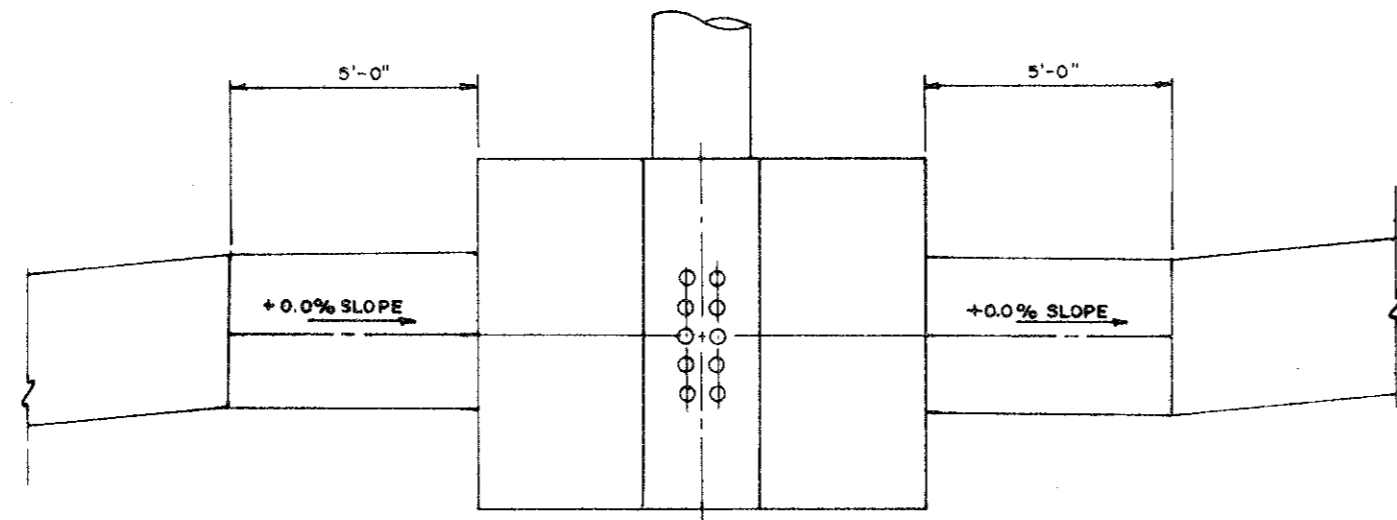
- INCOMPLETE DUCT LINE**
- ON ALL INCOMPLETE DUCT LINES, (DUCTS THAT ARE TO BE EXTENDED AT A FUTURE TIME) THE CONDUITS ARE TO BE MADE WATER-TIGHT WITH A CONDUIT CAP SOLVENT CEMENTED INTO PLACE.
  - NO EXPOSED REINFORCING STEEL IS TO PROTRUDE FROM THE END OF AN UNFINISHED DUCT.
  - DOWELLING IS THE METHOD TO BE USED IN ORDER TO JOIN NEW DUCT TO EXISTING UNFINISHED DUCT.
  - SPACING IS TYPICAL FOR 8E6 AND 4E6 DUCT BANKS.
  - 3'-6" MINIMUM COVER TO T.O.C.



**8E6 INCOMPLETE DUCT**

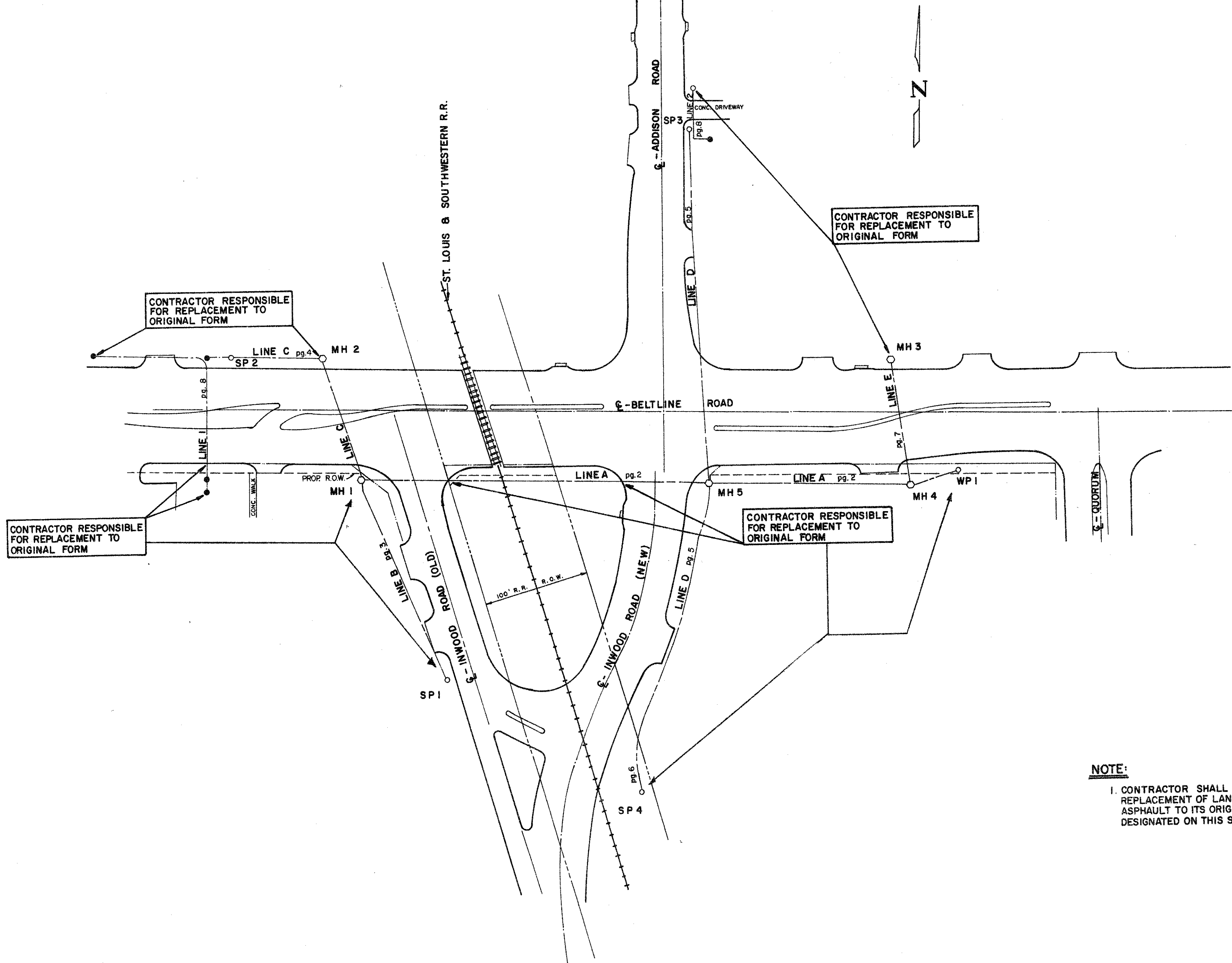


**TYPICAL MANHOLE WORK AREA**



**MAXIMUM ALLOWABLE SLOPE INTO MANHOLE IS 0.0%  
MANHOLE APPROACH PROFILE DETAIL**

DATE	REVISION	BY	CHK.	APP.



**NOTE:**  
 1. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF LANDSCAPING, CONCRETE, AND ASPHALT TO ITS ORIGINAL FORM IN THE AREAS DESIGNATED ON THIS SHEET.

BELTLINE ROAD-BELTWOOD PUMP-ADDISON ROAD

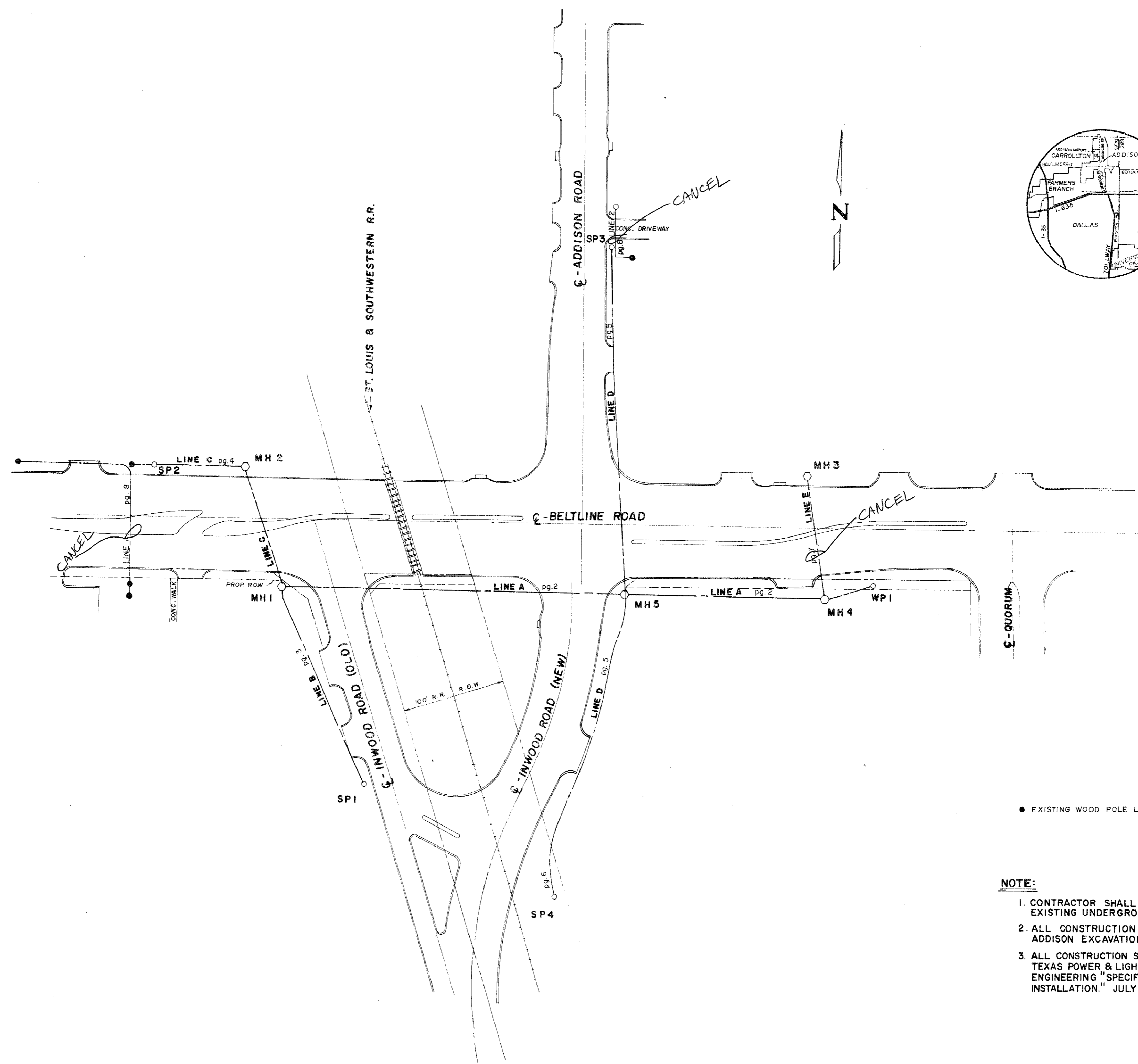
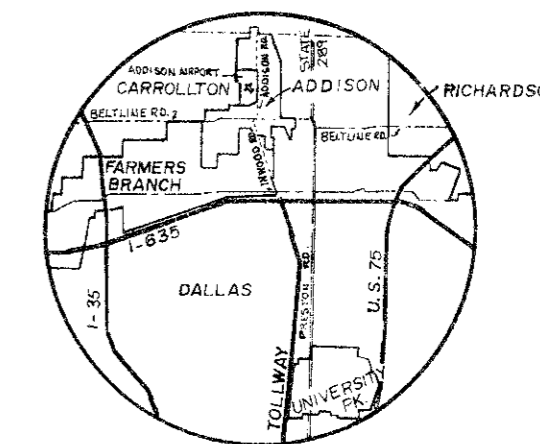
SHEET 11

TD

B-34

APP.	
CH.	
BY	
REVISION	
DATE	

TEXAS POWER & LIGHT CO.  
 DALLAS  
 SCALE NONE  
 DATE: 2-16-86  
 DR. John G. APPROVED  
 CH. M. Sulak  
 CORR. [Signature]  
 ENGR. VICE PRESIDENT-ENGINEERING



● EXISTING WOOD POLE LOCATION

**NOTE:**

1. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES.
2. ALL CONSTRUCTION MUST COMPLY WITH CITY OF ADDISON EXCAVATION ORDINANCE.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TEXAS POWER & LIGHT COMPANY CENTRAL DIVISION ENGINEERING "SPECIFICATIONS FOR DUCT SYSTEM INSTALLATION." JULY 15, 1985

BELTLINE ROAD-BELTWOOD PUMP-ADDISON ROAD  
 UNDERGROUND DISTRIBUTION  
 KEY SHEET

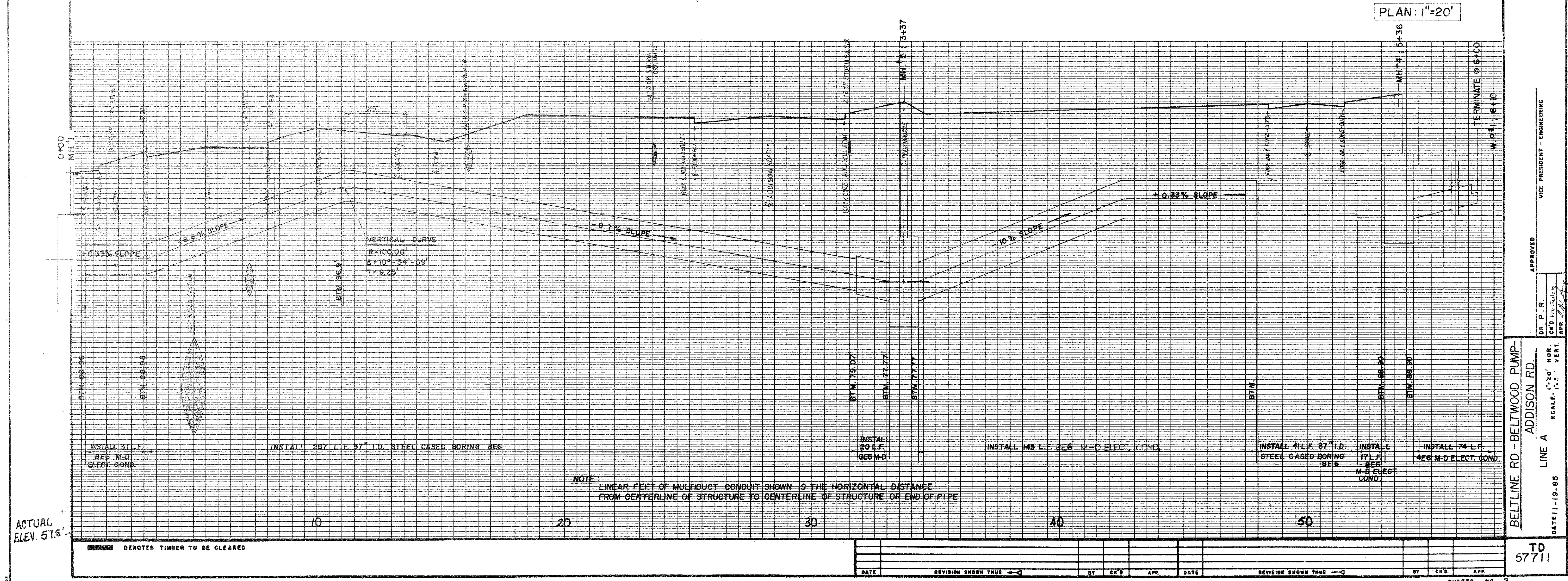
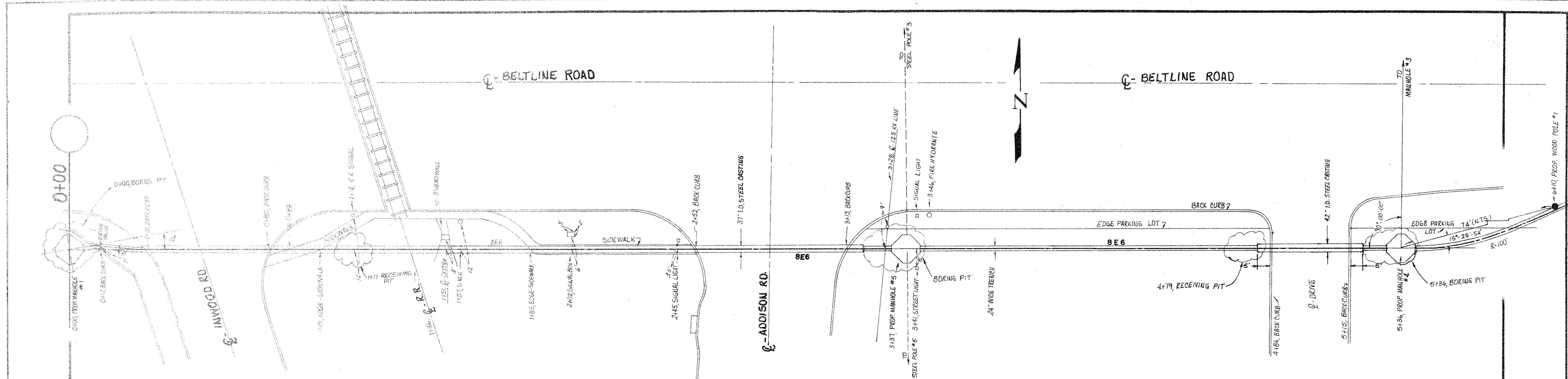
SHEET 1

TD 57711

DATE	REVISION	BY	CHK	APP.

TEXAS POWER & LIGHT CO.		DR. P.R.	APPROVED
DALLAS		CH. <i>M. S. ...</i>	
SCALE NONE	DATE 10-24-85	ENGR. <i>[Signature]</i>	VICE PRESIDENT - ENGINEERING

8-24



NOTE: LINEAR FEET OF MULTIDUCT CONDUIT SHOWN IS THE HORIZONTAL DISTANCE FROM CENTERLINE OF STRUCTURE TO CENTERLINE OF STRUCTURE OR END OF PIPE

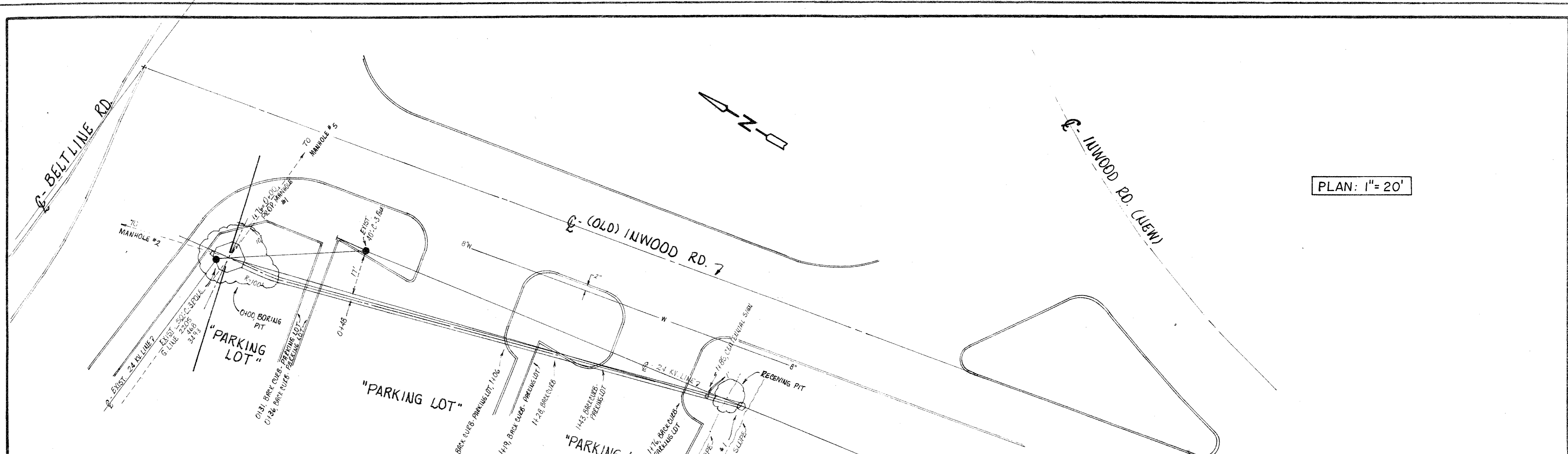
ACTUAL ELEV. 51.5'

███ DENOTES TIMBER TO BE CLEARED

DATE	REVISION SHOWN THUS	BY	CR'D	APP	DATE	REVISION SHOWN THUS	BY	CR'D	APP

BELTLINE RD - BELTWOOD PUMP-ADDISON RD.  
 LINE A  
 DATE: 11-19-85  
 SCALE: 1"=20' HOR. 1"=5' VERT.  
 DR. P. R. [Signature]  
 C.D. [Signature]  
 APP. [Signature]  
 APPROVED  
 VICE PRESIDENT - ENGINEERING  
 TD 57711  
 SHEETS NO. 2

6-25



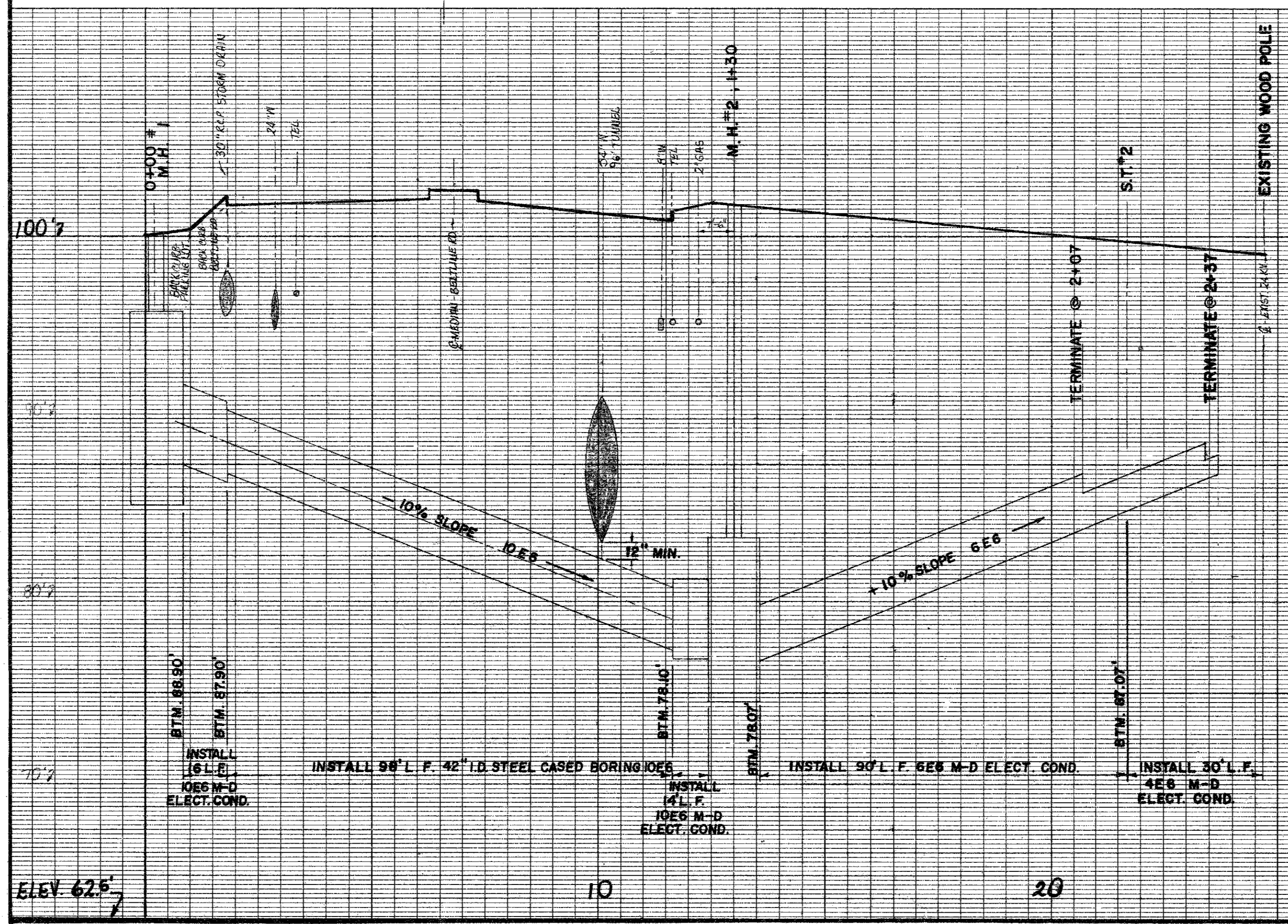
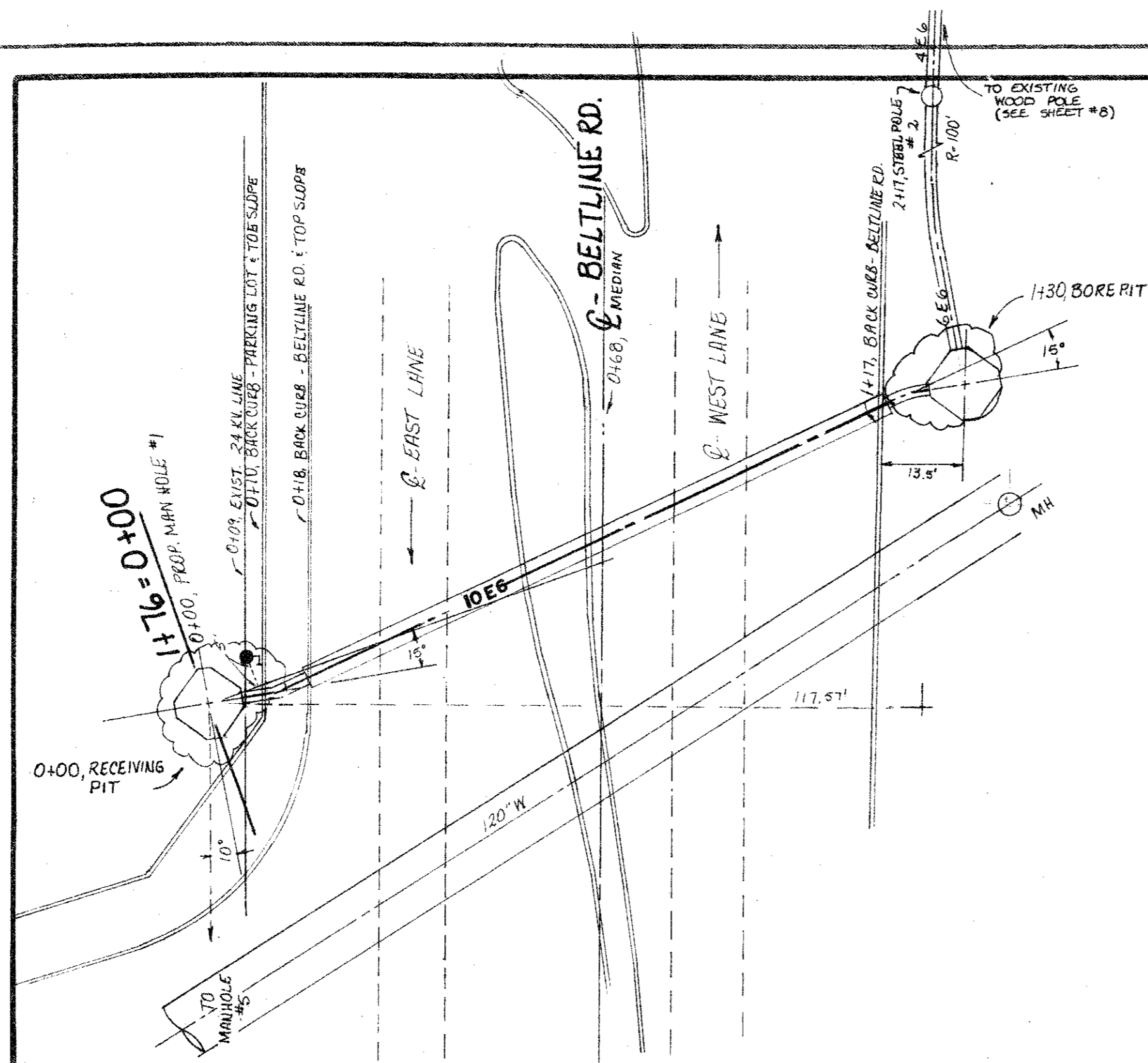
PLAN: 1" = 20'



DATE \_\_\_\_\_ REVISION SHOWN THUS \_\_\_\_\_ BY \_\_\_\_\_ CR'D \_\_\_\_\_ APR \_\_\_\_\_ DATE \_\_\_\_\_ REVISION SHOWN THUS \_\_\_\_\_ BY \_\_\_\_\_ CR'D \_\_\_\_\_

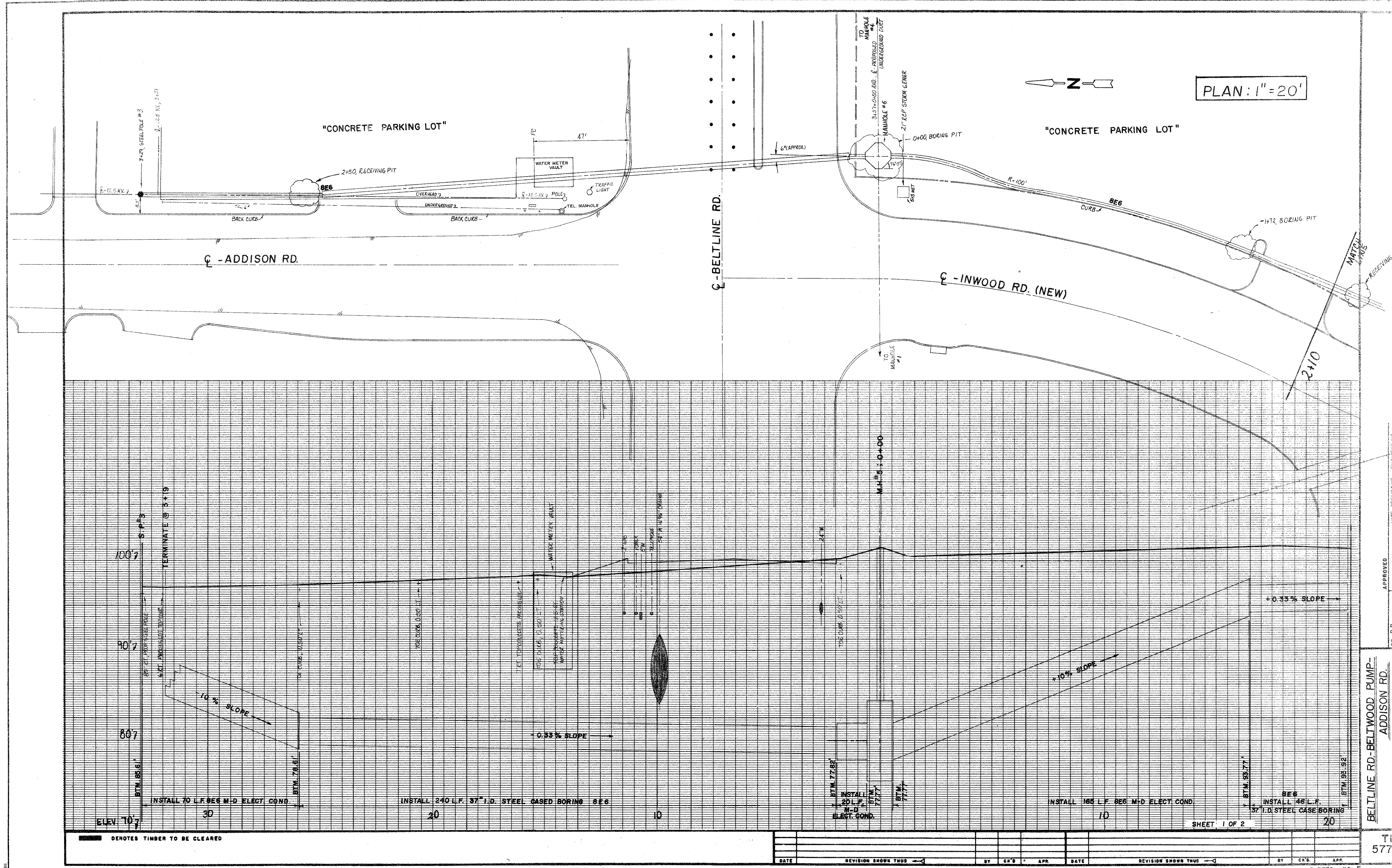
APPROVED \_\_\_\_\_  
 VICE PRESIDENT - ENGINEERING  
 DR. P. R. \_\_\_\_\_  
 BELTLINE RD - BELTWOOD PUMP -  
 ADDISON RD.  
 LINE B  
 DATE 11-19-85  
 SHEETS NO. 3

TD 57711



■ DENOTES TIMBER TO BE CLEARED  
 INSTALL 30' L.F. 48" M-D ELECT. COND.  
 INSTALL 98' L.F. 42" I.D. STEEL CASED BORING @ 12" MIN.  
 INSTALL 141' L.F. 48" M-D ELECT. COND.  
 INSTALL 90' L.F. 48" M-D ELECT. COND.  
 INSTALL 30' L.F. 48" M-D ELECT. COND.

NO.	REVISION SHOWN THUS	BY	CHK'D	APP.	DATE	REVISION SHOWN THUS	BY	CHK'D	APP.	DATE



PLAN: 1"=20'



"CONCRETE PARKING LOT"

"CONCRETE PARKING LOT"

℄ - ADDISON RD.

℄ - BELTLINE RD.

℄ - INWOOD RD. (NEW)

100.7	TERMINATE @ 3+9	INSTALL 24" I.D. STEEL CASED BORING 8E6	10	INSTALL 105 L.F. REG. M-D ELECT. COND.	20	INSTALL 14" I.D. STEEL CASE BORING 8E6	20
90.7	10% SLOPE	0.33% SLOPE		10% SLOPE		0.33% SLOPE	
80.7	BTM 88.61	BTM 88.61		BTM 88.61		BTM 88.77	
ELEV 70.7	BTM 77.84	BTM 77.84		BTM 77.84		BTM 77.77	

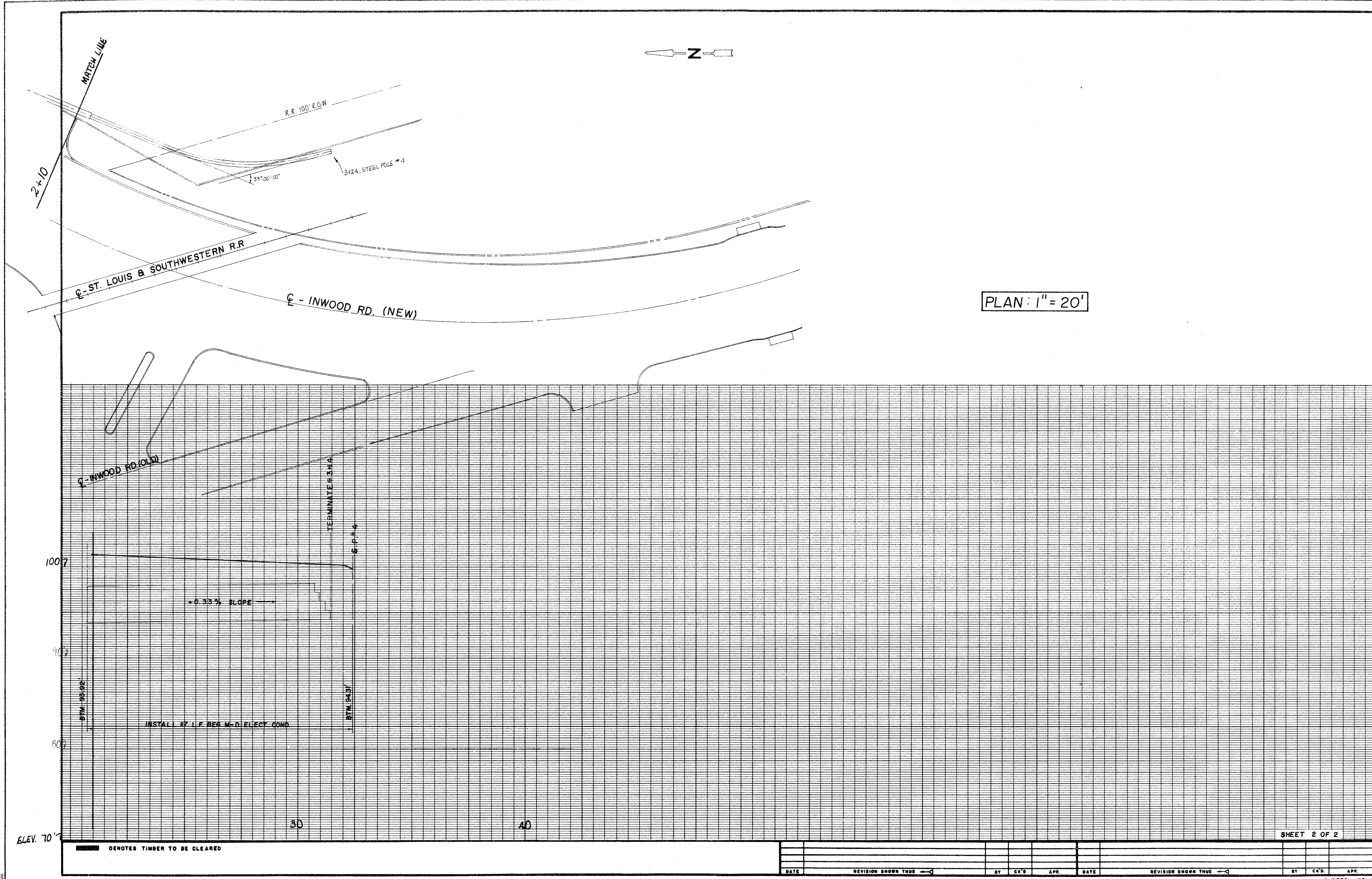
■ DENOTES TIMBER TO BE CLEARED

DATE	REVISION SHOWN THIS	BY	CR'S	APP.	DATE	REVISION SHOWN THIS	BY	CR'S	APP.

BELTLINE RD-BELTWOOD PUMP-  
ADDISON RD.  
LINE D  
DATE 11-19-85  
SCALE 1"=20'  
SHEETS NO. 5

T.D.  
57711





PLAN: 1" = 20'

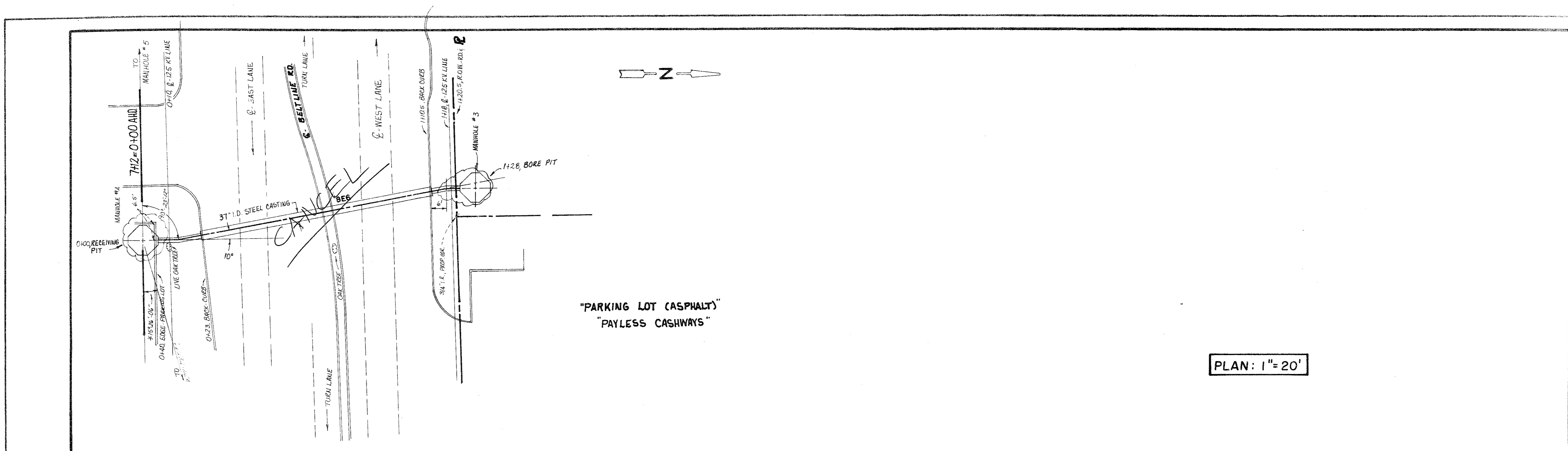
███ DENOTES TIMBER TO BE CLEARED

DATE	REVISION SHOWN THUS	BY	CHK'D	APP.	DATE	REVISION SHOWN THUS	BY	CHK'D	APP.

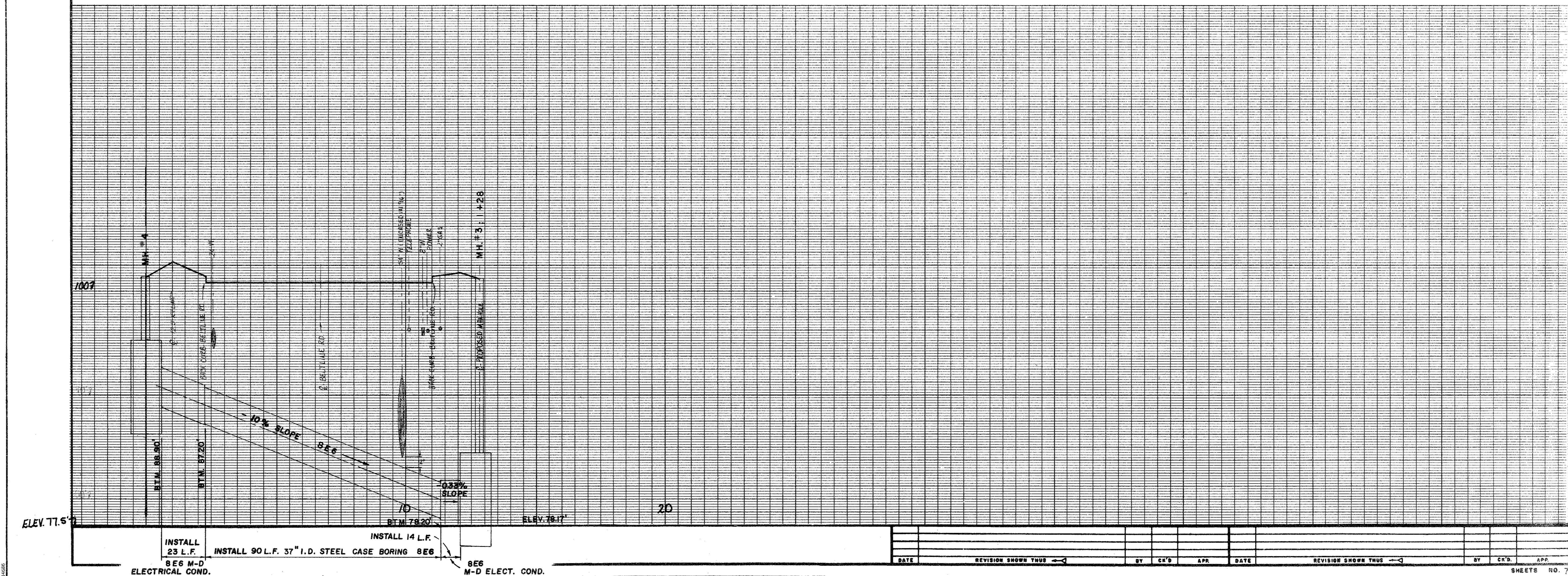
BELTLINE RD.-BELTWOOD PUMP-  
 ADDISON RD.  
 LINE D  
 DATE 11-19-85  
 SCALE 1" = 20'  
 DR. P. R. ...  
 VICE PRESIDENT - ENGINEERING  
 APPROVED  
 SHEETS NO. 6  
 TD 57711  
 TEXAS POWER & LIGHT COMPANY

SHEET 2 OF 2

4-27



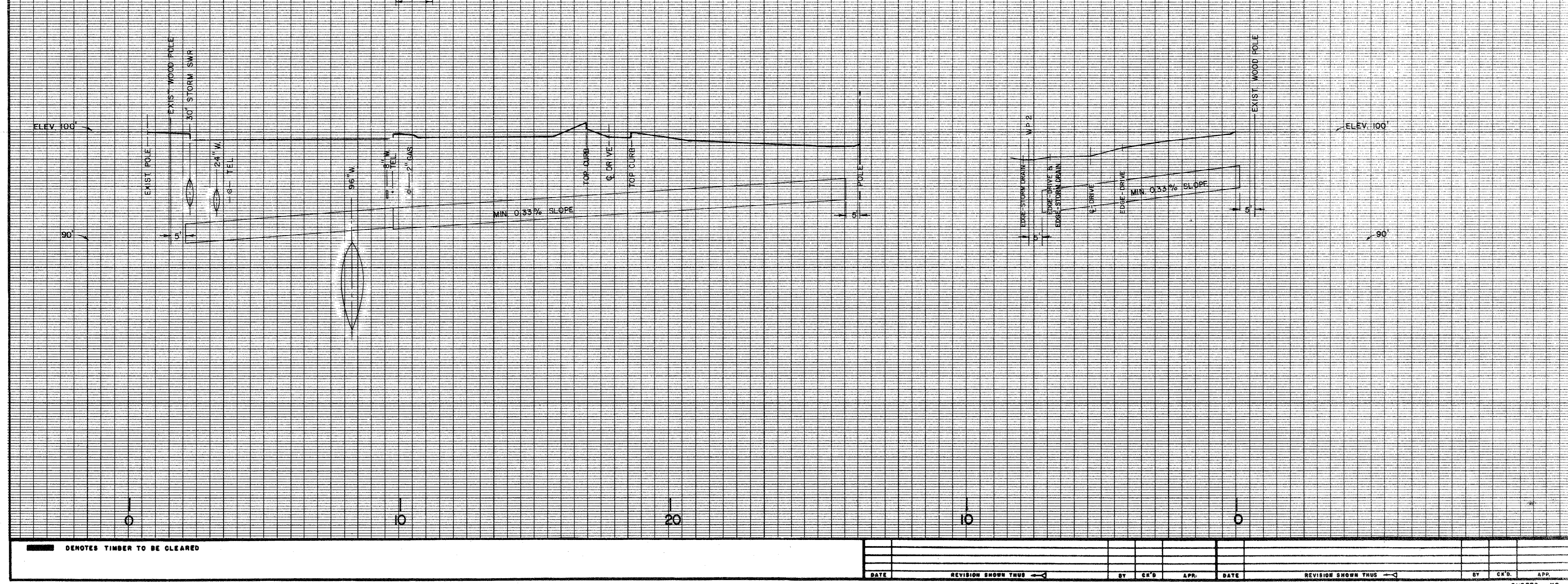
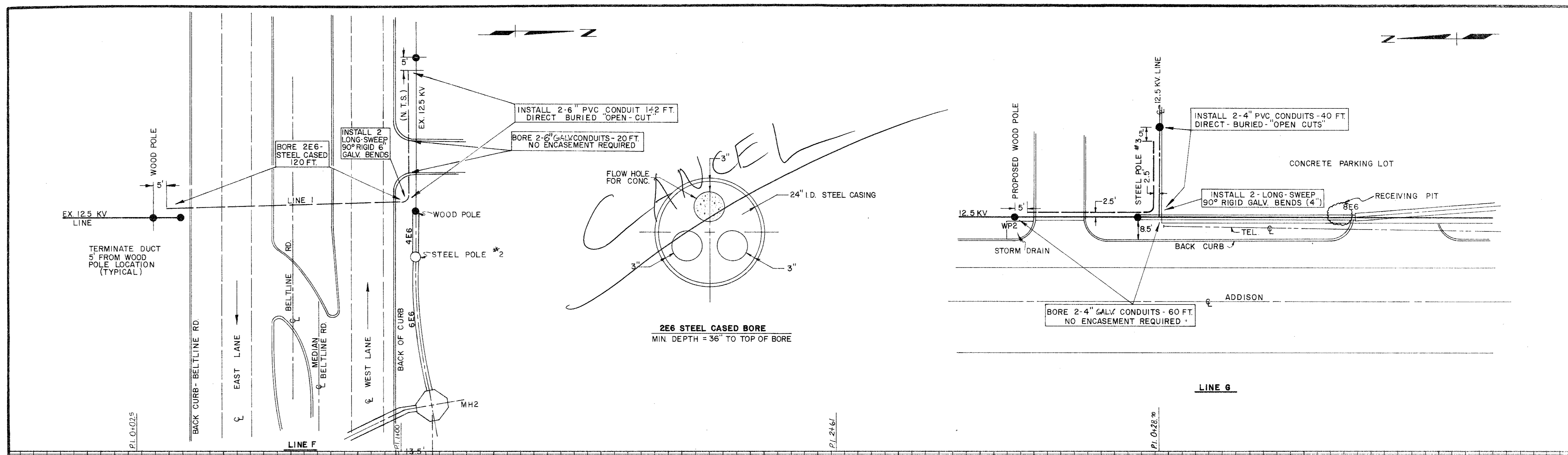
PLAN: 1" = 20'



INSTALL 23 L.F. 865 M-D ELECTRICAL COND.  
 INSTALL 90 L.F. 37" I.D. STEEL CASE BORING 866  
 INSTALL 14 L.F. 865 M-D ELECT. COND.

DATE	REVISION SHOWS THIS	BY	CHK'D	APP.	DATE	REVISION SHOWS THIS	BY	CHK'D	APP.

BELTLINE RD. - BELTWOOD PUMP  
 ADDISON RD.  
 LINE E  
 SCALE: 1" = 20'  
 SHEETS NO. 7  
 TD 57711  
 APPROVED  
 VICE PRESIDENT - ENGINEER INC.



DENOTES TIMBER TO BE CLEARED

DATE	REVISION SHOWN THUS	BY	CHK'D	APP.	DATE	REVISION SHOWN THUS	BY	CHK'D	APP.

**TD 57776**

**SHEETS NO.**

**APPROVED**

**DR. BRIAN B. CHIDMIST**

**VICE PRESIDENT - ENGINEERING**

**BELTWOOD PUMP - BELTLINE ROAD - ADDISON ROAD UNDERGROUND DISTRIBUTION**

**DATE: 1-27-06**

**SCALE: 1" = 10'**

**TERRACE ENGINEERING**