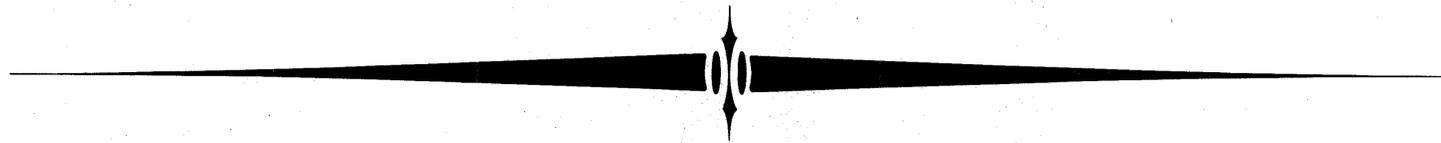


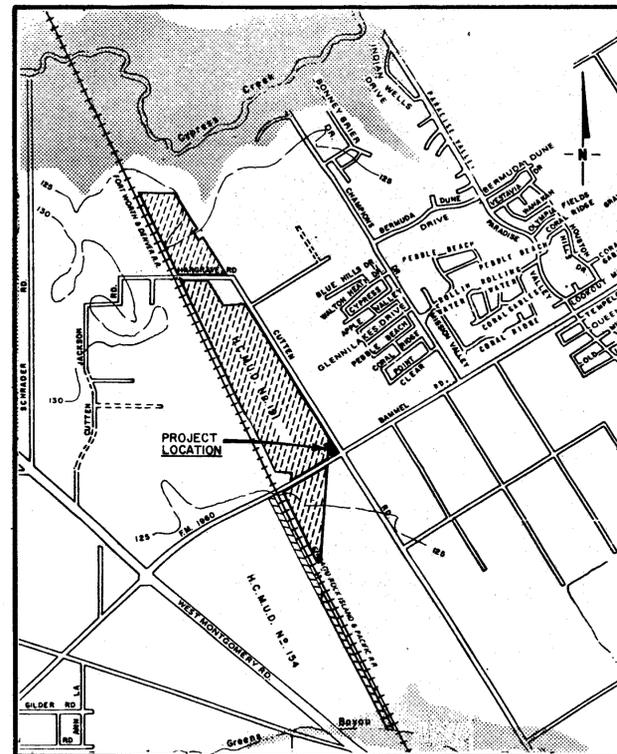
HARRIS COUNTY MUNICIPAL UTILITY DISTRICT 191

UTILITY EXTENSION TO SOUTHLAND CORP.



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GENERAL NOTES	2
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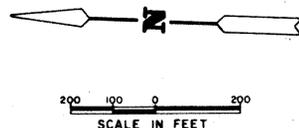
VICINITY MAP
SCALE 1" = 2000'
KEY MAP NO. 570-F

J.O. 85032

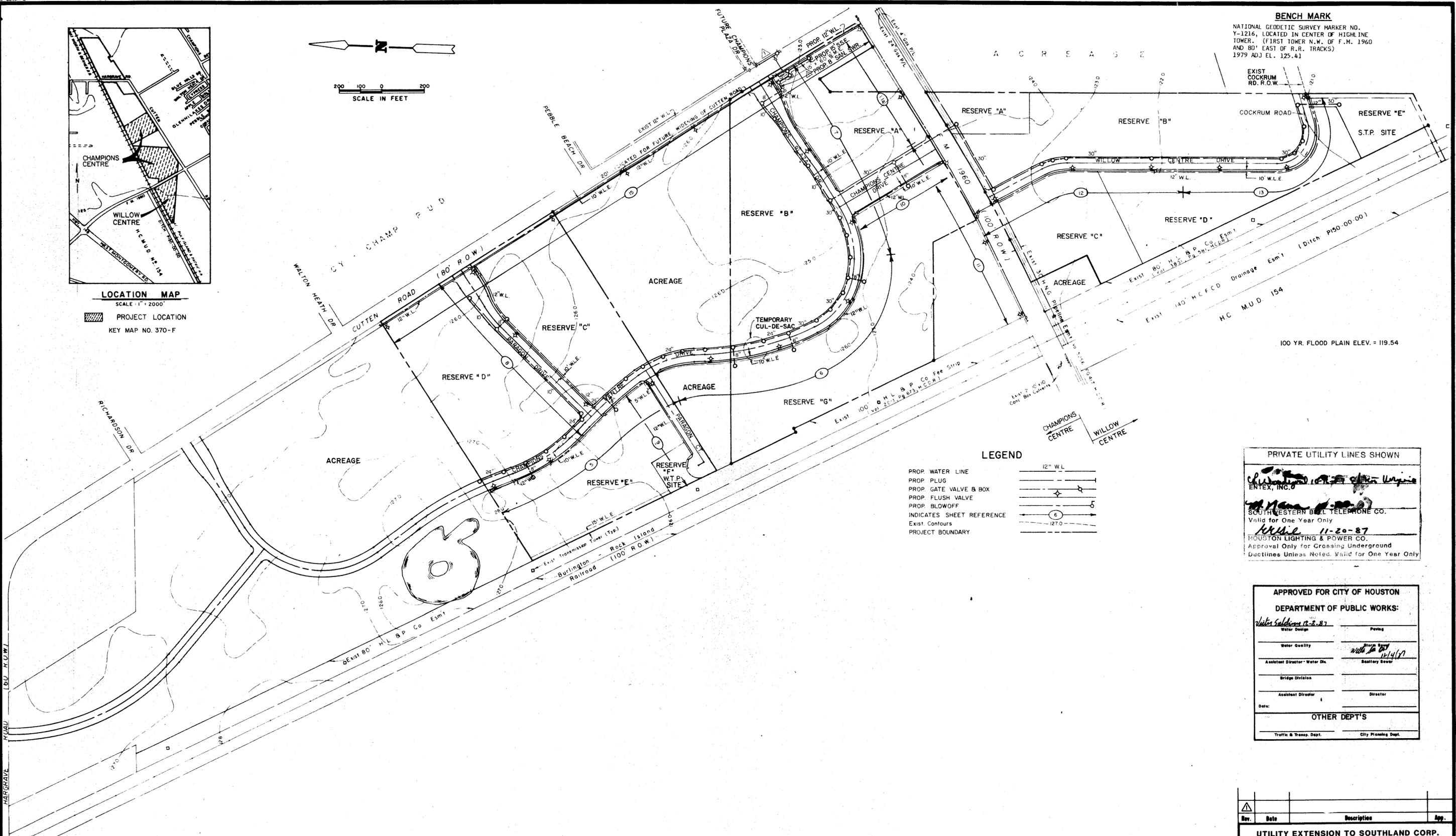
 **LANDEV ENGINEERS, INC.**
1706 SEAMIST DRIVE
Houston, Texas 77008



LOCATION MAP
SCALE: 1" = 2000'
PROJECT LOCATION
KEY MAP NO. 370-F



BENCH MARK
NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGH LINE TOWER. (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS) 1979 ADJ EL. 125.41



LEGEND

- PROP. WATER LINE
- PROP. PLUG
- PROP. GATE VALVE & BOX
- PROP. FLUSH VALVE
- PROP. BLOWOFF
- INDICATES SHEET REFERENCE
- Exist. Contours
- PROJECT BOUNDARY

PRIVATE UTILITY LINES SHOWN

W. S. ...
ENTEX, INC.

...
SOUTHWESTERN BELL TELEPHONE CO.
Valid for One Year Only
11-20-87

...
HOUSTON LIGHTING & POWER CO.
Approval Only for Crossing Underground
Ductlines Unless Noted. Valid for One Year Only

APPROVED FOR CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS:

Water Design	Paving
Water Quality	Sanitary Sewer
Assistant Director - Water Div.	Assistant Director
Assistant Director	Director

Date: _____

OTHER DEPT'S

Traffic & Transp. Dept. City Planning Dept.

NOTE: NO GAS LINES SHOWN
DATE: 12-2-87
M.W.B.



THIS SHEET NOT FOR CONSTRUCTION PURPOSES

Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
OVERALL LAYOUT			
Design By: J.G.R.	Job No: 85032	Sheet	1 of 6
Drawn By: J.G.R.	Scale: 1" = 200'		
Checked By: M.W.B.	Date: JULY, 1987		
LANDY ENGINEERS, INC. 1700 SEAMIST DRIVE Houston, Texas 77008			

GENERAL NOTES - SANITARY SEWER

- SPECIAL BACKFILL - SEE ADDENDUM SEWER SPECIFICATION E-14-62, CITY OF HOUSTON SEWER SPECIFICATIONS FOR CEMENT STABILIZED BACKFILL OF SANITARY AND TRENCHES UNDER OR WITHIN (1) FT. OF PROPOSED OR EXISTING PAVEMENT.
- WYE BRANCHES, STACKS AND TEES FOR HOUSE SERVICE CONNECTION SHALL BE CENTERED BETWEEN SIDE LOT LINES UNLESS OTHERWISE SHOWN. CONTRACTOR SHALL PROVIDE ENGINEER WITH DRAWINGS OF ACTUAL FIELD TIES OF THE WYES, STACKS AND TEES LOCATING THEM FROM THE NEAREST DOWNSTREAM MANHOLE.
- LOCATION OF UTILITIES WITHIN 10-FT AND 16-FT WIDE UTILITY EASEMENTS SHALL BE GOVERNED BY THE "UTILITY COORDINATING COMMITTEE" FOR THE METROPOLITAN AREA.
- SANITARY SEWERS SHALL HAVE CLASS "A" BEDDING WHERE CEMENT STABILIZED SAND BACKFILL IS USED OR WHEN DEPTH IS GREATER THAN TEN (10) FEET.
- ALL MANHOLE RIMS LOCATED OUTSIDE OF THE PROPOSED PAVING WILL BE SET 3" ABOVE TOP OF CURB ELEVATION WHEN WITHIN STREET RIGHT-OF-WAY OR 3" TO 6" ABOVE SURROUNDING LEVEL OF FINISHED GRADE ELSEWHERE WITH SLOPED FILL ADDED FOR STORM WATER DRAINAGE AWAY FROM THE MANHOLE RIM.
- ALL SANITARY SEWER MATERIALS, CONSTRUCTION, AND TESTING WILL BE IN ACCORDANCE WITH CITY OF HOUSTON E-14-62 (1977 PRINTING AND ALL SUBSEQUENT AMENDMENTS THERETO).
- ALL SANITARY SEWERS LOCATED IN SIDELOT EASEMENT WILL HAVE CLASS "AA" BEDDING AND BANK SAND BACKFILL (B.S.B.F.).
- ALL EASEMENTS CONTAINING SANITARY SEWERS ARE 16' U.E.S. UNLESS OTHERWISE SHOWN ON CONSTRUCTION DRAWINGS.
- 6" A.B.S. WILL NOT BE ALLOWED UNDER PAVEMENT.
- CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT".
- FOR USE IN WET SAND CONSTRUCTION AREAS, USE C/H SPEC. SEC. NO. 5, DWG NO. 485-5 (E-14-62) (1977 PRINTING AND ALL SUBSEQUENT AMENDMENTS THERETO)
- THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.

GENERAL NOTES - WATER

- ALL WATER LINES TO HAVE A MINIMUM OF FOUR (4) FEET OF COVER TO TOP OF CURB.
- WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATIONS WD-3 AND WD-5 & 6 AS CURRENTLY AMENDED.
- ALL FLUSHING VALVES SHALL BE SET THREE (3) FEET BEHIND BACK OF CURB.
- STEEL WATER SECTION TO EXTEND FIVE (5) FEET MINIMUM BEYOND 45° BENDS.
- THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
- WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, ONE 18' JOINT OF DUCTILE IRON PIPE SHALL BE INSTALLED IN THE SEWER LINE AND CENTERED AT THE WATER LINE CROSSING, 6" MINIMUM CLEARANCE.
- DUCTILE IRON PIPE SHALL BE MINIMUM THICKNESS CLASS 50. THE PRESSURE RATING FOR BOTH THE PIPE AND THE JOINTS SHALL BE 150 PSI OR GREATER.
- WHENEVER SANITARY SEWERS CROSS UNDER WATER MAINS, AND THE OUT-TO-OUT PIPE CLEARANCE IS LESS THAN 24", A CENTERED 18' JOINT OF DUCTILE IRON PIPE SHALL BE USED.
- WHENEVER SANITARY SEWER CROSS UNDER WATER MAINS, AND THE MINIMUM PIPE CLEARANCE IS 24" OR GREATER, A CENTERED 20' SECTION OF CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER CUBIC YARD) SHALL BE INSTALLED FROM THE LOWER 1/4 POINT OF THE SEWER PIPE TO A LEVEL OF 1 PIPE DIAMETER ABOVE THE SEWER PIPE, BUT IN NO CASE SHALL THE DEPTH OF SAND ABOVE THE SEWER PIPE BE LESS THAN 12".
- ALL P.V.C. WATER MAINS SHALL BE AWWA C-900, OR 18, CLASS 150.
- ALL WATER METERS MUST HAVE INDIVIDUAL SERVICE LEADS AS PER CITY OF HOUSTON STANDARDS W.D.-6 (EFFECTIVE 6-29-87)

STANDARD H.C.F.C.D. NOTES FOR PLANS

- Harris County Flood Control District, Inspection Division, shall be notified at least 48 hours prior to construction (713/684-4040).
- Engineer shall submit letter to Harris County Flood Control District requesting inspection and acceptance of items constructed in Harris County Flood Control District Right-of-Way. Prior to requesting inspection, the drainage right-of-way and/or easements shall be staked and flagged.
- Contractor shall be responsible for protecting, maintaining and restoring backslope drainage systems.
- All disturbed areas within the Harris County Flood Control District right-of-way, except the channel bottom, shall be hydro-mulch seeded as per Harris County Flood Control specification entitled "Hydro-Mulch Seeding" or approved equal.
- Backfill to be compacted in no greater than 1 foot lifts to the density of the undisturbed adjacent soil.
- Contractor shall be responsible for excavation channel flowline to design elevation as shown on plans and downstream as necessary to insure no water in storm sewer during "dry" conditions.
- Contractor shall be responsible for maintaining flow in channel during construction and restoring channel to original condition.
- All excavated material is to be removed from the HCFCO right-of-way. No fill is to be placed within a designated flood plain area without first obtaining a fill permit.
- Engineer shall be responsible for obtaining all applicable City, County, State, and Federal permits.

GENERAL NOTES - PAVING

- PAVING SHALL BE IN ACCORDANCE WITH HARRIS COUNTY "RULES, REGULATIONS AND REQUIREMENTS RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS OR RE-SUBDIVISIONS" AND THE LATEST REVISIONS AND/OR AMENDMENTS OF SAME.
- GUIDELINES SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
- ALL RADII AT CURB RETURNS TO BE 25.0' TO BACK OF CURB UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION.
- STOP SIGN (R1 - 1A) TO BE PLACED AT ALL INTERSECTIONS.
- OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY FOR CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN COUNTY ROAD R.O.W.

GENERAL NOTES - STORM SEWERS

- STORM SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON E-14-62 AS CURRENTLY AMENDED.
- REINFORCED CONCRETE PIPE (C-76 CLASS III) STORM SEWER SHALL BE INSTALLED BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 529-S-1, 530-S-1 and 530-S-2 AS APPLICABLE.
- ALL SEWERS UNDER OR WITHIN ONE (1) FT. OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED WITH 1 1/2 SACK CEMENT STABILIZED SAND TO WITHIN ONE (1) FT. OF SUBGRADE.
- ALL STORM SEWERS CONSTRUCTED IN SIDELOT EASEMENTS SHALL BE R.C.P. (C-76 CLASS III) AND SHALL BE BEDDED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 529-S-1, 530-S-1 and 530-S-2 AS APPLICABLE. TWENTY (20) FT WIDE, EASEMENT SHALL BE PROVIDED.
- ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION. 221-7024.
- CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT."
- ALL MANHOLE RIMS LOCATED OUTSIDE OF THE PROPOSED PAVING WILL BE SET 3" ABOVE TOP OF CURB ELEVATION WHEN WITHIN STREET RIGHT-OF-WAY OR 3" TO 6" ABOVE SURROUNDING LEVEL OF FINISHED GRADE ELSEWHERE WITH SLOPED FILL ADDED FOR STORM WATER DRAINAGE AWAY FROM THE MANHOLE RIM.
- BEFORE UTILITY CONSTRUCTION BEGINS, ADEQUATE DRAINAGE MUST BE PROVIDED SO THAT NO SHEET FLOW FLOODING OF ROADWAY OR ADJOINING PROPERTIES OCCURS.
- THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.

UTILITY LINES SHOWN

Checked by: *Ch. ...* 10-16-87

Valid for One Year Only

11-20-87

Valid for One Year Only

APPROVED FOR CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS:

Water Design: *W. S. ...* 11-6-87

Water Quality: *...* 12-8-87

Assistant Director - Water Div. *...* Sanitary Sewer

Bridge Division

Assistant Director Director

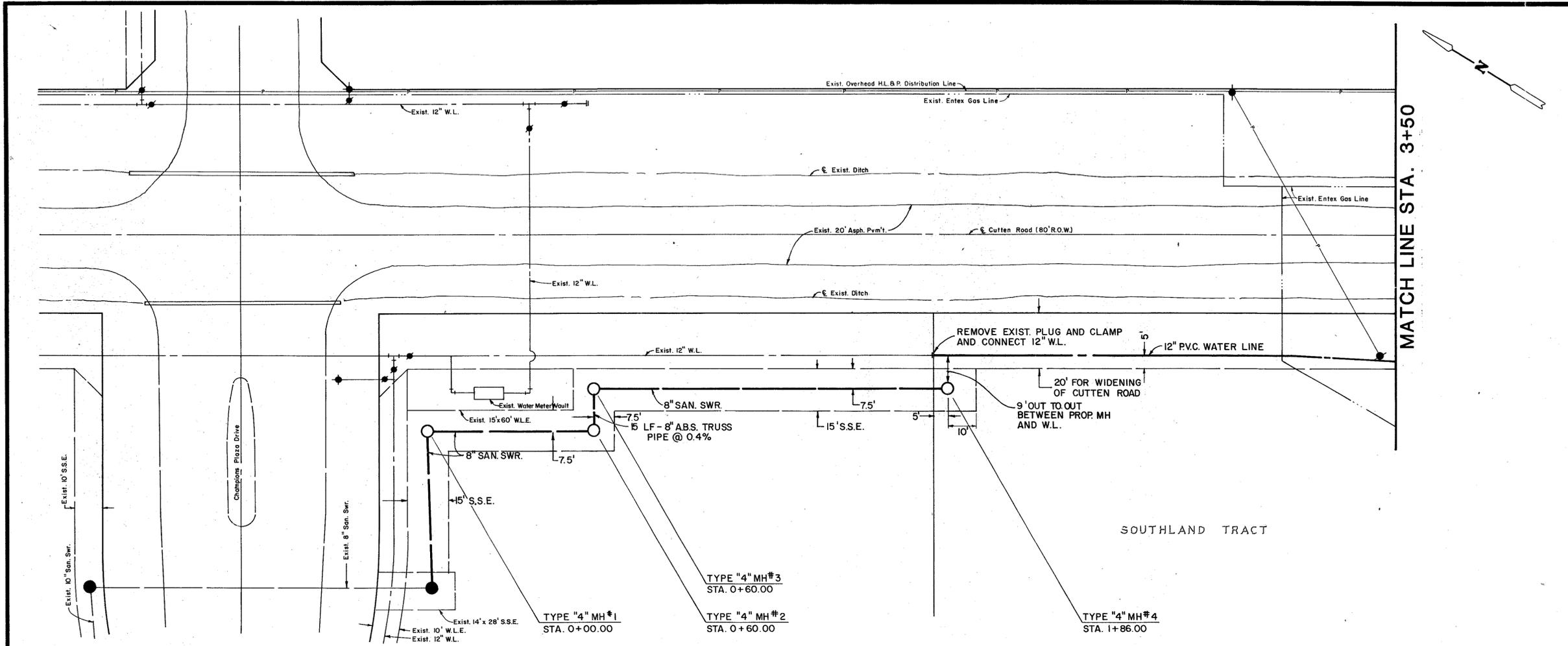
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OTHER DEPT'S

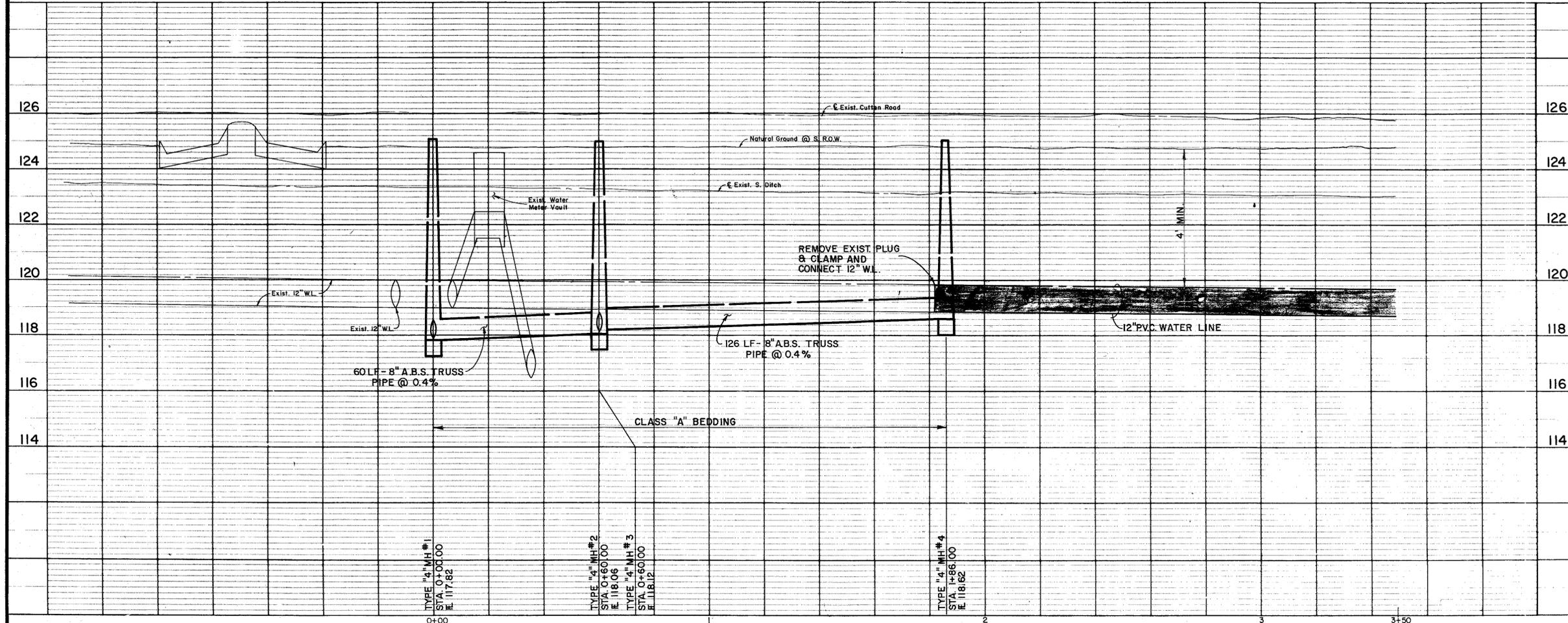
Traffic & Transp. Dept. City Planning Dept.

M. W. ...
11/19/87

Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
GENERAL NOTES			
Design By:	Job No: 85032	Sheet	2 of 6
Drawn By:	Scale: NONE		
Checked By:	Date: JULY, 1987		
 LANDEV ENGINEERS, INC. 1700 SEAMIST DRIVE Houston, Texas 77008			



BENCH MARK
 NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGHLINE TOWER. (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS). 1979 ADJ. ELEV. 125.41



UTILITY LINES CROWN
of Woodland 10-16-87 El. 125.41
 ENTEX, INC.
M. M. G. 10-17-87
 SOUTHWESTERN BELL TELEPHONE CO.
 valid for One Year Only
H. H. C. 11-20-87
 HOUSTON LIGHTING & POWER CO.
 Approval Only for Crossing Underground
 times before. No. adj. valid for One Year Only

APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS:

Vicki Sullivan 12-2-87 Permit
 Water Design
 Water Quality: *St. Helens 12-9-87* Storm Sewer
 Assistant Director: Water Div. *Willie W. 12/14/87* Sanitary Sewer

Bridge Division
 Assistant Director
 Director

Date: _____

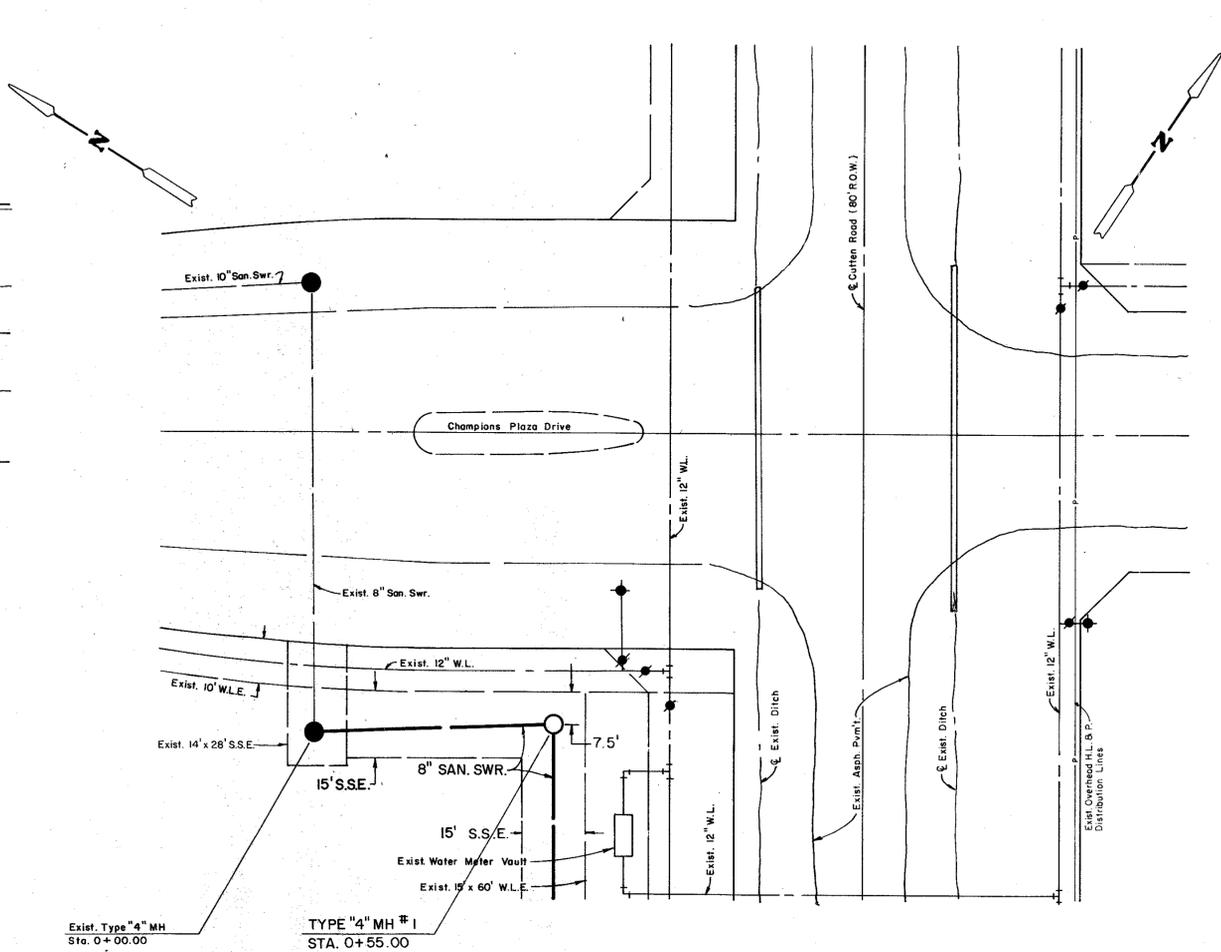
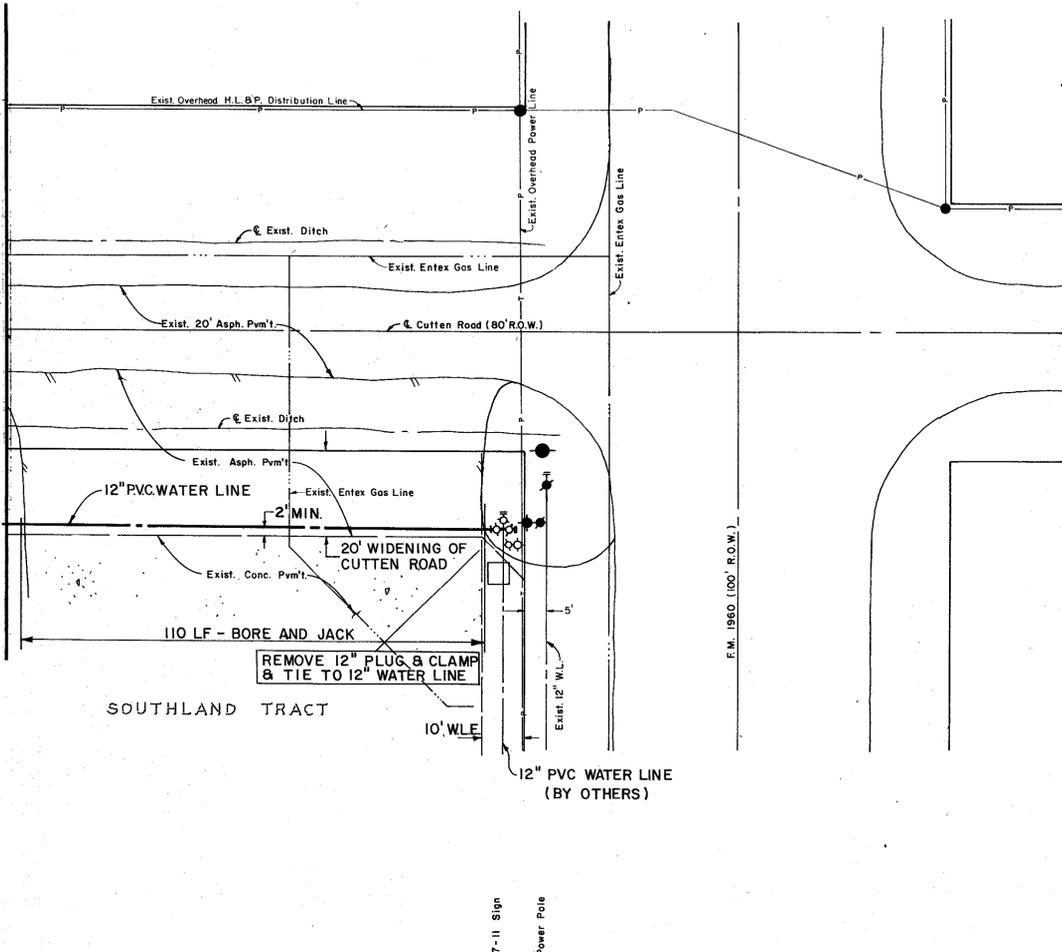
OTHER DEPT'S
 Traffic & Transp. Dept. City Planning Dept.



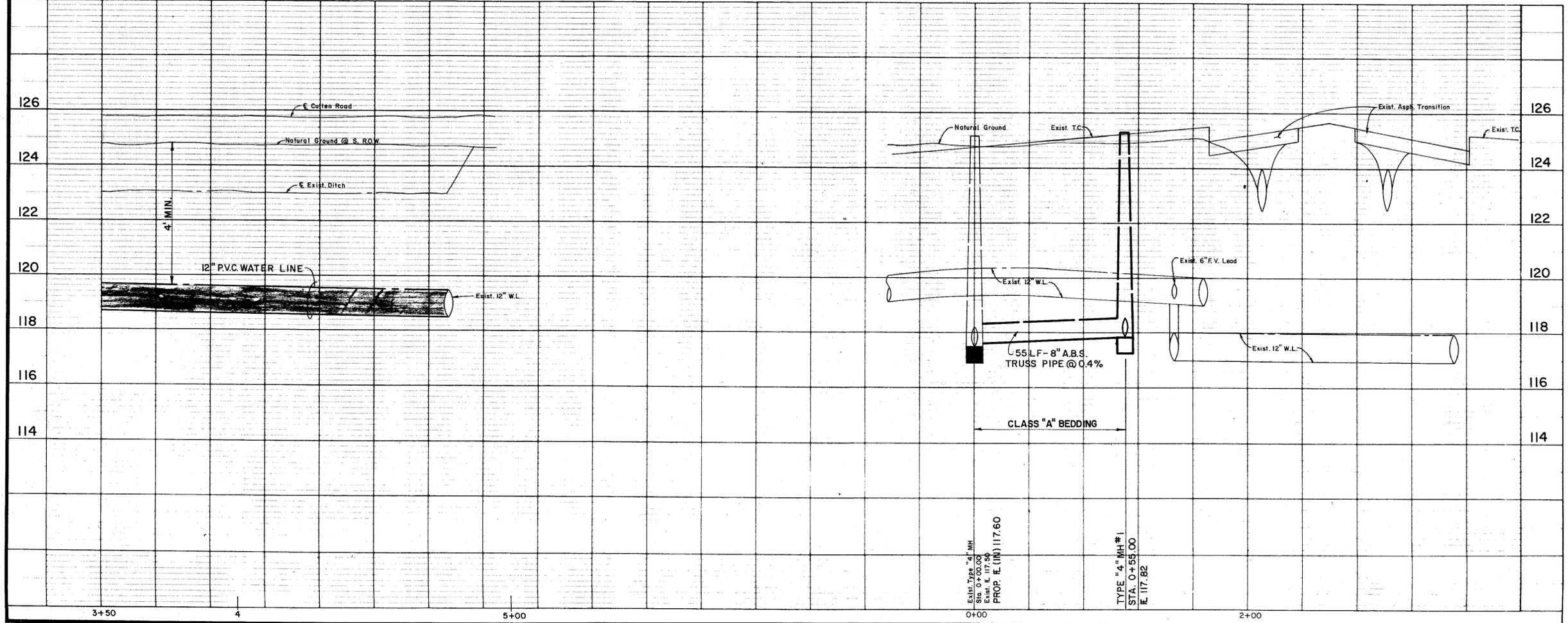
Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
PLAN AND PROFILE			
Design By: J.G.R.	Job No: 85032	Sheet 3	
Drawn By: J.G.R.	Scale: 1" = 20'(H), 1" = 2'(V)	of 6	
Checked By: M.W.B.	Date: JULY, 1987		

LANDEV ENGINEERS, INC.
 1706 SEAMIST DRIVE
 Houston, Texas 77008

MATCH LINE STA. 3+50



BENCH MARK
 NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGHLINE TOWER, (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS). 1979 ADJ. ELEV. 125.41



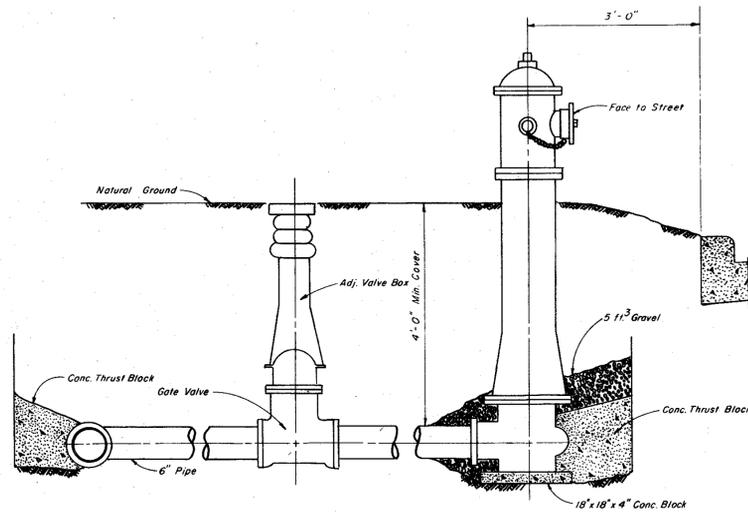
APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS:
 Water Subdiv. 12-8-87
 Water Quality: *St. Helens 12-8-87*
 Assistant Director - Water Div. *Wills 12-8-87*
 Bridge Division
 Assistant Director
 Director
 Date:
 OTHER DEPT'S
 Traffic & Transp. Dept. City Planning Dept.

APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS:
 Water Subdiv. 12-8-87
 Water Quality: *St. Helens 12-8-87*
 Assistant Director - Water Div. *Wills 12-8-87*
 Bridge Division
 Assistant Director
 Director
 Date:
 OTHER DEPT'S
 Traffic & Transp. Dept. City Planning Dept.

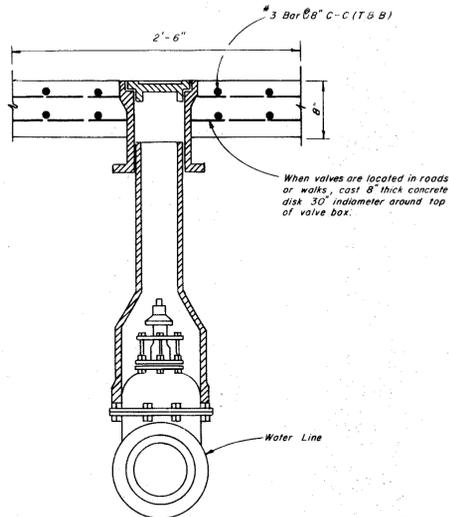
M.W. Bond
 11/19/87

Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
PLAN AND PROFILE			
Design By: J.G.R.	Job No: 85032	Sheet	4
Drawn By: J.G.R.	Scale: 1" = 20'(H), 1" = 2'(V)	of	
Checked By: M.W.B.	Date: JULY, 1987	of	6

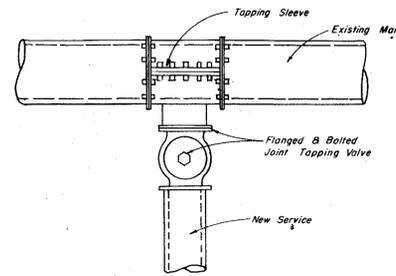
LANDEV ENGINEERS, INC.
 1706 SEAMIST DRIVE
 Houston, Texas 77008



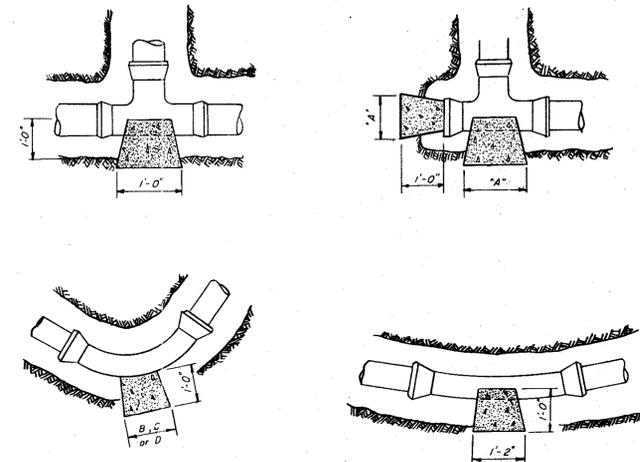
TYPICAL GATE VALVE & HYDRANT INSTALLATION



VALVE BOX DETAIL



WATER SERVICE CONNECTION

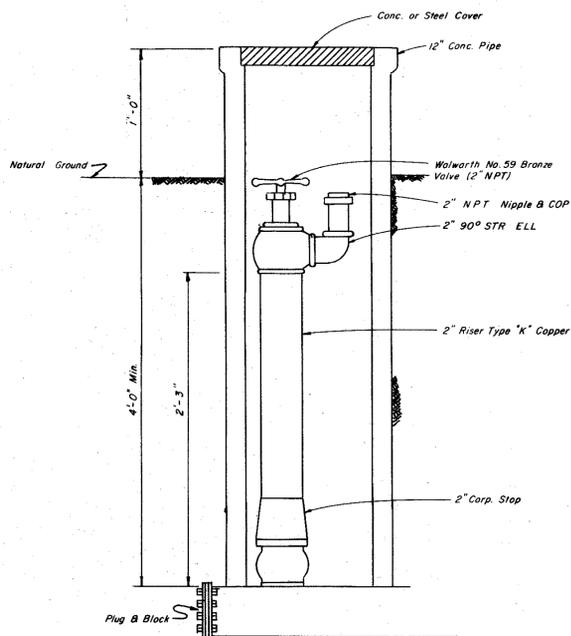


PIPE SIZE	"A" PLUGS & TEES	"B" 90° BEND	"C" 45° BEND	"D" 22 1/2° BEND
4" - 6"	1' - 0"	1' - 3"	1' - 0"	1' - 0"
8"	2' - 0"	2' - 6"	1' - 6"	1' - 0"
12"	4' - 0"	4' - 0"	2' - 6"	1' - 6"

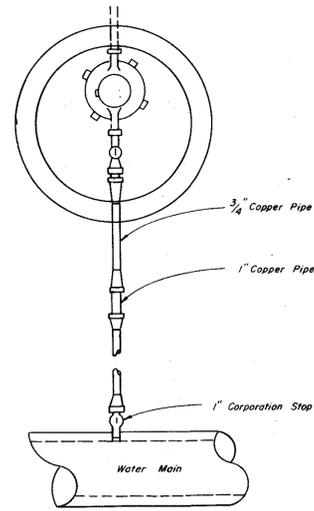
NOTE: Safe Bearing Load

NOTE: Thrust Block at trench face must have a minimum bearing surface of 1 sq. ft., and the least dimension shall be no smaller than 1.5x pipe diameter, but not less than 1.0 ft.

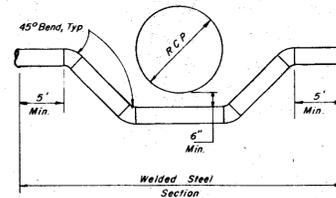
THRUST BLOCK DETAIL



2" BLOW-OFF VALVE ASSEMBLY



SINGLE SERVICE LEAD



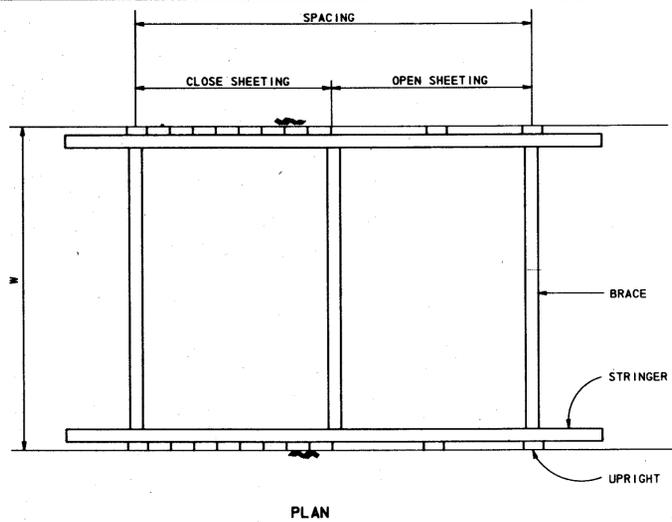
WELDED STEEL SECTION

Checked by 10-16-87 R.T. (Signature)

APPROVED FOR CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS:	
Water Design	Permit
Water Quality	<i>Sh. Helms 12/9/87</i>
Assistant Director - Water Div.	Sanitary Sewer
Bridge Division	
Assistant Director	Director
Date:	
OTHER DEPT'S	
Traffic & Transp. Dept.	City Planning Dept.

Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
WATER DETAILS			
Design By:	C. O. H.	Job No:	85032
Drawn By:	R. T.	Scale:	NONE
Checked By:	D. C. L.	Date:	JULY, 1987
			Sheet
			5
			of 6
LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008			

M.W. Bennett
11/19/87



TRENCH SHORING - MINIMUM REQUIREMENTS (•••)

DEPTH OF TRENCH FEET	KIND OR CONDITION OF EARTH TYPE	SIZE AND SPACING OF MEMBERS											
		UPRIGHTS		STRINGERS		CROSS BRACES ¹							
		MINIMUM DIMENSION	MAXIMUM SPACING	MINIMUM DIMENSION	MAXIMUM SPACING	WIDTH OF TRENCH							
				UP TO 3 FEET		3 TO 6 FEET		6 TO 9 FEET		9 TO 12 FEET		12 TO 15 FEET	
		INCHES	FEET	INCHES	FEET	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	FEET	FEET
5 TO 10	(A) HARD, COMPACT.....	3x4 OR 2x6	6			2x6	4x4	4x6	6x6	6x8	4	6	
	(B) LIKELY TO CRACK.....	3x4 OR 2x6	3	4x6	4	2x6	4x4	4x6	6x6	6x8	4	6	
	(C) SOFT, SANDY, OR FILLED.....	3x4 OR 2x6	CLOSE SHEETING	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6	
	(D) HYDROSTATIC PRESSURE.....	3x4 OR 2x6	CLOSE SHEETING	6x8	4	4x4	4x6	6x6	6x8	8x8	4	6	
10 TO 15	(A) HARD, COMPACT.....	3x4 OR 2x6	4	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6	
	(B) LIKELY TO CRACK.....	3x4 OR 2x6	2	4x6	4	4x4	4x6	6x6	6x8	8x8	4	6	
	(C) SOFT, SANDY, OR FILLED.....	3x4 OR 2x6	CLOSE SHEETING	4x6	4	4x6	6x6	6x8	8x8	8x10	4	6	
	(D) HYDROSTATIC PRESSURE.....	3x6	CLOSE SHEETING	8x10	4	4x6	6x6	6x8	8x8	8x10	4	6	
15 TO 20	(E) ALL KINDS OR CONDITIONS.....	3x6	CLOSE SHEETING	4x12	4	4x12	6x8	8x8	8x10	10x10	4	6	
OVER 20	(E) ALL KINDS OR CONDITIONS.....	3x6	CLOSE SHEETING	6x8	4	4x12	8x8	8x10	10x10	10x12	4	6	

¹ TRENCH JACKS MAY BE USED IN LIEU OF, OR IN COMBINATION WITH, CROSS BRACES. SHORING IS NOT REQUIRED IN SOLID ROCK, HARD SHALE, OR HARD SLIC. WHERE DESIRABLE, STEEL SHEET PILING AND BRACING OF EQUAL STRENGTH MAY BE SUBSTITUTED FOR WOOD.

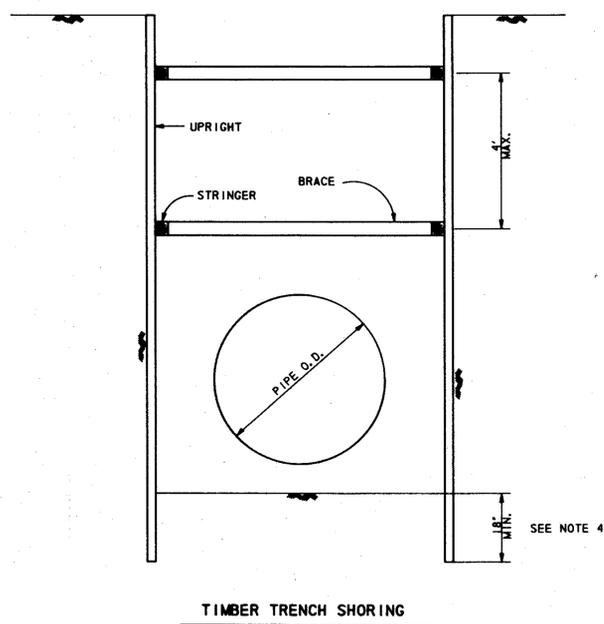
() DESIGNATION FOR PROPOSAL (BID) PURPOSES

(•••) FROM OSHA SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P.

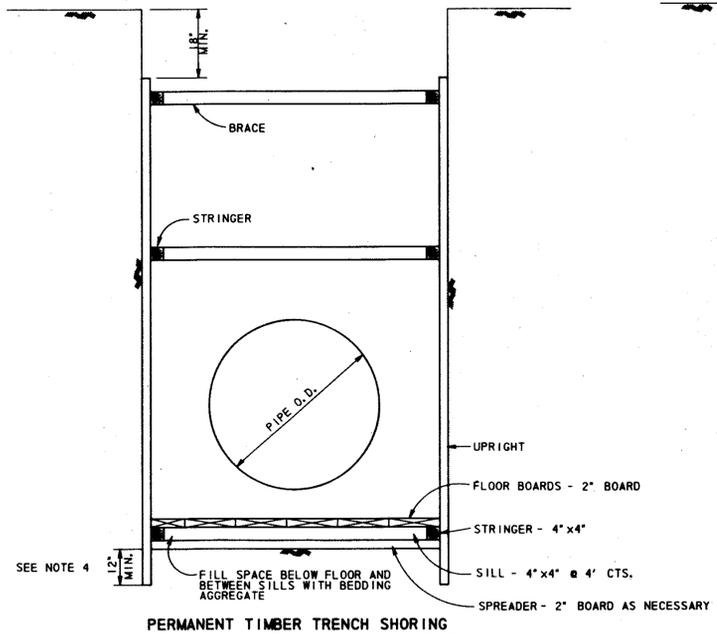
2. SIZE OF TIMBER MEMBERS ARE ROUGH CUT DIMENSIONS (FULL SIZE)

GENERAL NOTES

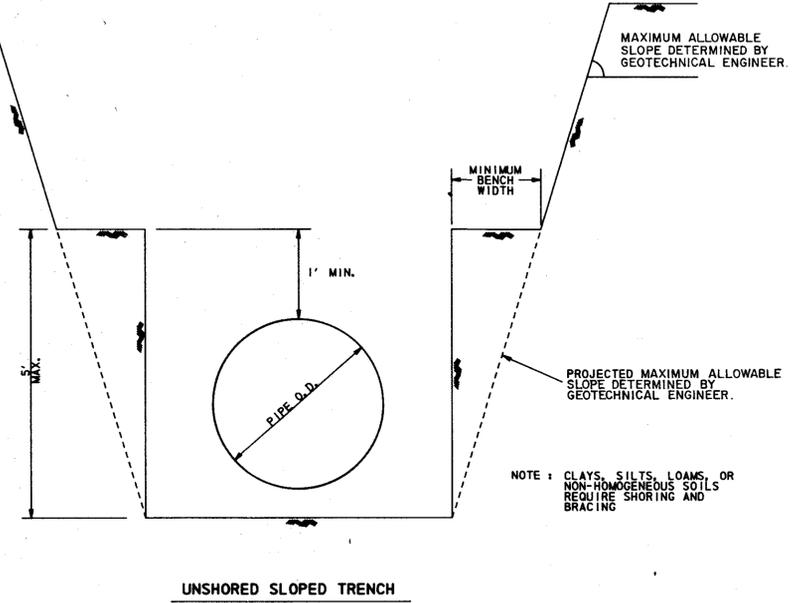
- TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P.
- THE CONTRACTOR MAY ELECT TO USE AN ALTERNATE SYSTEM TO THE TIMBER TRENCH SHORING SHOWN IN THE TABLE. THE ALTERNATE SYSTEM, BE IT A TRENCH BOX, STEEL SHEET PILING, TRENCH JACKS OR A COMBINATION OF THE ABOVE, MUST BE CERTIFIED BY THE CONTRACTOR'S REGISTERED PROFESSIONAL ENGINEER THAT IT PROVIDES EQUAL OR GREATER PROTECTION THAN THE TIMBER TRENCH SHORING SHOWN ON THIS DETAIL SHEET.
- CONTRACTOR SHALL PERFORM DAILY TRENCH SAFETY SYSTEM INSPECTIONS TO INSURE THAT THE SYSTEM MEETS OSHA REQUIREMENTS AND IS APPROPRIATE FOR SPECIFIC SITE CONDITIONS OF THE OPEN TRENCH. INSPECTIONS ARE REQUIRED AFTER RAINSTORMS OR ANY CHANGE IN CONDITIONS THAT MAY INCREASE THE POSSIBILITY OF A CAVE-IN OR SLIDE.
- IN THE EVENT THAT TRENCH UPRIGHTS CAN NOT BE PLACED BELOW TRENCH BOTTOM AS SHOWN ON DETAIL, CONTRACTOR MUST PROVIDE ENGINEER WITH PLANS THAT DEMONSTRATE THAT THE UPRIGHTS WILL BE BRACED AND MAINTAINED IN A VERTICAL POSITION.
- WHERE THE TRENCH SAFETY SYSTEM CROSSES A UTILITY, THE UTILITY LINE MUST BE ADEQUATELY SUPPORTED TO PREVENT ANY DAMAGE. IN TRENCHES WITH CLOSED SHEETING, THE UPRIGHTS MUST SURROUND THE UTILITY. OPEN TRENCH SHEETING SPACING MUST BE ADJUSTED AS TO NOT EXCEED THE MAXIMUM ALLOWED SPACING. (NO SEPARATE PAY)
- TRENCH SHALL BE DRAINED AS REQUIRED SO WORK MAY BE ACCOMPLISHED SAFELY AND EFFICIENTLY. IF NECESSARY, INSTALL DEWATERING SYSTEM TO PROVIDE A DRY TRENCH BOTTOM. DELIVER DISCHARGE FROM SYSTEM TO NATURAL DRAINAGE CHANNEL OR TO STORM DRAINS.
- IN TRENCHES FOUR FOOT DEEP OR MORE, CONTRACTOR TO PROVIDE ADEQUATE MEANS OF TRENCH EXIT SUCH AS LADDER OR STEPS AND THEY MUST BE LOCATED SO AS TO REQUIRE NO MORE THAN 25 FEET OF LATERAL TRAVEL.
- MEASURE "PERMANENT TIMBER TRENCH SHORING" BY LINEAR FOOT OF TRENCH PROTECTED. PAYMENT IS BY STATED DEPTH OF TRENCH AND EARTH CONDITIONS NOTED IN THE PROPOSAL (BID).
- MEASURE "TRENCH SAFETY SYSTEM" BY LINEAR FOOT OF TRENCH PROTECTED. PAYMENT IS BY STATED DEPTH OF TRENCH AND EARTH CONDITIONS NOTED IN THE PROPOSAL (BID).
- STRINGERS AND BRACES TO BE SECURELY FASTENED.
- ANY PART OF "TRENCH SAFETY SYSTEM" LEFT IN PLACE TO BE REMOVED A MINIMUM OF 18 INCHES BELOW FINISHED GRADE OR NATURAL GROUND, WHICHEVER IS LOWER.
- TRENCH SHORING SYSTEM HAS BEEN DESIGNED WITH NO ALLOWANCE FOR LIVE LOAD SURCHARGE. IF LIVE LOAD SURCHARGE IS ANTICIPATED IT SHALL NOT BE PLACED WITHIN 2 FEET OF EDGE OF TRENCH AND CONTRACTOR'S REGISTERED PROFESSIONAL ENGINEER SHALL DESIGN TRENCH SHORING SYSTEM TO ACCOMMODATE THE ANTICIPATED LIVE LOAD SURCHARGE.
- TIMBER SIZES ARE BASED ON STRESSES OF 1650 PSI FOR EXTREME FIBER IN BENDING AND 1450 PSI FOR COMPRESSION PARALLEL WITH GRAIN.
- EARTH TRENCH CONDITIONS FOR THIS PROJECT ARE ANTICIPATED TO BE AS SHOWN IN THE GEOTECHNICAL REPORT.



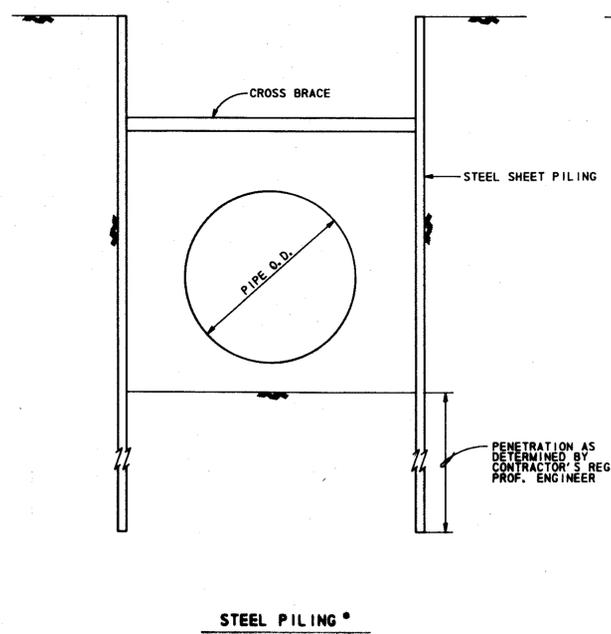
TIMBER TRENCH SHORING



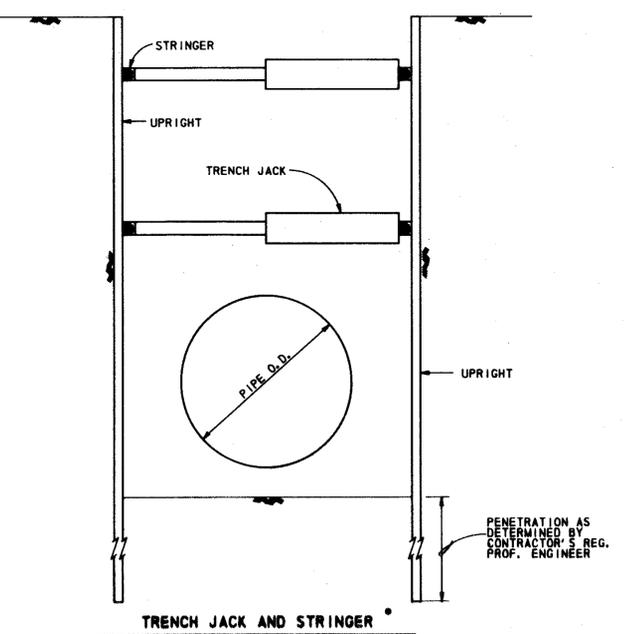
PERMANENT TIMBER TRENCH SHORING



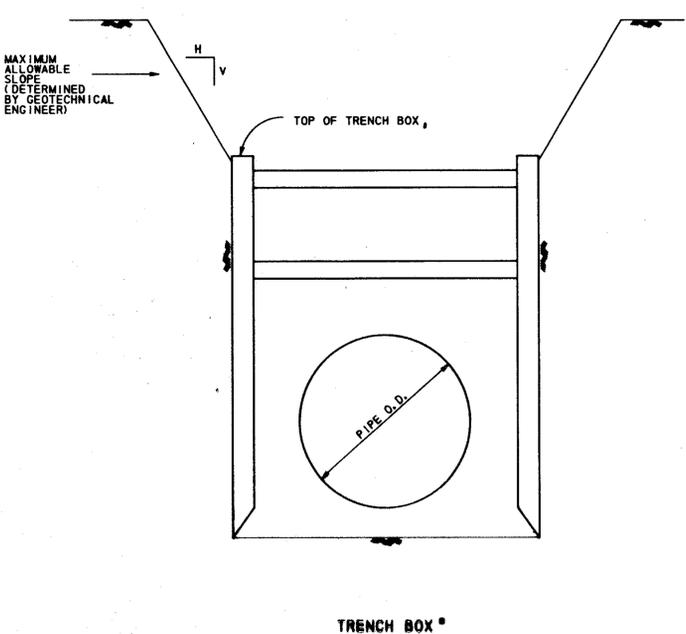
UNSHORED SLOPED TRENCH



STEEL PILING



TRENCH JACK AND STRINGER



TRENCH BOX

Rev.	Date	Description	App.
UTILITY EXTENSION TO SOUTHLAND CORP.			
H.C.M.U.D. No. 191			
TRENCH SAFETY SYSTEM			
Design By:	Job No: 85032	Sheet	6A
Drawn By:	Scale:	of 6	
Checked By:	Date: JULY, 1987		
LANDEV ENGINEERS, INC.			
1706 SEAMIST DRIVE Houston, Texas 77000			

• ALTERNATE SYSTEM