

# HARRIS COUNTY, TEXAS

## MUNICIPAL UTILITY DISTRICT NO. 191

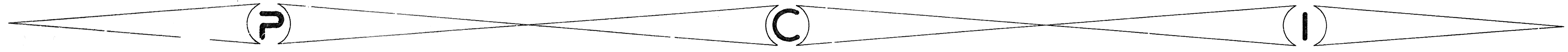
### HIGHLAND TIMBERS - SECTION TWO

plans of proposed

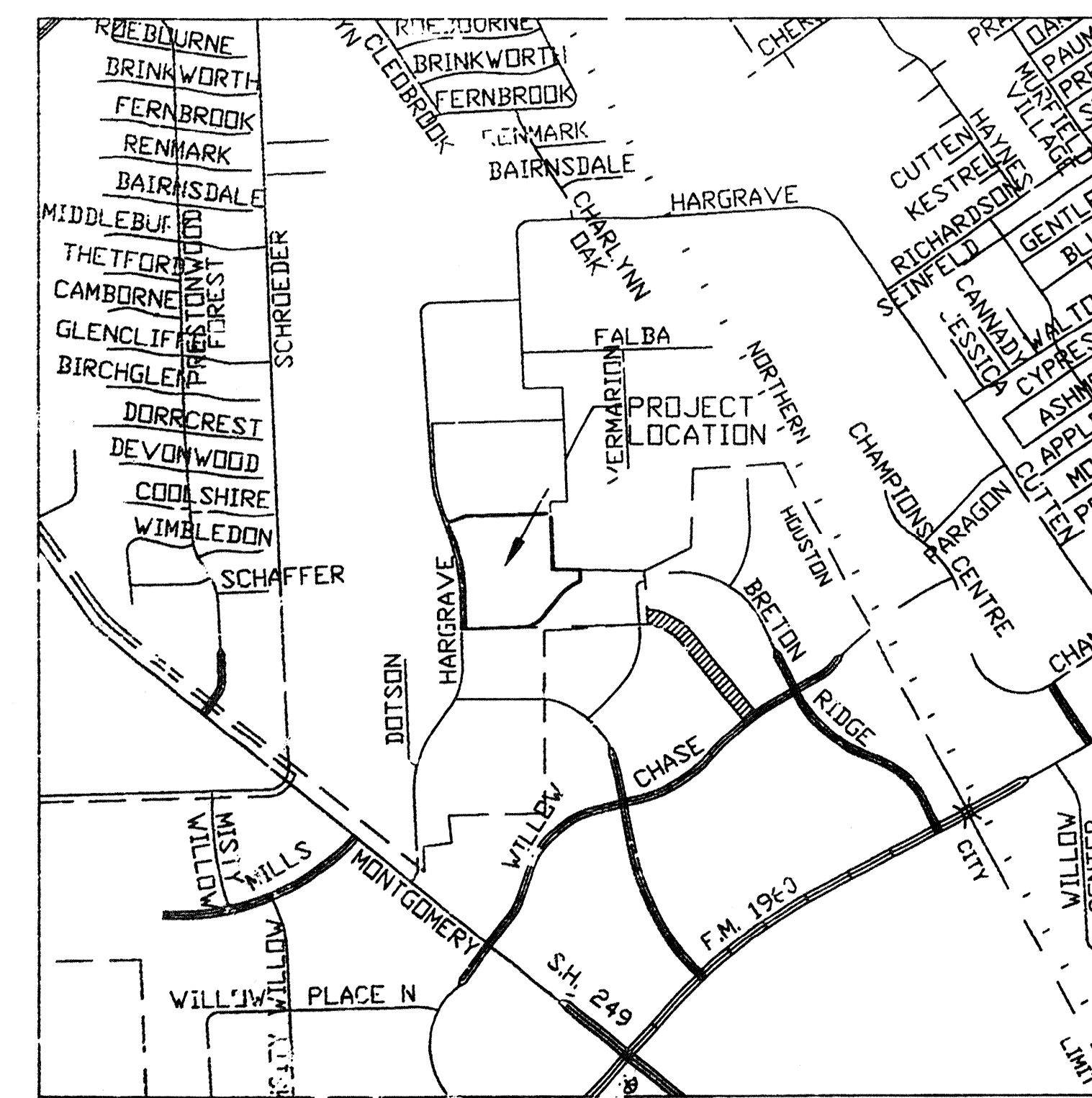
## WATER SANITARY STORM SEWER

and

## PAVING IMPROVEMENTS



STREET INDEX	PLAN and PROFILE INDEX	SHEET NO.
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HIGHLAND COVE DRIVE		6
HIGHLAND ARBOR DRIVE		7
MAPLE TRACE DRIVE		8
BERRY SPRINGS DRIVE		9
HIGHLAND BEND DRIVE		10
HIGHLAND TRACE DRIVE		10



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APPROVED  
CITY OF HOUSTON

*[Signature]*  
CITY ENGINEER  
HERBERT LUM, P.E.

*[Signature]*  
DATE  
4-9-2000

*[Signature]*  
DIRECTOR OF PUBLIC WORKS AND ENGINEERING  
JERRY KING, P.E.

*[Signature]*  
DATE  
4-9-2000

CITY DWG. NO.  
SHEET NO. 1 OF 19 SHEETS

LOCATION MAP  
HARRIS COUNTY, TEXAS  
MAP REFERENCE  
KEY MAP NO. 370A-E  
LAMBERT MAP NO. 4966(639)-B-1

DEVELOPER:  
HIGHLAND MANAGEMENT, INC.

\*CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING, ENGINEERING CONSTRUCTION AND REAL ESTATES GROUP (TELEPHONE NO. (713) 897-7000-48 HOURS BEFORE STARTING WORK ON THIS PROJECT.\*

JOB NO. 464U & 464P  
DATE: JUNE 1999

R# 103497  
COH LGG. NO. 99-0409

**PCI** PROVIDENT CONSULTING, INC.  
1200 WEST 11TH ST.  
HOUSTON, TEXAS 77008  
(713) 802-1019

Highland Timbers Section Two  
 AS-BUILT-PAVING Ac. Built  
 6/20/01  
 HIGHLAND TIMBERS SECTION TWO #464U & 464P



SANITARY SEWER NOTES:

1. WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING'S "STANDARD CONSTRUCTION SPECIFICATIONS" DATED SEPTEMBER 1997, AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" DATED JULY 1997 UNLESS OTHERWISE NOTED AND APPROVED ON THESE PLANS. THE DESIGN IS CONSISTENT WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "DESIGN MANUAL FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING", DATED NOVEMBER 1997. CONTRACTOR SHALL OBTAIN COPY OF SAME AND USE IT. OBTAIN FROM 611 WALKER FILE ROOM. (Latest Addendum thereto shall also be obtained).
2. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO, WITH NO COST TO THE CITY OF HOUSTON.
3. ALL SANITARY SEWERS SHALL BE INSTALLED BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 02601-02C, 02227-01C, AND 02227-08B AS APPLICABLE.

GENERAL NOTES - STORM SEWERS

1. STORM SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF HOUSTON DESIGN MANUAL (SEPT. 1996) AND CONSTRUCTION STANDARD SPECIFICATIONS AND DETAILS (SEPTEMBER, 1997) AS CURRENTLY AMENDED.
2. REINFORCED CONCRETE PIPE (C-76 CLASS III) STORM SEWER SHALL BE INSTALLED BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 02317-04, 02317-05 AND 02317-09 AS APPLICABLE.
3. ALL SEWERS CONSTRUCTED INSIDE LOT EASEMENTS SHALL BE R.C.P. TWENTY (20) FOOT WIDE EASEMENTS SHALL BE PROVIDED.
4. ALTERNATIVE TO CEMENT-STABILIZED SAND BACKFILL FOR PIPES 54-INCH AND LARGER, FROM 1-FOOT ABOVE THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE. CONTRACTOR MAY BACKFILL WITH SUITABLE MATERIAL, PROVIDED THE BACKFILL MATERIAL IS PLACED IN 8-INCH LIFTS AND MECHANICALLY COMPACTED TO 95% STANDARD PROCTOR DENSITY. TESTS SHALL BE TAKEN AT 100-FOOT INTERVALS ON EACH LIFT. BEDDING AND BACKFILL TO 1-FOOT ABOVE THE TOP OF THE PIPE SHALL BE CEMENT-STABILIZED SAND.
5. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION, (713-956-3071), AND WRITTEN NOTIFICATION 48 HOURS IN ADVANCE.
7. CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT."
8. ALL STORM SEWER MANHOLE RIMS LOCATED OUTSIDE THE PROPOSED PAVING SHALL BE SET TO PROPOSED FINISH GRADE ELEVATION.
9. BEFORE UTILITY CONSTRUCTION BEGINS, ADEQUATE DRAINAGE MUST BE PROVIDED SO THAT NO SHEET FLOW FLOODING OF ROADWAY OR ADJOINING PROPERTIES OCCURS.
10. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
11. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE FINAL DRAFT OF STORMWATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES AS PREPARED BY HARRIS COUNTY/HCFCD, AND THE CITY OF HOUSTON ALL IN COMPLIANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS.
12. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB, SHALL BE AS GOOD AS OR BETTER THAN THE CONDITION PRIOR TO STARTING WORK.

GENERAL NOTES - WATER

1. ALL WATER LINES TO HAVE A MINIMUM OF FOUR (4) FEET OF COVER TO TOP OF CURB.
2. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD SPECIFICATIONS AND STANDARD CONSTRUCTION DETAILS FOR WASTE WATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" SEPTEMBER 1997.
3. ALL A.C. WATER MAINS USED IN THIS PROJECT RANGING IN SIZE FROM 6 INCHES THRU 16 INCHES SHALL BE AWWA C-400-80 CLASS 200 OR LATEST REVISION WITH MAXIMUM PIPE LENGTH OF 6 FEET 6 INCHES.
4. ALL WATER MAINS UNDER STREET PAVEMENT - 4 INCHES THRU 12 INCHES IN DIAMETER, IF NOT SPECIFIED OTHERWISE, SHALL BE AWWA C-900 PVC PIPE.
3. ALL FLUSHING VALVES SHALL BE SET THREE (3) FEET BEHIND BACK OF CURB.
6. STEEL WATER LINE SECTION TO EXTEND A OF FIVE (5) FEET MINIMUM BEYOND 45' BENDS.
7. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
8. WHENEVER SANITARY SEWERS CROSS UNDER WATER MAINS, A 6" MINIMUM CLEARANCE IS REQUIRED. WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, A 2' MINIMUM CLEARANCE IS REQUIRED. ONE 18' JOINT OF DUCTILE PIPE SHALL BE INSTALLED IN THE SEWER LINE AND CENTERED AT THE WATER LINE CROSSING.
9. 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.
10. WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, AND THE OUT-TO-OUT PIPE CLEARANCE IS LESS THAN 24", A CENTERED 18' JOINT OF DUCTILE IRON PIPE SHALL BE USED.
11. WHENEVER WATER MAINS CROSS UNDER SANITARY SEWERS, AND THE MINIMUM PIPE CLEARANCE IS 2' OR GREATER, BUT LESS THAN 9', A CENTERED 20' OF CEMENT STABILIZED SAND BACKFILL (2 SACKS OF CEMENT PER CUBIC YARD OF SAND) STARTING AT A POINT 1/4 OF THE PIPE DIAMETER ABOVE THE BOTTOM OF SANITARY SEWER TO 1-FOOT ABOVE THE TOP OF SANITARY SEWER, OR ONE SANITARY DIAMETER, WHICHEVER IS LARGER. CENTER ONE JOINT OF SANITARY SEWER PIPE ABOUT THE WATER MAIN.
12. ALL P.V.C. WATER MAINS SHALL BE F C-900, DR 18, CLASS 150.
13. ALL WATER METERS MUST HAVE INDIVIDUAL SERVICE LEADS AS PER CITY OF HOUSTON STANDARDS.

STANDARD HCFCD NOTES

1. Harris County Flood Control District, Watershed Management Department, shall be notified at least 48 hours prior to construction (713-956-3075).
2. Engineer shall submit letter to Harris County Flood Control District, Watershed Management Department, 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.
3. Contractor shall be responsible for protecting, maintaining and restoring backslope drainage systems.
4. All disturbed areas within the Harris County Flood Control District right-of-way, except the changed bottom, shall be hydro-mulch seeded as per Harris County Flood Control specification entitled "Hydro-Mulch Seeding" or approved equal.
5. Backfill to be compacted in no greater than 1 foot lifts to the density of the undisturbed adjacent soil.
6. Contractor shall be responsible for excavating channel flowline to design elevation as shown on plans and downstream as necessary to insure no water in storm sewer during "dry" conditions.
7. Contractor shall be responsible for maintaining flow in channel during construction and restoring channel to original condition.
8. All excavated material is to be removed from the HCFCD right-of-way. No fill is to be placed within a designated flood plain areas without first obtaining a fill permit.
9. Contractor, with the assistance of the Engineer if necessary, shall be responsible for obtaining all applicable City, County, State, and Federal permits.

GENERAL NOTES - PAVING

1. 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.
2. GUIDELINES SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
3. ALL RADII AT CURB RETURNS TO BE 25.0' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION, (713-956-3071), AND WRITTEN NOTIFICATION 48 HOURS IN ADVANCE.
5. STOP SIGN (R1 - 1A) TO BE PLACED AT INTERSECTIONS.
6. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY FOR CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN COUNTY ROAD R.O.W.
7. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT. PRIOR TO STARTING CONSTRUCTION.
8. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY AND/OR CULVERTS WITHIN COUNTY ROAD RIGHTS OF WAY.

NOTE:

FORMAL "NOTIFICATION" APPROVED BY COMMISSIONERS COURT REQUIRED PRIOR TO CONSTRUCTION OF UTILITIES WITHIN HARRIS COUNTY R.O.W. CONTACT HARRIS COUNTY PERMIT OFFICE AT (713) 956-3565. CONSTRUCTION TO BE IN ACCORDANCE WITH SPECIFICATIONS DETAILED IN THE APPLICABLE HARRIS COUNTY COMMISSIONERS COURT ORDER.

△			
△			
△			
Rev.	Date	Description	App.

PRIVATE UTILITY LINES SHOWN	
<i>R. Young</i>	6-15-99
RELIANT ENERGIES, INC./ENTEX	
<i>Nike Balim</i>	7/1/99
SOUTHWESTERN BELL TELEPHONE CO.	
Valid for One Year Only	
<i>R. Young</i>	6-15/99
RELIANT ENERGIES, INC./H.L.&P. CO.	
Approval Only for Crossing Underground	
Ductlines Unless Noted. Valid at Time of Review Only.	

**CITY OF HOUSTON**  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

PRIVATELY FUNDED PUBLIC WORKS	REVIEWED BY	CITY FUNDED PUBLIC WORKS
<i>Nike Balim 7-23-00</i>		
WATER		PROJECT MANAGER
<i>Nike Balim 7-23-00</i>		
WASTEWATER		CONSTRUCTION
<i>Nike Balim 7-23-00</i>		
STORM WATER		CHIEF ENGINEER
STREET AND BRIDGE		

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT
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CITY ENGINEER	DATE
<i>Mike Balim</i>	
DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE

SUBMITTED:	DESIGNED BY: BOBBY WILSON
SCALE: 1" = 1'	DRAWN BY: BILL DORRIS
DATE: JUNE 1999	SHEET NO. 2 OF 18 SHEETS
SURVEY BY:	CITY DWG. NO. NOTED DWG
F B NO: 464J & 464P	

GENERAL NOTES

PRIVATE UTILITY COMPANY NOTES

Houston Lighting and Power Company

Overhead lines may exist on the property. We have not attempted to mark those lines since they are clearly visible, but you should locate them prior to beginning any construction. Texas Law, Section 752, Health & Safety Code, forbids all activities in which persons or things MAY come within six (6) feet of live overhead high voltage lines. Contractors and owners are legally responsible for safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or moved, call HL&P at 228-7400.

Entex

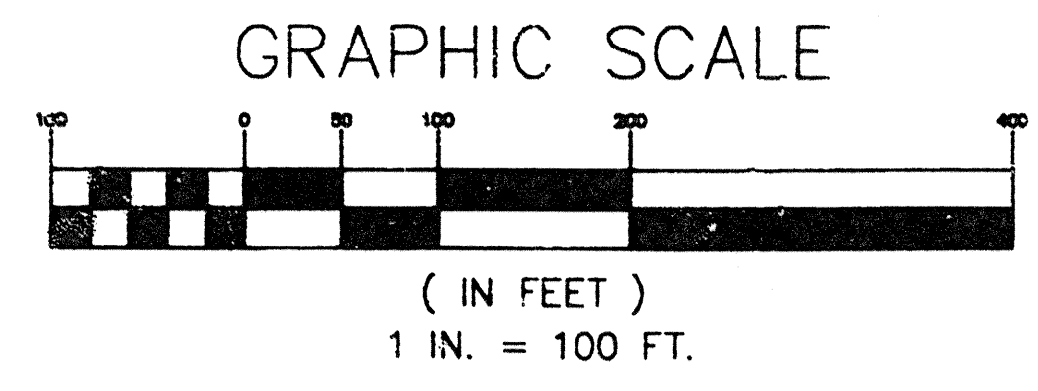
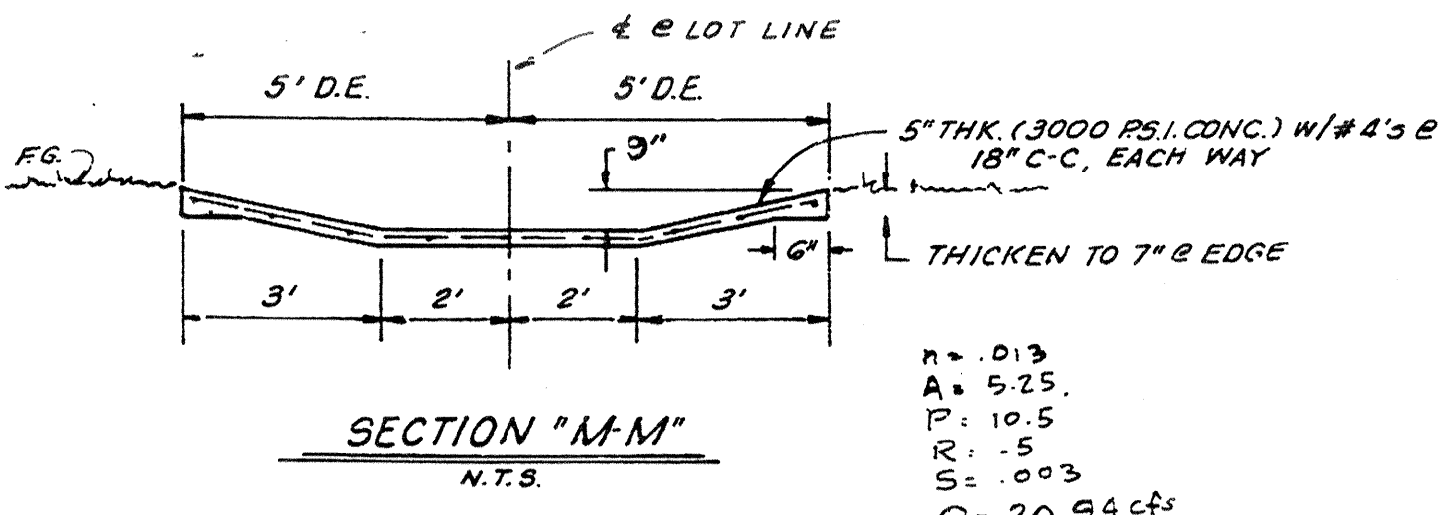
Location of Entex main lines (to include United Gas Transmission, and/or Industrial Gas Supply Corporation where applicable) are shown in an approximate location only. Service lines are usually not shown. The contractor shall contact the Utility Coordinating Committee at 223-4567 or 1-800-669-8344 a minimum of 48 hours prior to construction to have main and service lines field located. The contractor shall determine the exact location before commencing work and agree to be fully responsible for any damages caused by his failure to exactly locate and preserve these underground facilities.

Southwestern Bell Telephone Company

The locations of Southwestern Bell Telephone Co. utilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve these underground utilities.







**BENCH MARK**

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER  
 Y216, 1973 ADJ. ELEV. = 123.994  
 Y216, 1978 ADJ. ELEV. = 123.406  
 Y216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CITTEN ROAD)

ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14\"/>

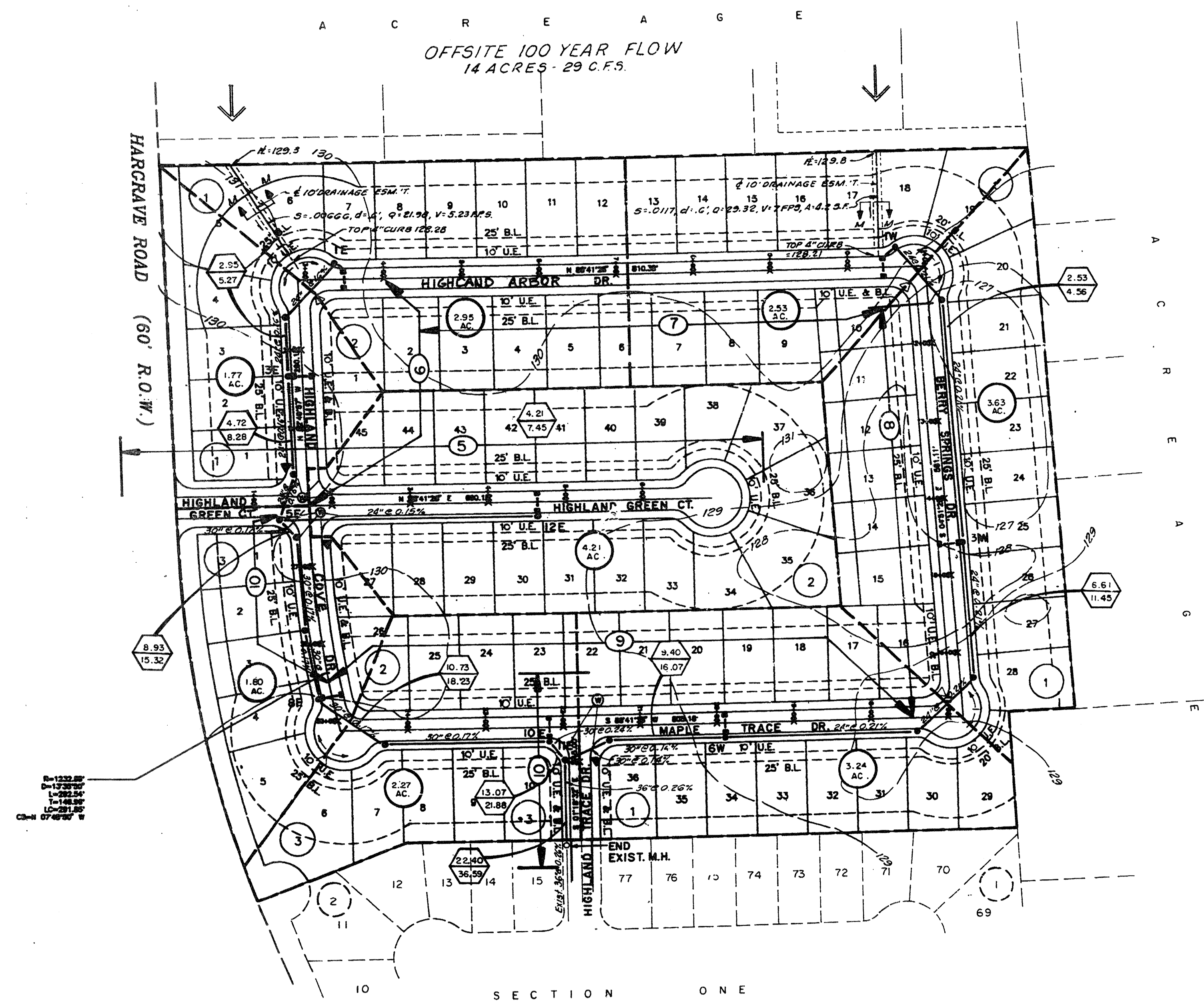
ELEVATION = 728.50

TM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200\"/>

ELEVATION = 130.62

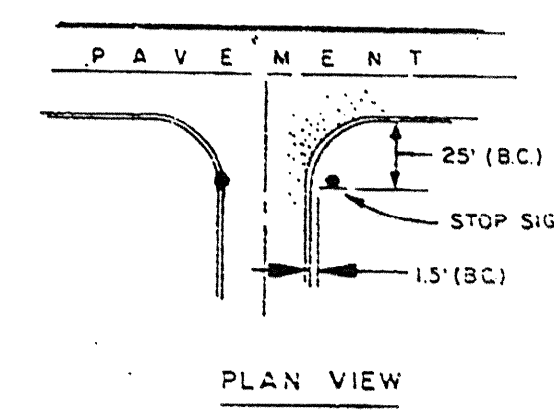
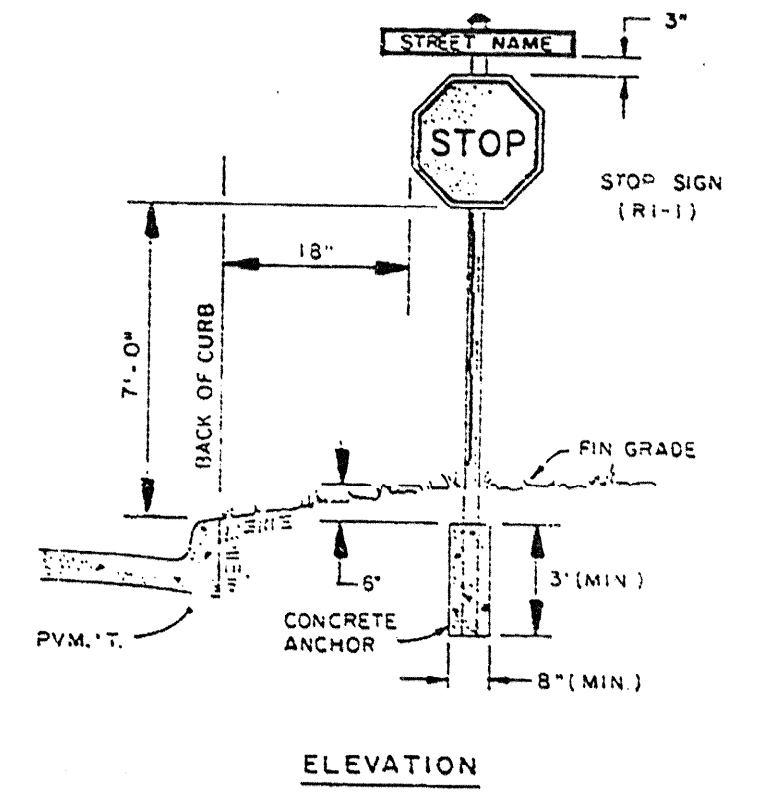
TM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DOTSON ROAD & HARGRAVE ROAD  
 ELEVATION = 128.0+

TM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13529 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GRAVEL DRIVE FROM 13527 HARGRAVE ROAD  
 ELEVATION = 130.56



**NOTE:**  
**SERVICE AREA:**  
 Offsite Drainage thru Section 2: 14.0 Ac  
 Section 2 Acreage: 28.53 Ac  
 Total flow in Sect 2 system: 36.53 Ac

Section 2 Drainage goes thru Sect 1 Storm Sewer System into Detention Pond No. 1 thence into Greens Bayou thru existing Outfall facilities. See Sheet 3B.  
 Construction of Sect. 1 & Pond 1 is Complete.



STOP SIGN DETAIL (R1-1)  
 N.T.S.

- LEGEND:**
- EXISTING M.H.
  - PROP. M.H.
  - PROP. "B-B" INLET.
  - ▲ STREET NAME SIGN LOCATION.
  - ▲ COMBINATION STOP SIGN & STREET NAME SIGN LOCATION.
  - ⊙ WHEEL CHAIR RAMP LOCATION.
  - STREET NAME CHANGE LOCATION.
  - EXIST. CONTOUR

INTERPRISE NO OBJECTION  
 FINAL APPROVAL BY OTHERS  
*sa. Paul*  
 Harris County Flood Control District  
 4/26/2000  
 Date THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY



Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

<i>R. Ryan</i>	6/15/99
RELIANT ENERGIES, INC./ENTEX	
<i>Mike Balin</i>	7/7/99
SOUTHWESTERN BELL TELEPHONE CO.	
Valid for One Year Only	
<i>R. Ryan</i>	6/15/99
RELIANT ENERGIES, INC./N.L.B.P. CO.	
Approval Only for Crossing Underground Ductlines Unless Noted. Valid at Time of Review Only.	

**CITY OF HOUSTON**  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY	
PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
<i>Walter Balin 3-23-00</i>	
WATER	
<i>Madd 3-23-00</i>	
WASTEWATER	PROJECT MANAGER
<i>Madd 3-23-00</i>	
STORM WATER	CONSTRUCTION
	CHIEF ENGINEER

**OTHER APPROVAL**

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT
CITY ENGINEER	DATE
<i>Madd</i>	
DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE

SUBMITTED: PROVIDENT C.I.	DESIGNED BY: BOBBY WILSON
SCALE: 1" = 100'	DRAWN BY: BILL DORRIS
DATE: JUNE 1999	SHEET NO. 3 OF 18 SHEETS
SURVEY BY:	CITY DWG. NO.
F B NO:	

**HIGHLAND TIMBERS SECTION TWO**  
**STORM SEWER**  
**AND**  
**EXTREME EVENT**  
**OVERALL LAYOUT**

**PCI** PROVIDENT CONSULTING, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019



NOTE:  
 THIS TRACT IS IN ZONE "X" AS PER FEMA FLOOD INSURANCE RATE MAP PANEL NO. 48201C0245 J, HARRIS COUNTY, TX, REVISED NOV. 8, 1996. ZONE "X" IS DESCRIBED AS BEING OUTSIDE THE 500 YR. FLOODPLAIN.

CITY OF HOUSTON STORM SEWER CALCULATION FORM

Project: Highland Timbers, Sections One and Two  
 Job No.: 461U/464U  
 By: Bobby Wilson  
 Date: 06/22/99

MH From	M.H. To	Area (acres)	Runoff Coefficient C	Sum of CA	Intensity I (in/hr)	Sum of Flows (cfs)	Time of Conc. (minutes)	Reach Length (feet)	Diameter or Rise (inches)	Span (inches)	Slope %	Manning's "n"	Design Capacity (cfs)	Design Velocity (ft/s)	Fall (feet)	Manhole Drop (feet)	Flowline Elevation Upstream (feet)	Flowline Elevation Downstream (feet)	Actual Velocity (ft/s)	Hydraulic Gradient (ft/s)	Change In Head (feet)	Elevation of Hyd. Grad. Upstream (feet)	Elevation of Hyd. Grad. Downstream (feet)	Natural Ground Upstream (feet)	Natural Ground Downstream (feet)
SECTION 2																									
1E	3E	2.95	0.55	1.62	3.250	5.27	27.00	175	24	24	0.16	0.013	9.6	3.10	0.28	0	124.06	123.78	2.32	0.063	0.11	125.42	125.31	130.2	130.0
3E	5E	4.72	0.55	2.59	3.190	8.28	27.25	237	24	24	0.16	0.013	9.6	3.10	0.38	0	123.78	123.40	3.27	0.160	0.38	125.28	124.90	130.0	129.8
12E	5E	4.21	0.55	2.32	3.220	7.45	27.75	333	24	24	0.15	0.013	9.5	3.00	0.50	0.50	122.90	122.40	2.37	0.106	0.36	125.10	124.74	129.7	129.8
5E	8E	6.93	0.55	4.91	3.120	15.32	29.11	241	30	30	0.17	0.013	18.0	3.70	0.41		121.90	121.49	3.12	0.141	0.34	124.74	124.40	129.8	129.7
8E	10E	10.73	0.55	5.90	3.090	18.23	30.18	317	30	30	0.17	0.013	18.0	3.70	0.54		121.49	120.95	3.71	0.199	0.63	124.37	123.74	129.7	129.8
10E	11E	13.00	0.55	7.15	3.060	21.88	30.71	25	30	30	0.24	0.013	23.0	4.40	0.06		120.95	120.89	4.46	0.280	0.07	123.69	123.62	129.8	129.4
11E	END	22.40	0.55	12.32	2.970	36.59	32.31	111	36	36	0.26	0.013	36.5	5.00	0.29	0.50	120.39	120.10	5.18	0.297	0.33	123.56	123.23	129.4	129.4
1W	4W	2.53	0.55	1.39	3.275	4.56	26.78	290	24	24	0.21	0.013	11.5	3.60	0.61		124.00	123.39	1.61	0.038	0.11	125.69	125.58	130.5	128.0
4W	7W	6.61	0.55	3.63	3.150	11.45	28.82	523	24	24	0.21	0.013	11.5	3.60	1.10	0.08	123.31	122.21	3.65	0.256	1.34	125.55	124.21	128.0	128.7
7W	11E	3.40	0.55	5.17	3.110	16.07	29.41	214	30	30	0.14	0.013	17.0	3.35	0.30	0.50	121.71	121.40	3.57	0.140	0.30	123.86	123.56	128.7	129.4
SECTION 1 22.4 Ac Enters Section 1																									
11E	28	22.40	0.55	12.32	2.975	36.65	32.31	220	36	36	0.20	0.013	32.0	6.50	0.43		120.39	119.96	1.39	0.018	0.04	123.21	123.17	129.4	129.8
25	28	3.46	0.55	1.90	3.240	6.15	27.30	386	24	24	0.17	0.013	10.0	3.20	0.58		122.41	121.83	2.98	0.127	0.49	123.66	123.17	128.1	129.4
24	28	2.11	0.55	1.16	3.300	3.83	26.50	127	24	24	0.17	0.013	10.0	3.20	0.20		123.00	122.80	2.72	0.150	0.19	123.92	123.73	129.2	129.4
28	23	28.59	0.55	15.72	2.940	46.22	33.00	72	42	42	0.21	0.013	48.0	5.10	0.15	0.50	119.46	119.31	4.60	0.208	0.15	123.17	123.02	129.4	128.3
23	21	29.27	0.55	16.10	2.930	47.17	33.05	275	42	42	0.21	0.013	48.0	5.10	0.45		119.31	118.86	4.90	0.218	0.60	122.96	122.38	128.3	128.7
18	20	1.76	0.55	0.97	3.340	3.23	26.25	142	24	24	0.17	0.013	10.0	3.20	0.18		122.75	122.57	2.36	0.106	0.15	123.65	123.50	129.0	128.8
20	21	2.54	0.55	1.40	3.290	4.60	26.70	29	24	24	0.17	0.013	10.0	3.20	0.07		122.57	122.50	3.34	0.241	0.07	123.47	123.40	128.8	128.8
21	9	31.81	0.55	17.49	2.930	51.26	35.85	210	42	42	0.24	0.013	52.0	5.50	0.50		118.86	118.35	5.76	0.233	0.49	121.91	121.42	128.8	128.6
17	15	2.35	0.55	1.29	3.300	4.26	26.51	336	24	24	0.17	0.013	10.0	3.20	0.28		122.92	122.66	1.57	0.033	0.11	124.53	124.42	128.0	128.2
15	11	3.58	0.55	0.97	3.230	6.36	27.45	126	24	24	0.17	0.013	10.0	3.20	0.23		122.41	122.18	2.02	0.063	0.08	124.41	124.33	128.2	128.4
12	13	1.84	0.55	1.01	3.320	3.36	26.35	108	24	24	0.17	0.013	10.0	3.20	0.18		122.70	122.52	1.13	0.019	0.02	124.49	124.47	127.8	128.0
13	17	2.92	0.55	1.61	3.260	5.24	27.00	194	24	24	0.17	0.013	10.0	3.20	0.34		122.52	122.18	1.68	0.052	0.10	124.46	124.36	128.0	128.4
11	10	6.50	0.55	3.57	3.150	11.26	28.77	207	24	24	0.17	0.013	10.0	3.20	0.36		122.18	121.82	3.58	0.246	0.51	124.33	123.82	128.4	128.6
9	9	8.17	0.55	4.49	3.120	14.02	29.45	61	30	30	0.17	0.013	18.0	3.70	0.10	0.50	121.32	121.22	3.78	0.164	0.10	123.09	122.99	128.6	128.6
6	5	39.98	0.55	21.99	2.880	63.32	34.21	328	48	48	0.18	0.013	64.0	5.40	0.58	0.50	117.85	117.26	5.42	0.177	0.58	121.36	120.78	128.6	130.5
6	5	2.28	0.55	1.25	3.300	4.14	26.50	152	24	24	0.17	0.013	10.0	3.20	0.23		122.70	122.47	2.75	0.145	0.22	123.67	123.45	130.5	128.1
5	3	42.48	0.55	23.64	2.870	67.84	34.40	253	48	48	0.21	0.013	70.0	5.50	0.53		117.26	116.73	5.80	0.206	0.52	120.70	120.18	130.5	128.2
3	D.P.	45.36	0.55	24.95	2.860	71.36	34.50	255	48	48	0.24	0.013	75.0	6.00	0.61	0.62	116.11	115.50	5.68	0.239	0.61	120.11	119.50	130.5	127.4
BRETON RIDGE STREET Sedona Woods Subdivision Enters - 28.97 Ac + 4.566 of Apts. at MH 1B; 10.24 Ac of Apts. at MH 2B																									
38	36	33.53	0.59	19.78	2.910	57.60	33.56	450	54	54	0.10	0.013	65.0	4.00	0.45		116.17	115.72	3.68	0.076	0.34	120.48	120.14	127.3	127.9
36	35	43.77	0.63	27.57	2.860	79.10	34.45	173	54	54	0.15	0.013	80.0	5.00	0.25		115.72	115.46	5.02	0.145	0.25	120.08	119.83	127.9	127.7
35	32	44.83	0.63	28.24	2.850	81.05	34.50	217	54	54	0.15	0.013	80.0	5.00	0.32		115.46	115.13	5.17	0.147	0.32	119.77	119.45	127.7	128.0

Key  
 W West  
 E East  
 D.P. Detention Pond

CITY OF HOUSTON  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS WATER  
 CITY FUNDED PUBLIC WORKS WASTEWATER

PROJECT MANAGER

CONSTRUCTION

CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION SPONSOR DEPARTMENT

CITY ENGINEER DATE  
 DIRECTOR OF PUBLIC WORKS AND ENGINEERING DATE

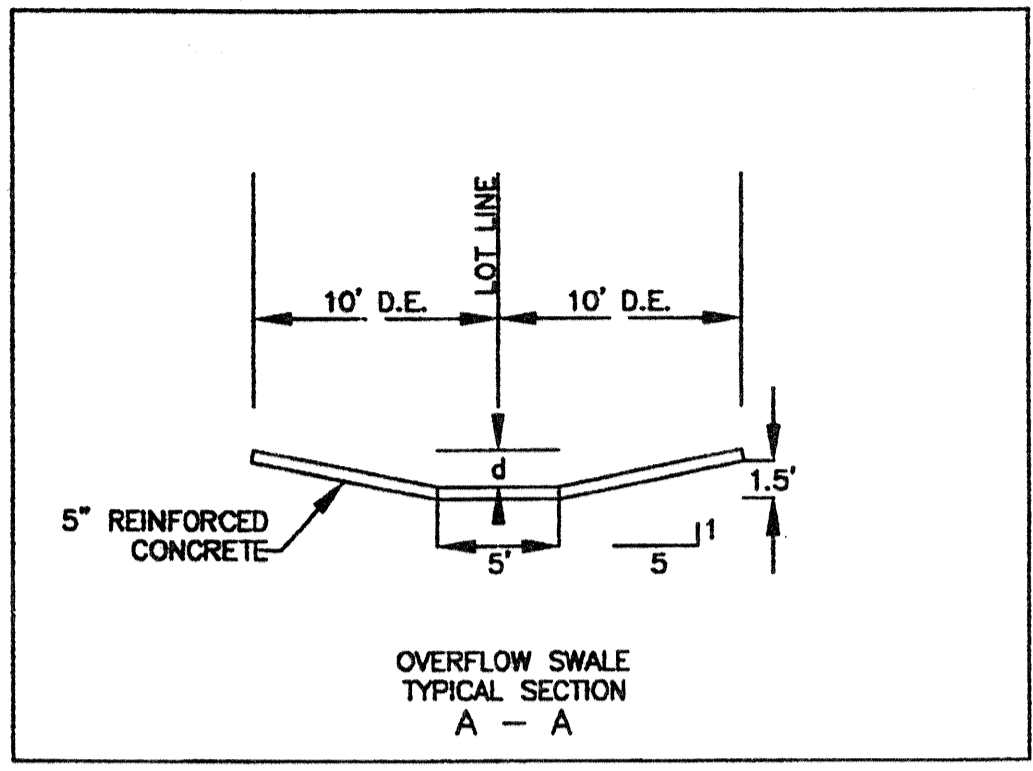
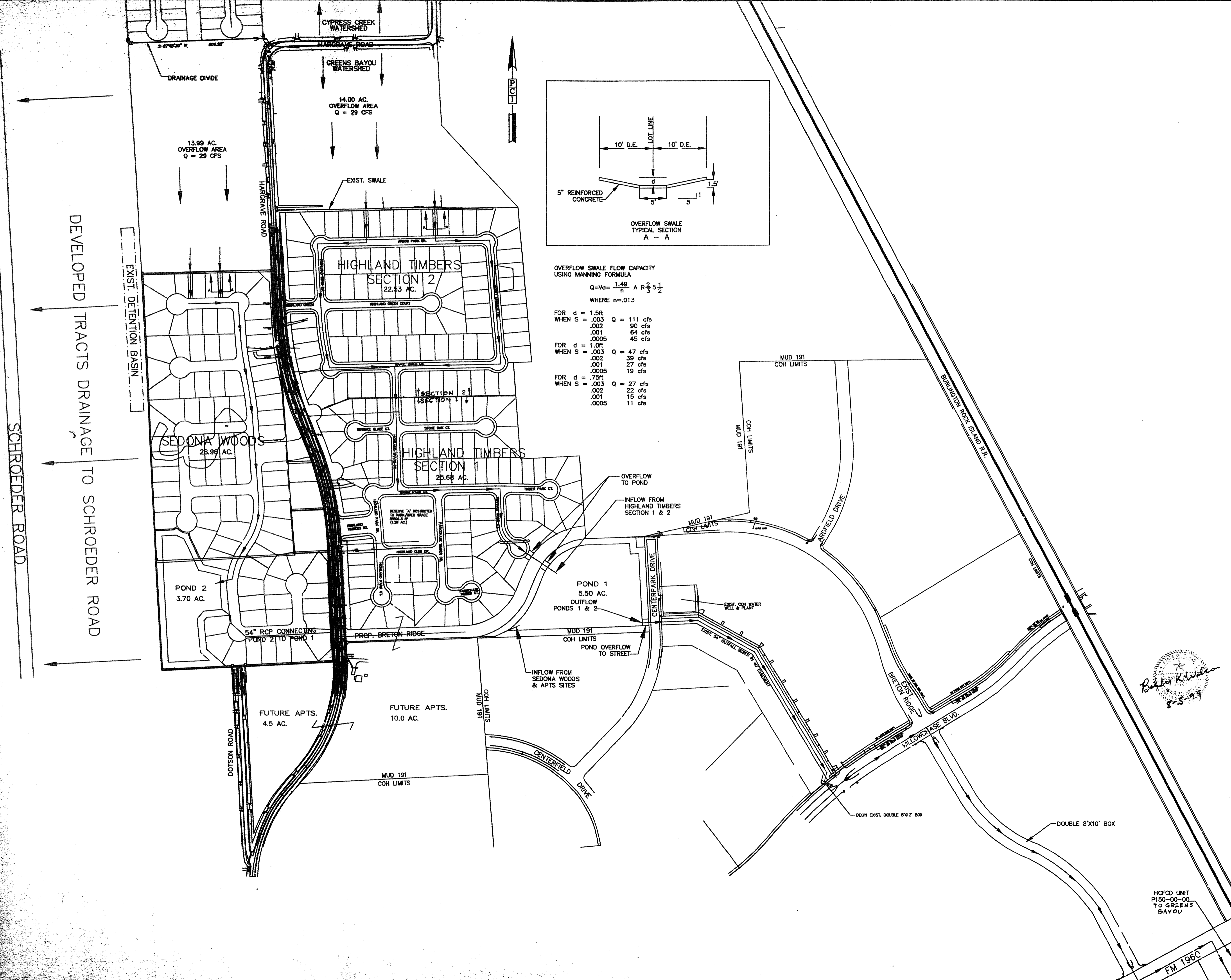
SUBMITTED: \_\_\_\_\_ DESIGNED BY: \_\_\_\_\_  
 SCALE: N/A DRAWN BY: \_\_\_\_\_  
 DATE: JUNE 1999 SHEET NO. 3A OF 16 SHEETS  
 SURVEY BY: \_\_\_\_\_ CITY DWG. NO.: \_\_\_\_\_  
 F B NO.: \_\_\_\_\_

HARRIS COUNTY MUD 191  
 HIGHLAND TIMBERS  
 SECTION 1 & 2  
 STORM SEWER  
 CALCULATIONS

PCI PROVIDENT CONSULTANT, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019







OVERFLOW SWALE FLOW CAPACITY USING MANNING FORMULA

$$Q = Va = \frac{1.49}{n} A R^{2/3} S^{1/2}$$

WHERE  $n = .013$

FOR d = 1.5ft	Q = 111 cfs
WHEN S = .003	90 cfs
.002	64 cfs
.001	45 cfs
.0005	
FOR d = 1.0ft	Q = 47 cfs
WHEN S = .003	39 cfs
.002	27 cfs
.001	19 cfs
.0005	
FOR d = .75ft	Q = 27 cfs
WHEN S = .003	22 cfs
.002	15 cfs
.001	11 cfs
.0005	

BENCH MARK

Rev.	Date	Description	App.

PRIVATE UTILITY LINES SHOWN

*R. Yancy* 6.15.99  
 RELIANT ENERGIES, INC./ENTEX  
*Mike Bolin* 7/7/99  
 SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only  
*R. Yancy* 6.15.99  
 RELIANT ENERGIES, INC./H.L.A.P. CO.  
 Approved Only for Crossing Underground  
 Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY	CITY FUNDED PUBLIC WORKS
<i>Victor Salinas</i> 3-23-00 WATER	PROJECT MANAGER
<i>Mike Bolin</i> 7-7-99 WASTEWATER	CONSTRUCTION
<i>Mike Bolin</i> 7-7-99 STORM WATER	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION | SPONSOR DEPARTMENT

CITY ENGINEER | DATE

*W. J. ...* | DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING

SUBMITTED: | DESIGNED BY: BOBBY WILSON

SCALE: 1" = 200' | DRAWN BY: BILL DORRIS

DATE: JUNE 1999 | SHEET NO. 3B OF 18 SHEETS

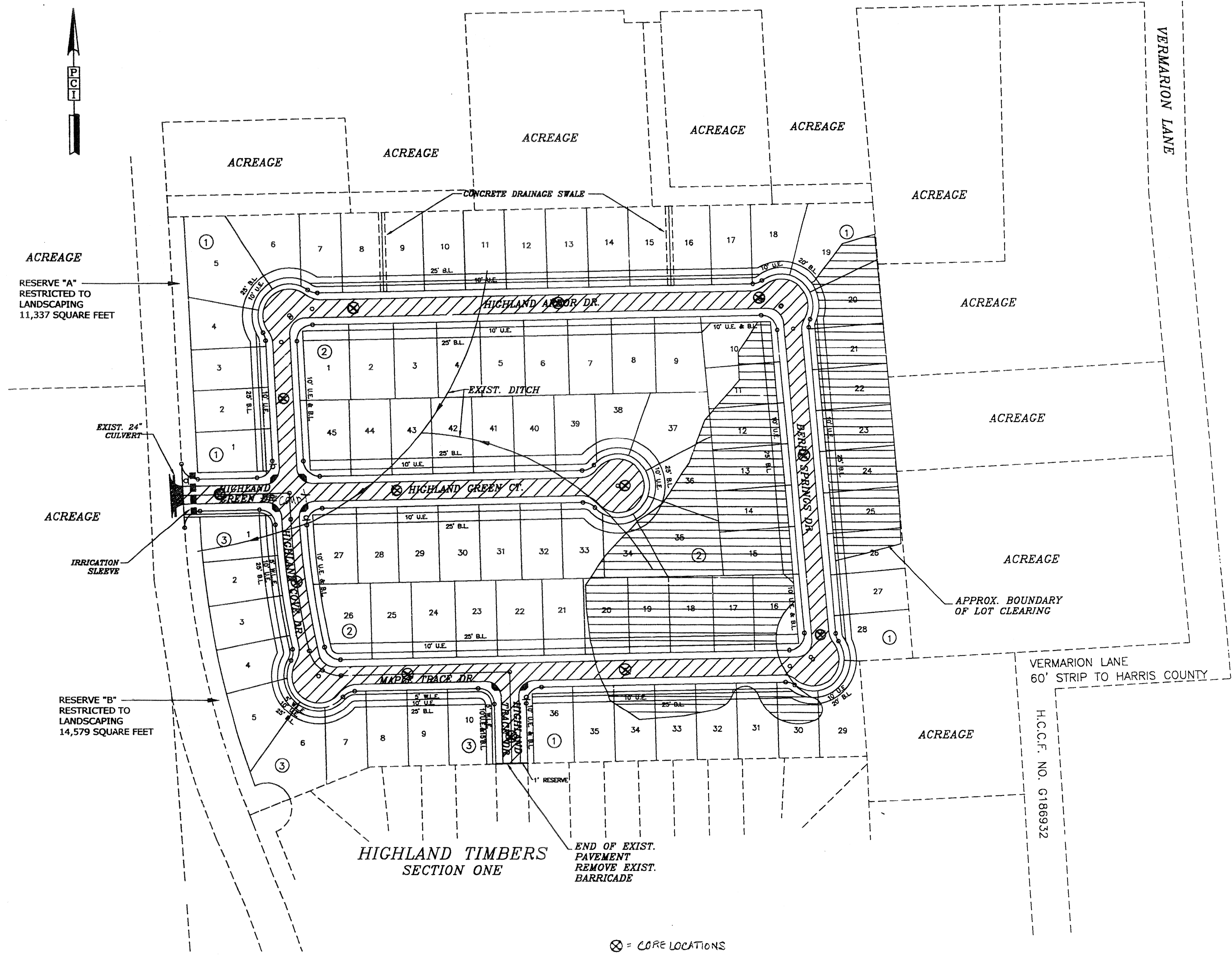
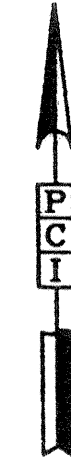
SURVEY BY: | CITY DWG. NO. ARDLA01.DWG

F B NO: 464U & 464P

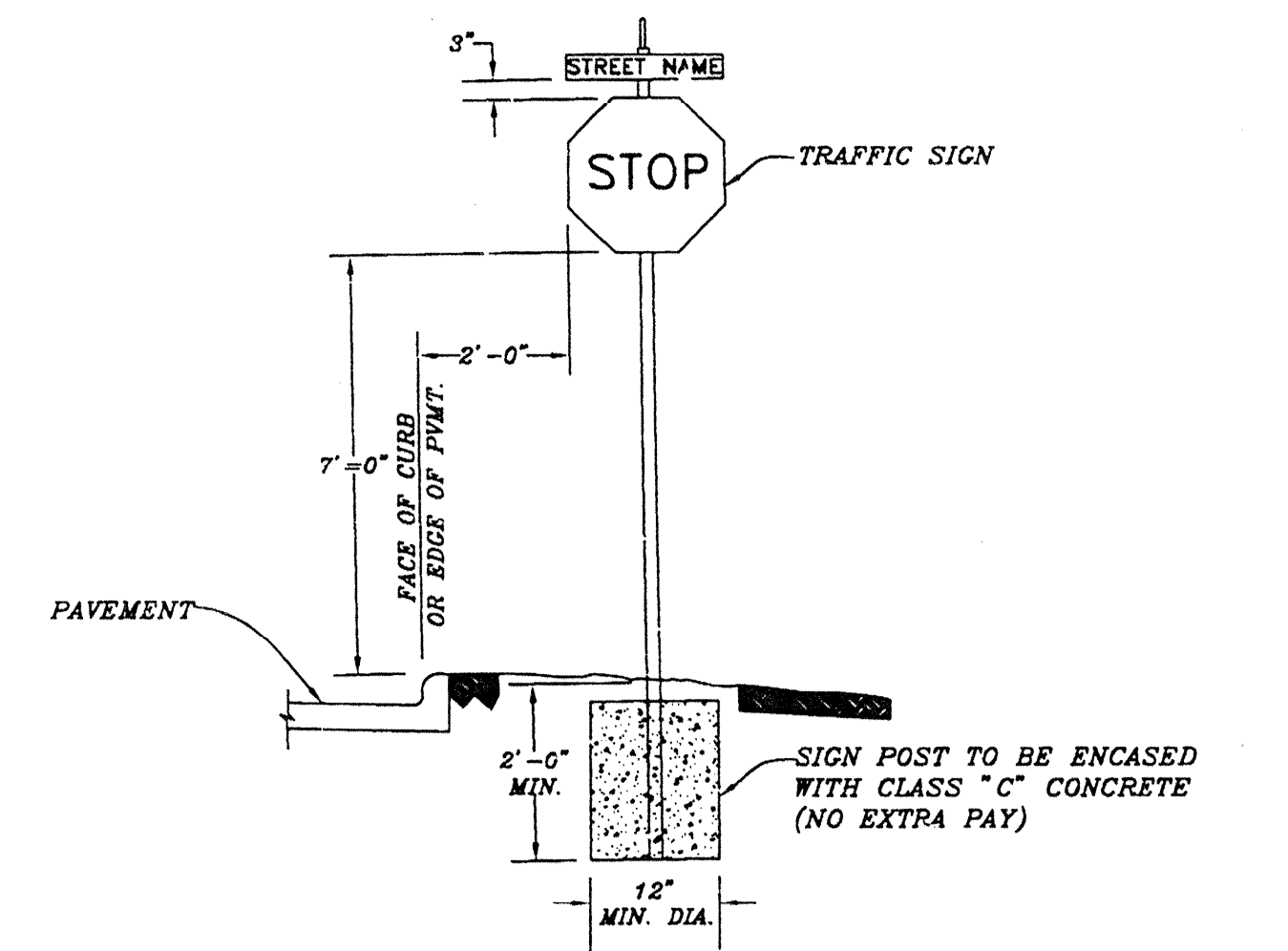
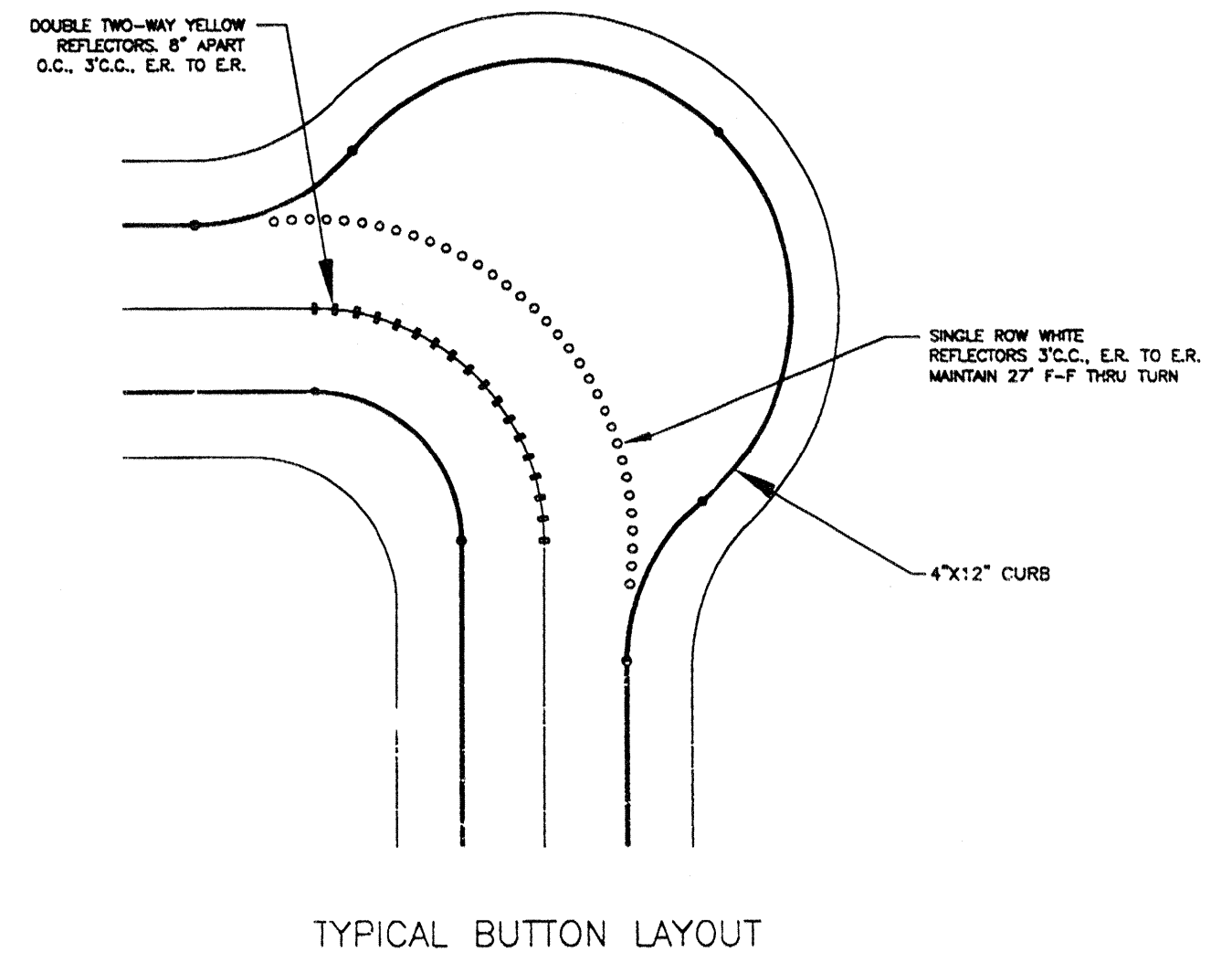
HARRIS COUNTY MUD 191  
 DETENTION FACILITIES  
 to serve  
 HIGHLAND TIMBERS  
 SECTION 1 & 2  
 OVERALL AREA DRAINAGE

**PCI** PROVIDENT CONSULTING, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019

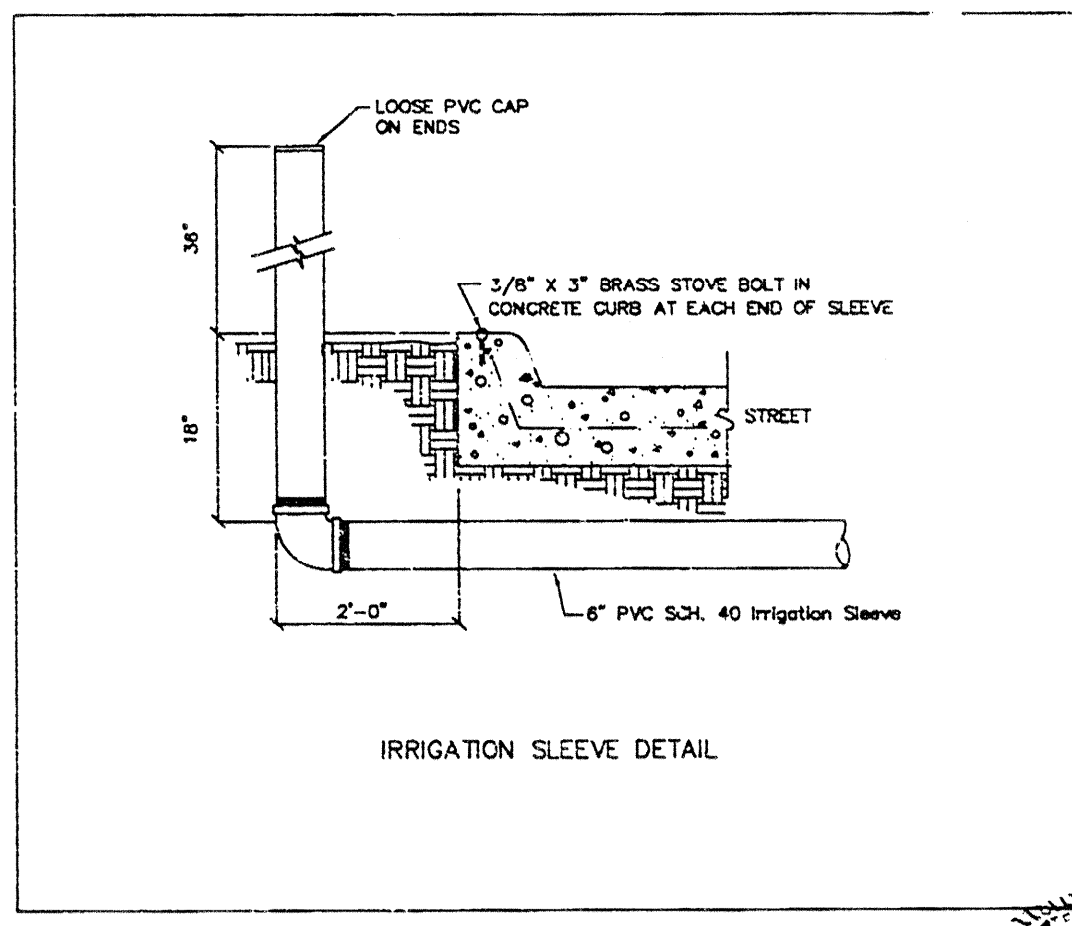




- PAVING QUANTITIES**
- 1. 6" REINFORCED CONCRETE = 12,514.06 sq.yds.
  - 2. ASPHALT TRANSITION = 81.40 sq.yds.
  - 3. AREA TO BE FILLED = 157,947.64 SQ. FT.
  - 4. 4"x12" MONOLITHIC CURBING = 7,209.08 LF
  - 5. SUBGRADE = 13,314.83 sq.yds.
  - 6. EXCAVATION = 10,500 cu.yds.



- NOTES:**
- ALL STOP SIGNS TO BE SIZED AND PLACED AS SHOWN ON PLANS.
  - STREET NAME SIGNS TO BE INSTALLED AT INTERSECTION OF ALL STREETS.



**BENCH MARK**  
 NATIONAL GEODETIC SURVEY MARKER  
 11216, 1973 ADJ. ELEV. = 125.694  
 11216, 1978 ADJ. ELEV. = 125.406  
 11216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTEN ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE  
 ELEVATION = 128.90

TM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET NORTH OF PRIVATE ROAD  
 ELEVATION = 130.62

TM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DUTTON ROAD & HARGRAVE ROAD  
 ELEVATION = 128.04

TM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GRAVEL DRIVE FROM 13827 HARGRAVE ROAD  
 ELEVATION = 130.56

- LEGEND**
- PROPOSED 6" REINFORCED CONCRETE PAVING
  - 2" ASPHALT PAVING WITH 10" LIMESTONE BASE
  - PROPOSED WHEEL CHAIR RAMP
  - STREET/STOP SIGN (R1-1/R1-1A)
  - STANDARD 6" C 3
- NOTE:**  
 INDICATES STANDARD 6" DOWELED-ON CURB. 4"x12" MONOLITHIC CURBS TO BE USED EXCEPT WHERE 6" CURB IS SHOWN. T.C.'S ARE SHOWN FOR 6" CURB, WHERE 4"x12" MONOLITHIC CURB IS PRESENT SUBTRACT 2.0".
- 15" PAVER BAND @ ENTRY
- THIS AREA TO BE BLOCKED OUT BY PAVING CONTRACTOR WITH PREPARED SUBGRADE AND REINFORCING IN PLACE. PATTERNED CONCRETE CONTRACTOR WILL POUR THIS AREA AND LEAVE CURB BARS. THIS AREA IS NOT INCLUDED IN THE PAVING SQUARE YARD QUANTITIES.

- 6" PVC SCH. 40 IRRIGATION SLEEVES (ALIGN W/ LOT LINES AT CUL-DE-SAC AS SHOWN)

**NOTES:**

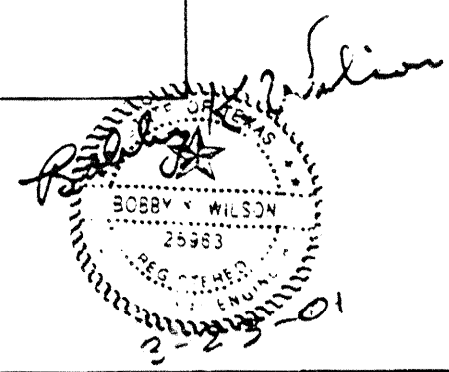
- ALL CURBS TO BE 4"x12"

Rev.	Date	Description	App.

SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: 1" = 100'	DRAWN BY: BILL DORRIS
DATE: MARCH 2001	SHEET NO. 3C OF 18 SHEETS
SURVEY BY:	DWG. NO. OPPHTS2.DWG
JOB NO: 464P	

HARRIS COUNTY MUD 191  
 HIGHLAND TIMBERS  
 SECTION II  
 OVERALL  
 PAVING PLAN

**PCI** PROVIDENT CONSULTING, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019





**BENCH MARK**

BENCH MARK NATIONAL GEODETIC SURVEY MARKER  
 Y1216, 1973 ADJ. ELEV. = 129.804  
 Y1216, 1978 ADJ. ELEV. = 129.408  
 Y1216, 1986 ADJ. ELEV. = 129.394 (THIS ADJUSTMENT WAS USED FOR CUTTER ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TEM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE  
 ELEVATION = 129.80

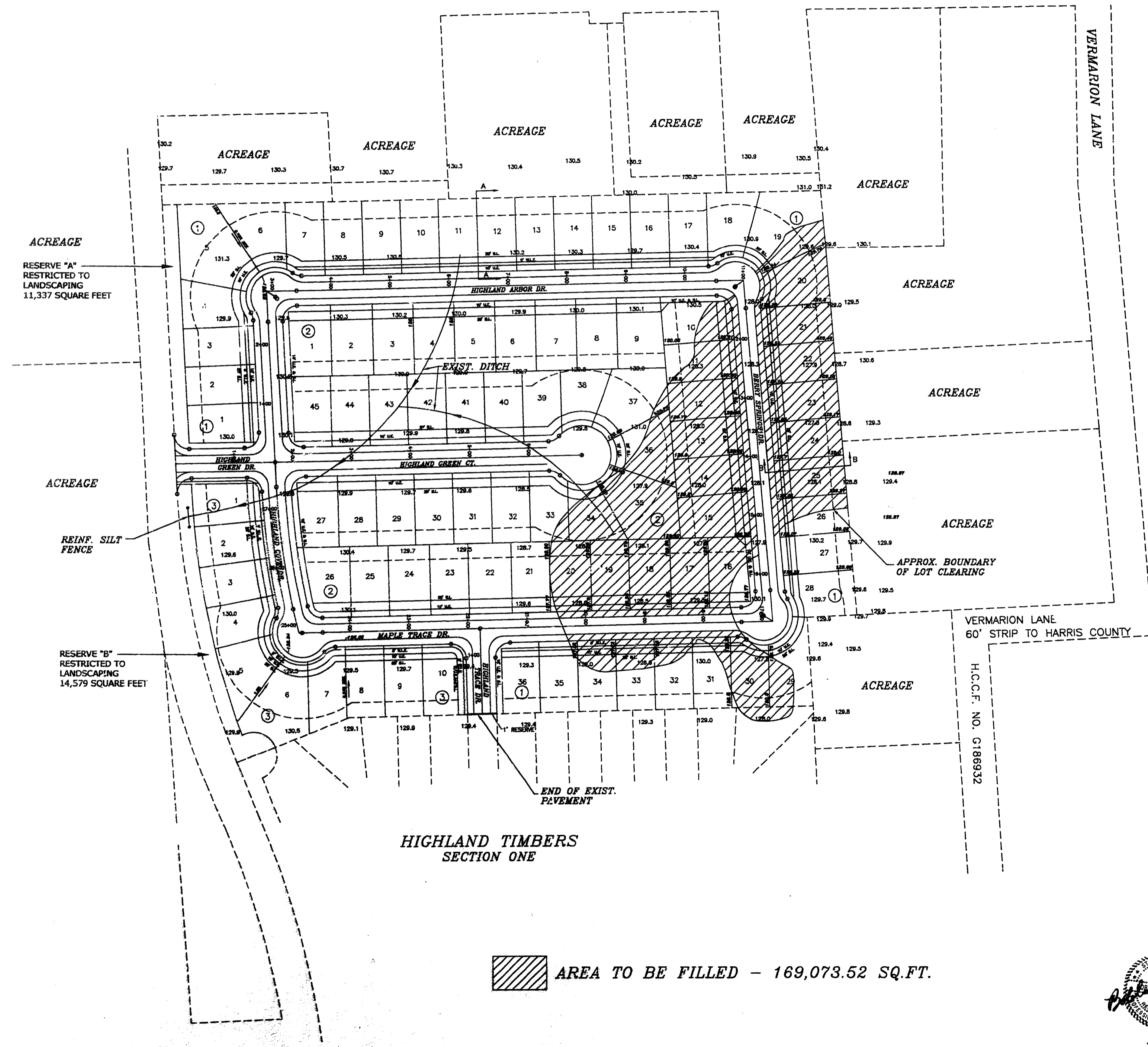
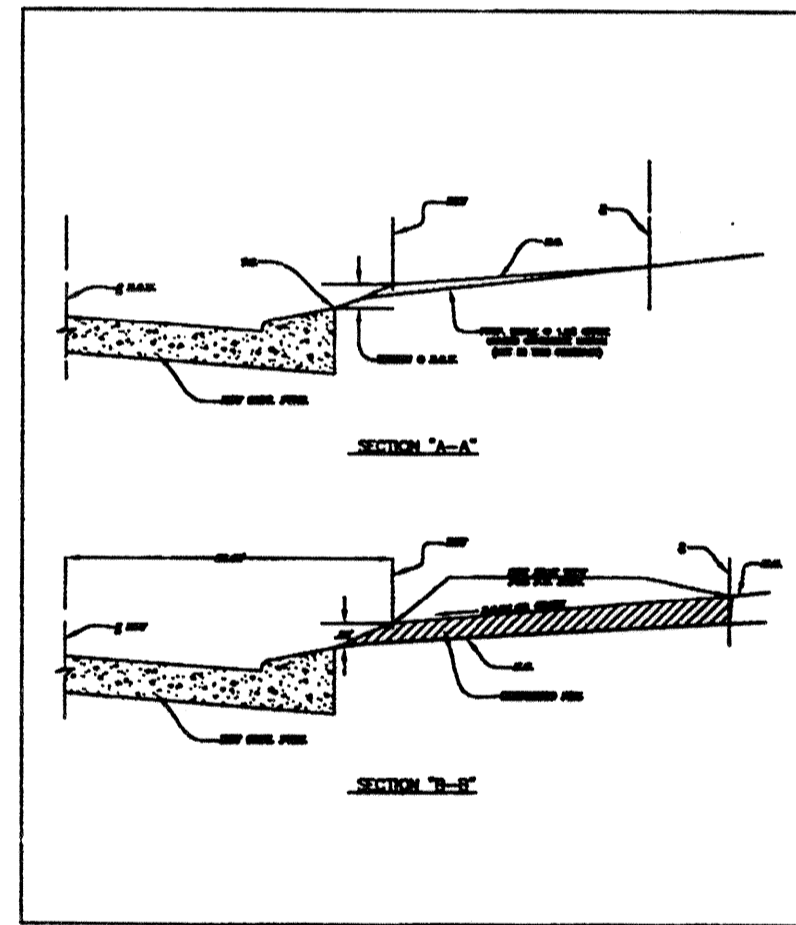
TEM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET NORTH OF PRIVATE ROAD  
 ELEVATION = 129.82

TEM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DORSON ROAD & HARGRAVE ROAD  
 ELEVATION = 129.04

TEM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GROWL DRIVE FROM 13627 HARGRAVE ROAD  
 ELEVATION = 129.56

**NOTES:**

1. Where finished grade elevation are shown in fill area they are for back lot and street ROW line.
2. Good drainage must be maintained in the fill area at all times. Compaction cannot be attained without a drying and draining period after a rain.
3. Compaction density testing must be done on each compacted 6" layer of each lot as the fill progresses.
4. Some clay fill is stockpiled in the fill area. This material is to be used in the filling of the lots but should be mixed with the silty surface material.



**AREA TO BE FILLED - 169,073.52 SQ.FT.**

Rev.	Date	Description	App.

SUBMITTED: \_\_\_\_\_ DESIGNED BY: B K WILSON  
 SCALE: 1" = 100' DRAWN BY: BILL DORRIS  
 DATE: MARCH 2001 SHEET NO. 30 OF 18 SHEETS  
 SURVEY BY: \_\_\_\_\_ DWG. NO. LFPL2.DWG  
 JOB NO: 464P

3-23-01

**HARRIS COUNTY MUD 191  
 HIGHLAND TIMBERS  
 SECTION II  
 LOT & GRADING  
 OVERALL LAYOUT**

**PCI** PROVIDENT CONSULTING, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019



BENCH MARK

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER  
 11216, 1973 ADJ. ELEV. = 125.894  
 11216, 1978 ADJ. ELEV. = 125.406  
 11216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT  
 WAS USED FOR CUTTEN ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

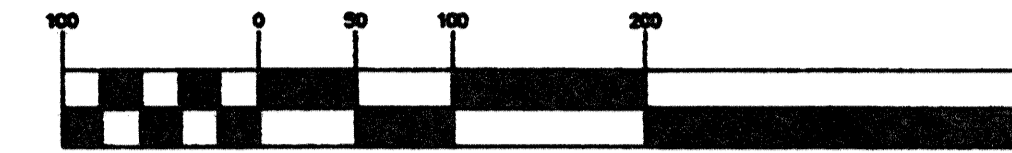
TRM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW  
 APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE.  
 ELEVATION = 128.80

TRM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE  
 WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET  
 NORTH OF PRIVATE ROAD.  
 ELEVATION = 130.82

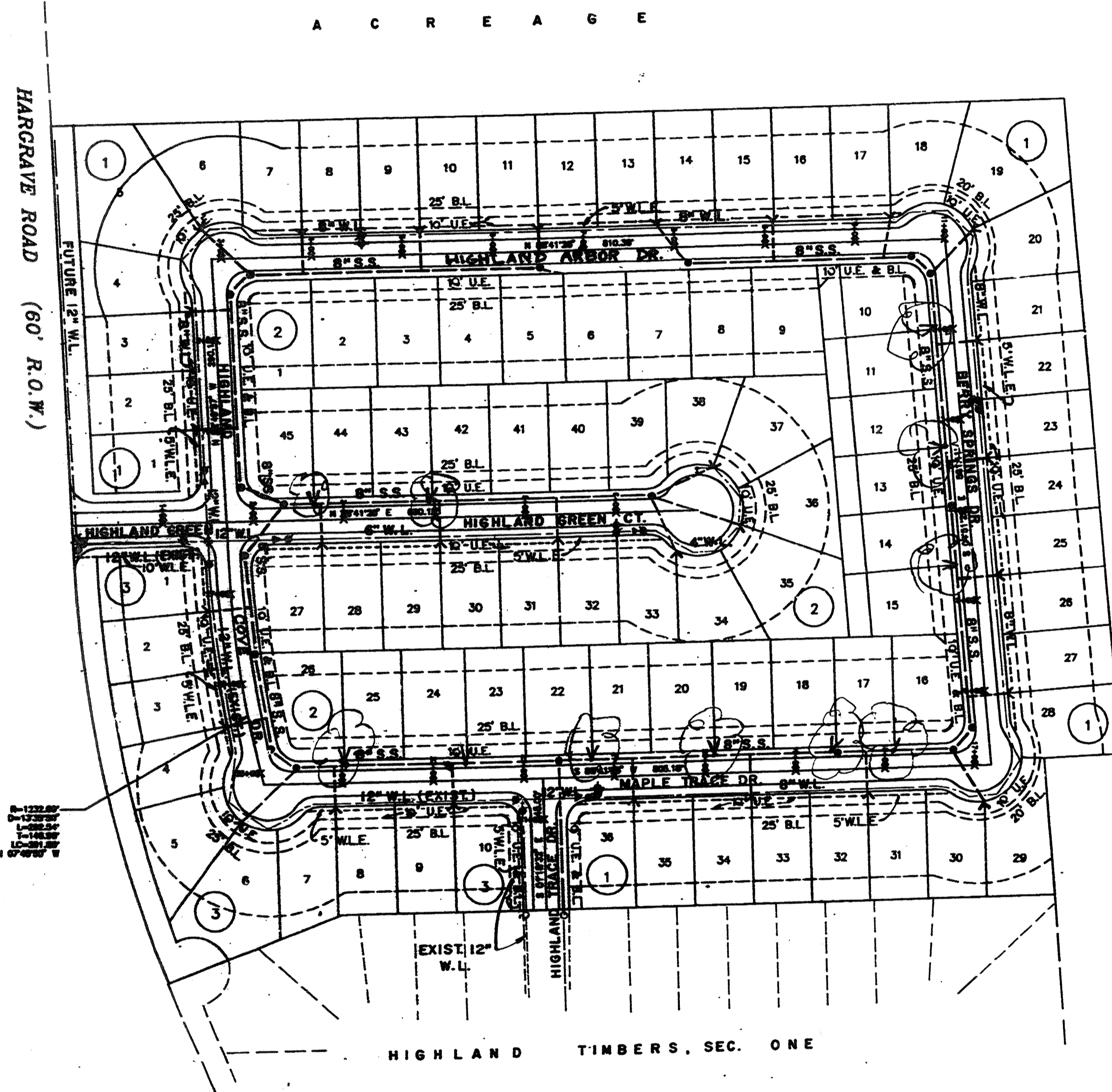
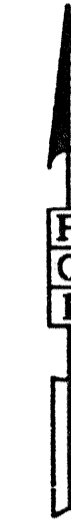
TRM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON  
 WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION  
 OF DOTSON ROAD & HARGRAVE ROAD.  
 ELEVATION = 128.04

TRM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829  
 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH  
 OF 18 INCH R.L.P. AT GRAVEL DRIVE FROM 13827 HARGRAVE ROAD.  
 ELEVATION = 130.56

GRAPHIC SCALE



( IN FEET )  
 1 IN. = 100 FT.



Rev.	Date	Description	App.
02-08-01		Added 11 Sharp Side Sanitary Streets	PCW

PRIVATE UTILITY LINES SHOWN

Reliant	6/15/99
RELIANT ENERGIES, INC./ENTEX	
Mike Balin	7/7/99
SOUTHWESTERN BELL TELEPHONE CO. Valid for One Year Only	
Reliant	6/15/99
RELIANT ENERGIES, INC./M.L.P. CO. Approval Only for Crossing Underground Ductlines Unless Noted. Valid at Time of Review Only.	

CITY OF HOUSTON  
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY	
PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
Water 3-23-00 WATER PS	
Wastewater 3-23-00 WASTEWATER CE	PROJECT MANAGER
Storm Water 3-20-00 STORM WATER	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

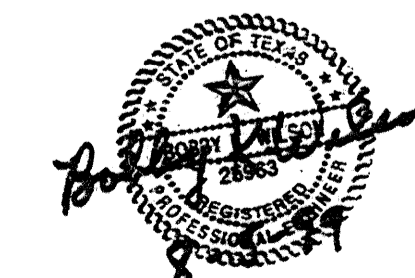
OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT
----------------------------	--------------------

CITY ENGINEER	DATE
<i>[Signature]</i>	
DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE
<i>[Signature]</i>	

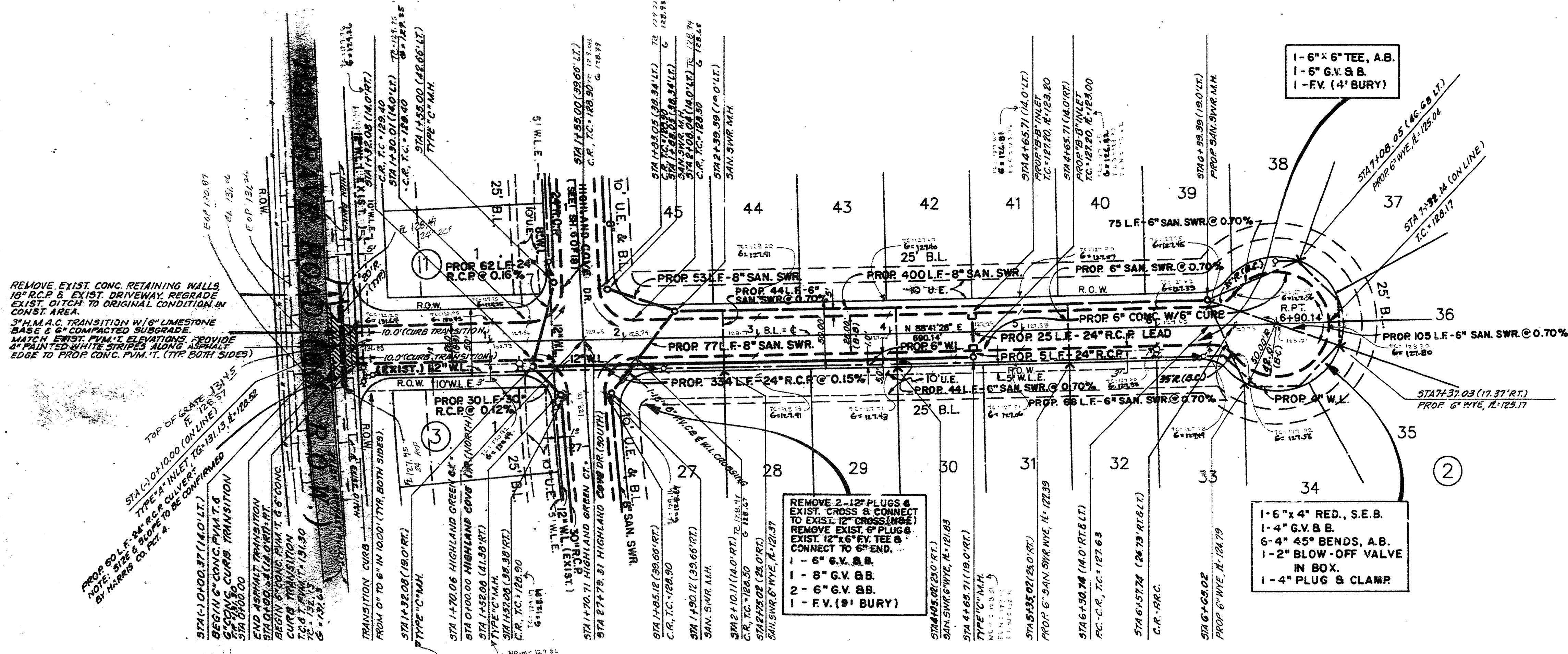
SUBMITTED: PROVIDENT C.I.	DESIGNED BY: BOBBY WILSON
SCALE: 1" = 100'	DRAWN BY: BILL DOWNS
DATE: JUNE 1999	SHEET NO. 4 OF 18 SHEETS
SURVEY BY:	CITY DWS. NO.
F B NO:	

HIGHLAND TIMBERS SECTION TWO  
 WATER AND SANITARY  
 OVERALL LAYOUT



**PCI** PROVIDENT CONSULTING, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019





*Handwritten signature and date:*  
 17 May 2000

HIGHLAND GREEN CT. HIGHLAND GREEN COURT

**BENCH MARK**  
 BENCH MARK: NATIONAL GEODETIC SURVEY MARKER  
 1216, 1973 ADJ. ELEV. = 125.895  
 1216, 1979 ADJ. ELEV. = 125.308  
 1216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTER ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT  
 TBM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE ELEVATION = 128.80  
 TBM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 230 FEET NORTH OF PRIVATE ROAD ELEVATION = 130.82  
 TBM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DOTSON ROAD & HARGRAVE ROAD ELEVATION = 123.04  
 TBM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13025 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.S.P. AT GRAVEL DRIVE FROM 13027 HARGRAVE ROAD ELEVATION = 130.56

**NOTES:**  
 1. SURVEYOR DID NOT ABSTRACT TRACT.  
 2. REVISED NOVEMBER 12, 1997 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

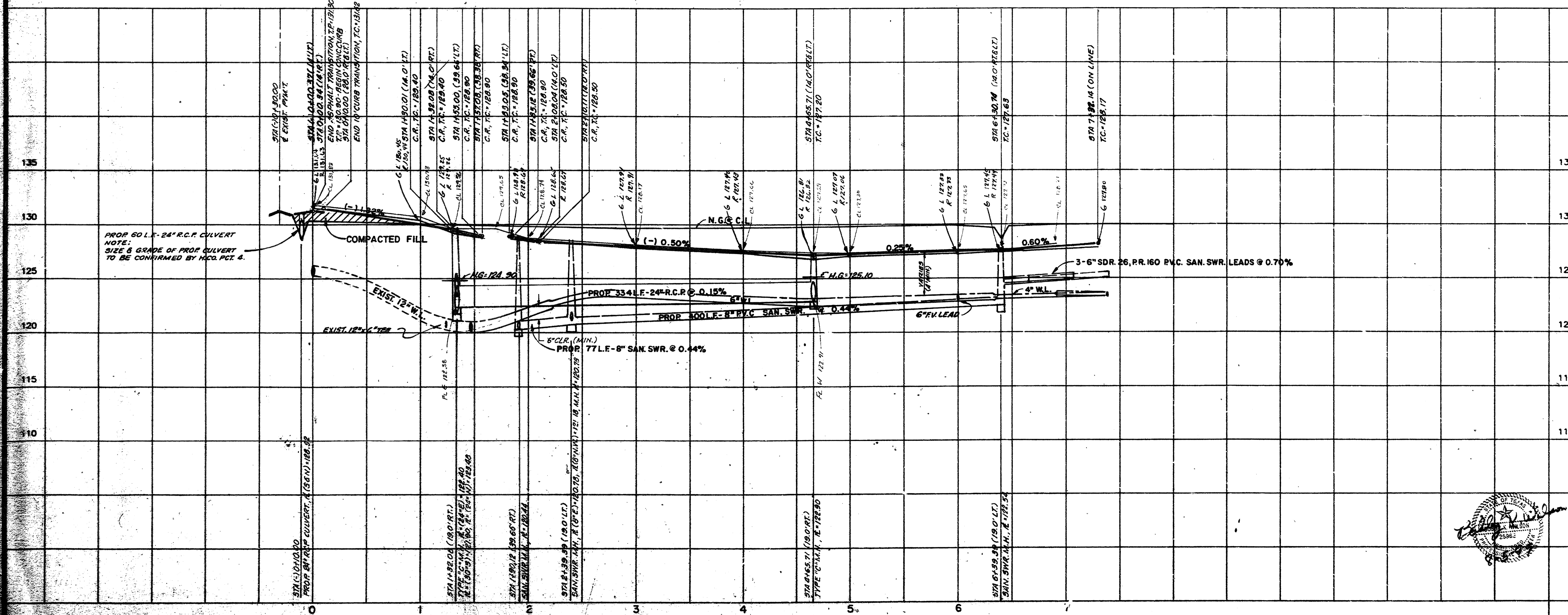
Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**  
 P. Young 6/15/83  
 ENTEX, INC.  
 Mike Balin 7/1/99  
 SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only  
 Ryming 6/15/99  
 HOUSTON LIGHTING & POWER CO.  
 Approval Only for Crossing Underground  
 Ductlines Unless Noted. Valid at Time of Review Only.

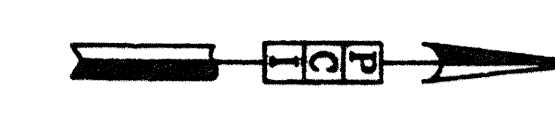
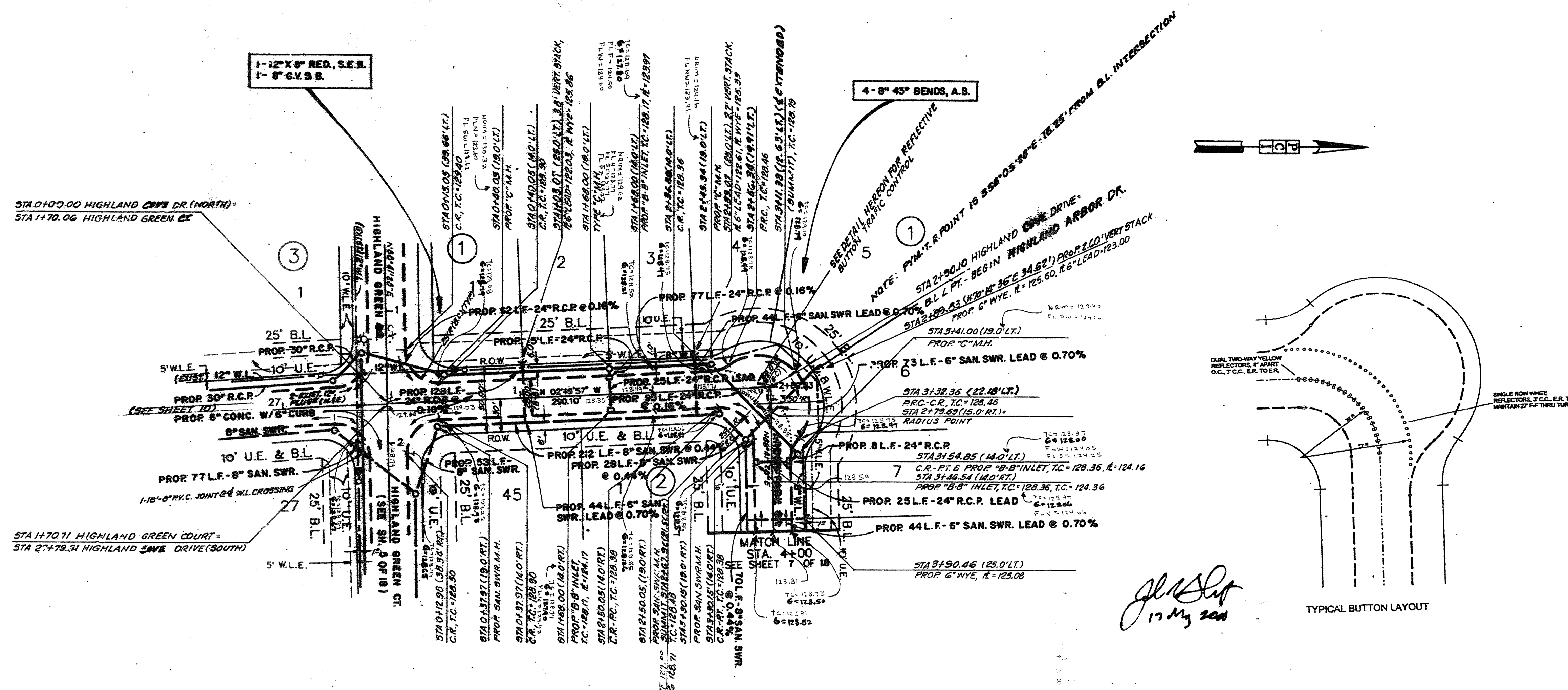
**CITY OF HOUSTON**  
 DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP  
 Water Engineering 2300  
 TRAFFIC AND SIGNAL ENGINEERING  
 Wastewater Engineering  
 STREET & BRIDGE ENGINEERING  
 Storm Sewer Engineering  
 CONSTRUCTION

**OTHER DEPARTMENTS**  
 PLANNING AND DEVELOPMENT SPONSOR DEPARTMENT  
 CITY ENGINEER DATE  
 DIRECTOR OF PUBLIC WORKS AND ENGINEERING DATE  
 SUBMITTED: PROVIDENT C.I. DESIGNED BY: B.W.  
 SCALE: H: 1"=30' V: 1"=5' DRAWN BY: C.K.  
 DATE: JUNE 1999 SHEET NO. 13 OF 18 SHEETS  
 SURVEY BY: CITY DING. NO.  
 JOB NO: 484U & 484P

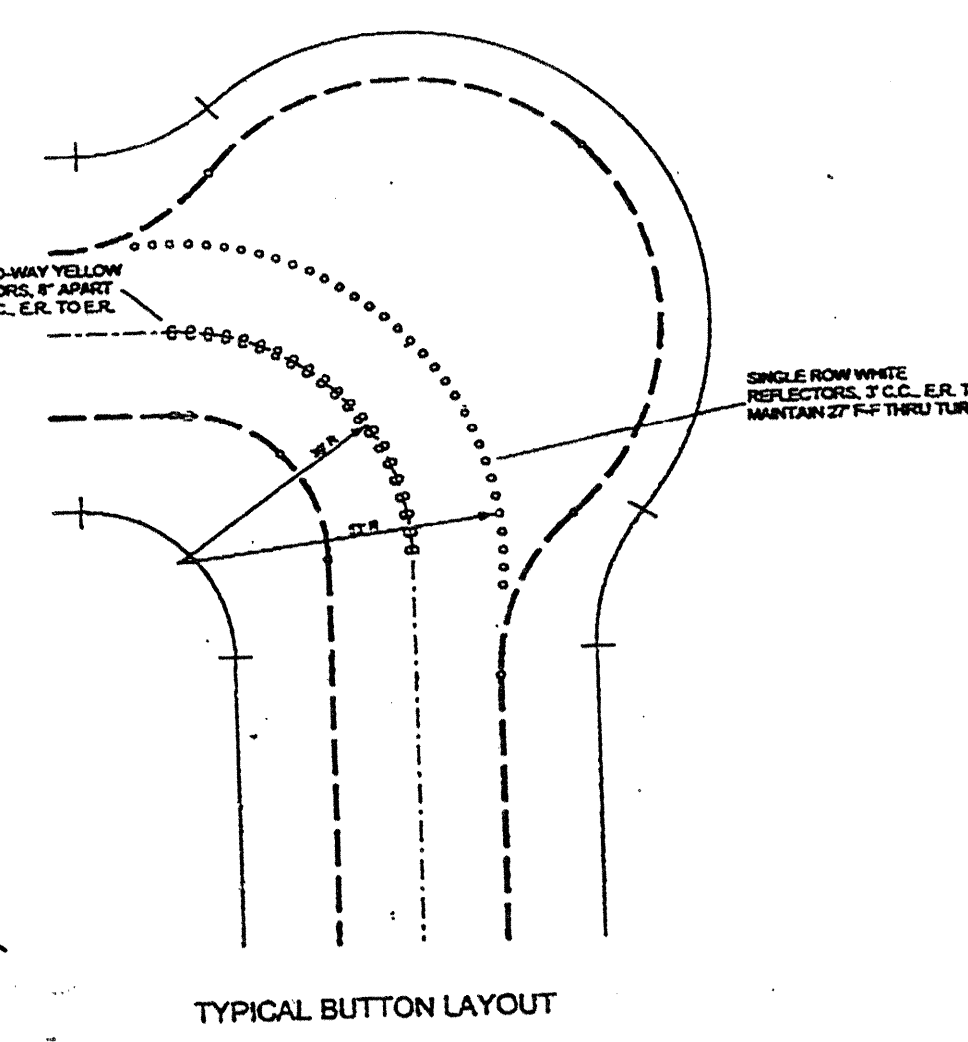
**PLAN & PROFILE**  
 HIGHLAND GREEN COURT  
 PROVIDENT CONSULTANT, INC.  
 1200 WEST 15TH ST.  
 HOUSTON, TEXAS 77008  
 (713) 862-1010







*J. R. Smith*  
12 May 2000



**BENCH MARK**

NATIONAL GEODETIC SURVEY MARKER  
 Y1214, 1973 ADJ. ELEV. = 123.494  
 Y1214, 1978 ADJ. ELEV. = 123.495  
 Y1214, 1988 ADJ. ELEV. = 123.494 (THIS ADJUSTMENT WAS USED FOR CUTTER ROAD)

ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE. ELEVATION = 128.80

TM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 250 FEET NORTH OF PRIVATE ROAD. ELEVATION = 130.82

TM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DOTSON ROAD & HARGRAVE ROAD. ELEVATION = 128.04

TM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13629 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.L.P. AT GRAVEL DRIVE FROM 13627 HARGRAVE ROAD. ELEVATION = 130.56

**NOTES:**

1. SURVEYOR DID NOT ABSTRACT TRACT.
2. REVISED NOVEMBER 12, 1997 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

EXT. *A-yours* 6/15/99

*Mike Bolin* 7/7/99  
SOUTHWESTERN BELL TELEPHONE CO.  
Valid for One Year Only

*A-yours* 6/15/99  
HOUSTON LIGHTING & POWER CO.  
Approved Only for Crossing Underground  
Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**

DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

<i>Walter...</i>	TRAFFIC AND SIGNAL ENGINEERING
<i>Mark...</i>	STREET & BRIDGE ENGINEERING
<i>Mark...</i>	CONSTRUCTION

OTHER DEPARTMENTS

PLANNING AND DEVELOPMENT SPONSOR DEPARTMENT

CITY ENGINEER DATE

*Walter...*

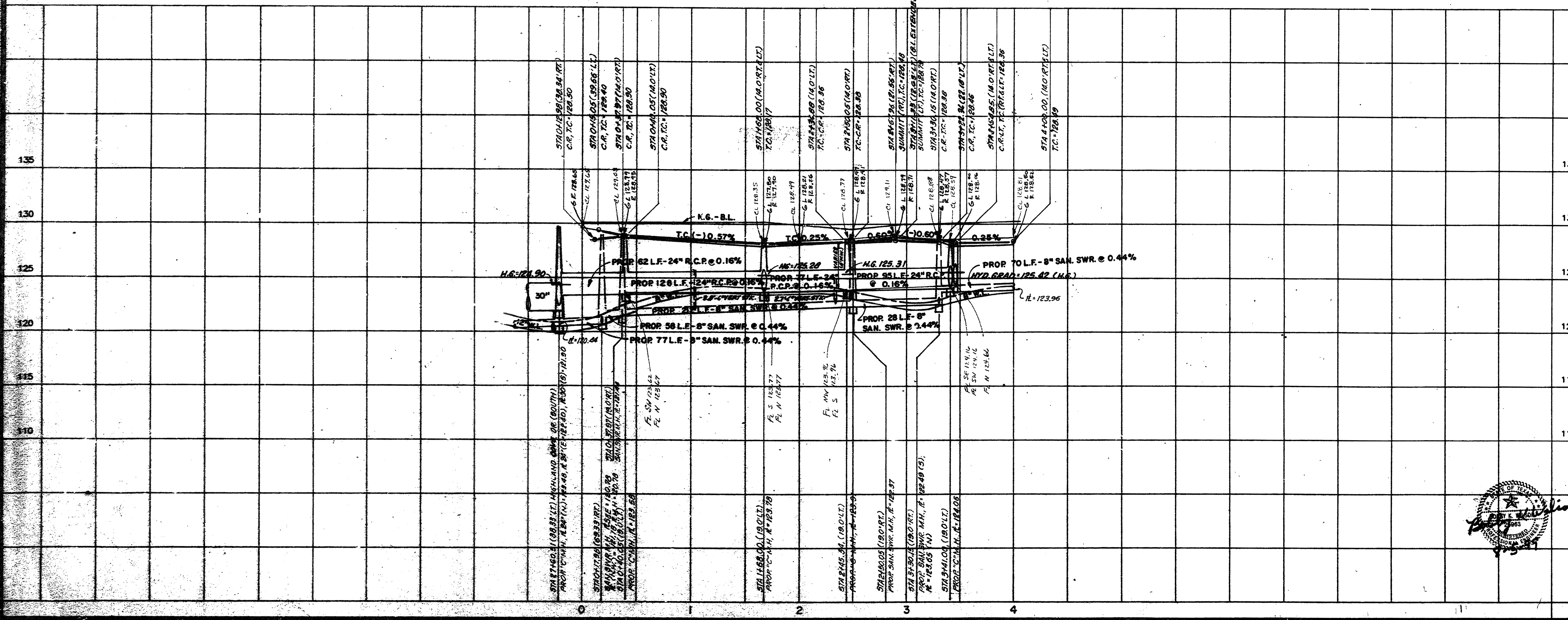
DIRECTOR OF PUBLIC WORKS AND ENGINEERING DATE

SUBMITTED: PROVIDENT C.I. DESIGNED BY: B.W.  
 SCALE: H: 1"=50'  
 V: 1"=5'  
 DATE: JUNE - 1999 DRAWN BY: C.K.  
 SURVEY BY: SHEET NO. 16 OF 18 SHEETS  
 JOB NO: 464J & 464P CITY DWG. NO.

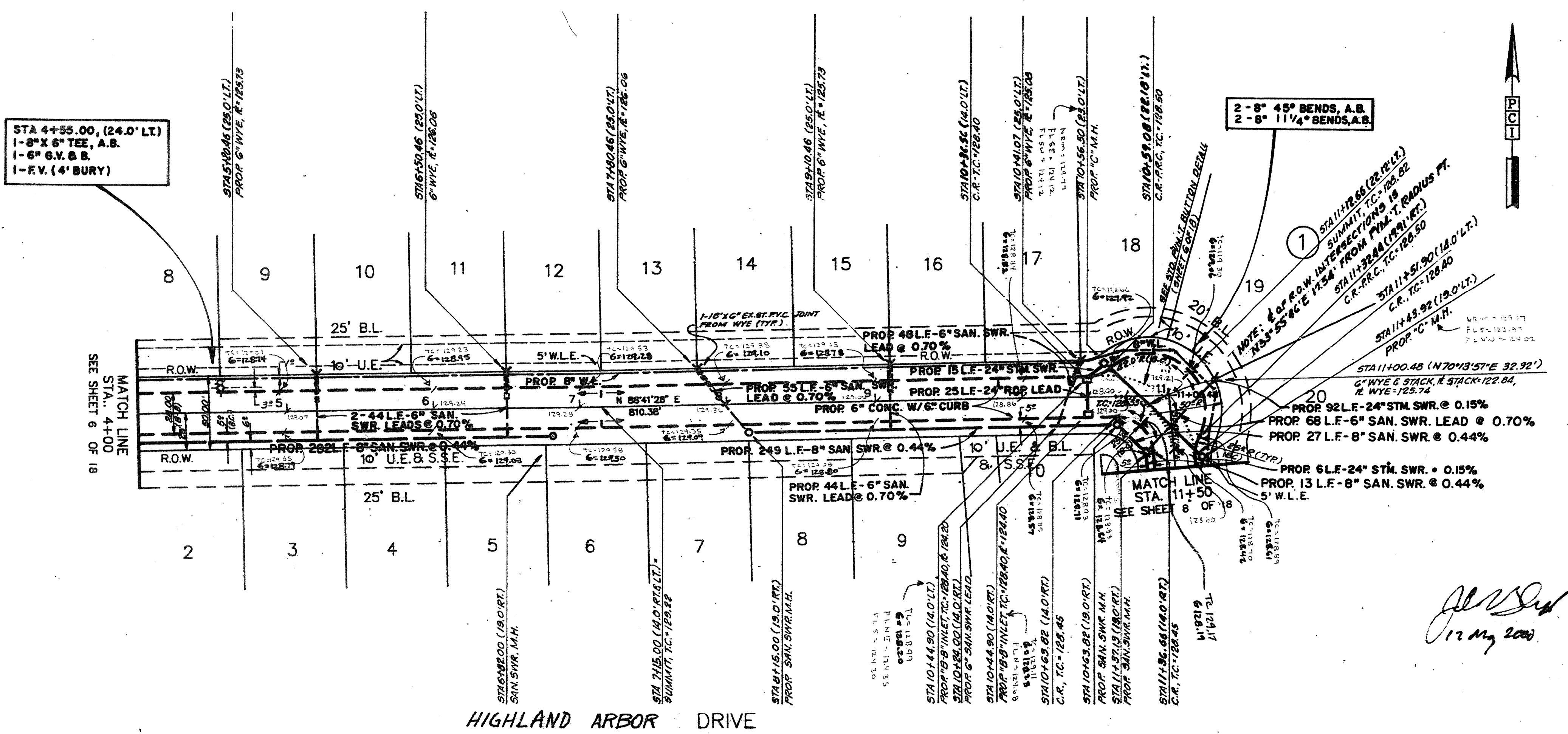
**PLAN & PROFILE**

**HIGHLAND COVE DRIVE**

**PROVIDENT CONSULTANT, INC.**  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713) 862-1019







**BENCH MARK**

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER  
 Y1216, 1973 ADJ. ELEV. = 123.984  
 Y1216, 1978 ADJ. ELEV. = 123.408  
 Y1216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTER ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TRM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE ELEVATION = 128.60  
 TRM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET NORTH OF PRIVATE ROAD ELEVATION = 130.02  
 TRM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF BOTSON ROAD & HARGRAVE ROAD ELEVATION = 128.04  
 TRM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GRAVEL DRIVE FROM 13827 HARGRAVE ROAD ELEVATION = 130.58

- NOTES:**
1. SURVEYOR DID NOT ABSTRACT TRACT.
  2. REVISED NOVEMBER 12, 1997 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

*J. L. Smith*  
 12 May 2000

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

ENTER BY: *R. Young* 6/15/99  
*Mike Balin* 7/1/99  
 SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only

ENTER BY: *R. Young* 6/15/99  
 HOUSTON LIGHTING & POWER CO.  
 Approve Only for Crossing Underground  
 Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**

DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

*Walter* 5-23-00  
 WATER ENGINEERING      TRAFFIC AND SIGNAL ENGINEERING

*Walter* 5-23-00  
 WASTEWATER ENGINEERING      STREET & BRIDGE ENGINEERING

*Walter* 5-23-00  
 STORM SEWER ENGINEERING      CONSTRUCTION

OTHER DEPARTMENTS

PLANNING AND DEVELOPMENT      SPONSOR DEPARTMENT

CITY ENGINEER      DATE  
*Walter*      4/6/2000

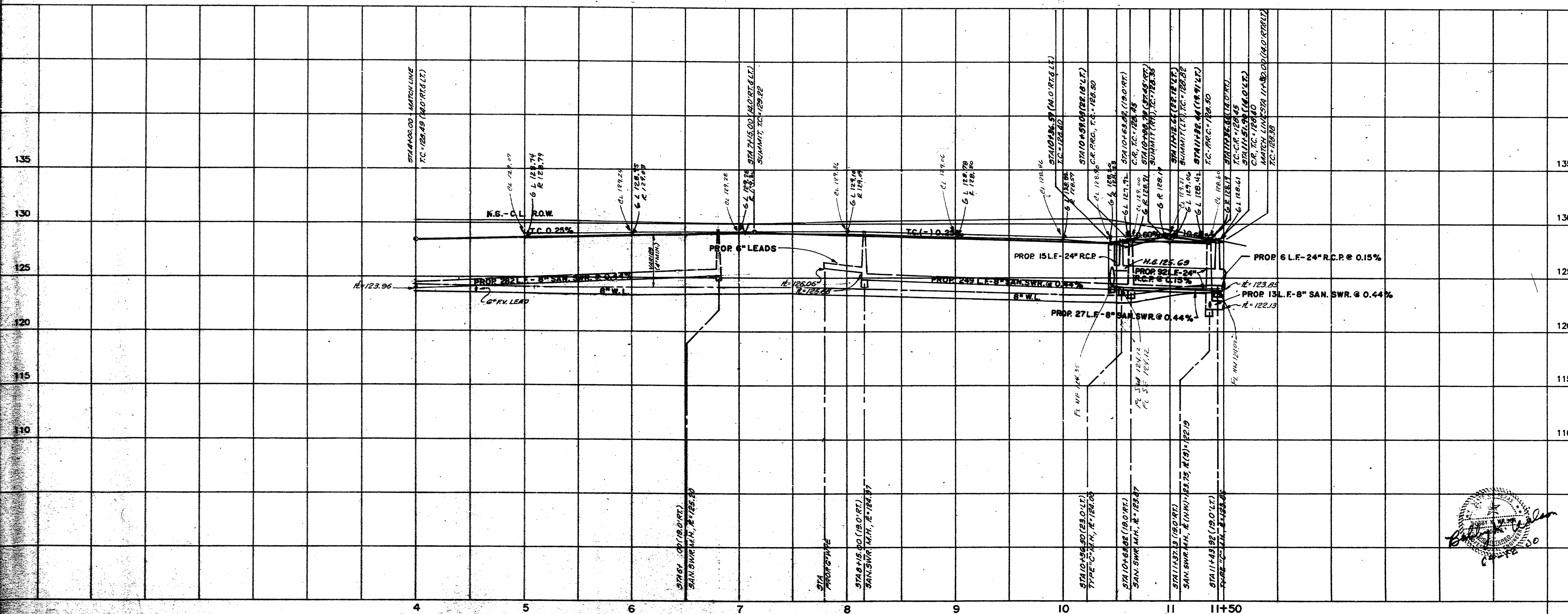
DIRECTOR OF PUBLIC WORKS AND ENGINEERING      DATE

SUBMITTED: PROVIDENT C.I.  
 SCALE: H: 1"=50'  
 V: 1"=5'  
 DATE: JUNE 1999  
 SURVEY BY:  
 JOB NO: 464J & 464P      CITY DWG. NO.

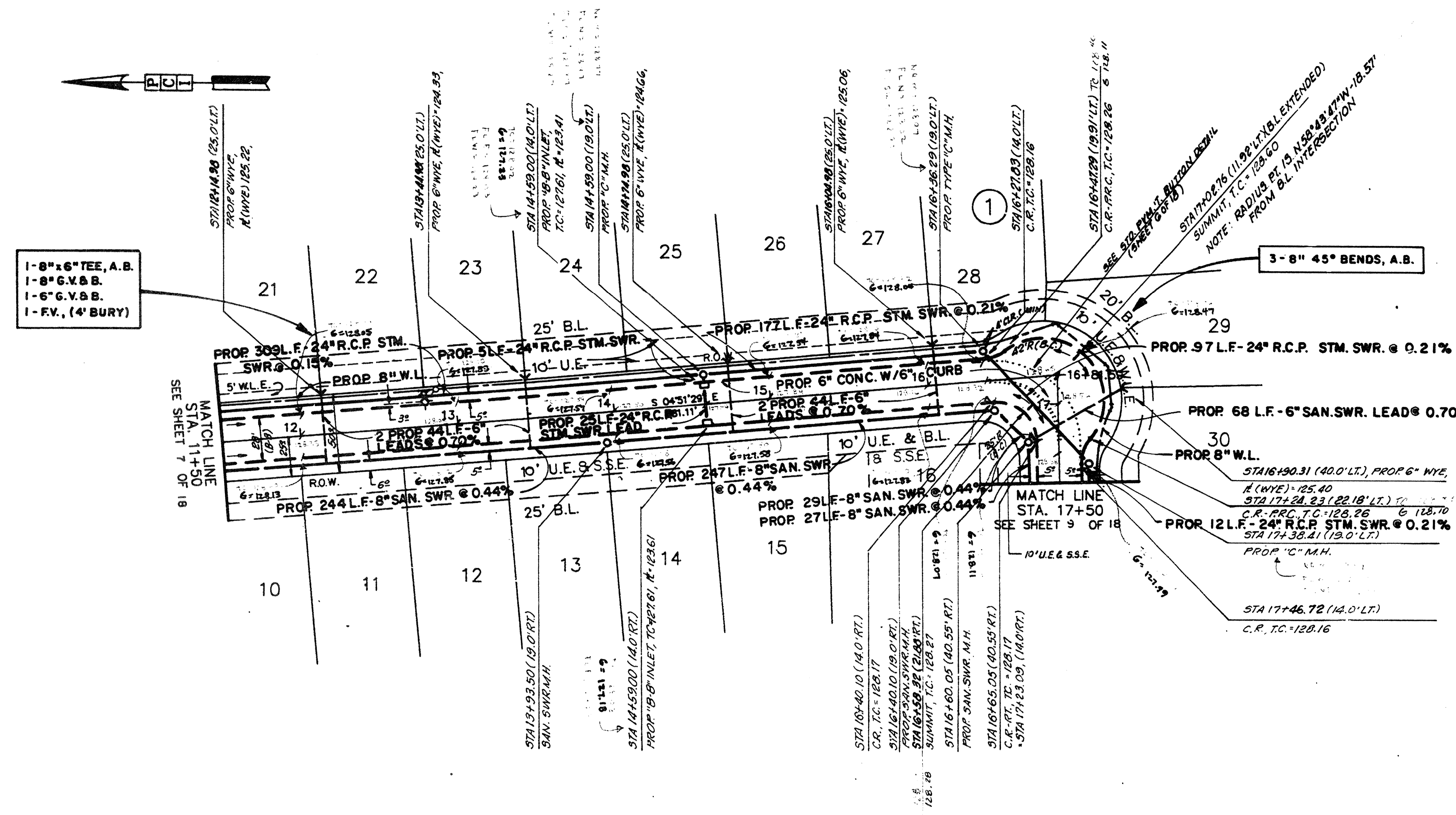
**PLAN & PROFILE**

HIGHLAND ARBOR DRIVE

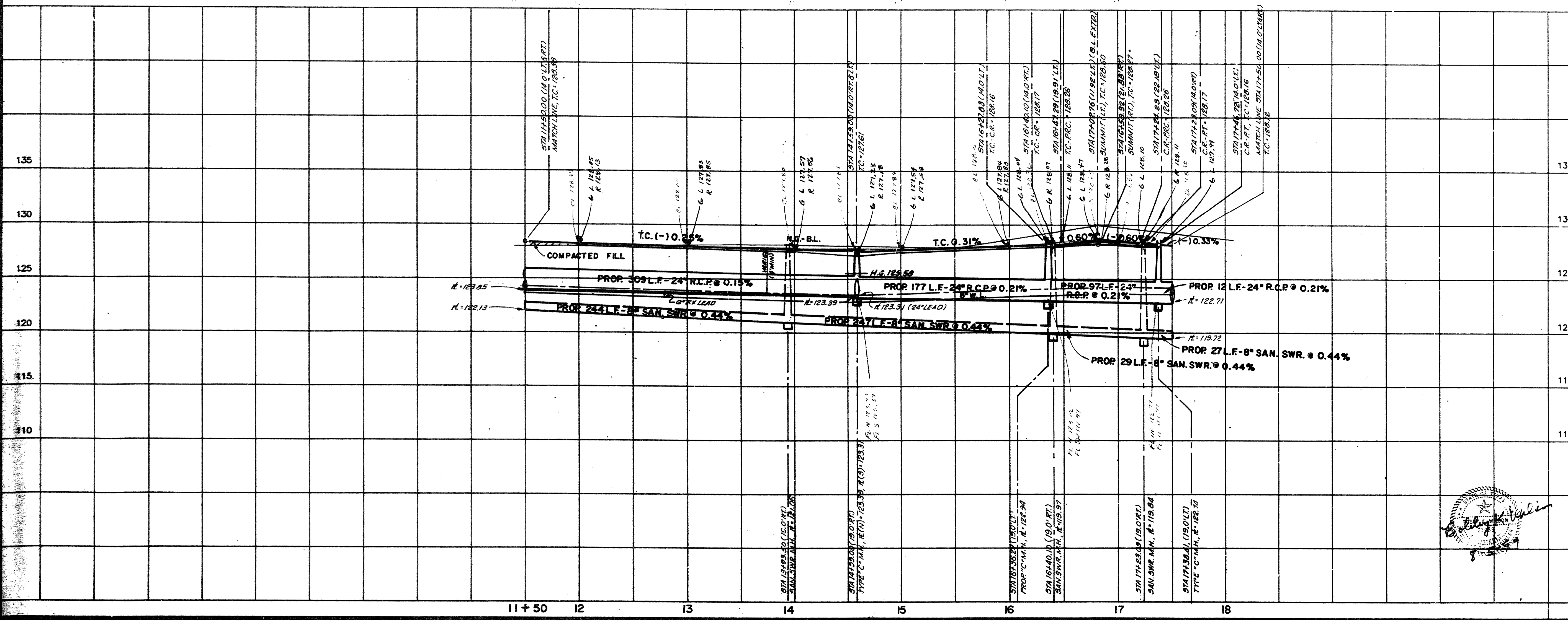
**PCI** PROVIDENT CONSULTANT, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019







BERRY SPRINGS DRIVE



BENCH MARK

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER  
 Y1216, 1973 ADJ. ELEV. = 123.994  
 Y1216, 1978 ADJ. ELEV. = 123.408  
 Y1216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTEN ROAD)  
 ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

TRM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TALLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE  
 ELEVATION = 128.60

TRM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET NORTH OF PRIVATE ROAD  
 ELEVATION = 130.62

TRM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DOTSON ROAD AND HARGRAVE ROAD  
 ELEVATION = 128.04

TRM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GRAVEL DRIVE FROM 13627 HARGRAVE ROAD  
 ELEVATION = 130.56

NOTES:  
 1. SURVEYOR DID NOT ABSTRACT TRACT.  
 2. REVISED NOVEMBER 12, 1997 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

*P. YUSUM* 01/15/99  
 ENTER INC.

SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only

*P. YUSUM* 01/15/99  
 HOUSTON LIGHTING & POWER CO.  
 Approval Only for Crossing Underground  
 Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**

DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

<i>Water</i> 01/23/00 WATER ENGINEERING	TRAFFIC AND SIGNAL ENGINEERING
<i>Water</i> 01/23/00 WASTEWATER ENGINEERING	STREET & BRIDGE ENGINEERING
<i>Water</i> 01/23/00 STORM SEWER ENGINEERING	CONSTRUCTION

OTHER DEPARTMENTS

PLANNING AND DEVELOPMENT	SPONSOR DEPARTMENT
--------------------------	--------------------

CITY ENGINEER: *Mark* DATE: \_\_\_\_\_  
 DIRECTOR OF PUBLIC WORKS AND ENGINEERING: *Mark* DATE: \_\_\_\_\_

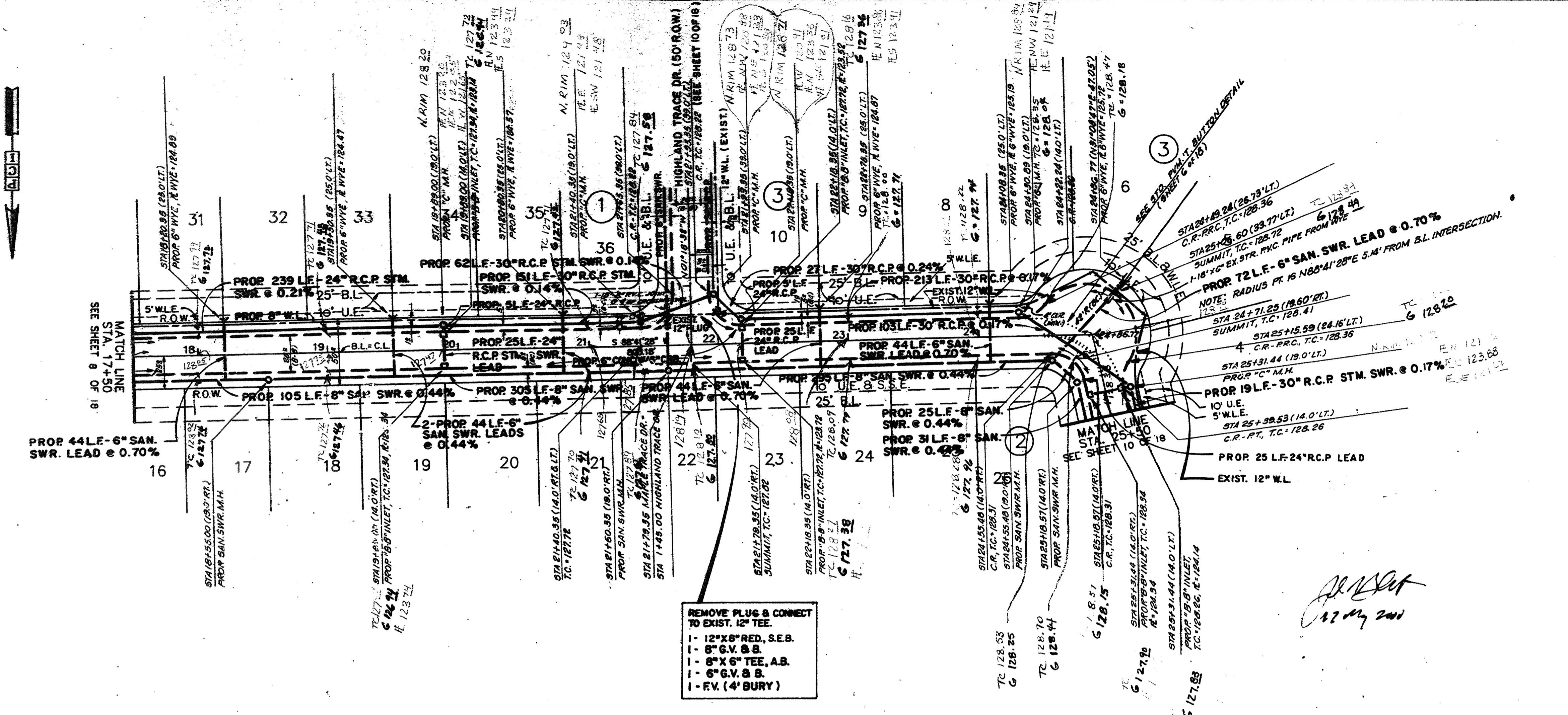
SUBMITTED: PROVIDENT C.I.  
 SCALE: H. 1"=50'  
 V. 1"=5'  
 DATE: JUNE 1999  
 SURVEY BY: \_\_\_\_\_  
 JOB NO: 464J & 464P

DESIGNED BY: B.W.  
 DRAWN BY: C.K.  
 SHEET NO. 18 OF 18 SHEETS  
 CITY DWG. NO.

**PLAN & PROFILE**  
**BERRY SPRINGS DRIVE**

**PCI** PROVIDENT CONSULTANT, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019





MAPLE TRACE DRIVE

**BENCH MARK**

BENCH MARK NATIONAL GEODETIC SURVEY MARKER  
 Y1216, 1973 ADJ. ELEV. = 123.894  
 Y1216, 1978 ADJ. ELEV. = 123.406  
 Y1216, 1988 ADJ. ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTER ROAD)

ELEVATIONS SHOWN HEREON ARE BASED ON 1973 ADJUSTMENT

ITEM #1: SET RAILROAD SPIKE ON SOUTH SIDE OF 14" TULLOW APPROXIMATELY 31 FEET NORTH OF THE END OF CENTERFIELD DRIVE ELEVATION = 1128.80

ITEM #2: SET RAILROAD SPIKE ON SOUTH SIDE OF POWER POLE WITH TRANSFORMER ON WEST SIDE OF PRIVATE ROAD AND 200 FEET NORTH OF PRIVATE ROAD ELEVATION = 130.82

ITEM #3: SET RAILROAD SPIKE ON EAST SIDE OF POWER POLE ON WEST SIDE OF HARGRAVE ROAD AND NORTH OF THE INTERSECTION OF DOTSON ROAD & HARGRAVE ROAD ELEVATION = 128.04

ITEM #4: RAILROAD SPIKE ON EAST SIDE OF POWER POLE #13829 ON THE WEST SIDE OF HARGRAVE ROAD APPROXIMATELY 30 FEET NORTH OF 18 INCH R.C.P. AT GRAVEL DRIVE FROM 13827 HARGRAVE ROAD ELEVATION = 130.56

**NOTES:**

1. SURVEYOR DID NOT ABSTRACT TRACT.
2. REVISED NUMBER 12, 1997 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

ENTER BY: *M. Balin* 4/15/99

*M. Balin* 7/7/99  
SOUTHWESTERN BELL TELEPHONE CO.  
Valid for One Year Only

*R. Perry* 6/15/99  
HOUSTON LIGHTING & POWER CO.  
Approved Only for Crossing Underground  
Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**

DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

<i>Victoria</i> 3-23-00 WATER ENGINEERING	TRAFFIC AND SIGNAL ENGINEERING
<i>M. Balin</i> WASTEWATER ENGINEERING	STREET & BRIDGE ENGINEERING
<i>M. Balin</i> 2/23/00 STORM SEWER ENGINEERING	CONSTRUCTION

OTHER DEPARTMENTS

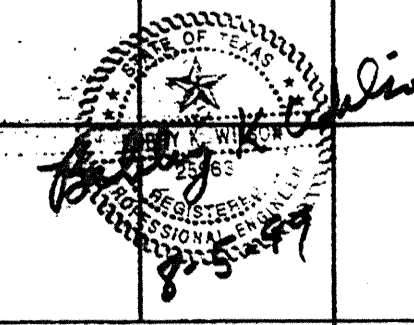
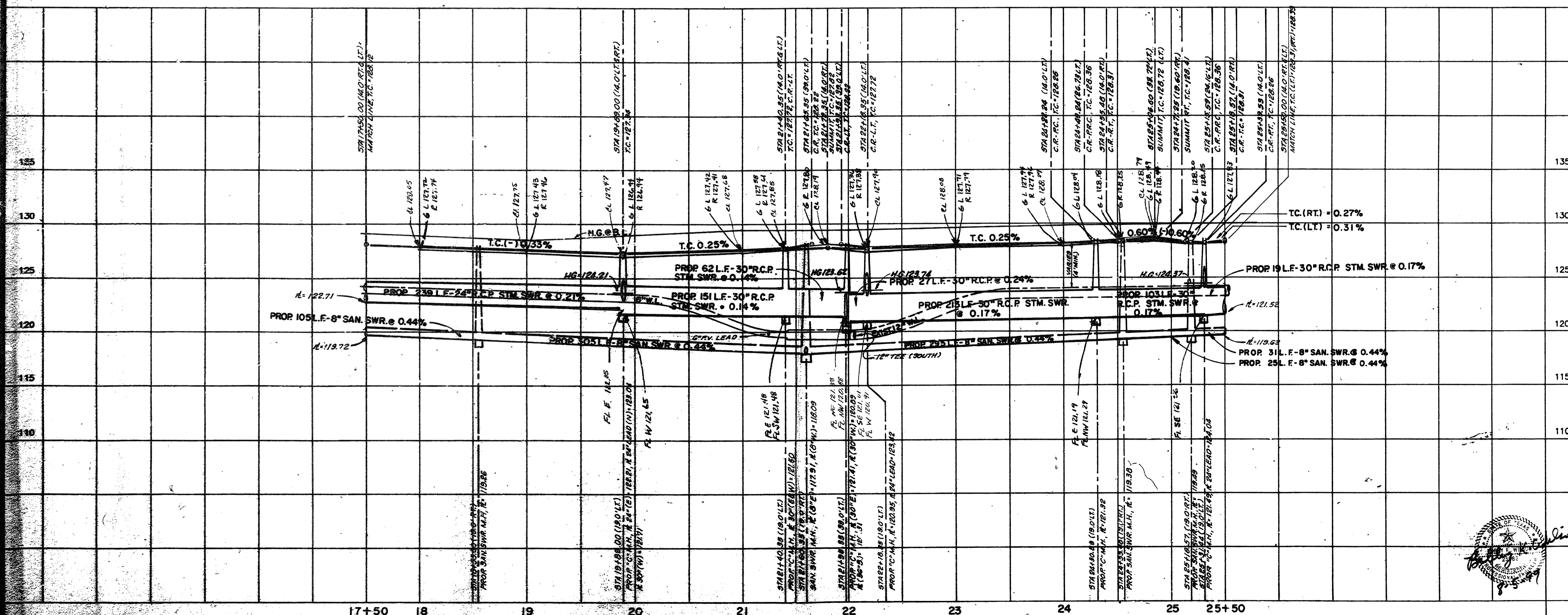
PLANNING AND DEVELOPMENT	SPONSOR DEPARTMENT
--------------------------	--------------------

CITY ENGINEER: *M. Balin* DATE: \_\_\_\_\_  
 DIRECTOR OF PUBLIC WORKS AND ENGINEERING: \_\_\_\_\_ DATE: \_\_\_\_\_

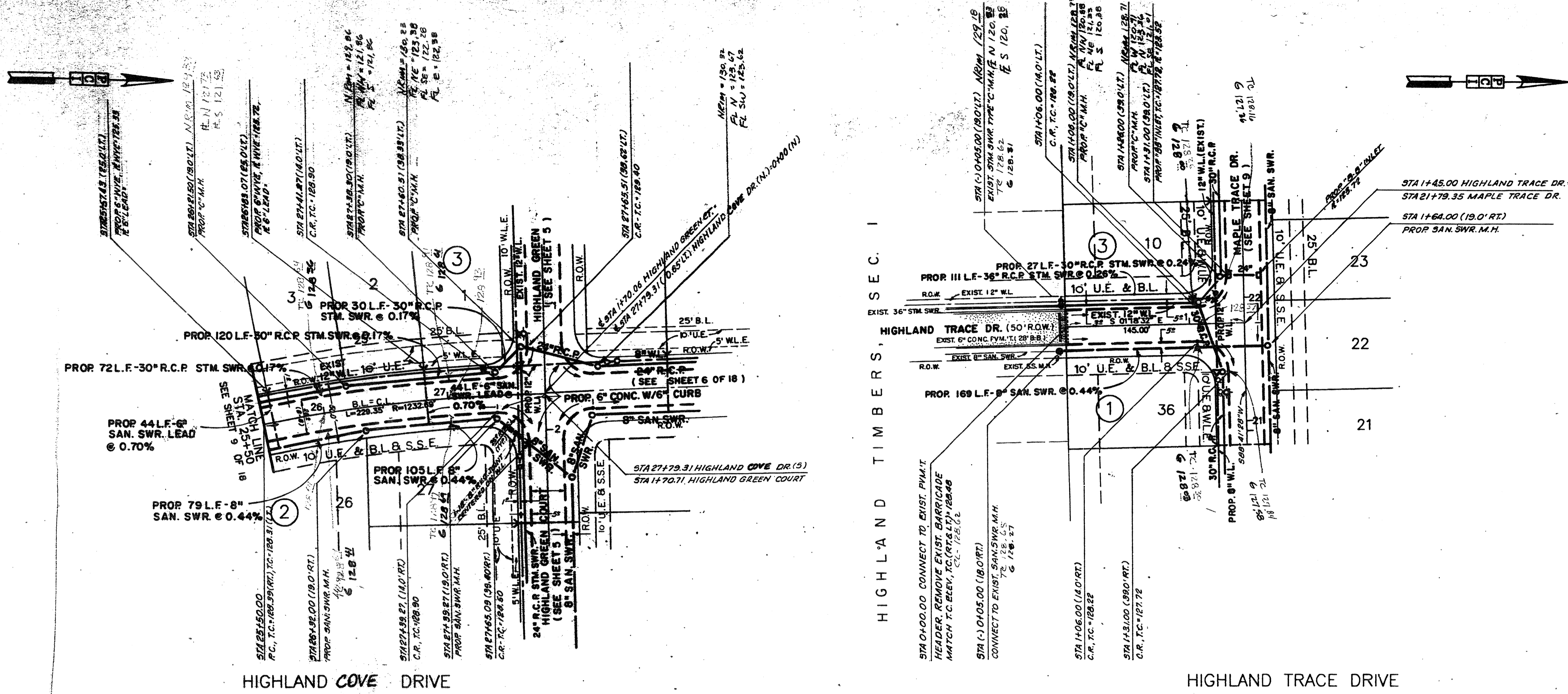
SUBMITTED BY: PROVIDENT C.I.  
 SCALE: H: 1"=50'  
 V: 1"=5'  
 DATE: JUNE 1999  
 SURVEY BY: \_\_\_\_\_  
 JOB NO: 464U & 464P  
 CITY DWG. NO. \_\_\_\_\_

DESIGNED BY: B.W.  
 DRAWN BY: C.K.  
 SHEET NO. 19 OF 18 SHEETS

**PLAN & PROFILE**  
**MAPLE TRACE DRIVE**







**BENCH MARK**

BENCH MARK: NATIONAL GEODESIC SURVEY NUMBER  
 11214, 1973 ADJ. ELEV. = 128.884  
 11214, 1978 ADJ. ELEV. = 128.408  
 11214, 1988 ADJ. ELEV. = 128.534 (THIS ADJUSTMENT WAS USED FOR CUTTING ROAD)

ELEVATIONS SHOWN HEREIN ARE BASED ON 1973 ADJUSTMENT

TRM #1: SET RAILROAD SPIRE ON SOUTH SIDE OF 14\"/>

- NOTES:**
1. SURVEYOR DID NOT ABSTRACT TRACT.
  2. REVISED NOVEMBER 12, 1987 TO ADD ADDITIONAL TOPOGRAPHY INFORMATION.

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

ENTEX, INC. *6/15/99*

SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only  
*6/15/99*

HOUSTON LIGHTING & POWER CO.  
 Approved Only for Draining Underground  
 Ductlines Unless Noted. Valid at Time of Review Only.

**CITY OF HOUSTON**

DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

<i>Nick Adams 3-2300</i>	TRAFFIC AND SIGNAL ENGINEERING
<i>Mark 3-2300</i>	STREET & BRIDGE ENGINEERING
<i>Mark 3-2300</i>	CONSTRUCTION

OTHER DEPARTMENTS

PLANNING AND DEVELOPMENT      SPONSOR DEPARTMENT

CITY ENGINEER      DATE  
*Mark*      *4-2000*

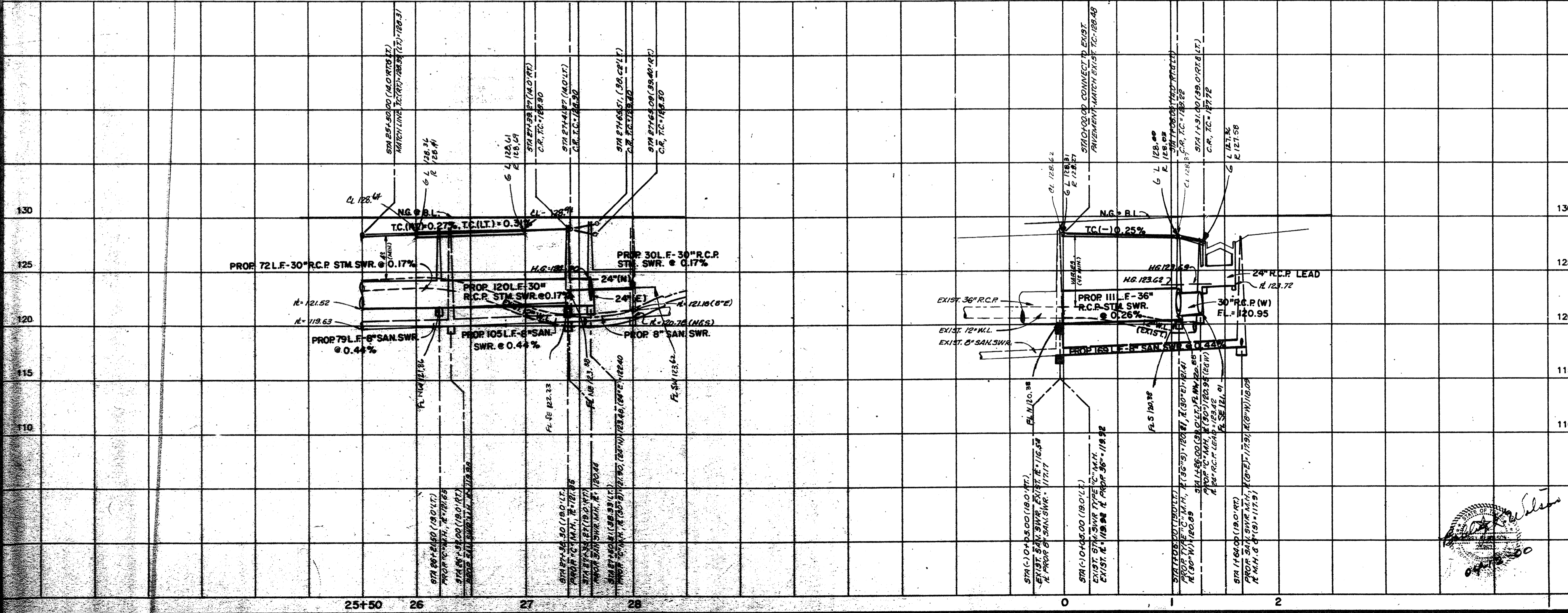
DIRECTOR OF PUBLIC WORKS AND ENGINEERING      DATE

SUBMITTED: PROVIDENT C.I.      DESIGNED BY: B.W.  
 SCALE: H 1"=50'  
 V 1"=5'  
 DATE: JUNE 1999      DRAWN BY: C.K.  
 SURVEY BY:      SHEET NO. *10* OF 18 SHEETS  
 JOB NO: 484U & 484P      CITY DNG. NO.

**PLAN & PROFILE**

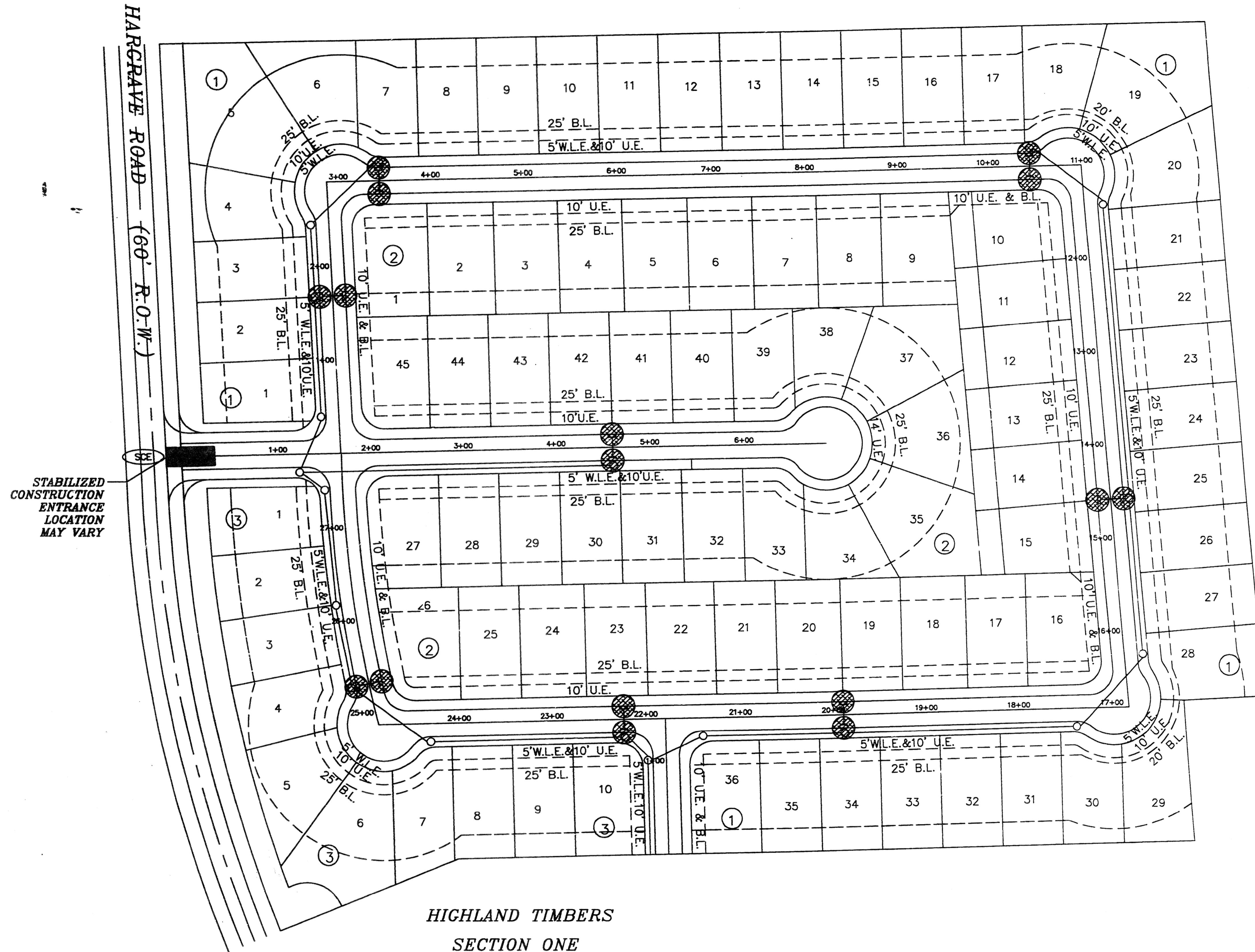
HIGHLAND COVE DRIVE & HIGHLAND TRACE DRIVE

**PCI** PROVIDENT CONSULTANT, INC.  
 1200 WEST 11TH ST.  
 HOUSTON, TEXAS 77008  
 (713)802-1019





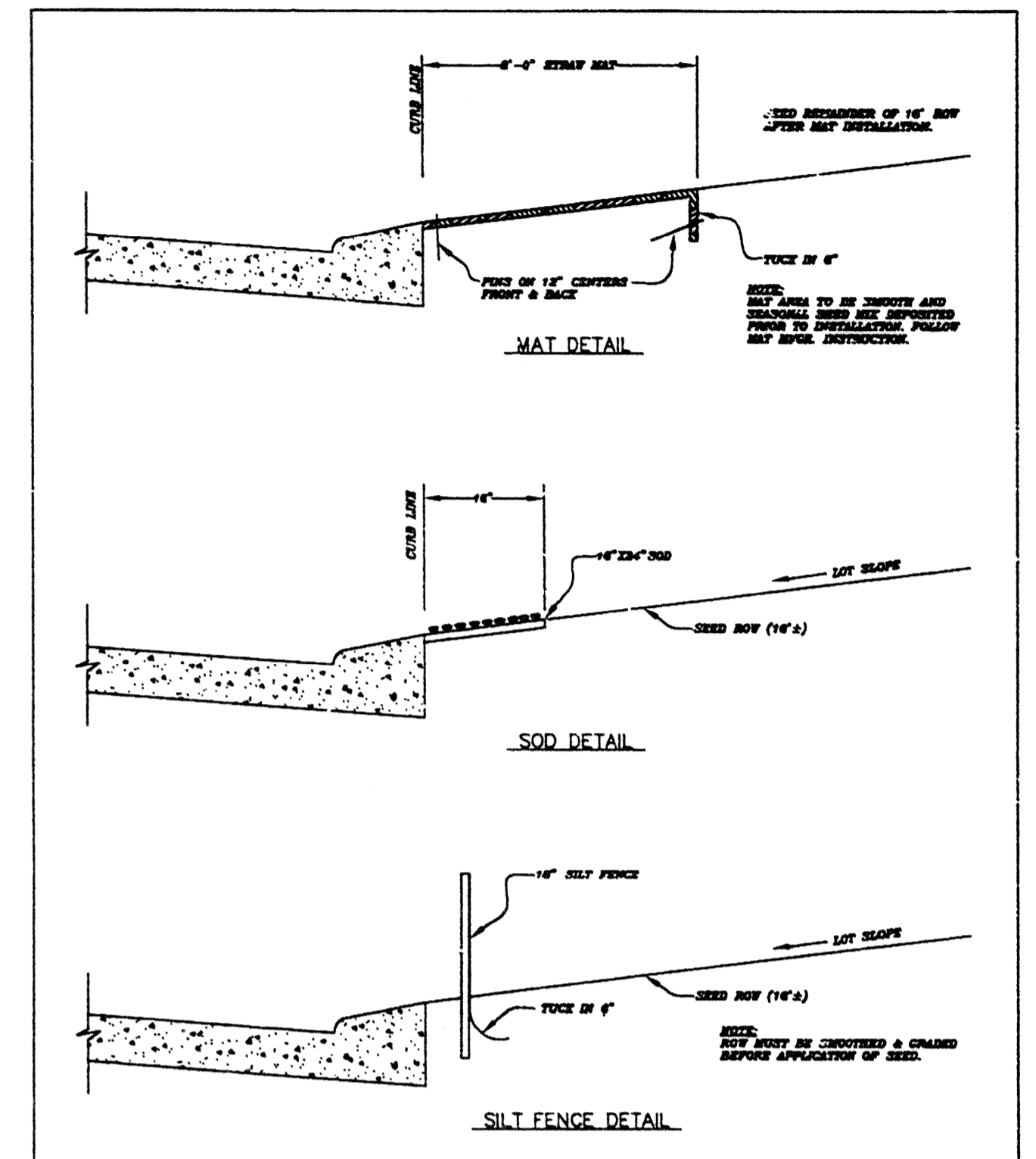
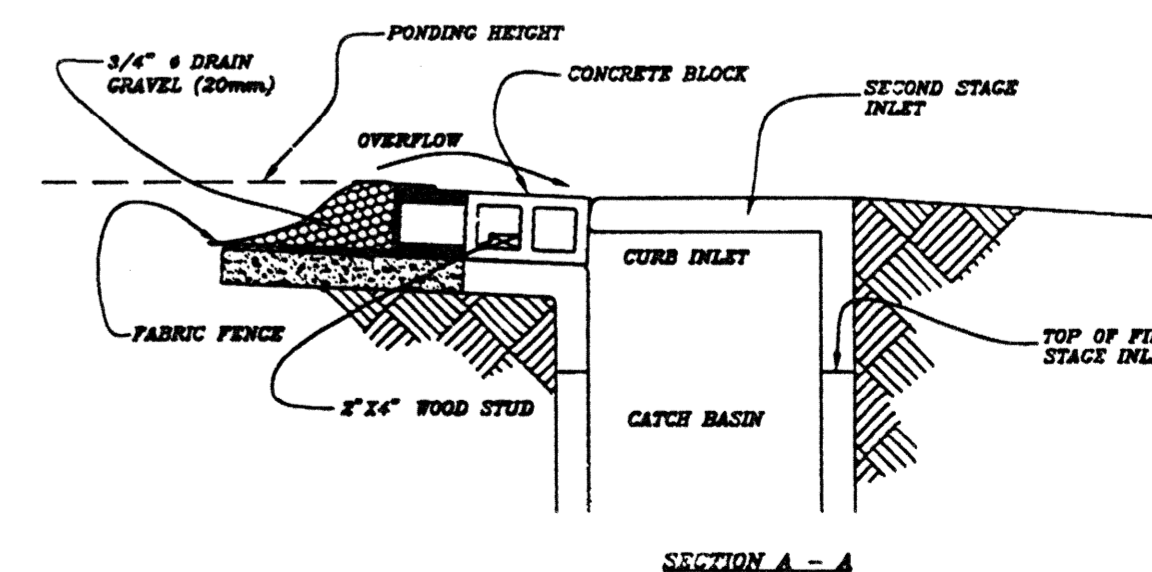
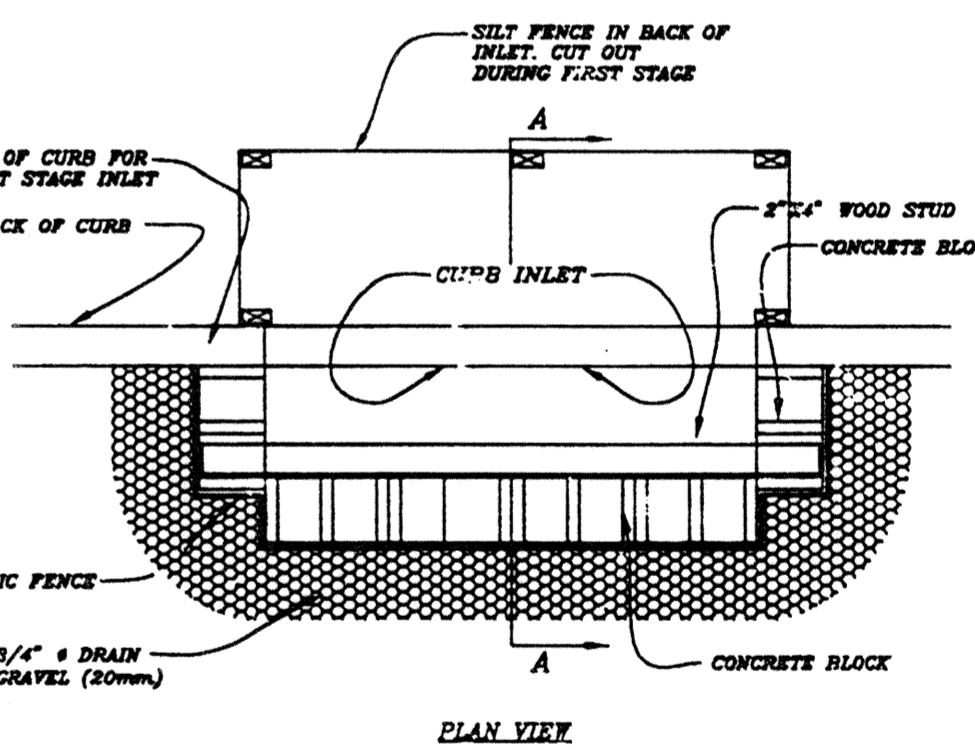
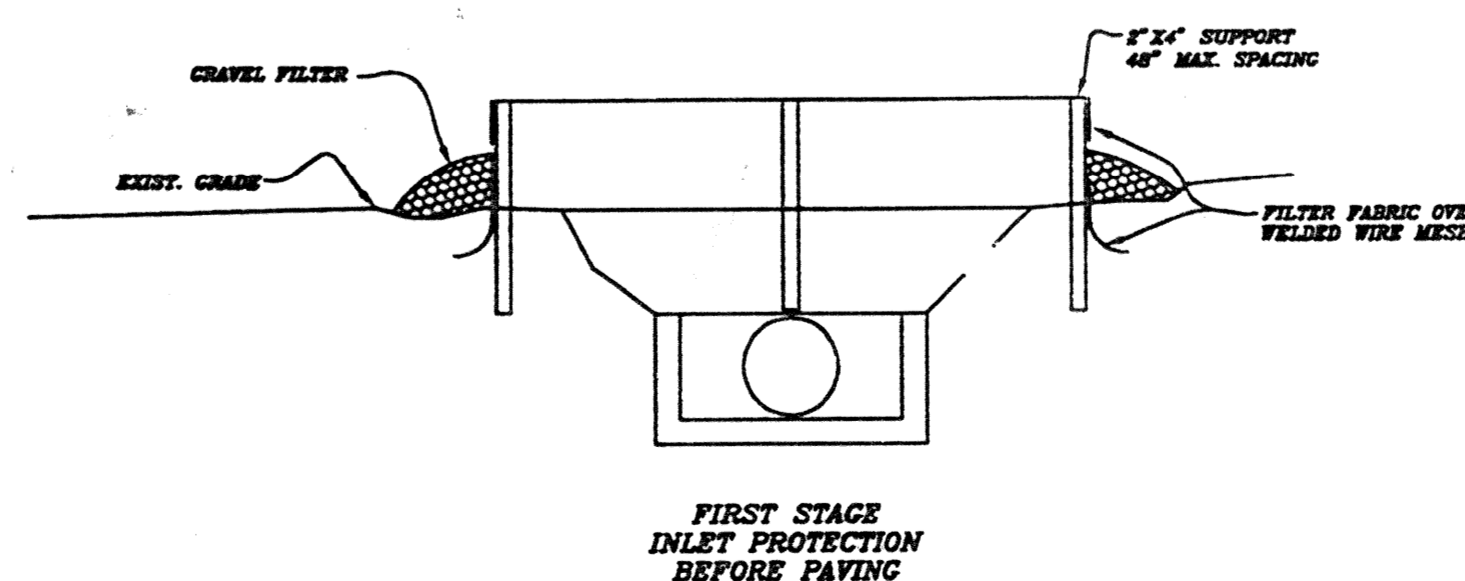
ACREAGE



HIGHLAND TIMBERS  
SECTION ONE

LEGEND

- PROP. STORM SEWER LINE & MANHOLE
- PROP. INLET
- DRAINAGE AREA DIVIDE
- STABILIZED CONSTRUCTION EXIT w/CONC. TRUCK WASHOUT SITE
- INLET PROTECTION LOCATION



EROSION CONTROL FOR COMPLETED LOTS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

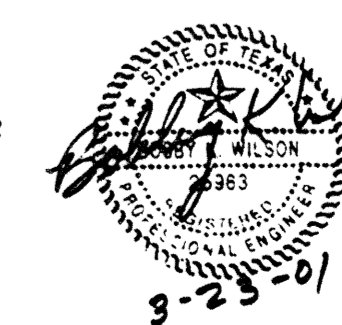
REVIEWED BY	
PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
WATER	PROJECT MANAGER
WASTEWATER	CONSTRUCTION
STORM WATER	CHIEF ENGINEER
STREET AND BRIDGE	

OTHER APPROVAL	
TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT
CITY ENGINEER	DATE
DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE

SUBMITTED:	DESIGNED BY: BOBBY WILSON
SCALE: 1" = 60'	DRAWN BY: BILL DORRIS
DATE: MARCH 2001	SHEET NO. 11 OF 18 SHEETS
SURVEY BY:	CITY DWG. NO. POLLUTE2.DWG
F B NO: 464P	

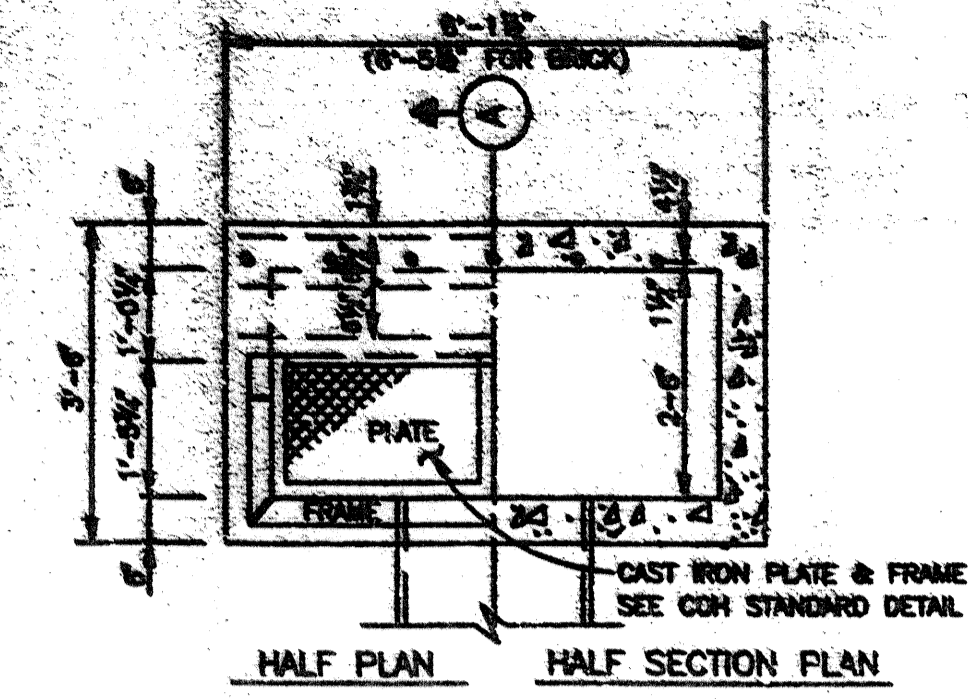
HARRIS COUNTY MUD 191  
HIGHLAND TIMBERS  
SECTION TWO  
POLLUTION PREVENTION LAYOUT

**PCI** PROVIDENT CONSULTING, INC.  
1200 WEST 11TH ST.  
HOUSTON, TEXAS 77008  
(713)802-1019



3-25-01



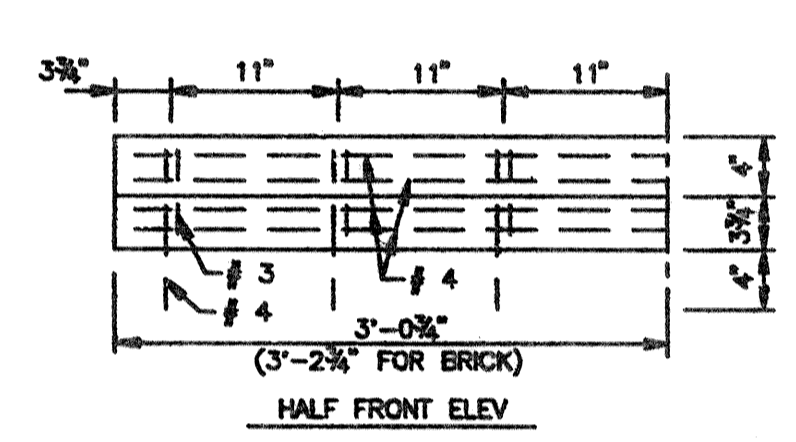
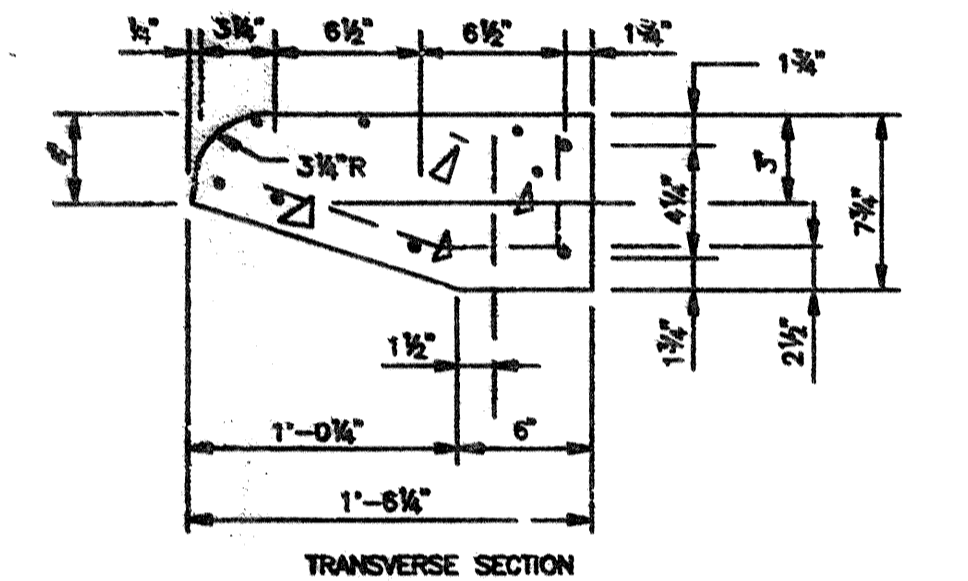
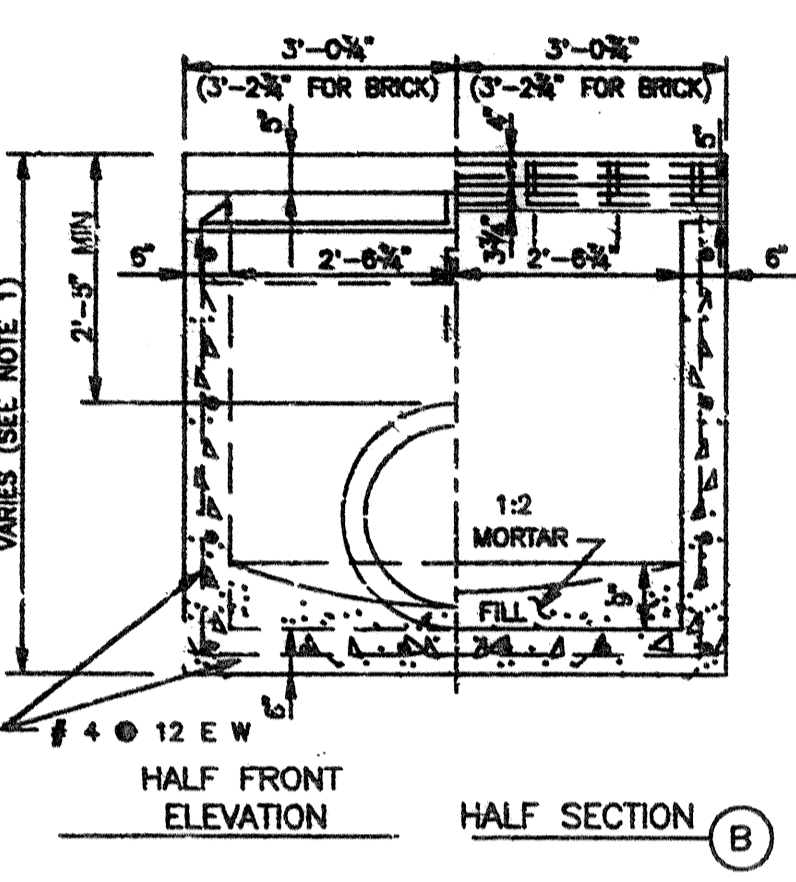
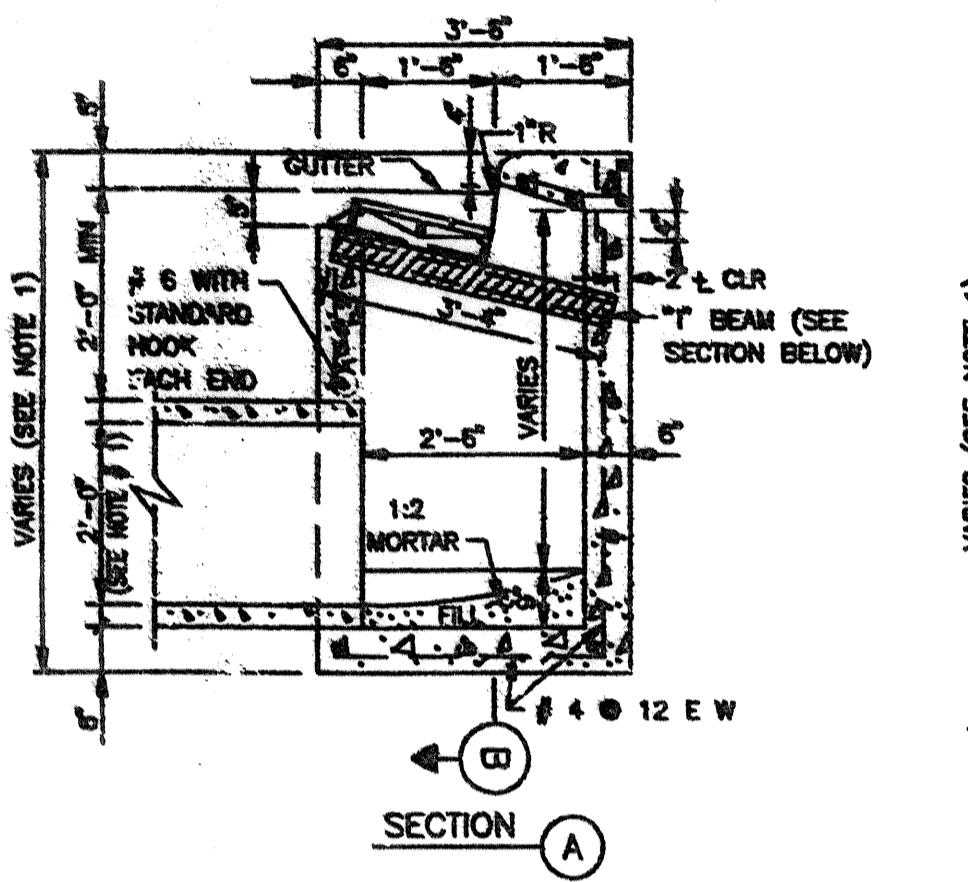


**GENERAL NOTES:**

- USE STD. CAST IRON FRAME & PLATE. LEAD SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED.
- WHEN BRICK INLETS ARE BUILT, EXTEND DOWELS 4 INCHES FROM CURB BEAM INTO BRICKWORK.
- WHEN BRICK INLETS ARE BUILT, WALLS SHALL BE INCREASED TO 8 INCHES, AND INLET BEAMS TO BE 4 INCHES LONGER.

**NOTES:**

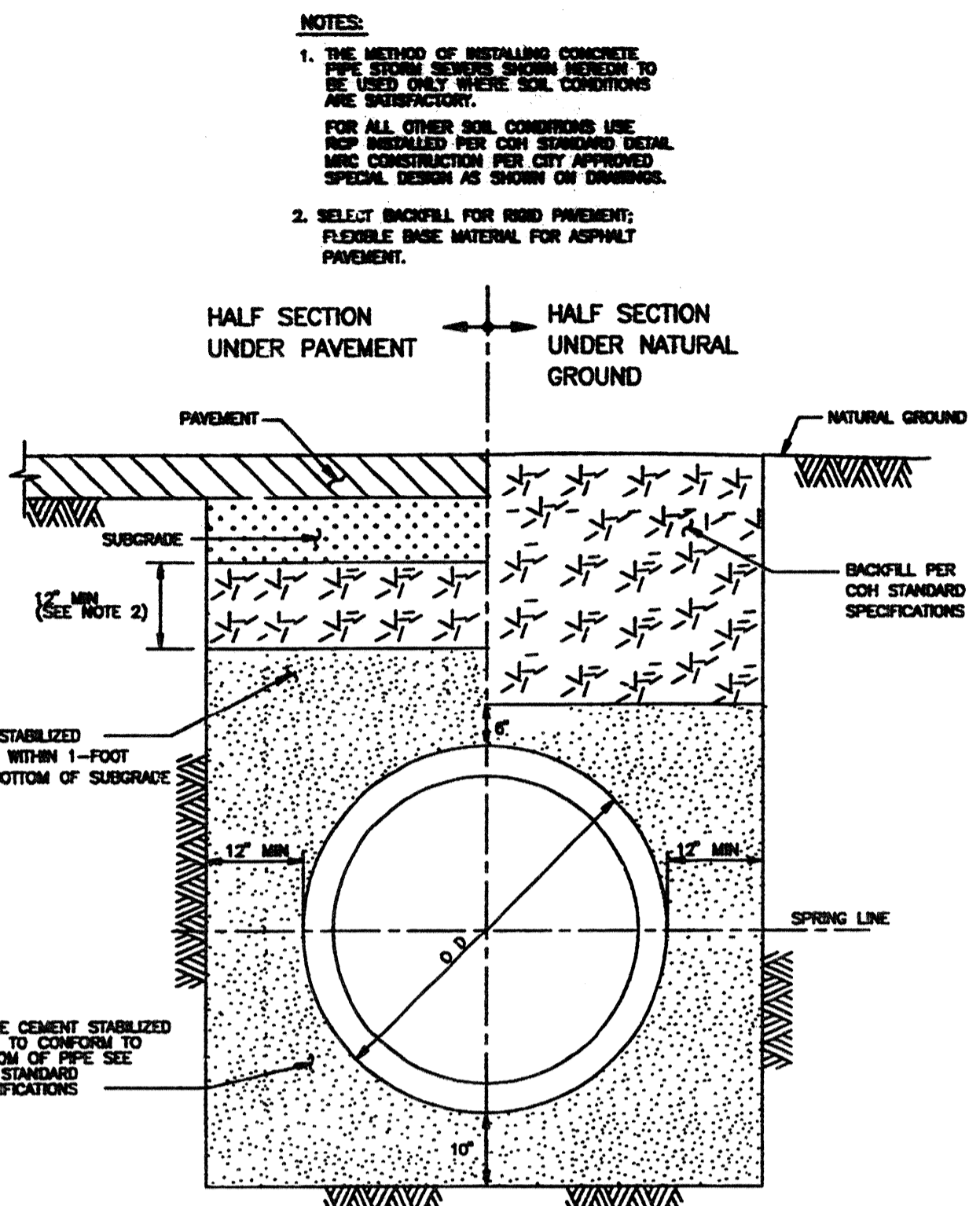
- DIMENSION VARIES BASED ON PIPE DIAMETER AND WALL THICKNESS.
- CENTER REINFORCING IN SLAB AND WALLS.
- CENTER STEEL BEAM ON INLET AND CAST INTO WALLS AS SHOWN.



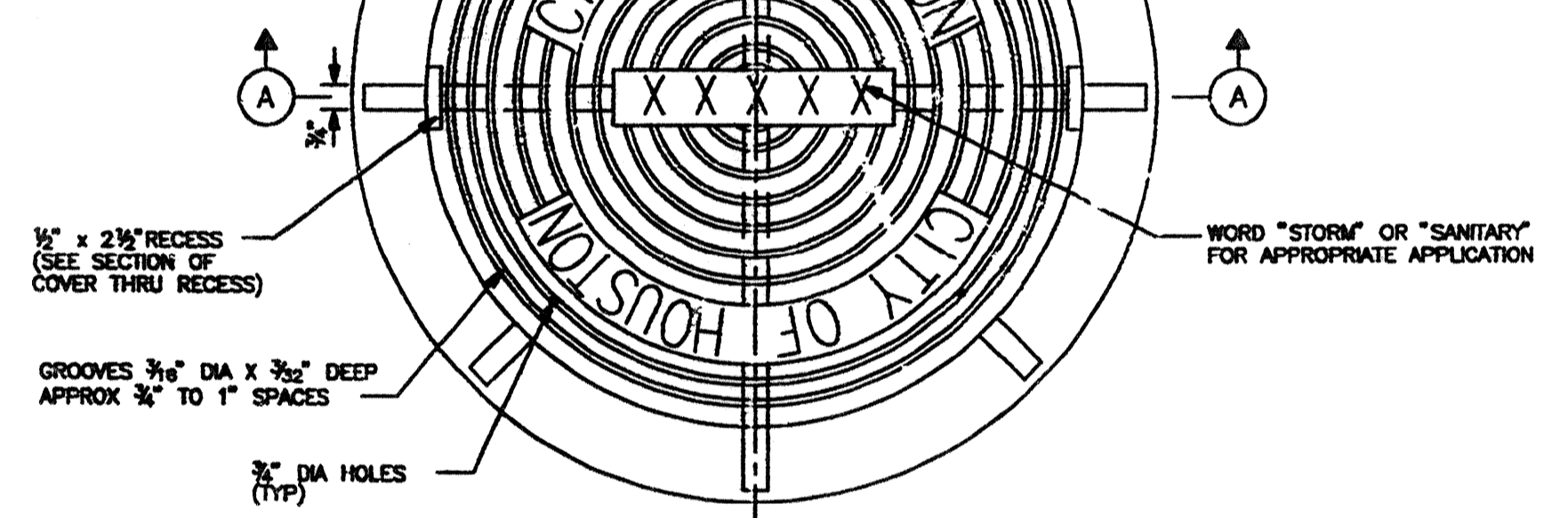
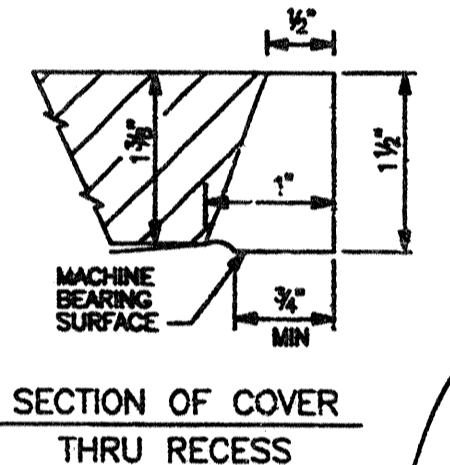
**PRECAST CURB BEAM**

CURB BEAM BAR LIST					
NO.	SIZE	LENGTH	SHAPE	LOC.	
4	#4	9'-10"	ST	HOR.	
7	#4	0'-10"	ST	VERT.	
7	#3	1'-6"	BT		

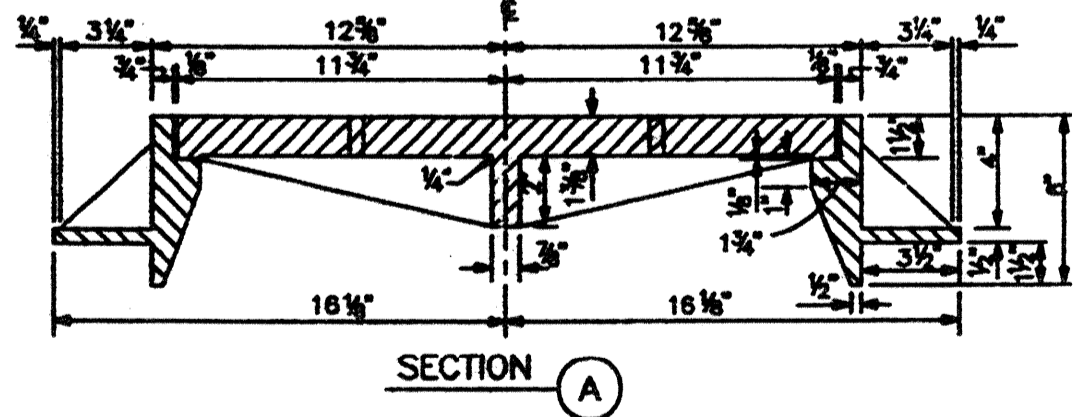
**STORM SEWER TYPE "BB" INLET**  
(NOT TO SCALE)  
EFF DATE: JUL-01-97 DWG NO: 02632-04



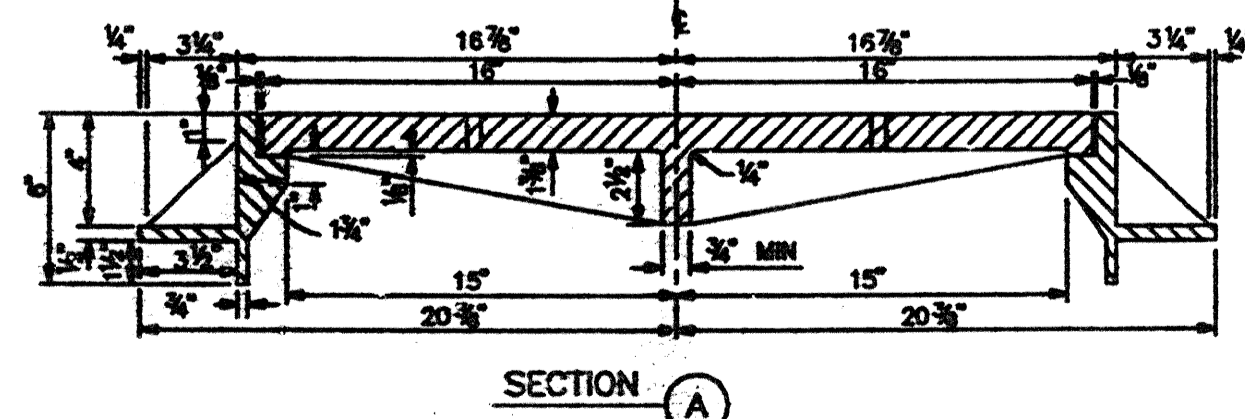
**STORM SEWER BEDDING AND BACKFILL FOR 24" TO 36" DIAMETER RCP WHERE SATISFACTORY SOIL CONDITIONS EXIST (NOT TO SCALE)**  
EFF DATE: JUL-01-97 DWG NO: 02317-04



**23 1/2" AND 32" MANHOLE COVER WITH FRAME**

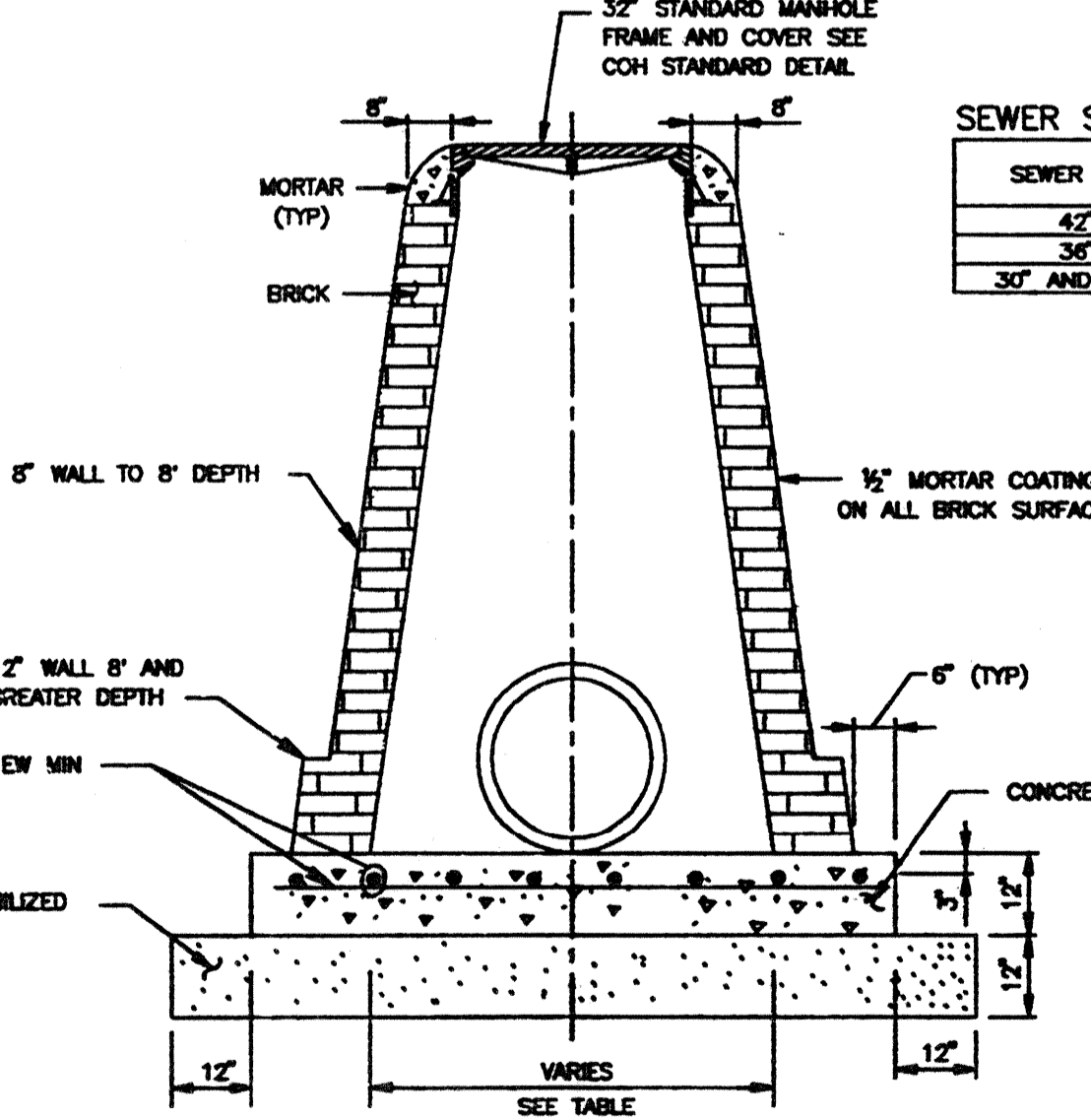
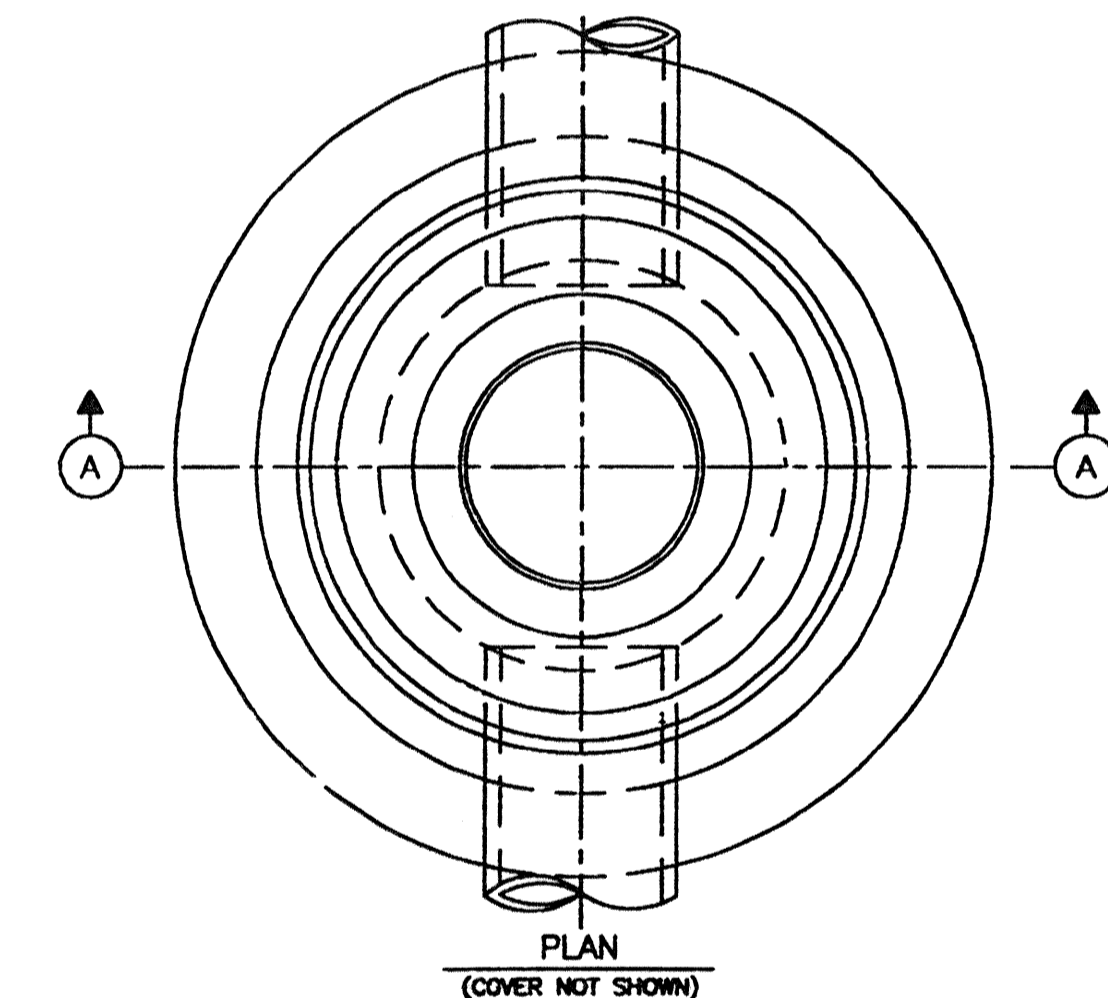


**23 1/2" MANHOLE COVER WITH FRAME**



**32" MANHOLE COVER WITH FRAME**

**MANHOLE FRAME AND COVER (NOT TO SCALE)**  
EFF DATE: JUL-01-97 DWG NO: 02084-01

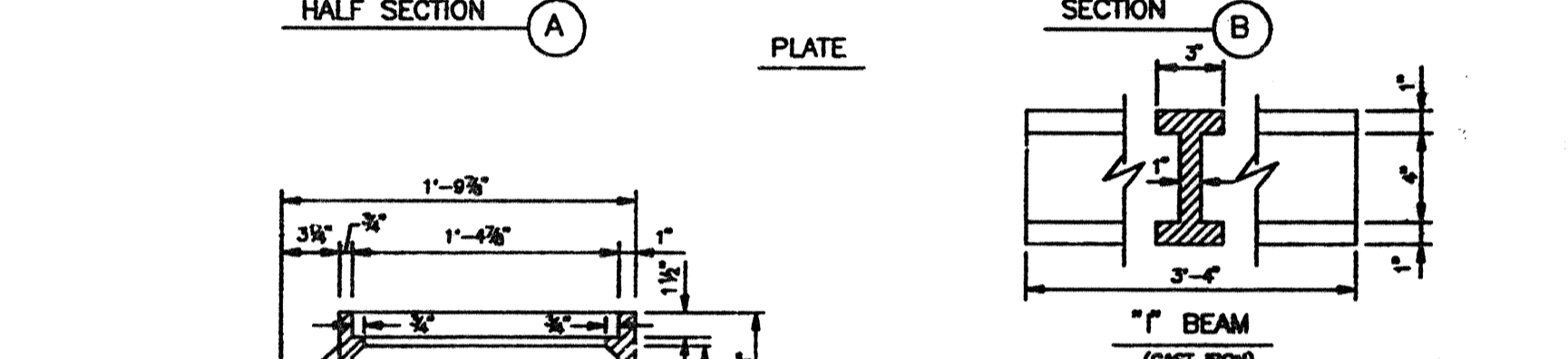
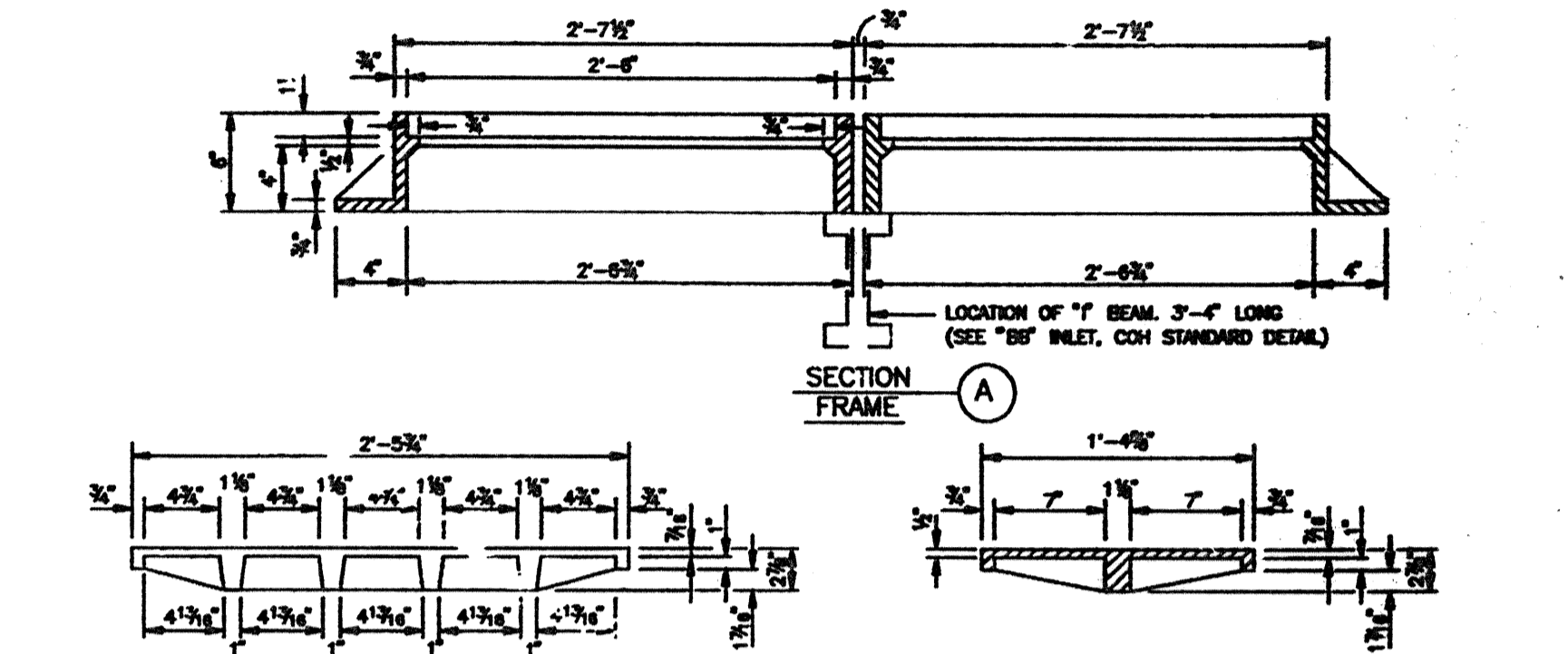
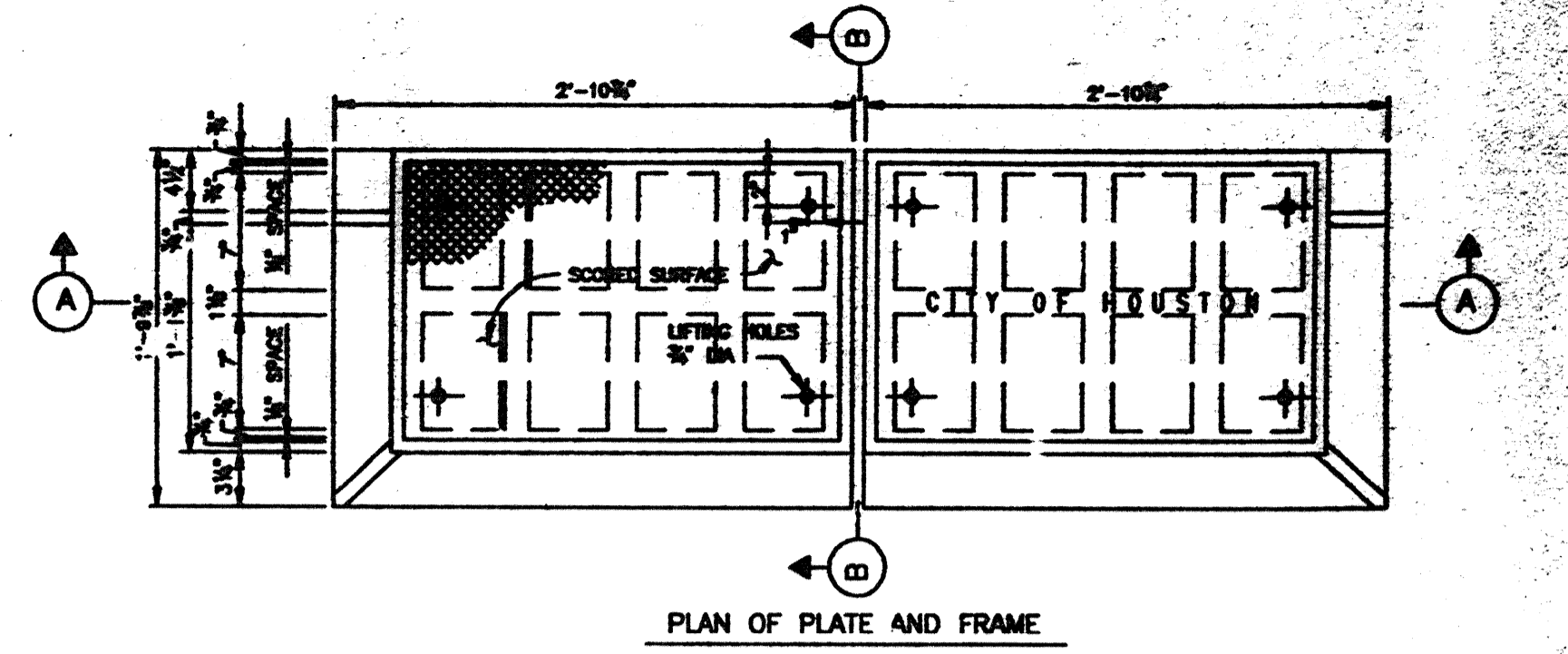


**32" STANDARD MANHOLE FRAME AND COVER SEE COH STANDARD DETAIL**

**TABLE SEWER SIZE VS MANHOLE SIZE**

SEWER SIZE	MANHOLE BASE DIAMETER
42"	5'-0"
36"	4'-6"
30" AND LESS	4'-0"

**STORM SEWER MANHOLE TYPE "C" FOR 42" DIAMETER RCP AND SMALLER (NOT TO SCALE)**  
EFF DATE: JUL-01-97 DWG NO: 02381-03



**SECTION FRAME AND I BEAM**  
**STORM SEWER TYPE "BB" INLET PLATE, FRAME, AND I BEAM (NOT TO SCALE)**  
EFF DATE: JUL-01-97 DWG NO: 02084-04

**CITY OF HOUSTON**  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
<i>Water</i>	
<i>Wastewater</i>	PROJECT MANAGER
<i>Storm Water</i>	CONSTRUCTION
STREET & BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT
CITY ENGINEER	DATE
<i>Director of Public Works and Engineering</i>	DATE
SUBMITTED:	DESIGNED BY:
SCALE: N/A	DRAWN BY:
DATE: JUNE 1999	SHEET NO. 12 OF 18 SHEETS
SURVEY BY:	CITY DWG. NO: STORM.DWG
F B NO:	

**STORM SEWER DETAILS**

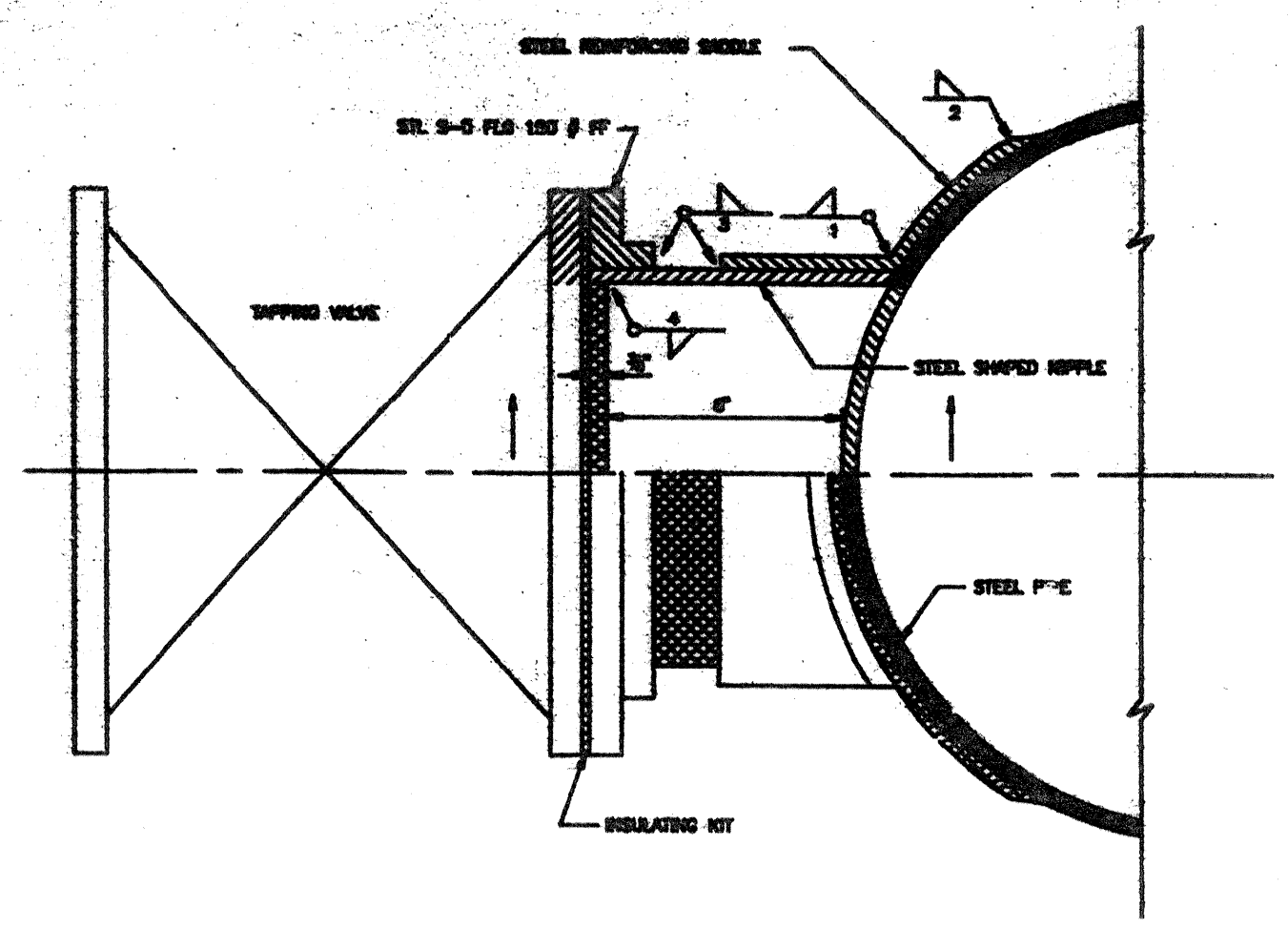
**PCI** PROVIDENT CONSULTANT, INC.  
1200 WEST 11TH ST.  
HOUSTON, TEXAS 77008  
(713)802-1019



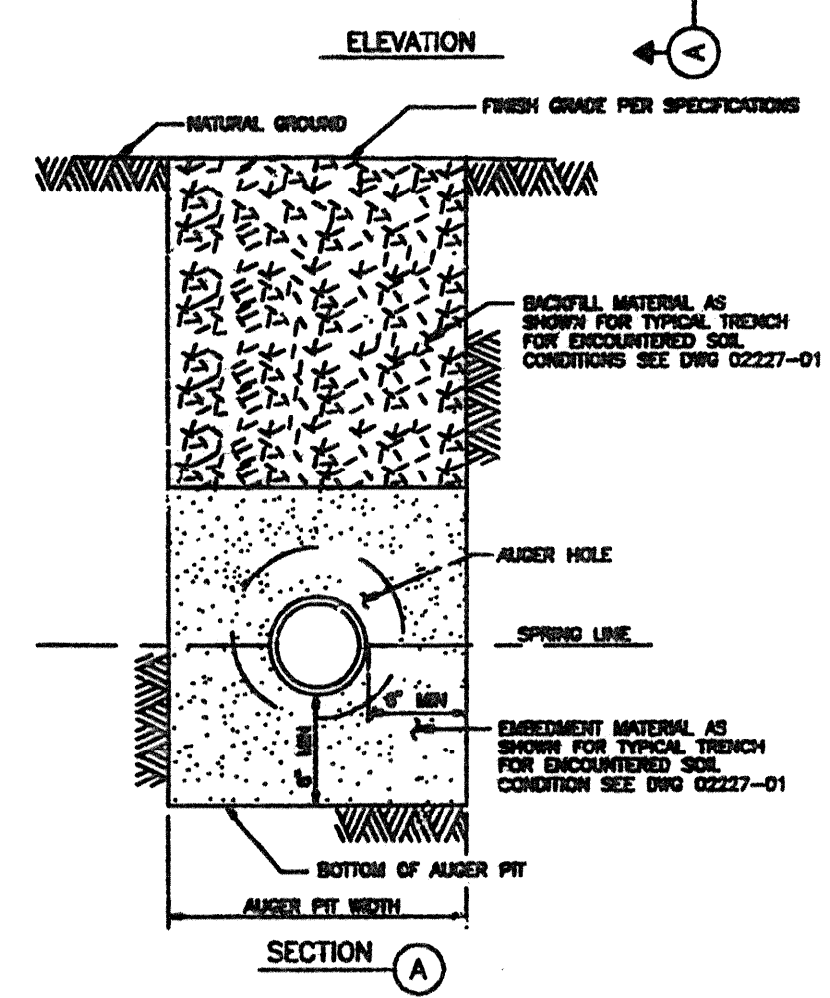
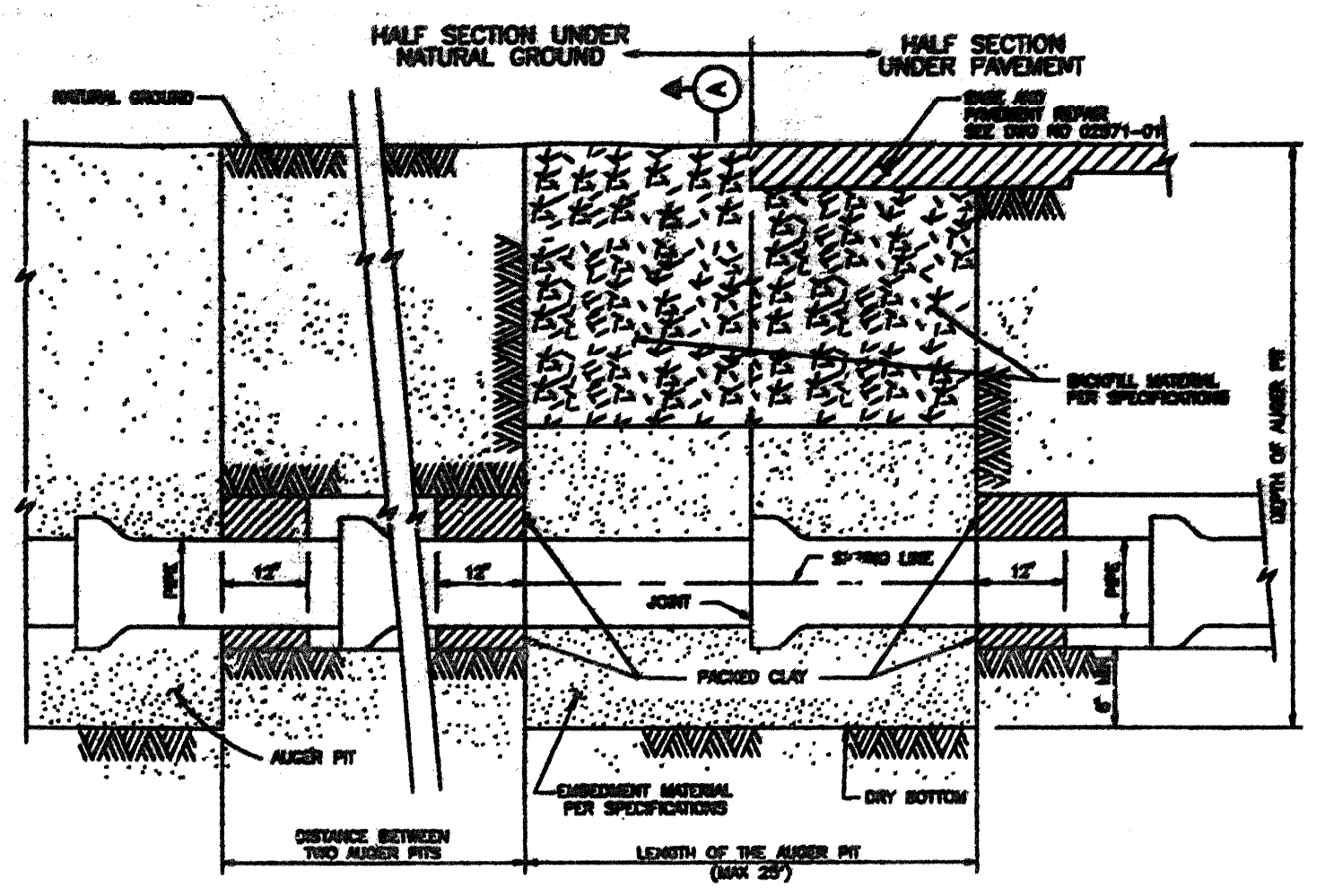




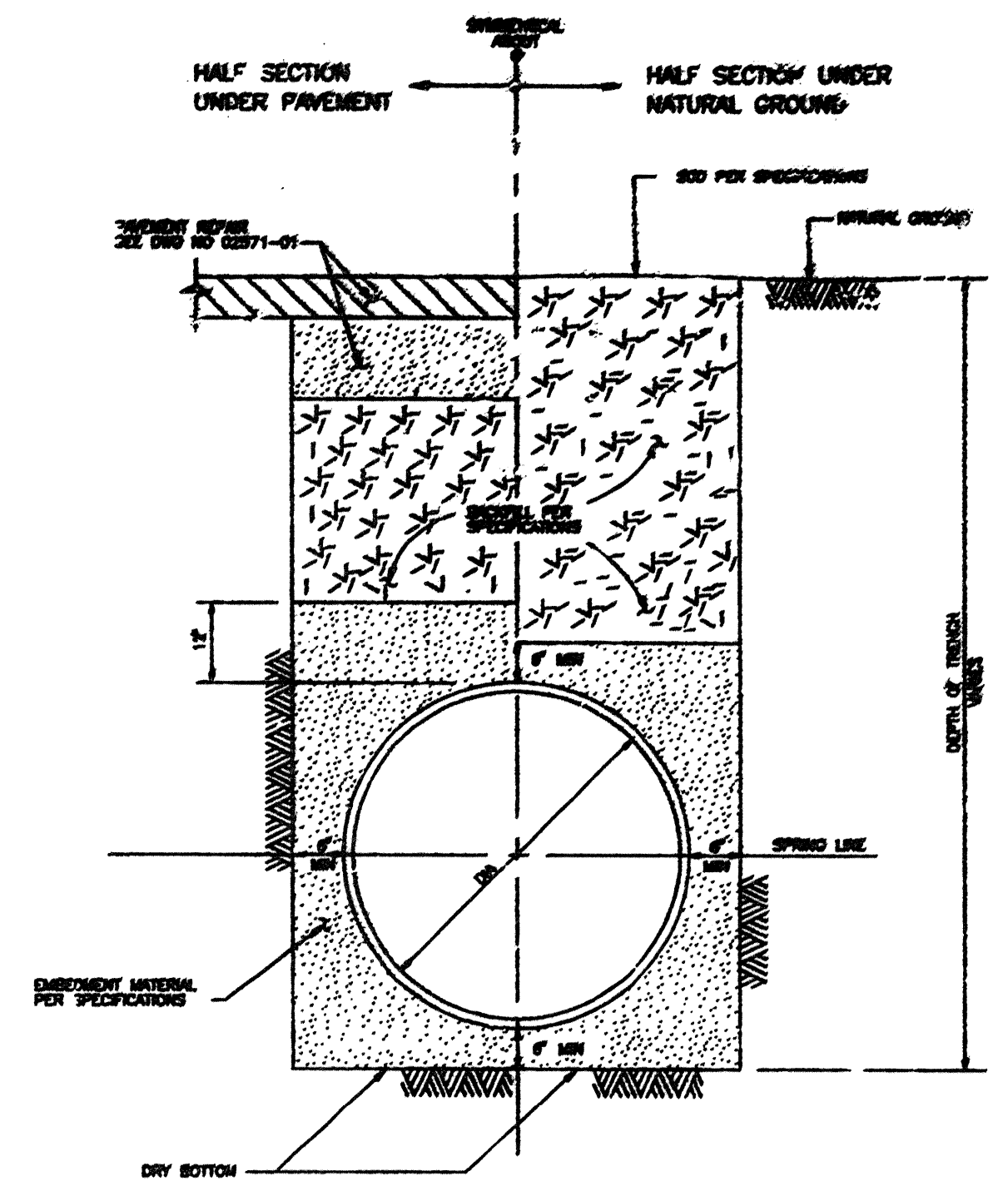
- NOTES:**
1. ALL MATERIALS AND CONTIGS TO BE IN ACCORDANCE WITH WATER MAIN STANDARD SPECIFICATIONS.
  2. RESTRAIN EXISTING PIPES BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.



STANDARD TAP TO STEEL MAIN (NOT TO SCALE) 02665-04B

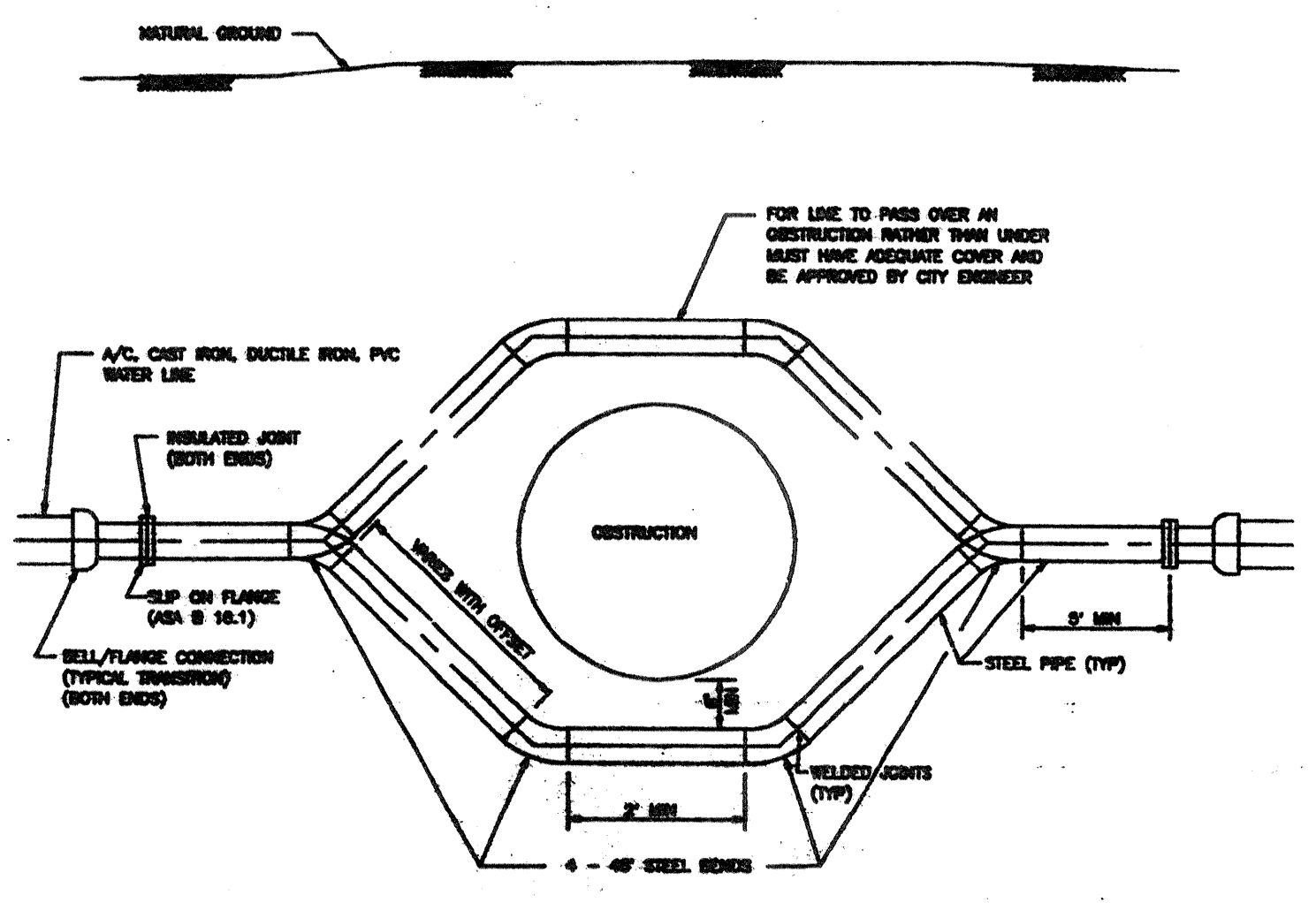


BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE FOR WATER MAIN (NOT TO SCALE) 02316-01C



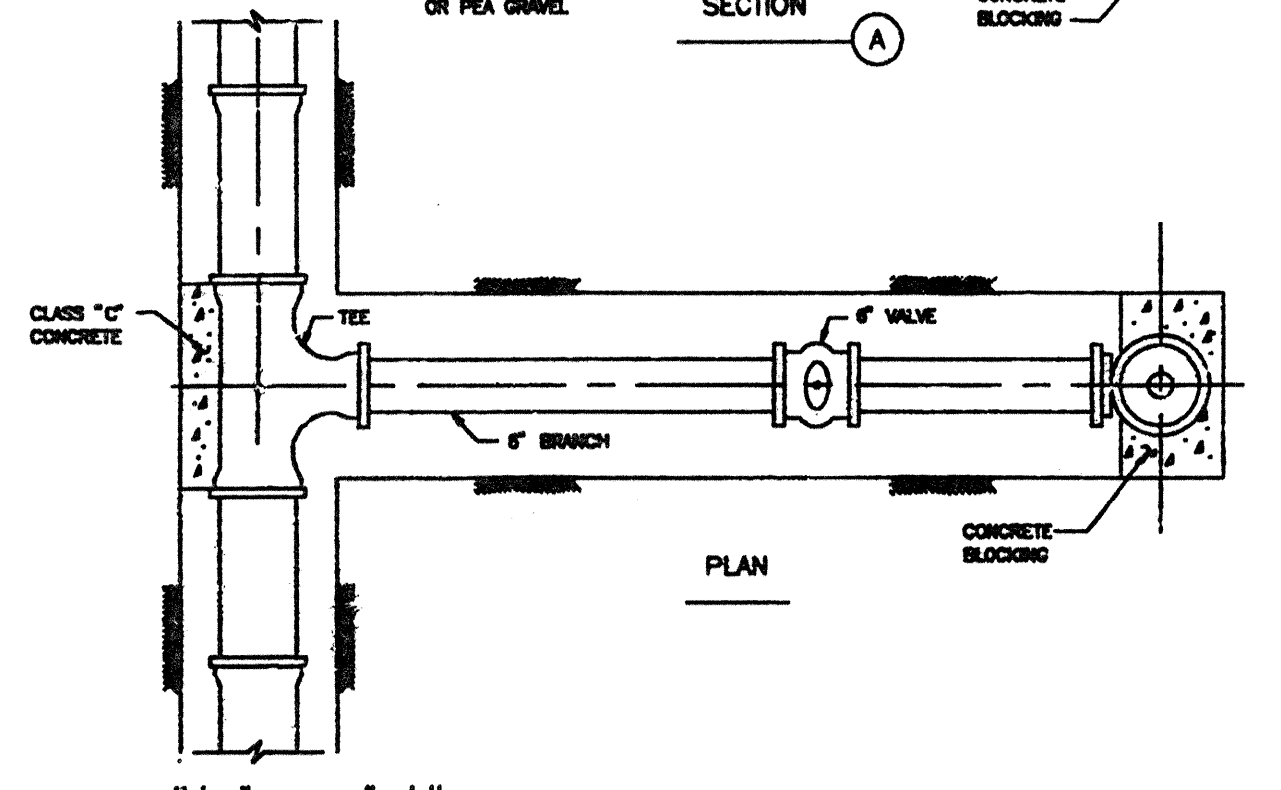
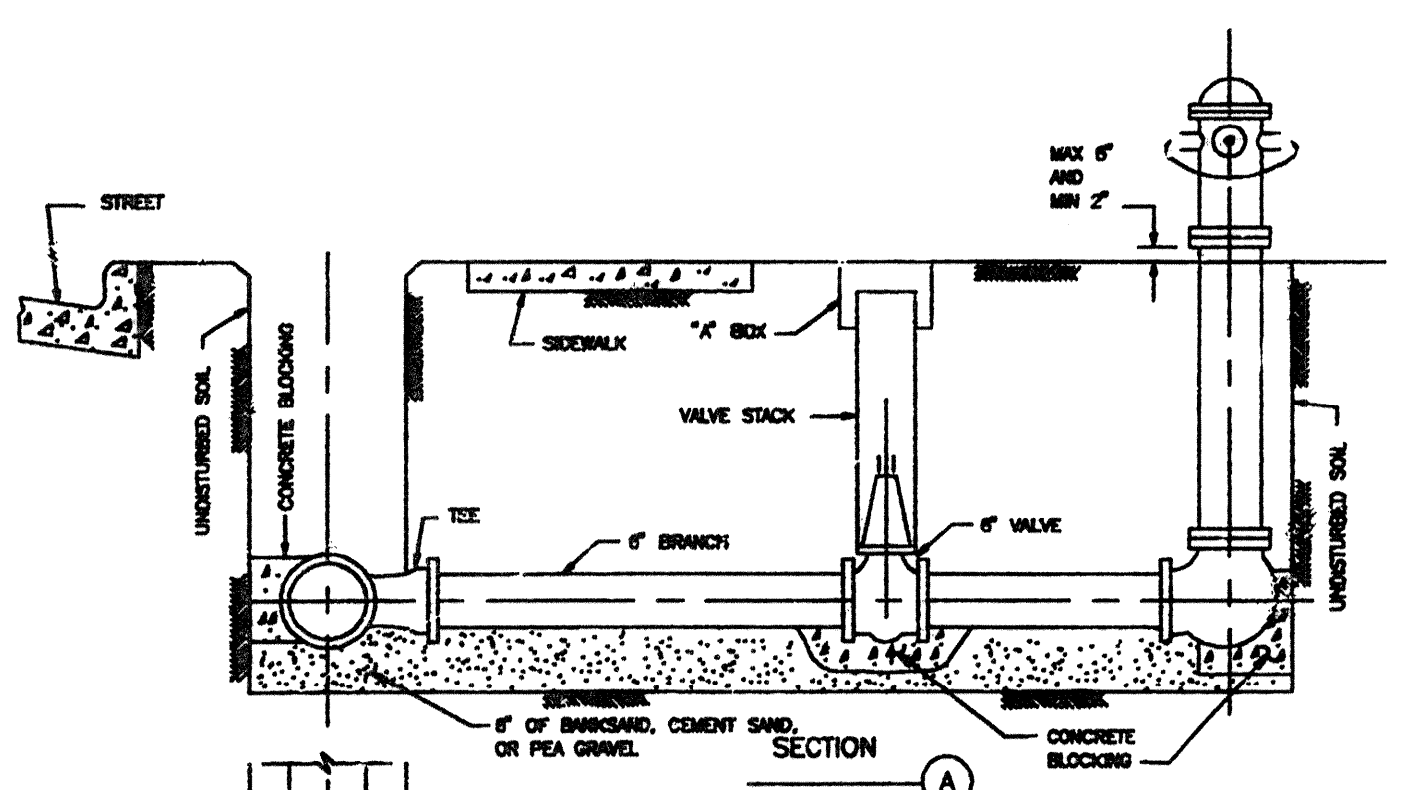
WATER DISTRIBUTION MAIN BEDDING AND BACKFILL FOR OPEN CUT TRENCHES (NOT TO SCALE) 02664-01C

- NOTE:**
1. ALL MATERIALS AND CONTIGS TO BE IN ACCORDANCE WITH WATER MAIN STANDARD SPECIFICATIONS.
  2. RESTRAIN EXISTING PIPES BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.



- TYPICAL STEEL SECTION FITTINGS**
- 4 - 4" STEEL BEAMS
  - 2 - 8" BELL-FLANGE ADAPTERS
  - 2 - 8" SLIP-ON FLANGES 100 #
  - 2 - 8" INSULATED JOINTS

TYPICAL STEEL PIPE OFFSET SECTION FOR WATER MAINS (NOT TO SCALE) 02611-02A



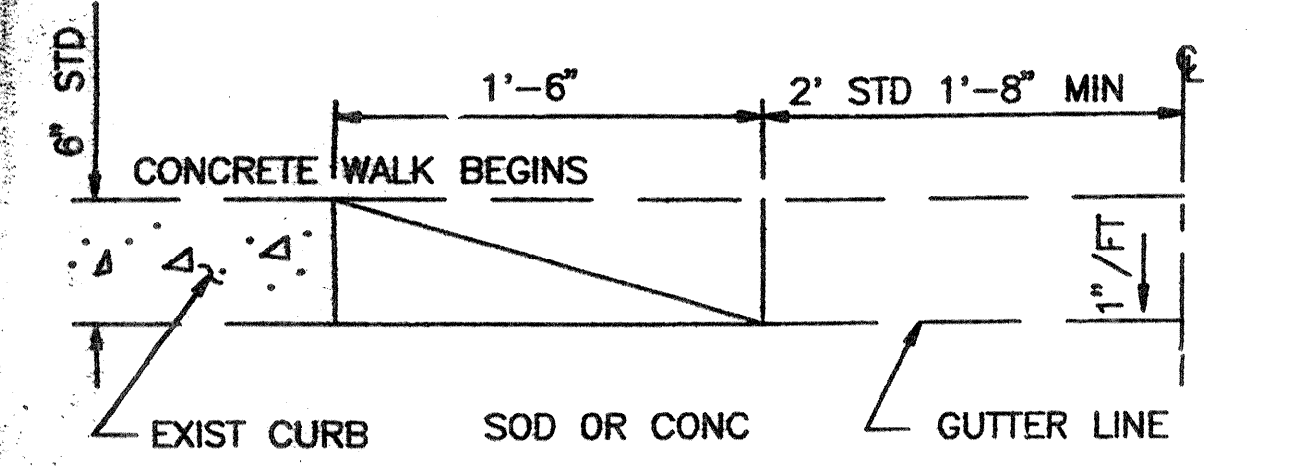
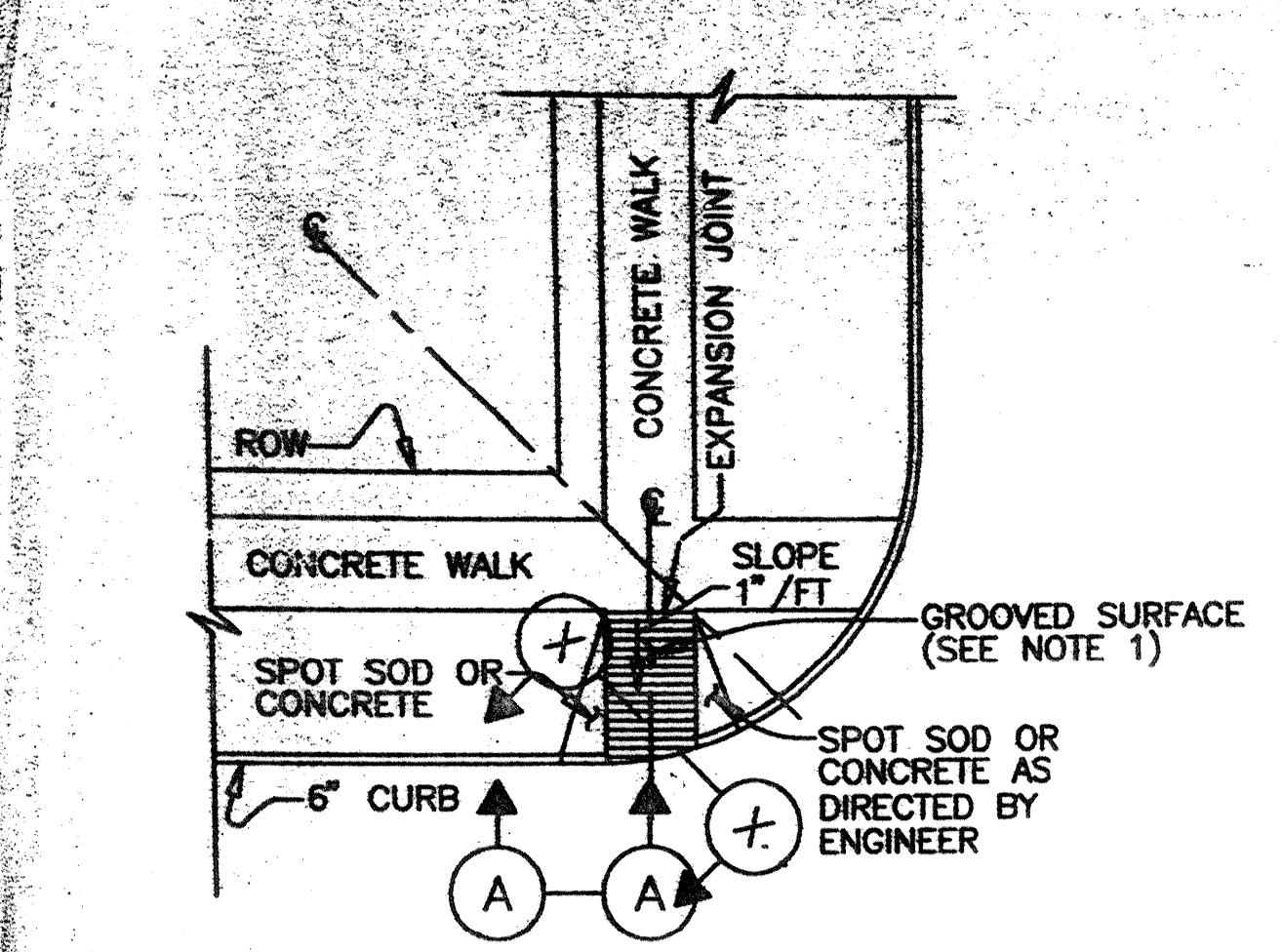
STANDARD FIRE HYDRANT DETAIL (NOT TO SCALE) 02645-01B

CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS & ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP	
<i>Victor Salinas 3-23-00</i> WATER ENGINEERING	TRAFFIC AND SIGNAL ENGINEERING
<i>W. Salinas</i> WASTEWATER ENGINEERING	STREET & BRIDGE ENGINEERING
<i>W. Salinas</i> STORM SEWER ENGINEERING	CONSTRUCTION
OTHER DEPARTMENTS	
PLANNING AND DEVELOPMENT	SPOHSOR DEPARTMENT
CITY ENGINEER	DATE
<i>Mark L...</i> DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE
SUBMITTED: _____	DESIGNED BY: BKW
SCALE: N/A	DRAWN BY: CWK
DATE: JUNE 1999	SHEET NO. 14 OF 18 SHEETS
SURVEY BY: _____	CITY DWG. NO. WATERD.DWG
F B NO. _____	
WATER DETAILS	
<b>PCI</b> PROVIDENT CONSULTANT, INC. 1200 WEST 11TH ST. HOUSTON, TEXAS 77008 (713)802-1019	

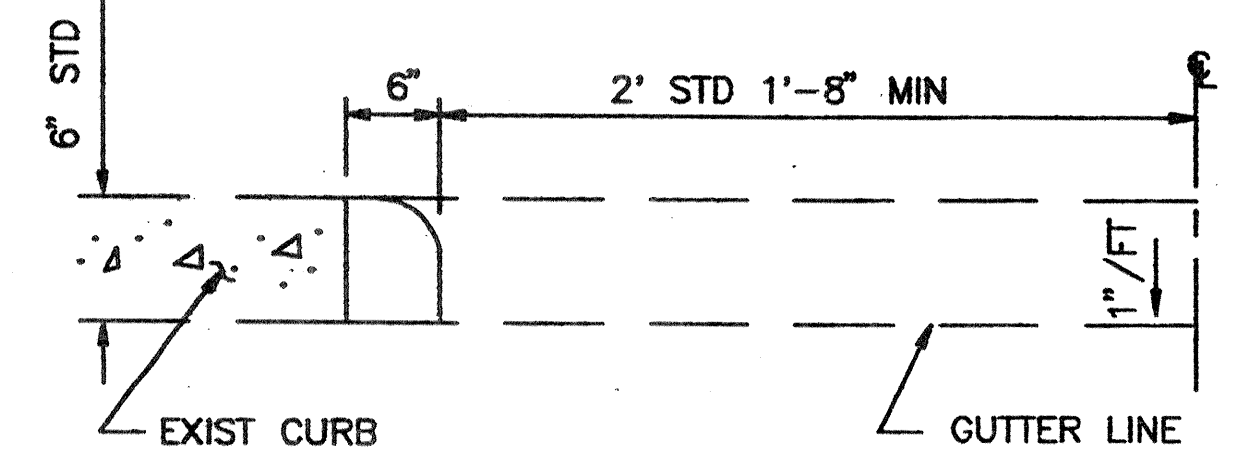
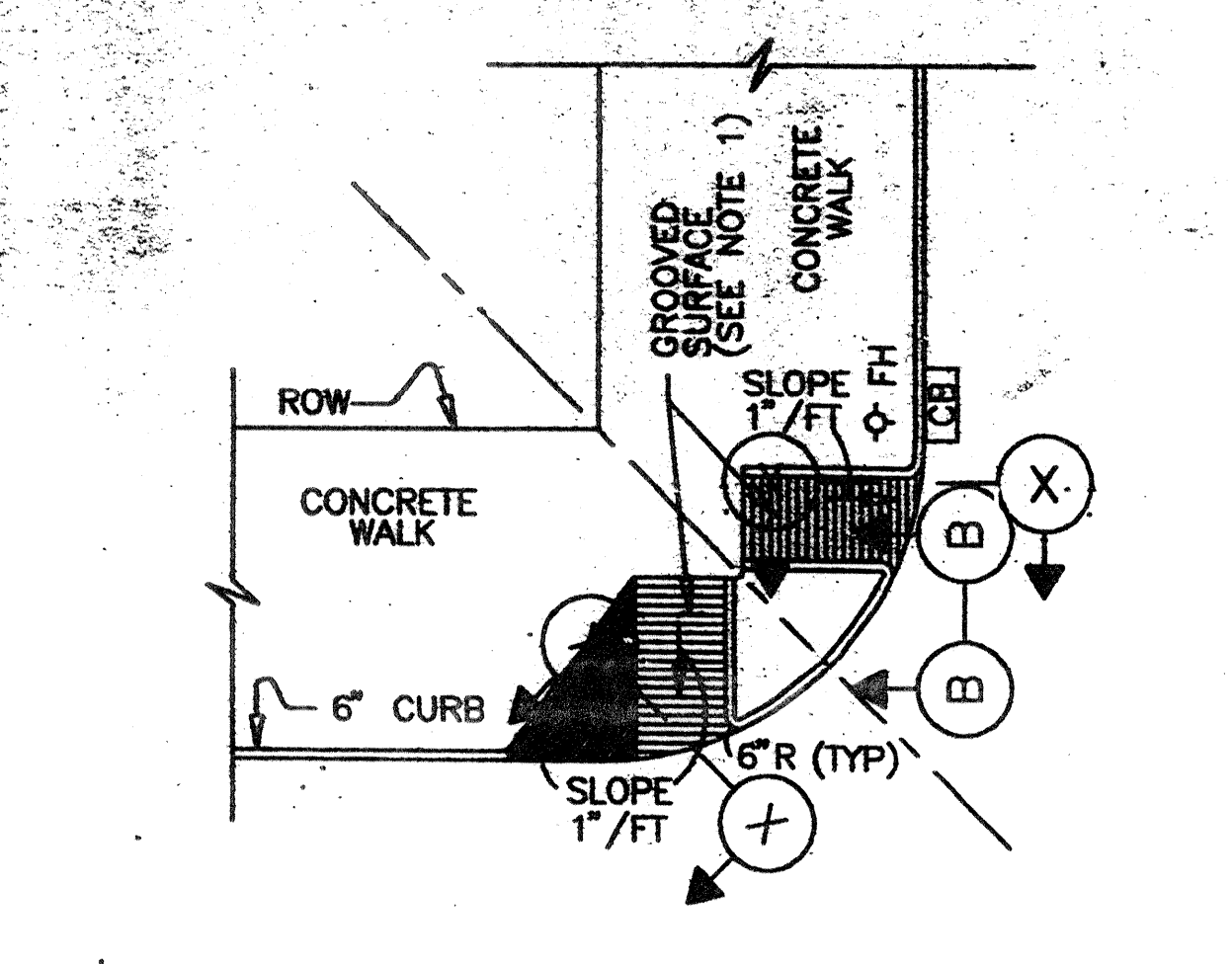






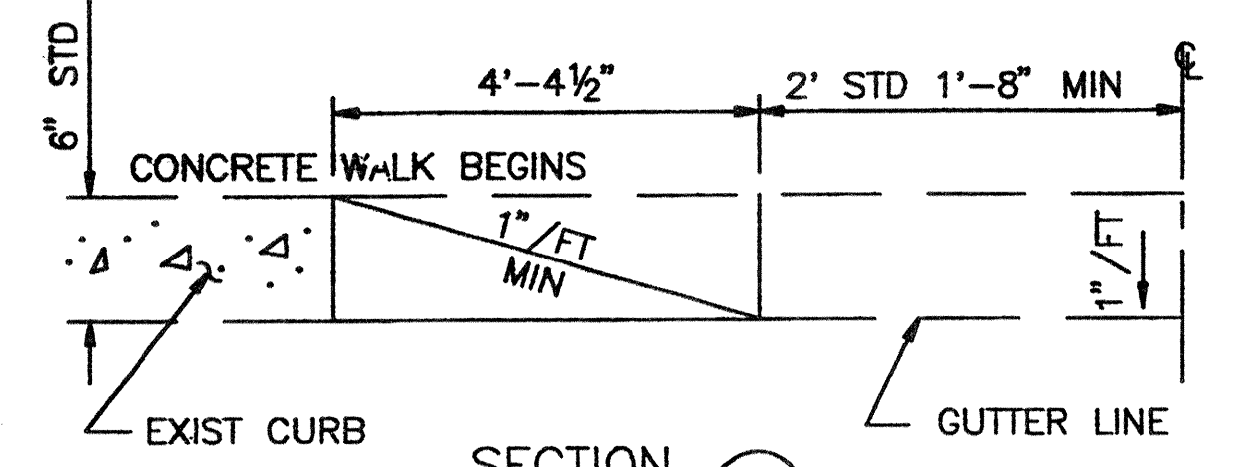
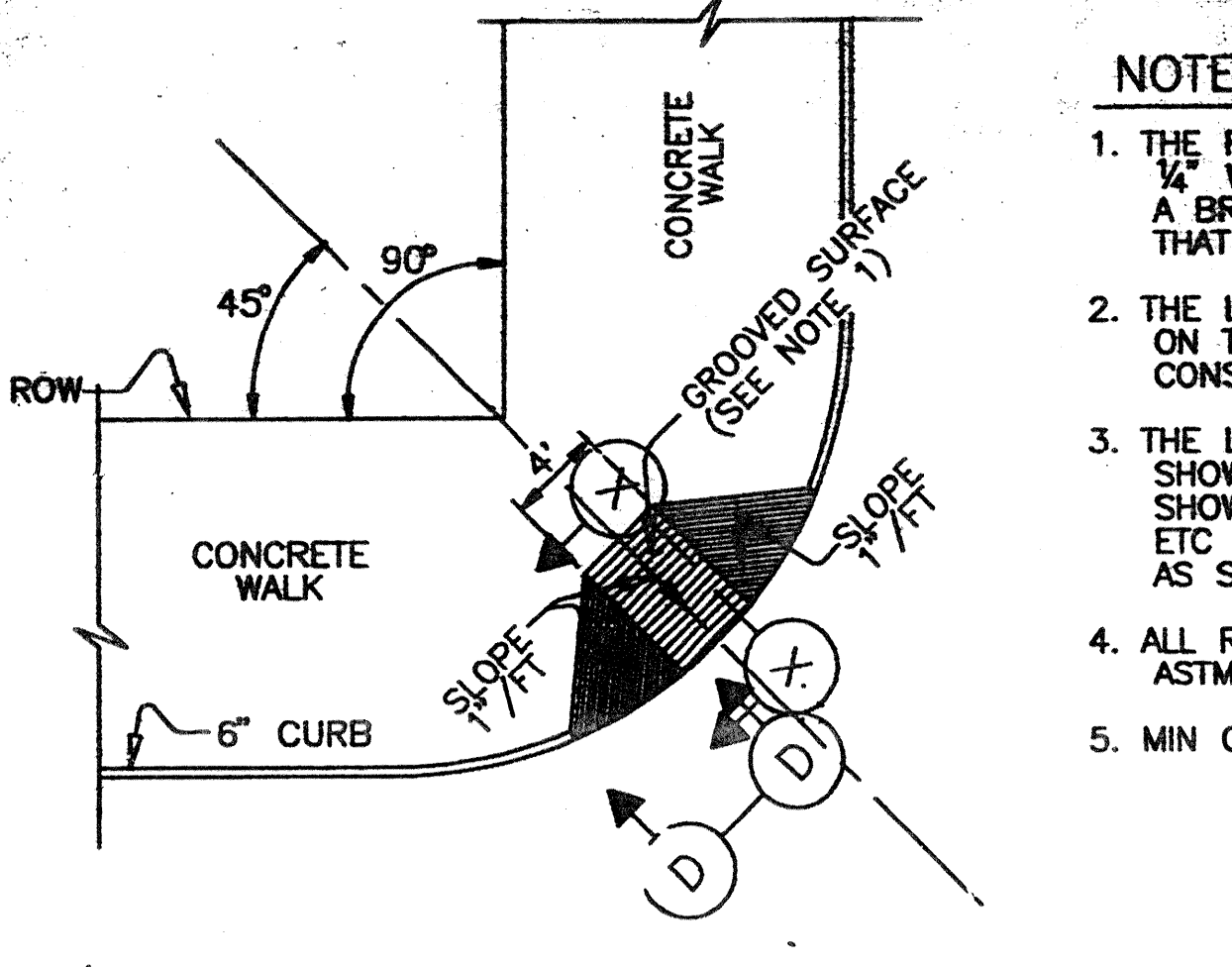


SECTION A  
RESIDENTIAL & RURAL CONDITIONS



SECTION B  
URBAN AREAS RESTRICTED BY SMALL RADII, FH, ETC

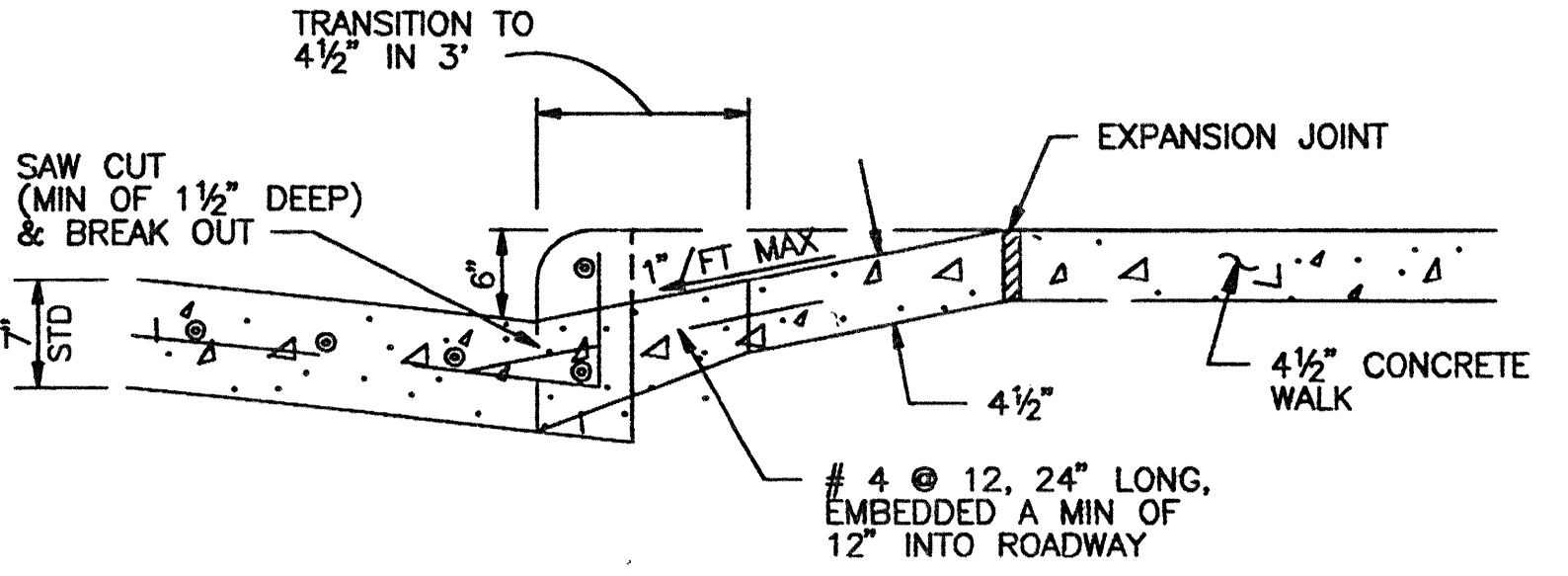
SECTION C  
COMBINATION OF B & D



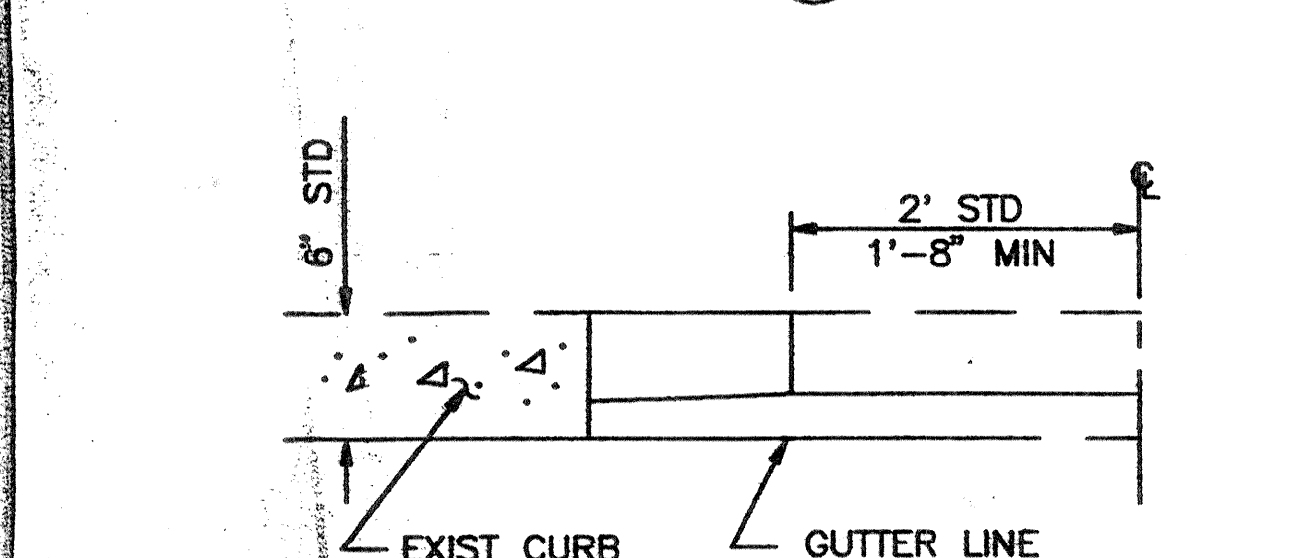
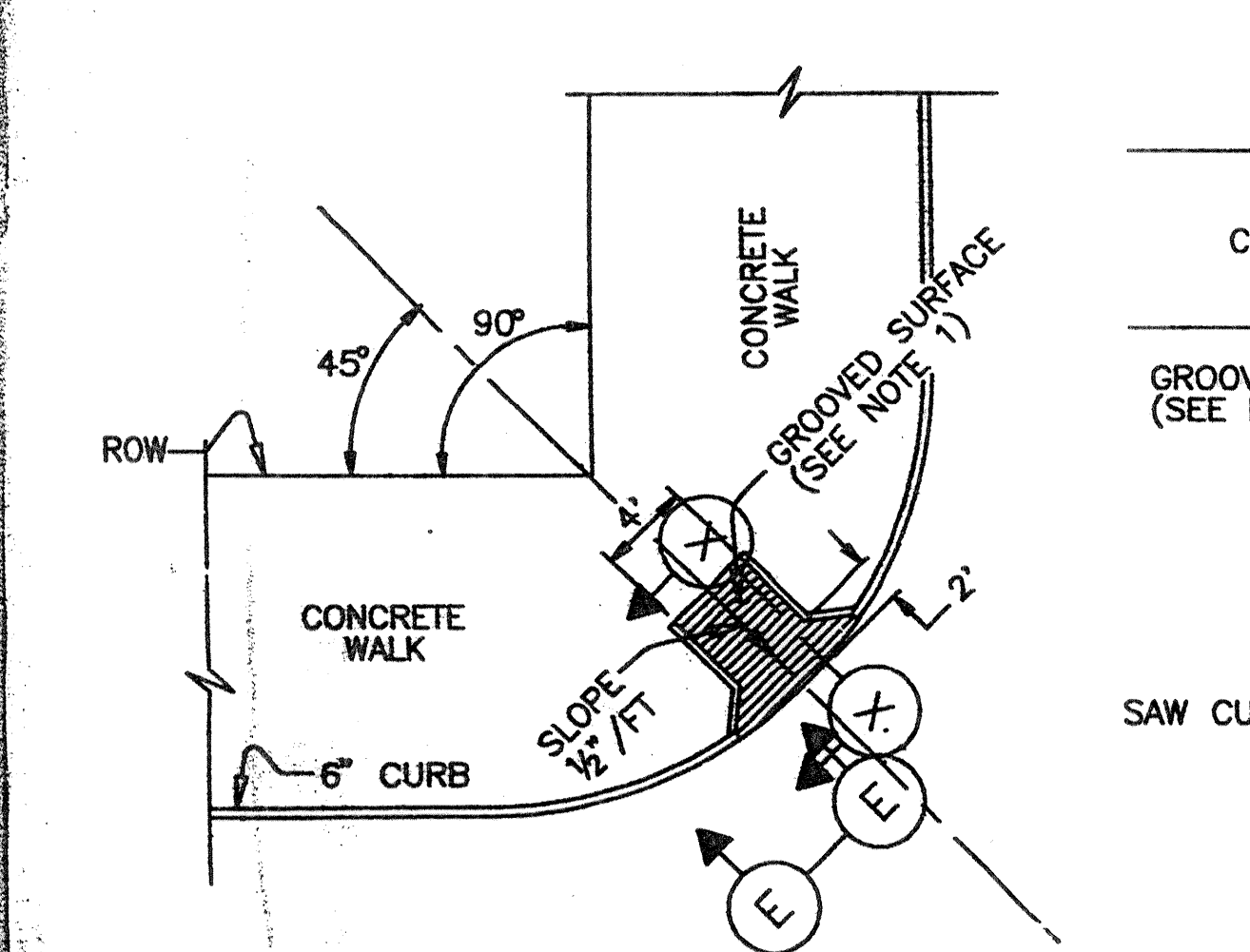
SECTION D  
URBAN & METROPOLITAN AREAS WITH LARGE RADII & NO RESTRICTIONS

NOTES:

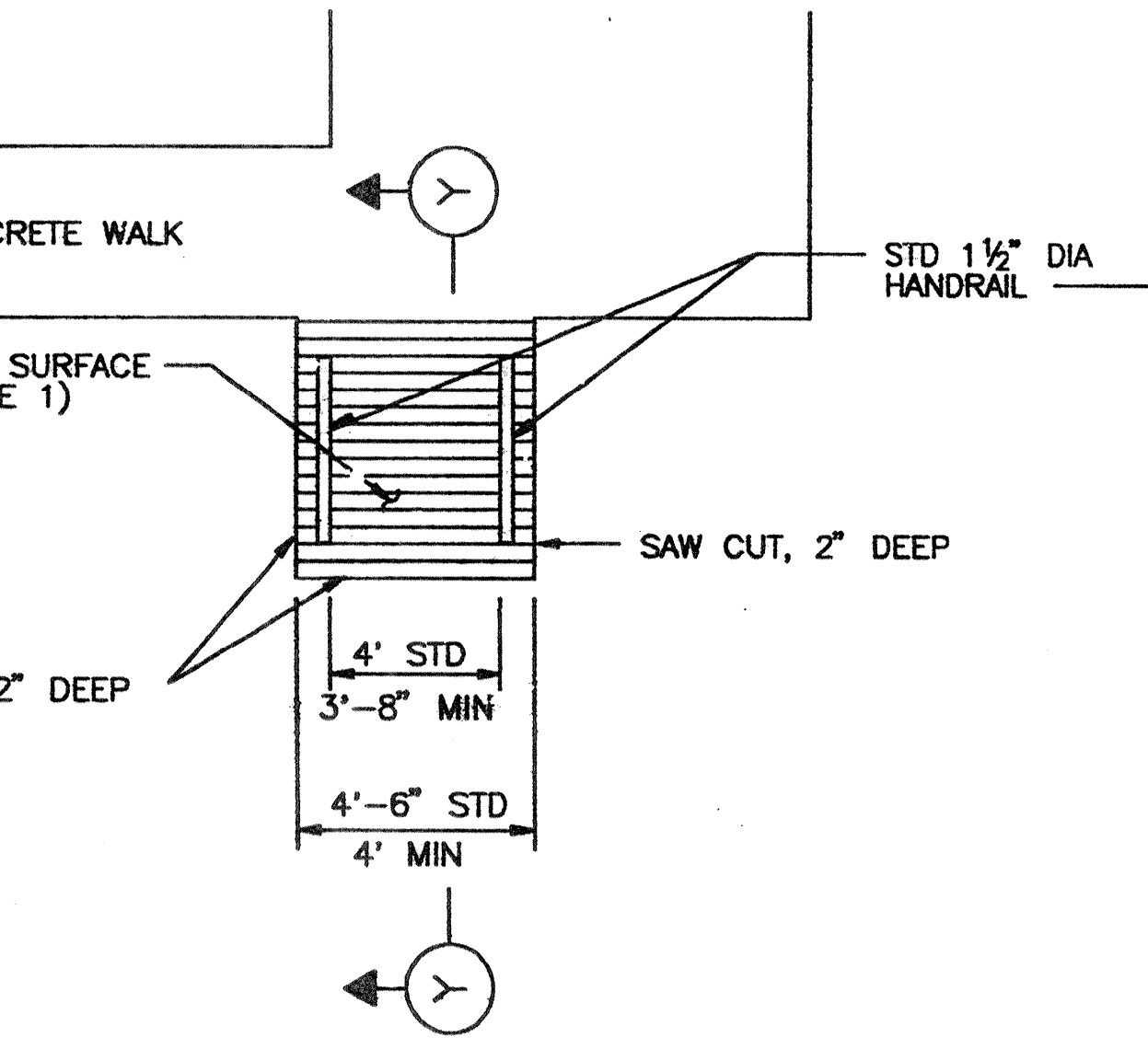
1. THE FINISHED SURFACE OF A WHEELCHAIR RAMP IS TO BE GROOVED LATERALLY WITH 1/4" WIDE BY 1/4" DEEP GROOVES, SPACED 2 1/4", AND ROUGHENED WITH NO LESS THAN A BROOM FINISH TO PREVENT SLIPPING, AND TO DIFFERENTIATE ITS TEXTURE FROM THAT OF STANDARD SIDEWALK.
2. THE LOCATION OF A WHEELCHAIR RAMP MAY BE SHIFTED FROM THE PROPOSED LOCATION ON THE PLANS, BECAUSE OF UNFORSEEN EXISTING CONDITIONS AT THE TIME OF CONSTRUCTION, A CHANGE IN LOCATION WILL BE AS DIRECTED BY THE ENGINEER.
3. THE LOCATIONS AND AREAS OF USES OF THE VARIOUS TYPES OF WHEEL CHAIR RAMPS SHOWN ARE FOR ILLUSTRATIVE AND SUGGESTIVE PURPOSES ONLY. ANY ONE OF THE TYPES SHOWN (A, B, C, OR D) MAY BE LOCATED IN ANY AREA, IE URBAN, RESIDENTIAL, ETC OR AT ANY POINT ON OR OFF THE RADIUS, ACCORDING TO TYPE AND LOCATION AS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER.
4. ALL REINFORCING STEEL SHALL BE NEW BILLET STEEL AND MEET THE REQUIREMENTS OF ASTM DESIGNATION A-615, GRADE 60 DEFORMED BARS, FOR CONCRETE REINFORCEMENT.
5. MIN CLEAR WIDTH OF WHEEL CHAIR RAMP IS 4'-0".



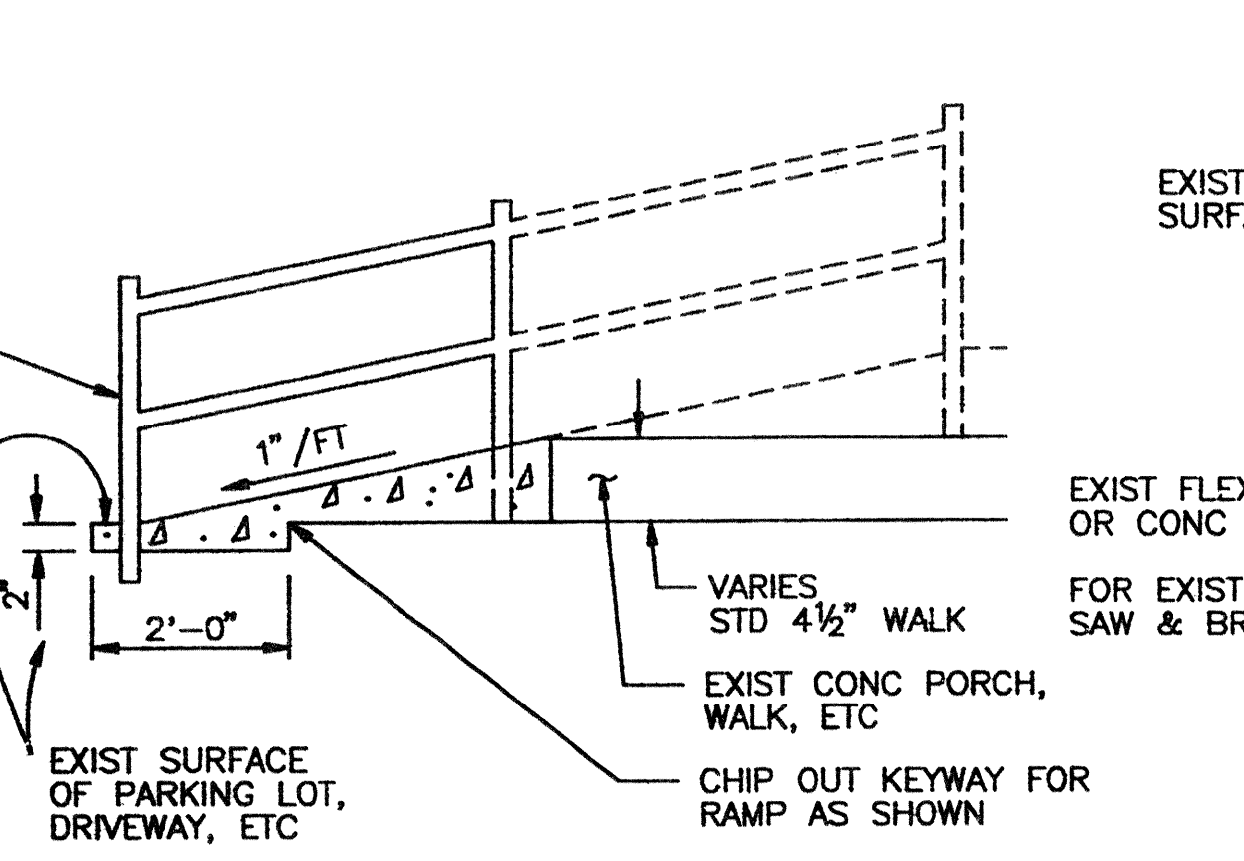
SECTION X  
EXISTING CONCRETE PAVEMENT CONSTRUCTION



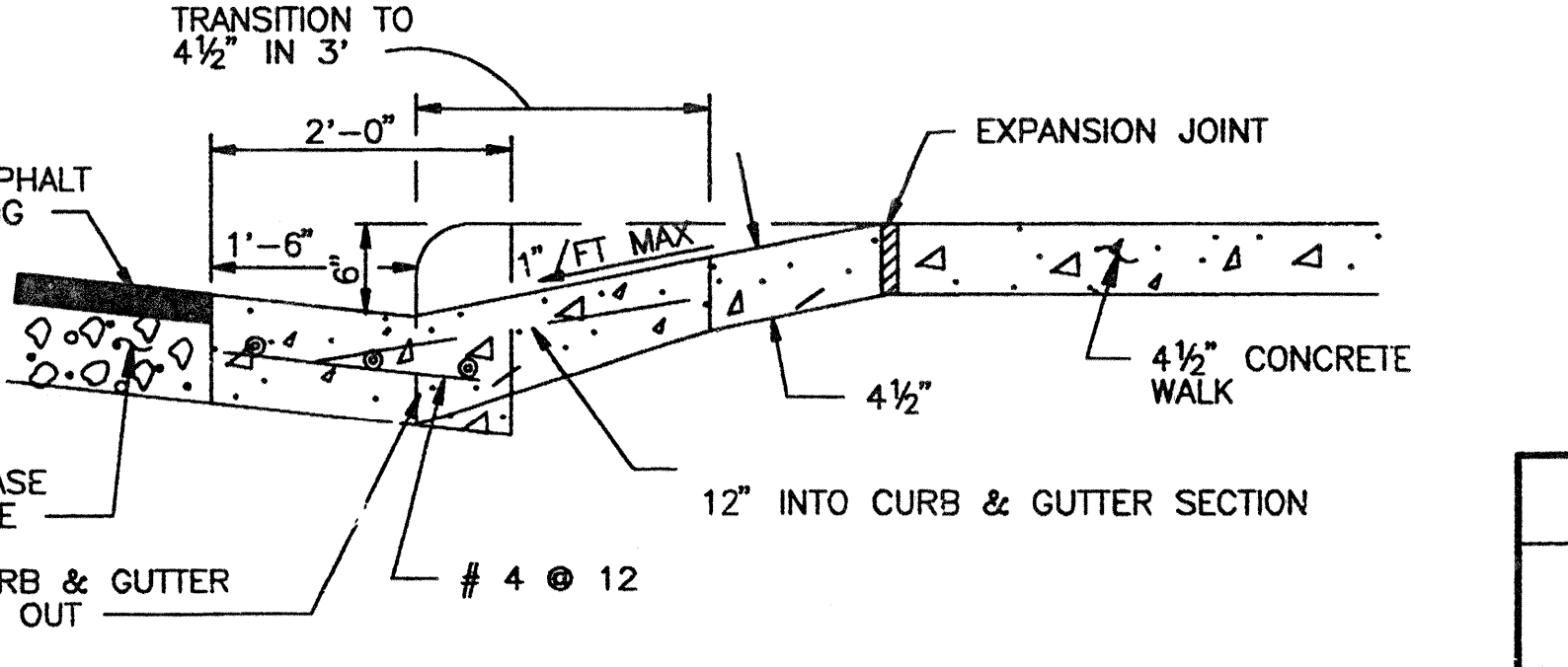
SECTION E  
MODIFICATION OF TYPE



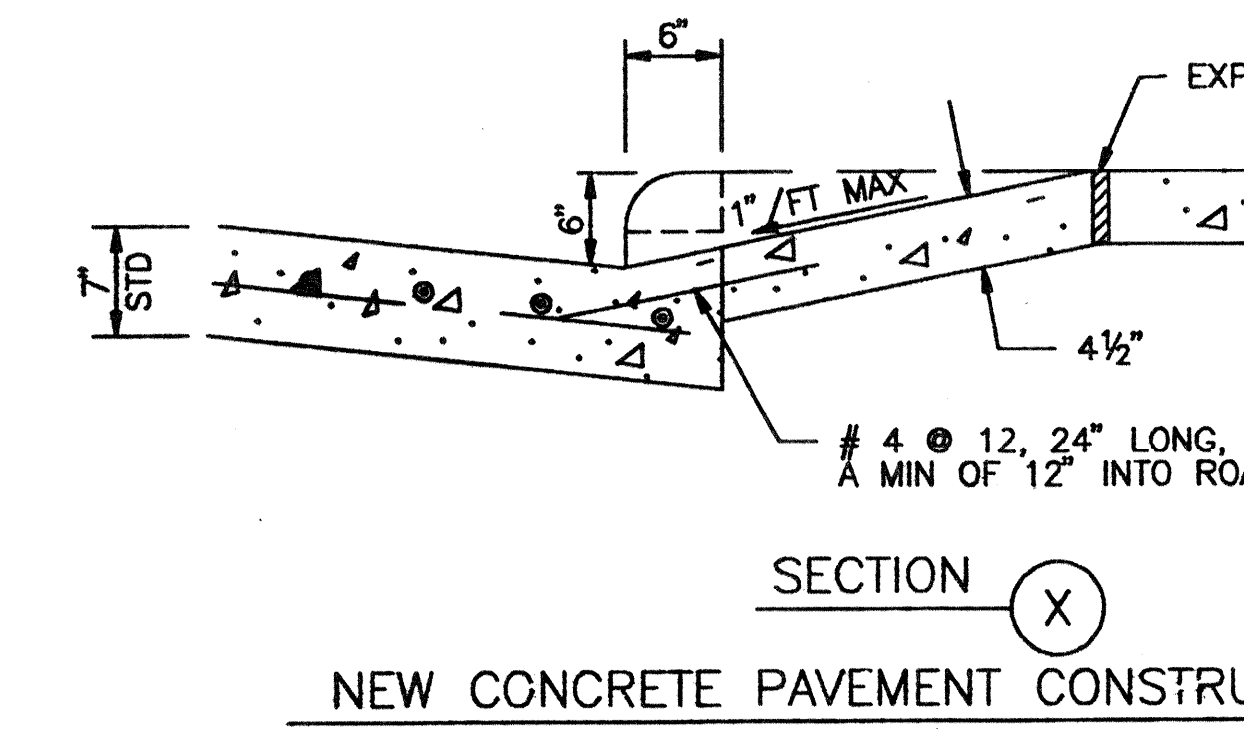
SECTION F  
ACCESS TO AREAS WHERE CUT IS NOT REQUIRED



SECTION Y  
NEW CONCRETE PAVEMENT CONSTRUCTION



SECTION X  
NEW & EXISTING \* CURB & GUTTER CONSTRUCTION



SECTION X  
NEW CONCRETE PAVEMENT CONSTRUCTION

WHEELCHAIR RAMP DETAILS  
DWG. NO: 02530-03



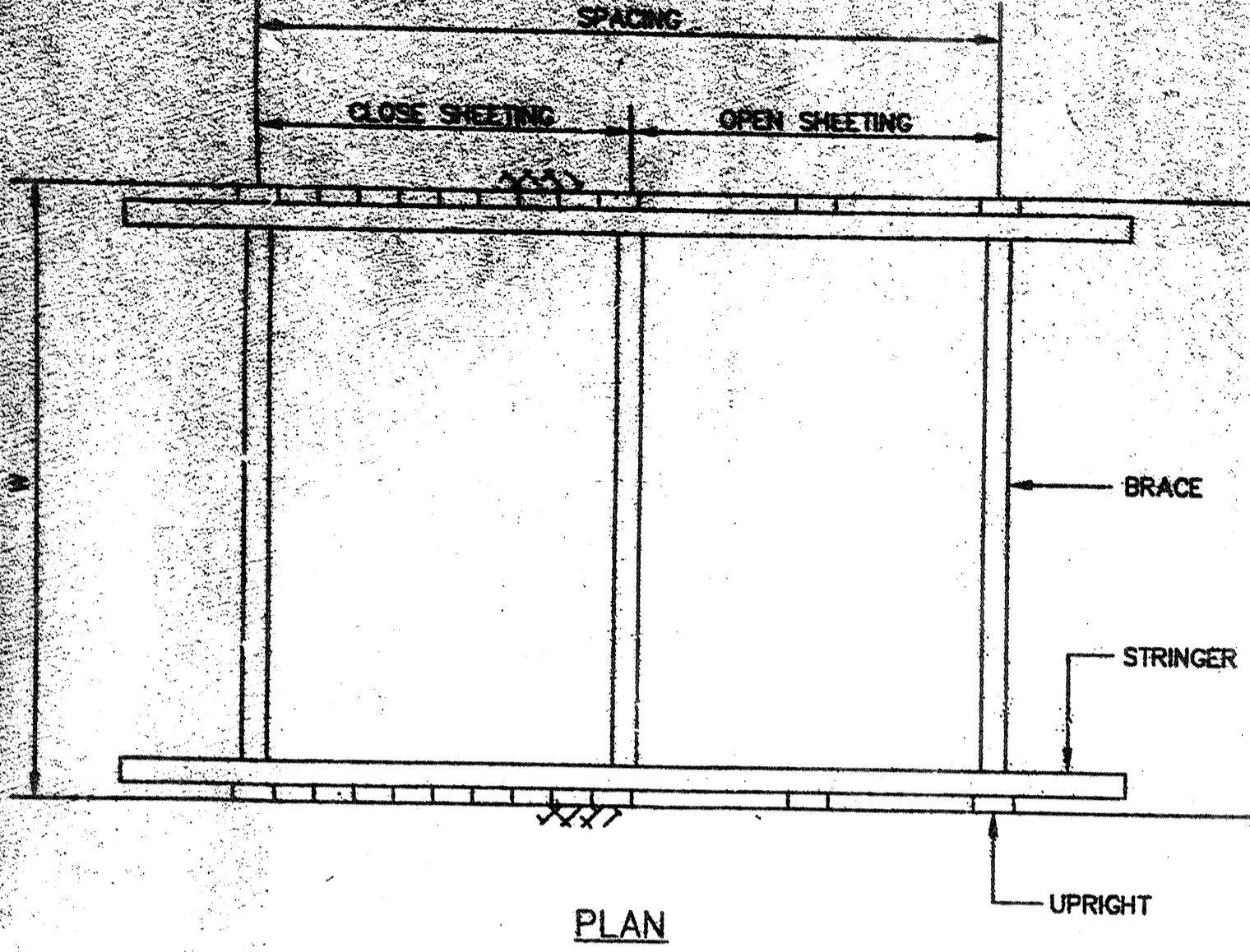
CITY OF HOUSTON	
DEPARTMENT OF PUBLIC WORKS & ENGINEERING ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP	
Walt Collins 2-2300 WATER ENGINEERING	TRAFFIC AND SIGNAL ENGINEERING
Mark Brown WASTEWATER ENGINEERING	STREET & BRIDGE ENGINEERING
Walt Collins 2-2300 STORM SEWER ENGINEERING	CONSTRUCTION
OTHER DEPARTMENTS	
PLANNING AND DEVELOPMENT	SPONSOR DEPARTMENT
CITY ENGINEER	DATE
Walt Collins DIRECTOR OF PUBLIC WORKS AND ENGINEERING	DATE
SUBMITTED: _____	DESIGNED BY: BKW
SCALE: N/A	DRAWN BY: CWK
DATE: JUNE 1999	SHEET NO. 17 OF 18 SHEETS
SURVEY BY: _____	CITY DWG. NO: WHEELDWG
F B NO: _____	
WHEELCHAIR RAMP DETAILS	
<b>PCI</b> PROVIDENT CONSULTANT, INC. 1200 WEST 11TH ST. HOUSTON, TEXAS 77008 (713)802-1019	



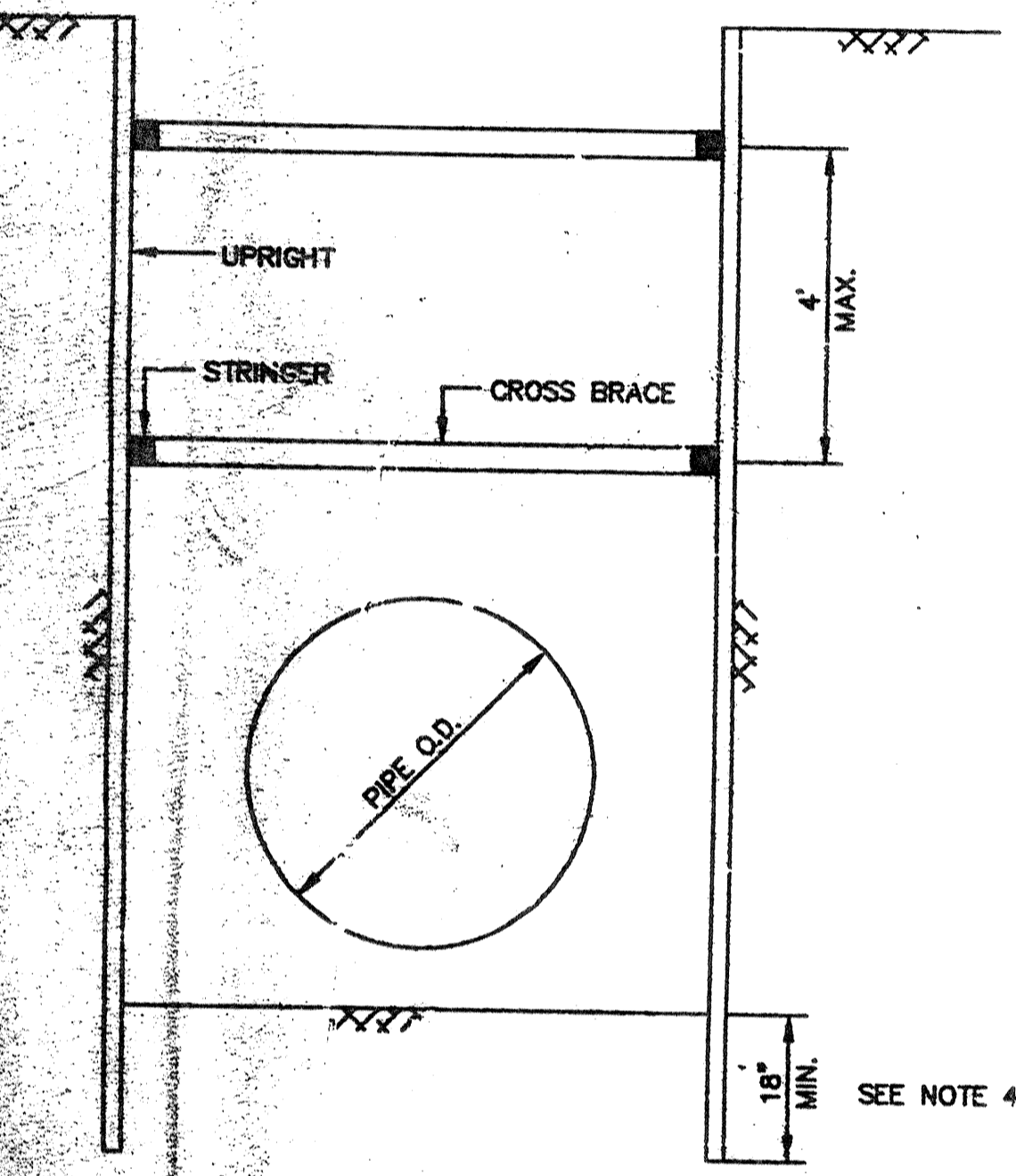
TRENCH SHORING - MINIMUM REQUIREMENTS ( \*\* )

DEPTH OF TRENCH FEET	KIND OF CONDITION OF EARTH TYPE	SIZE AND SPACING OF MEMBERS										
		UPRIGHTS		STRINGERS		CROSS BRACES					MAXIMUM SPACING	
		MINIMUM DIMENSION INCHES	MAXIMUM SPACING FEET	MINIMUM DIMENSION INCHES	MAXIMUM SPACING FEET	WIDTH OF TRENCH					VERTICAL	HORIZONTAL
				UP TO 3 FEET	3 TO 6 FEET	6 TO 9 FEET	9 TO 12 FEET	12 TO 15 FEET	15 TO 20 FEET	20 TO 25 FEET	FEET	FEET
5 TO 10	(A) HARD, COMPACT	3x4 OR 2x6	6	4	4	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	8x	4	4x6	6x6	6x8	8x8	8x10	4	6
15 TO 20	(C) SOFT, SANDY, OR CONDITIONS	3x6	CLOSE SHEETING	4x12	4	4x12	6x8	6x8	8x10	10x10	4	6
	(E) ALL KINDS OR CONDITIONS	3x6	CLOSE SHEETING	6x8	4	4x12	8x8	8x10	10x10	10x12	4	6

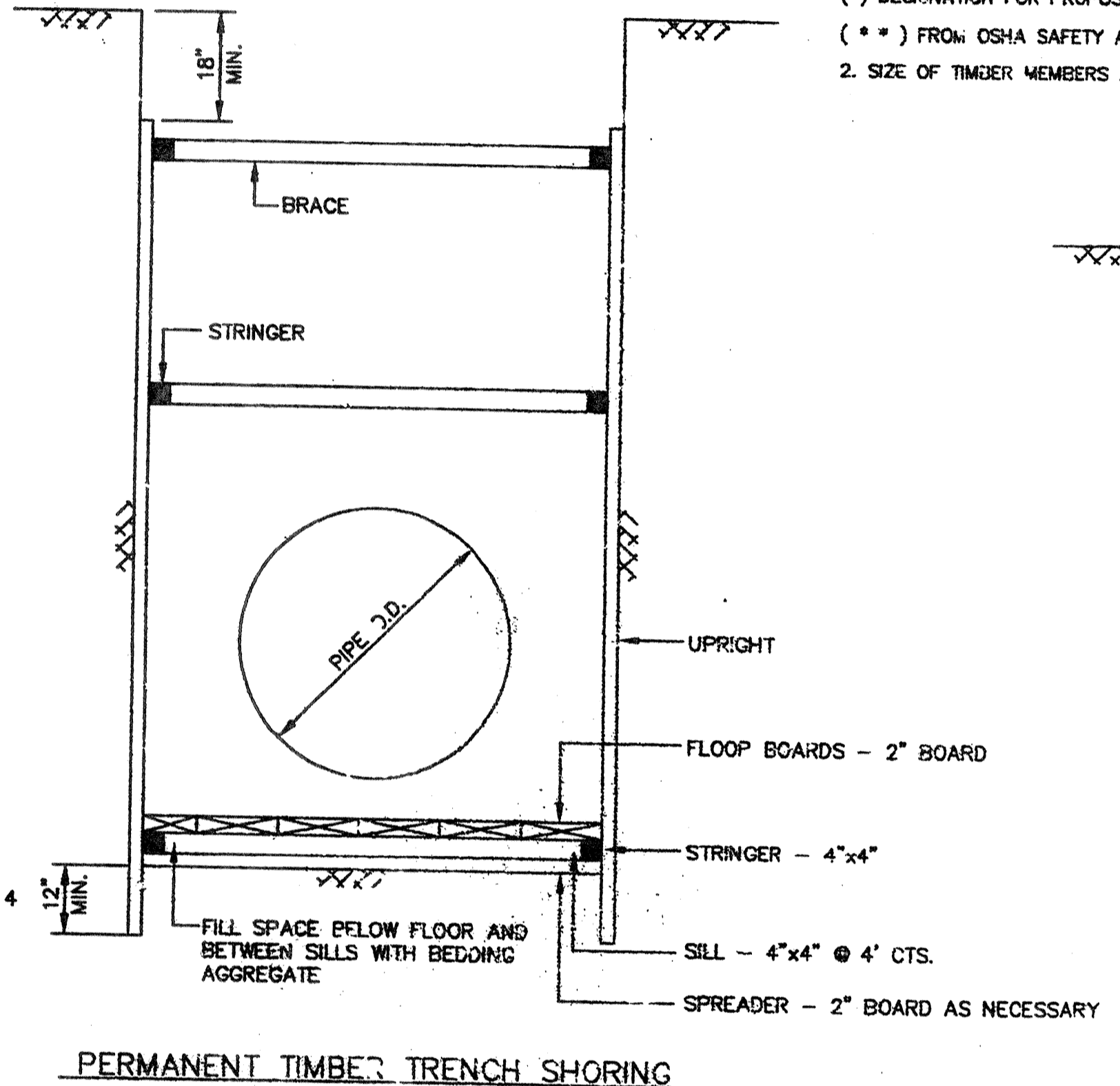
1. TRENCH JACKS MAY BE USED IN LIEU OF, OR IN COMBINATION WITH, CROSS BRACES. SHORING IS NOT REQUIRED IN SOLID ROCK, HARD SHALE, OR HARD SLAG. WHERE DESIRABLE, STEEL SHEET PILING AND BRACING OF EQUAL STRENGTH MAY BE SUBSTITUTED FOR WOOD.  
( ) DESIGNATION FOR PROPOSAL (BID) PURPOSES  
( \*\* ) FROM OSHA SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P  
2. SIZE OF TIMBER MEMBERS ARE ROUGH CUT DIMENSIONS (FULL SIZE)



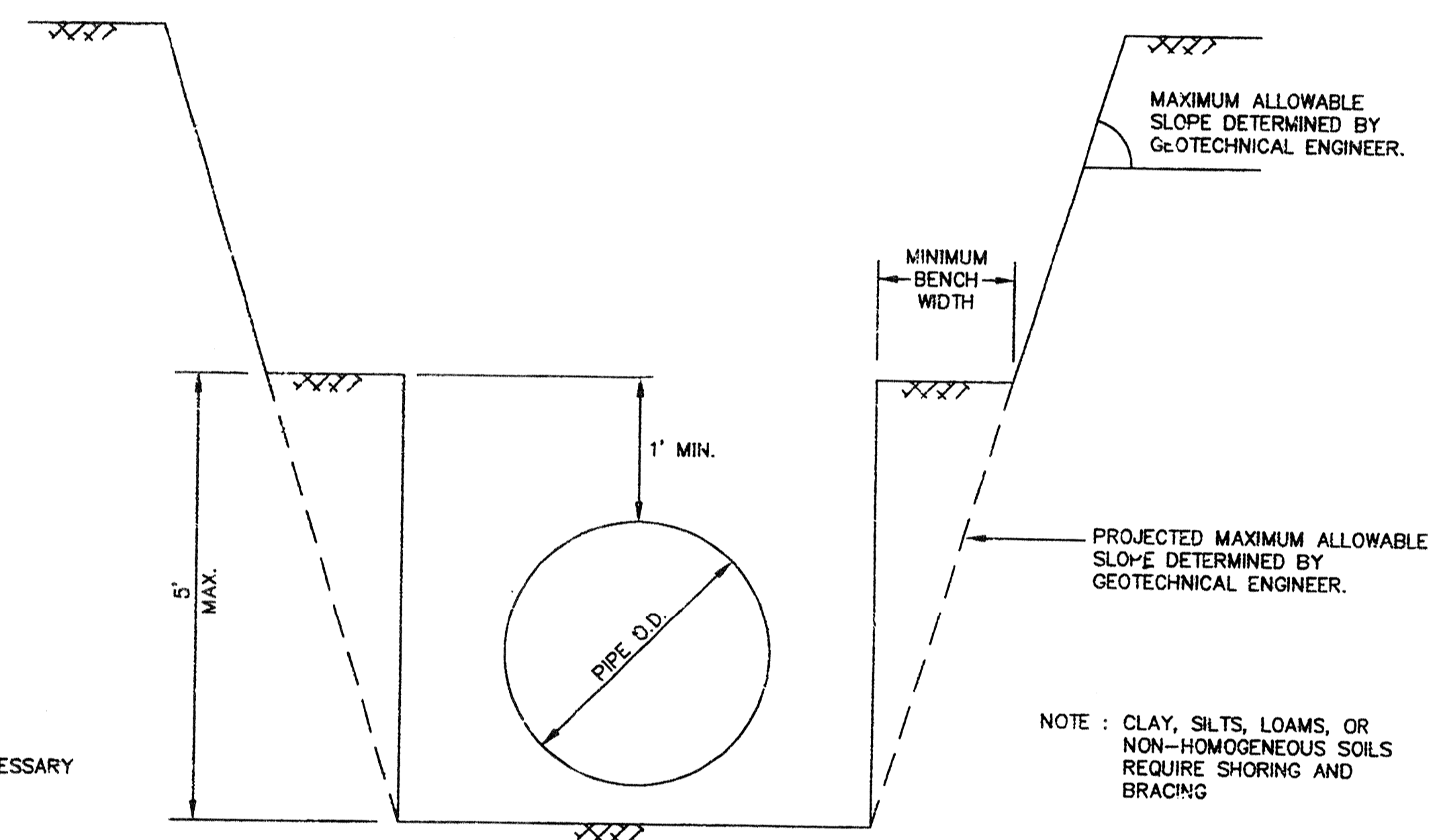
PLAN



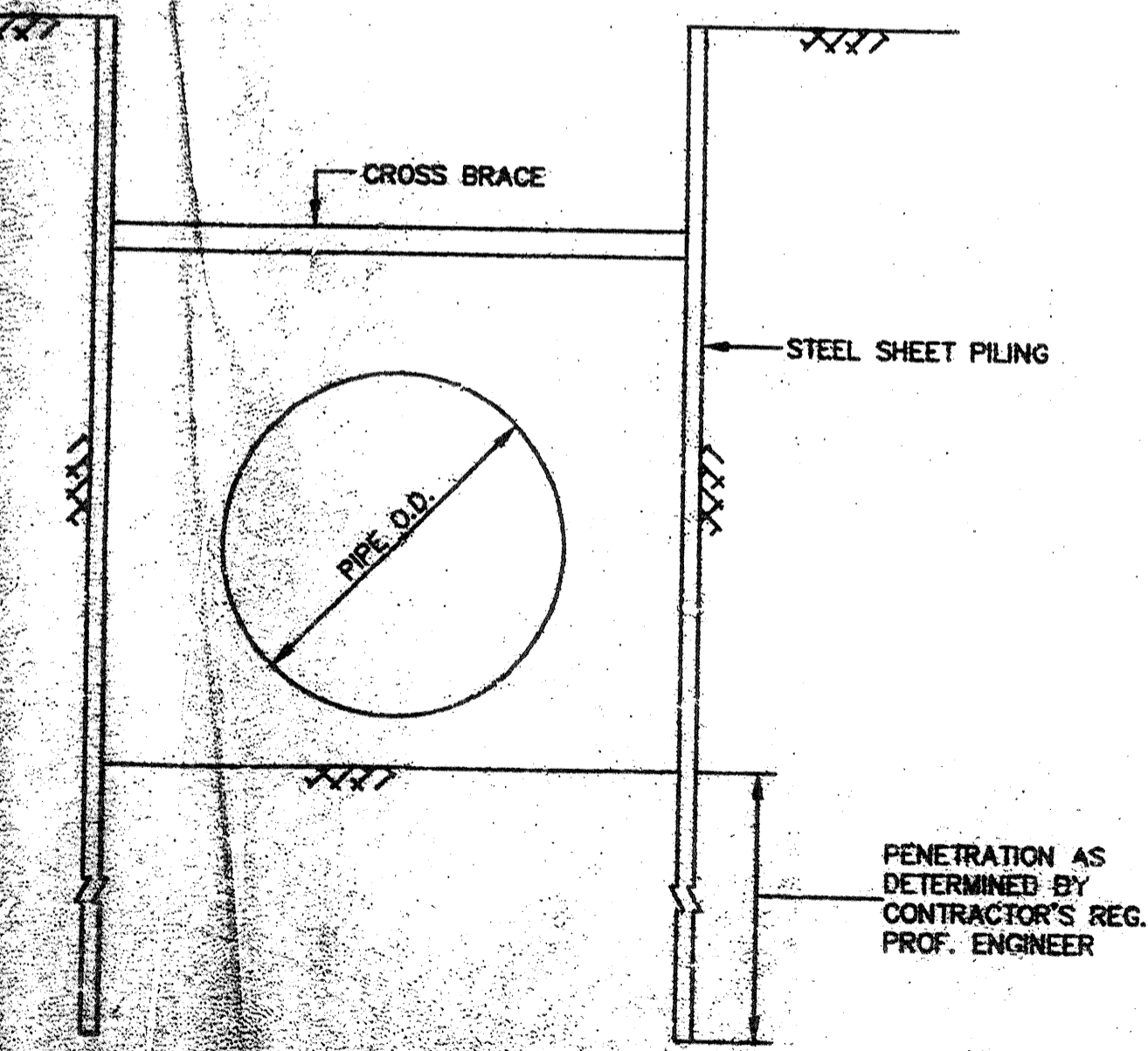
TIMBER TRENCH SHORING



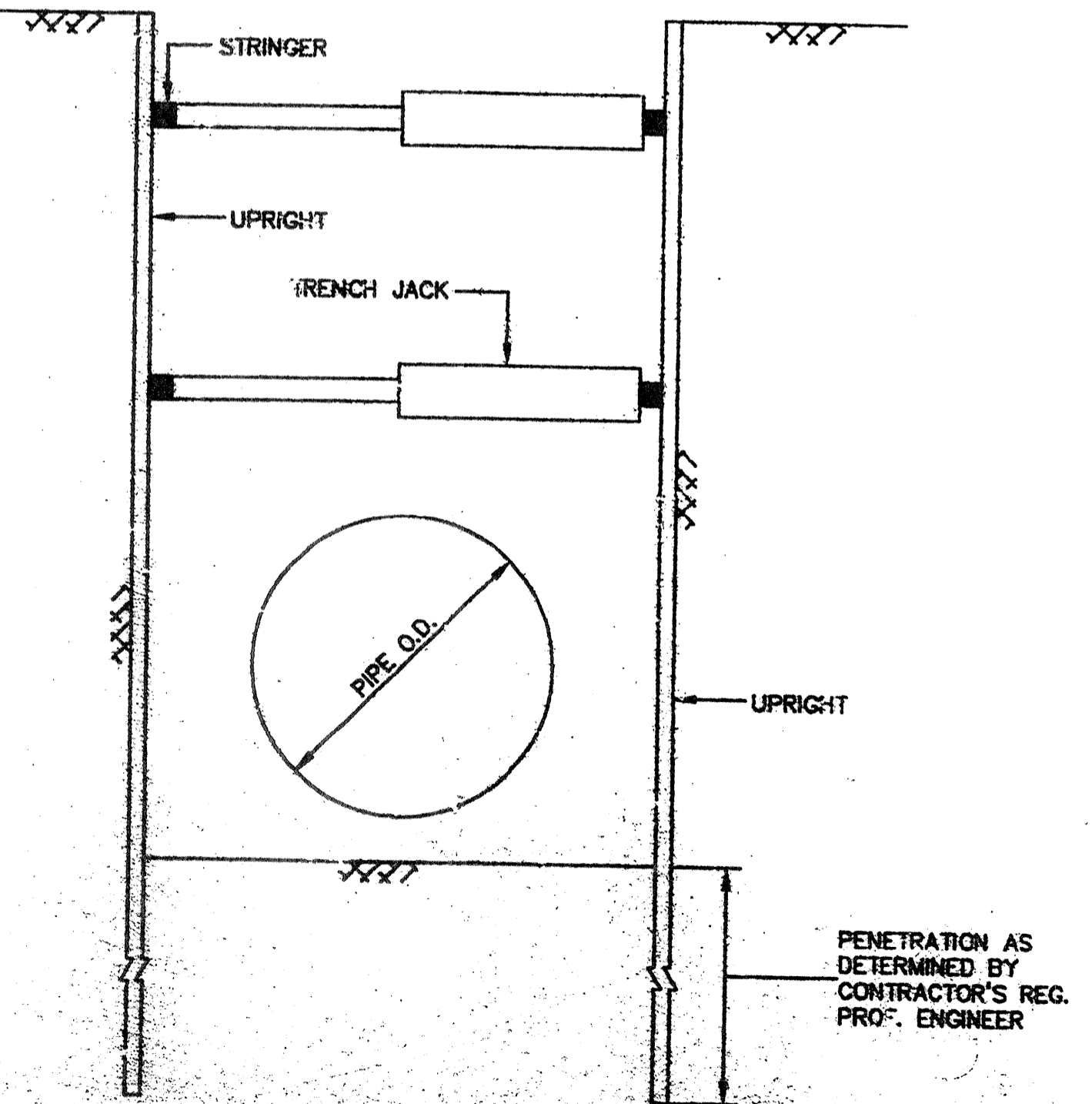
PERMANENT TIMBER TRENCH SHORING



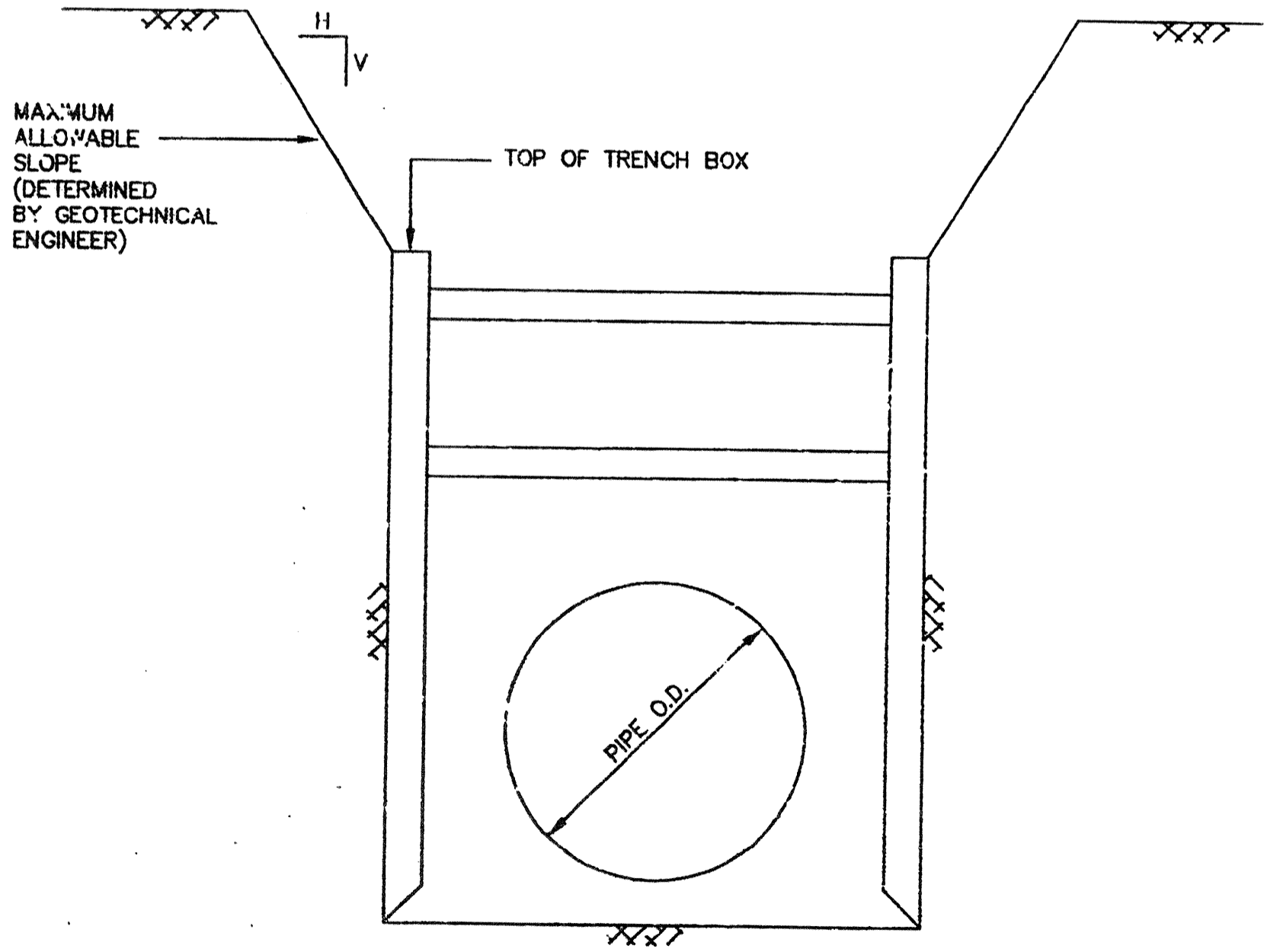
UNSHORED SLOPED TRENCH



STEEL PILING \*



TRENCH JACK AND STRINGER \*



TRENCH BOX \*

- 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 ADDITION, 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.

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
<i>Walter Galvan 3-23-00</i>	
WATER	
<i>M. Baker 3-20</i>	
WASTEWATER	PROJECT MANAGER
<i>Mel 3-23-00</i>	
STORM WATER	CONSTRUCTION
	CHEF ENGINEER
STREET & BRIDGE	

OTHER *Leah*

TRAFFIC AND TRANSPORTATION SPONSOR DEPARTMENT

CITY ENGINEER DATE *Walter Galvan 3-23-00*

DIRECTOR OF PUBLIC WORKS AND ENGINEERING DATE

SUBMITTED: \_\_\_\_\_ DESIGNED BY: BKW

SCALE: N/A DRAWN BY: CWK

DATE: JUNE 1999 SHEET NO. 18 OF 18 SHEETS

SURVEY BY: \_\_\_\_\_ CITY DWG. NO. TRENCHLWNG

F B NO: \_\_\_\_\_



TRENCH SAFETY

PCI PROVIDENT CONSULTANT, INC.  
1200 WEST 11TH ST.  
HOUSTON, TEXAS 77008  
(713)802-1019