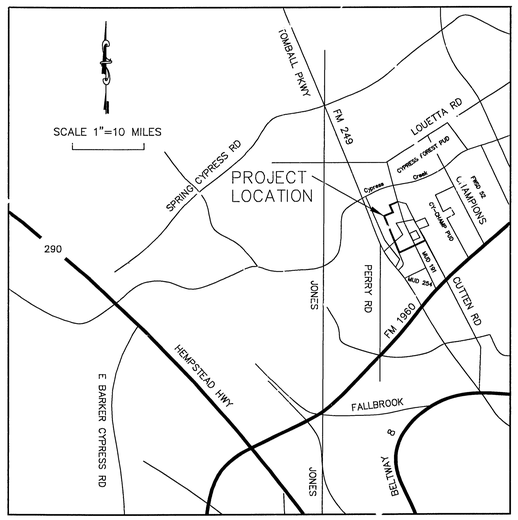
HARRIS COUNTY, TEXAS
MUNICIPAL UTILITY DISTRICT NO. 191

OFFSITE WATER LINE
to serve
HIGHLAND TIMBERS SECTIONS 1 & 2
CHAMPIONS ARBOR
&
PRESTONWOOD FOREST PARK

WATER LINE #462U

HCMUD 191 OFFSITE WATER LINE

DRAWING INDEX



LOCATION MAP
HARRIS COUNTY, TEXAS

MAP REFERENCY

KEY MAP NO. 370A-B
LAMBERT MAP NO. 4966(639)-B-1

NO REVIEW REQUIRED
Harris County Development Project Section
12 May 00
Date

APPROVED
CITY OF HOUSTON

CITY ENGINEER
HERBERT LUM, P.E.
3-8-2000
DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING
JERRY E. KING, P.E.
3-8-2000
DATE

CITY DWG. NO:
SHEET NO. 1 OF 14 SHEETS

"PRIOR TO THE CONSTRUCTION OF THESE FACILITIES WITHIN OR BY THE DISTRICT, THE DISTRICT OR ITS ENGINEER WILL GIVE WRITTEN NOTICE BY REGISTERED OR CERTIFIED MAIL TO THE DIRECTOR OF PUBLIC WORKS AND ENGINEERING STATING THE DATE SUCH CONSTRUCTION WILL BE COMMENCED."

"CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING, ENGINEERING CONSTRUCTION AND REAL ESTATES GROUP (TELEPHONE (713)837-7000) 48 HOURS BEFORE STARTING WORK ON THIS PROJECT."

BOBBY K. WILSON
25963
LICENSED PROFESSIONAL ENGINEER
03-02-00

R#99570

COH LOG. NO. 99-0123

JOB NO. 462U
DATE: MARCH 2000

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

COVER.DWG

SANITARY SEWER NOTES:

1. 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. 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.
2. ALL SEWERS CONSTRUCTED INSIDE LOT EASEMENTS SHALL BE R.C.P. TWENTY (20) FOOT WIDE EASEMENTS SHALL BE PROVIDED.
3. 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.
4. ALL PROPOSED PIPE STUB–OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
5. 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.
6. CONTRACTOR TO OBTAIN ALL CONSTRUCTION PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT."
7. ALL STORM SEWER MANHOLE RIMS LOCATED OUTSIDE THE PROPOSED PAVING SHALL BE SET TO PROPOSED FINISH GRADE ELEVATION.
8. BEFORE UTILITY CONSTRUCTION BEGINS, ADEQUATE DRAINAGE MUST BE PROVIDED SO THAT NO SHEET FLOW FLOODING OF ROADWAY OR ADJOINING PROPERTIES OCCURS.
9. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
10. 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.
11. 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 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.
2. 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.
4. STEEL WATER LINE SECTION TO EXTEND A OF FIVE (5) FEET MINIMUM BEYOND 45° BENDS.
5. THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
6. 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.
7. 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.
8. 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.
9. 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.
10. ALL P.V.C. WATER MAINS SHALL BE F C–900, DR 18, CLASS 150.
11. ALL WATER METERS MUST HAVE INDIVIDUAL SERVICE LEADS AS PER CITY OF HOUSTON STANDARDS.

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 located 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.

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 956–3000. CONSTRUCTION TO BE IN ACCORDANCE WITH SPECIFICATIONS DETAILED IN THE APPLICABLE HARRIS COUNTY COMMISSIONERS COURT ORDER.

HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPT. DEVELOPMENT PROJECTS CONSTRUCTION NOTES

1. ALL SEWERS UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED WITH 1–1/2 SACK CEMENT STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE.
2. THE CONTRACTOR SHALL NOTIFY THE HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT, DEVELOPMENT PROJECTS SECTION, TWENTY–FOUR (24) HOURS IN ADVANCE OF COMMENCING CONSTRUCTION (713) – (956–3071) AND WRITTEN NOTIFICATION FORTY–EIGHT HOURS IN ADVANCE OF COMMENCING CONSTRUCTION.
3. ALL STORM SEWER MANHOLE RIMS LOCATED OUTSIDE THE PROPOSED PAVING SHALL BE SET TO PROPOSED FINISH GRADE ELEVATION.

GENERAL UTILITIY NOTES – PAVING

WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED AND TESTED 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 OCTOBER 1999.

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.

BOBBY K. WILSON 23962 REGISTERED PROFESSIONAL ENGINEER
03-02-00

Rev.	Date	Description	App.
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△			

PRIVATE UTILITY LINES SHOWN

ENTEX, INC. — 3/1/2000

SOUTHWESTERN BELL TELEPHONE CO. Valid for One Year Only — 3/7/00

HOUSTON LIGHTING & POWER CO. Approval Only for Crossing Underground Ductlines Unless Noted. Valid at Time of Review Only. — 3/1/2000

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
WATER — 3-2-00	
WASTEWATER — 3-2-00	PROJECT MANAGER
STORM WATER — 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER — DATE

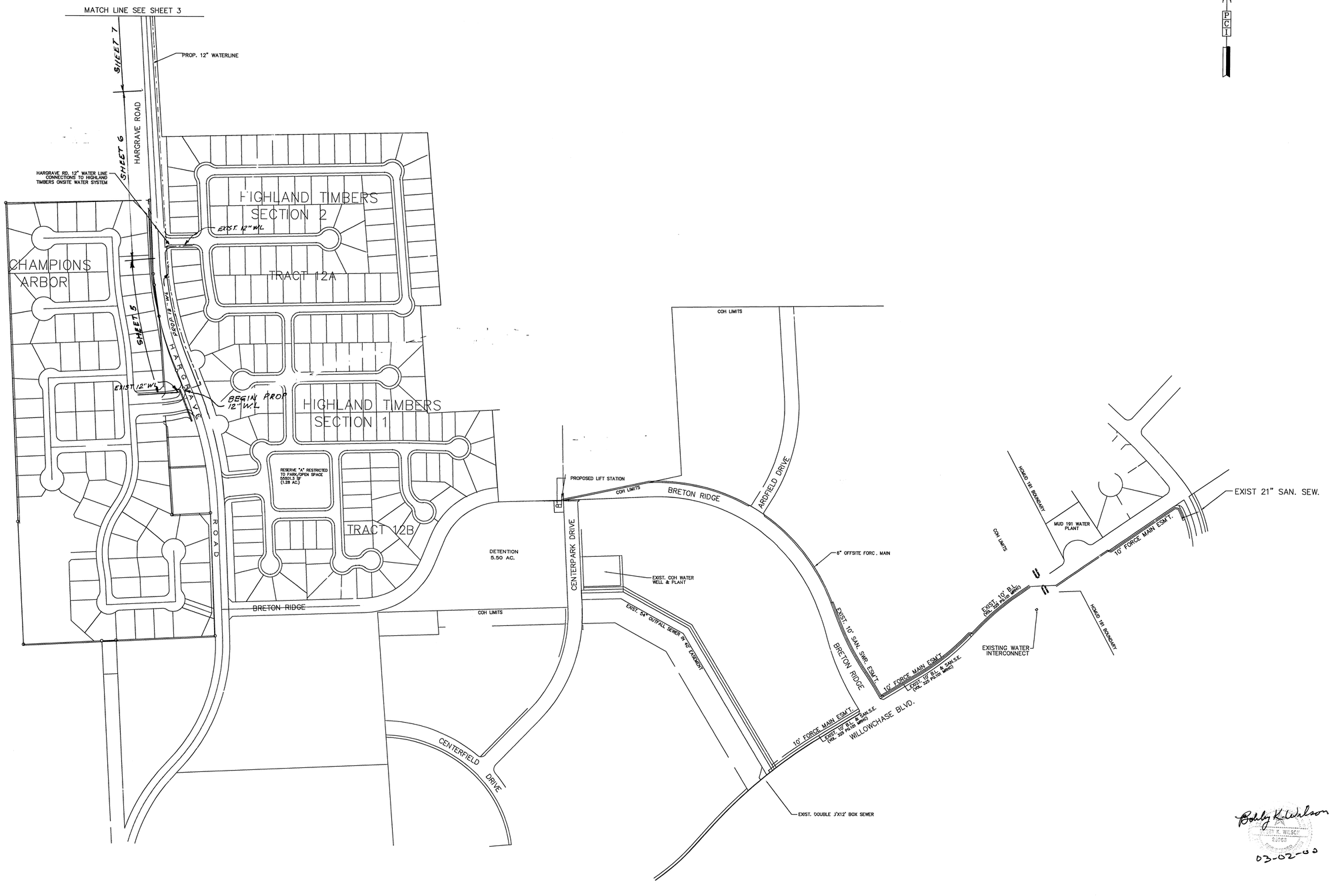
DIRECTOR OF PUBLIC WORKS AND ENGINEERING — 3-2-2000 — DATE

SUBMITTED:	DESIGNED BY: BOBBY WILSON
SCALE: N/A	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 2 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	DWG. NO. NOTE.DWG

GENERAL NOTES

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

NOTE.DWG



Bobby K. Wilson
03-02-00

BENCH MARK

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER
Y1216, 1973 ADJ., ELEV. = 125.994
Y1216, 1978 ADJ., ELEV. = 125.406
Y1216, 1988 ADJ., ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTEN 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 = 128.60

TBM #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

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 = 128.04

TBM #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.C.P. AT GRAVEL DRIVE FROM 13627 HARGRAVE ROAD
ELEVATION = 130.56

100 YEAR FLOOD PLAIN NOTE

As per FIRM Panel No 480120-435J dated Nov. 6, 1996 This tract is not within the 100 year flood plain. The applicable 100 year flood plain elevation is 117.6 (NAD 1927 projection

Rev.	Date	Description	App.
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△			

PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX — 3/1/2000

SOUTHWESTERN BELL TELEPHONE CO. — 3/7/00
Valid for One Year Only

RELIANT ENERGIES, INC./H.L.&P. CO. — 3/1/2000
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 — 3-2-00	
WASTEWATER — 3-2-00	PROJECT MANAGER
STORM WATER — 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION — SPONSOR DEPARTMENT

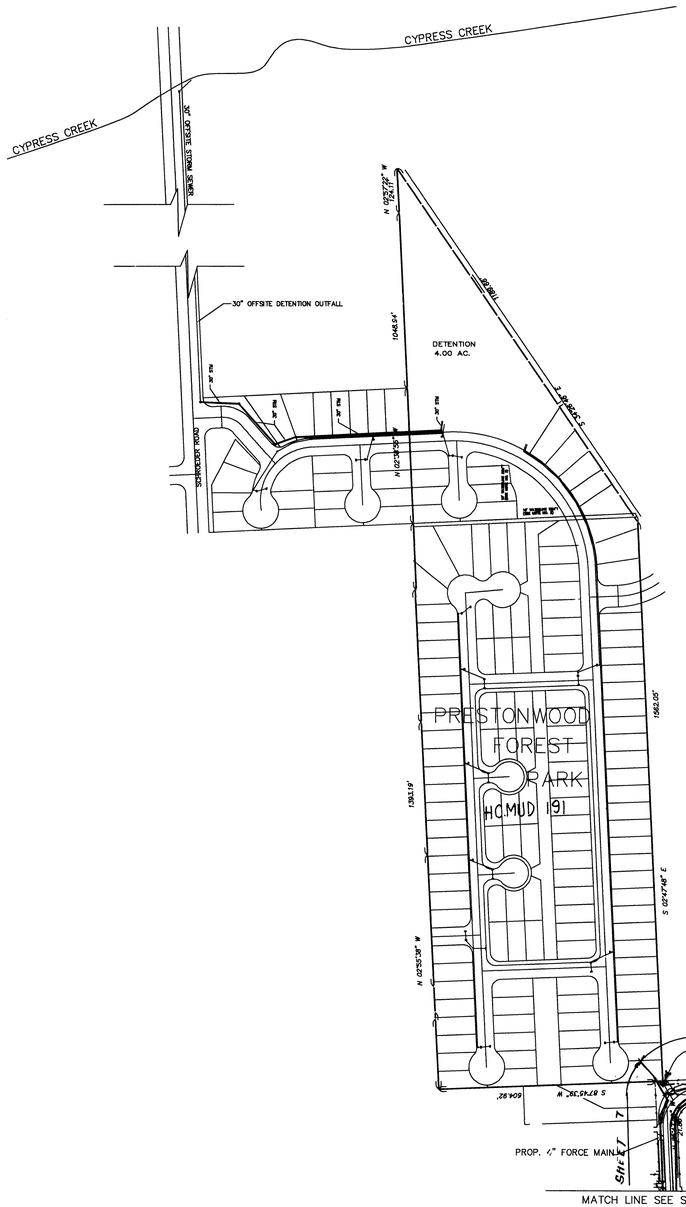
CITY ENGINEER — DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING — for — 3-8-2000 DATE

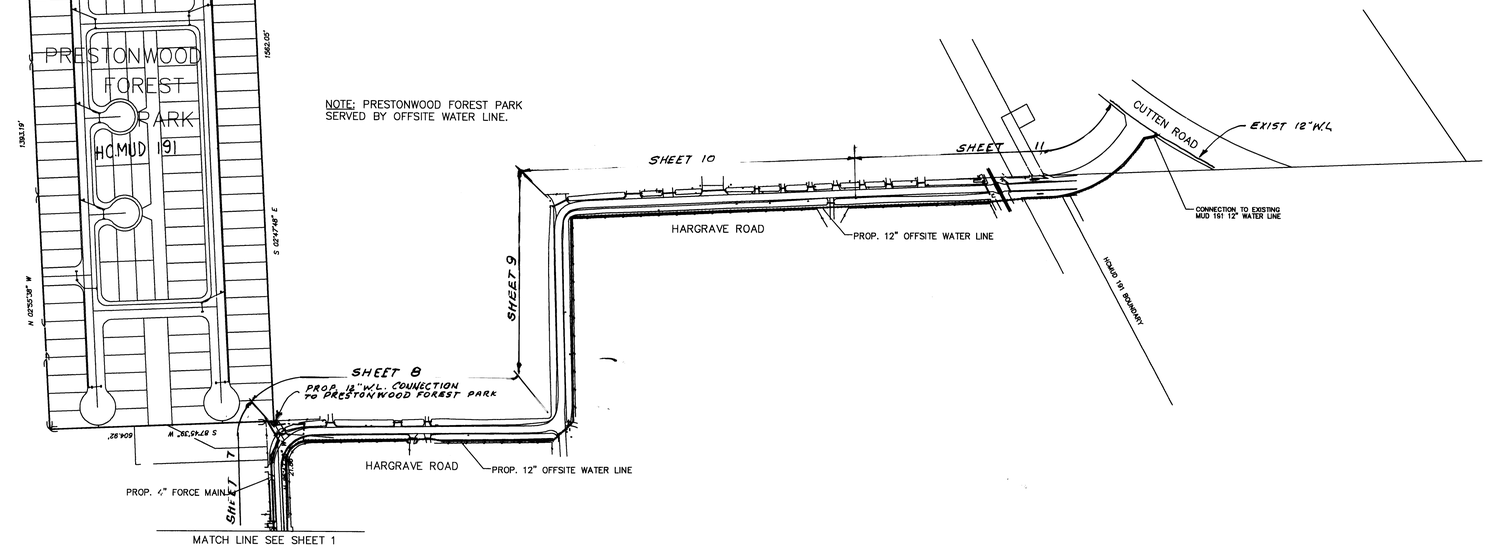
SUBMITTED:		DESIGNED BY:	B K WILSON
SCALE:	1" = 200'	DRAWN BY:	BILL DORRIS
DATE:	MARCH 2000	SHEET NO.	3 OF 14 SHEETS
SURVEY BY:			
F B NO:	462U	CITY DWG. NO.	OVRAL1.DWG

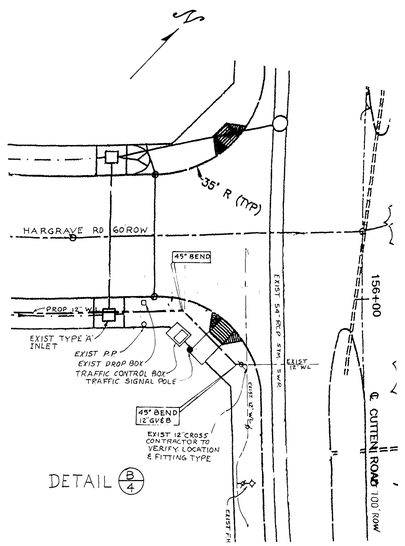
HARRIS COUNTY MUD 191
OVERALL LAYOUT HIGHLAND TIMBERS & CHAMPIONS ARBOR & PRESTONWOOD FOREST PARK
OFFSITE WATER LINE

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



NOTE: PRESTONWOOD FOREST PARK SERVED BY OFFSITE WATER LINE.





DETAIL B/4

PCI

BENCH MARK

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ELEVATION = 128.60

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ELEVATION = 130.56

Rev.	Date	Description	App.
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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX — 3/1/2000

SOUTHWESTERN BELL TELEPHONE CO. — 3/7/00
Valid for One Year Only

RELIANT ENERGIES, INC./HL&P. CO. — 3/1/2000
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 — 3-3-00	
WASTEWATER — 3-3-00	PROJECT MANAGER
STORM WATER — 3-2-00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER — DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING — 3-8-2000 — DATE

SUBMITTED:		DESIGNED BY:	B K WILSON
SCALE:	1" = 200'	DRAWN BY:	BILL DORRIS
DATE:	MARCH 2000	SHEET NO.	4 OF 14 SHEETS
SURVEY BY:			
F B NO:	462U	CITY DWG. NO.	OVRAL2.DWG

Bobby K Wilson
03-02-00

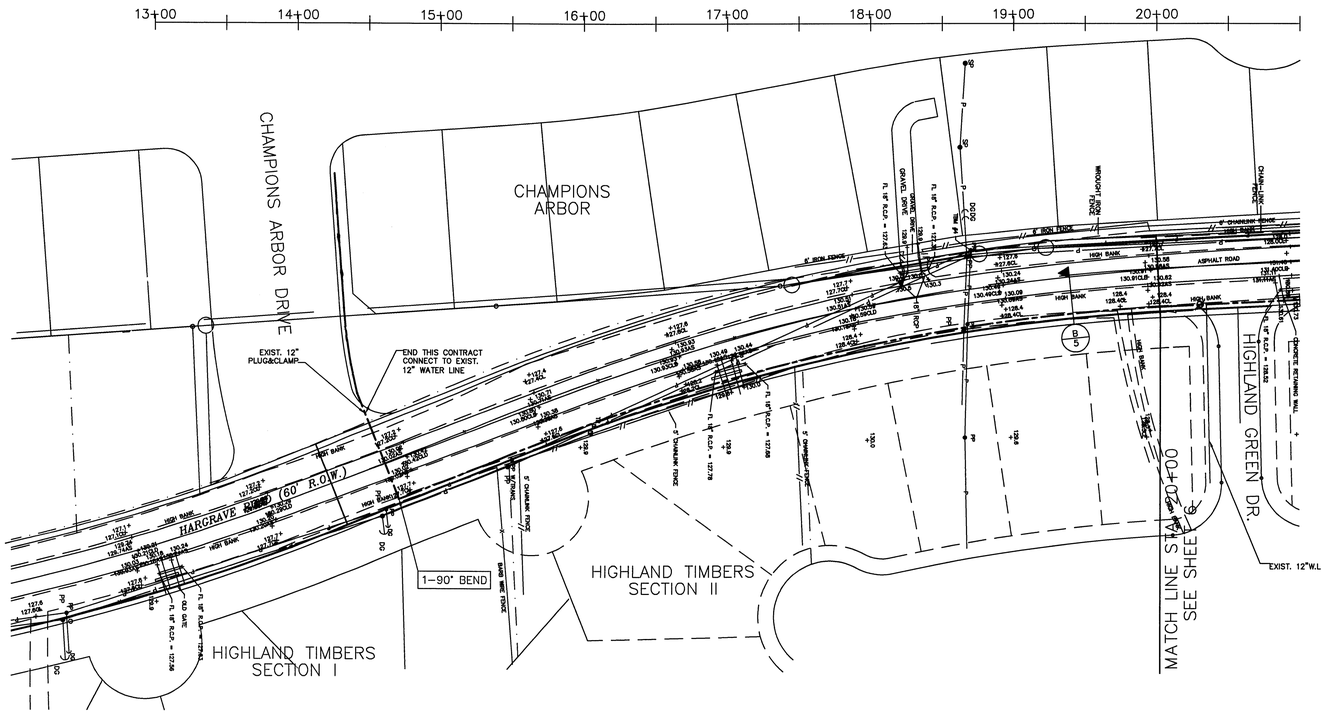
HARRIS COUNTY MUD 191

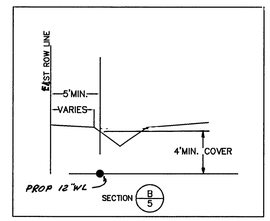
OVERALL LAYOUT
HIGHLAND TIMBERS SECTIONS 1 & 2
& CHAMPIONS ARBOR &
PRESTONWOOD FOREST PARK

OFFSITE WATER LINE

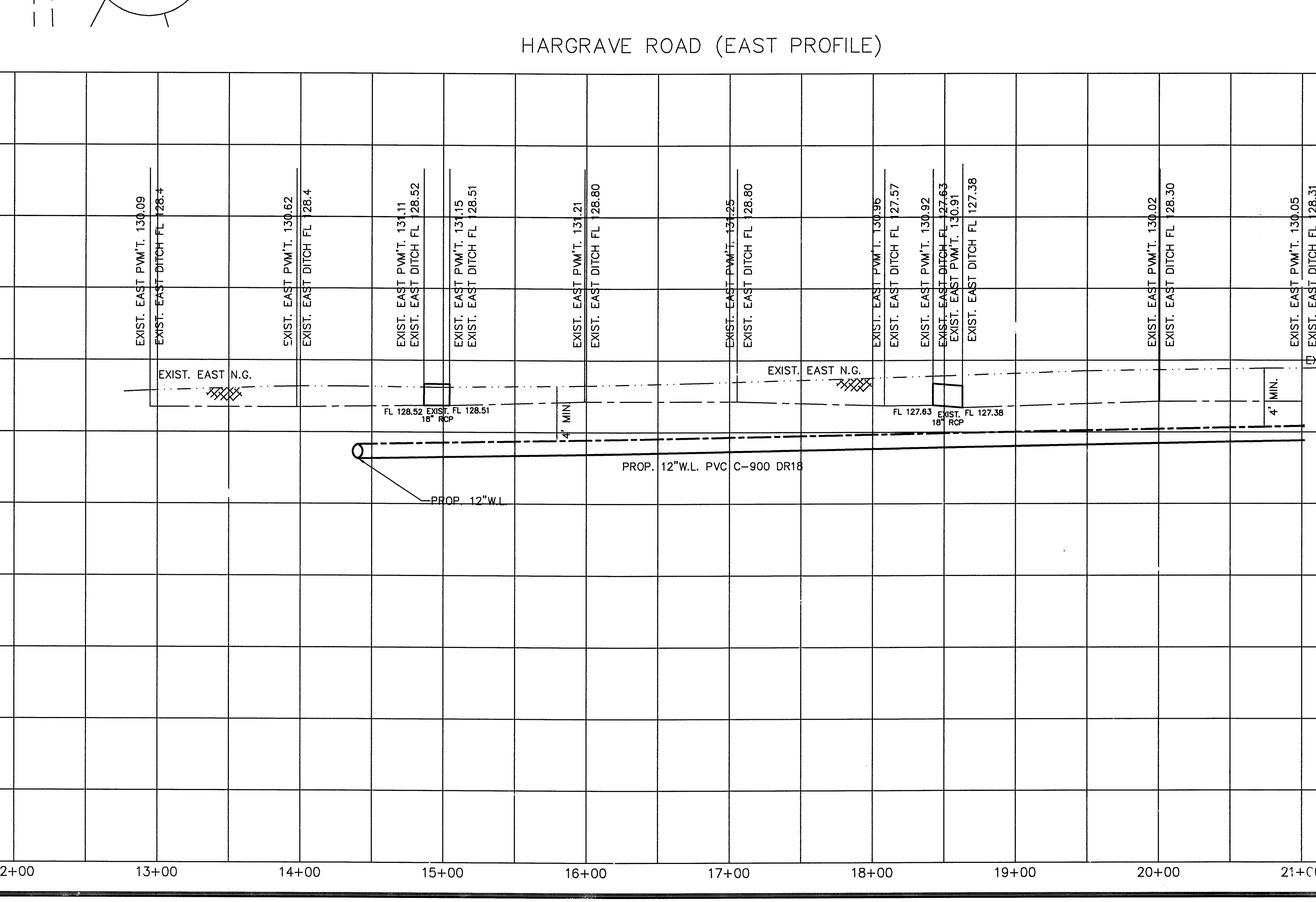
PCI
PROVIDENT CONSULTING, INC.
PROVIDENT CONSULTING, INC.
1200 WEST 11TH ST.
HOUSTON, TEXAS 77008
(713)802-1019

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE





HARGRAVE ROAD (EAST PROFILE)



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ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
Date

Approval implied for paving and drainage facilities within Harris County R.O.W. and/or jurisdiction. All other improvements in H.C.R.O.W. and/or jurisdiction are approved as to location only.
The above authorization is valid for one (1) year only.

Rev.	Date	Description	App.
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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX — 3/1/2000
SOUTHWESTERN BELL TELEPHONE CO. Valid for One Year Only — 3/7/00
RELIANT ENERGIES, INC./H.L.&P. CO. Approval Only for Crossing Underground Ductlines Unless Noted. Valid at Time of Review Only. — 3/1/2000

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
WATER — 3-7-00	
WASTEWATER — 3-2-00	PROJECT MANAGER
STORM WATER — 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER — DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING — 3-8-2000 DATE

SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: H: 1"=50' V: 1"=5'	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 5 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	CITY DWG. NO. HARDITCO.DWG

HARRIS COUNTY MUD 191

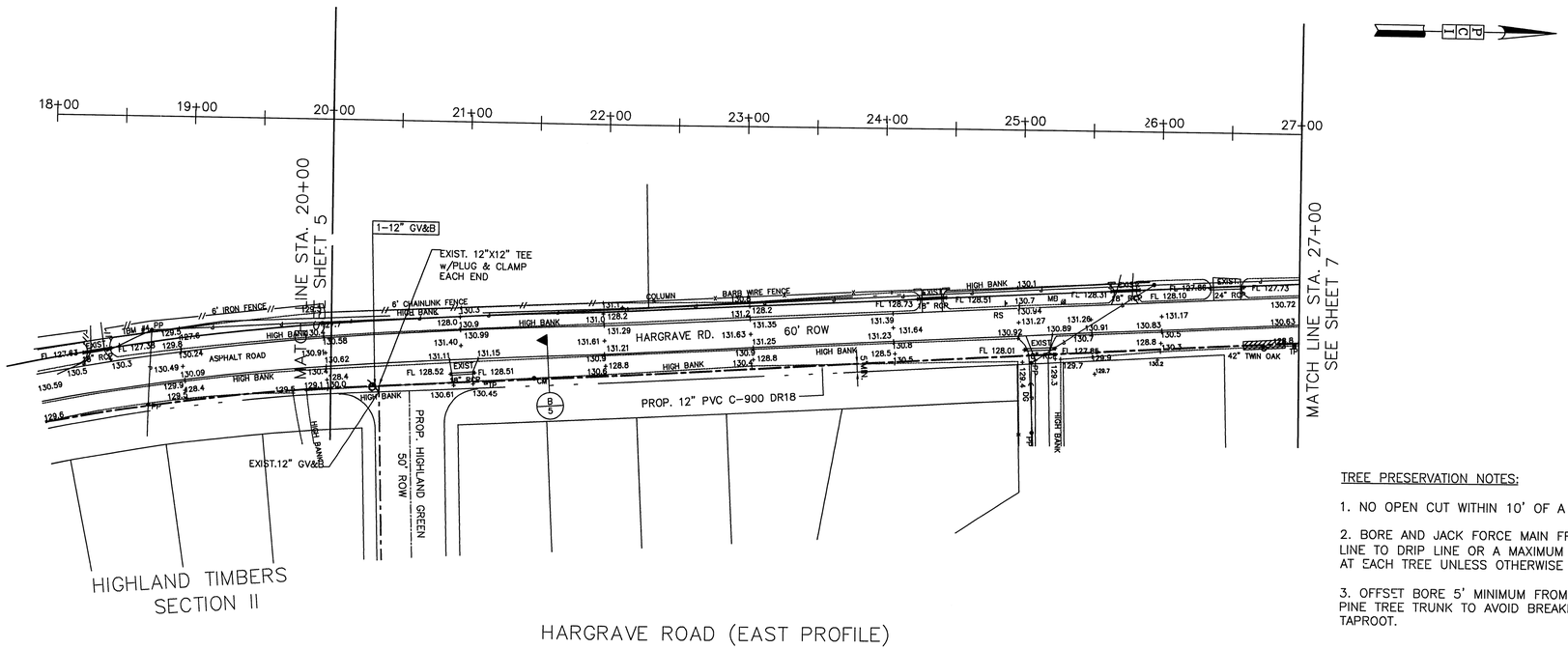
WATER LINE ALONG
HARGRAVE ROAD
(EAST PROFILE)

STA. 14+00 TO STA. 20+00

Bobby K. Wilson
STATE OF TEXAS
BOBBY K. WILSON
25963
REGISTERED
PROFESSIONAL ENGINEER
03-02-00

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

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE



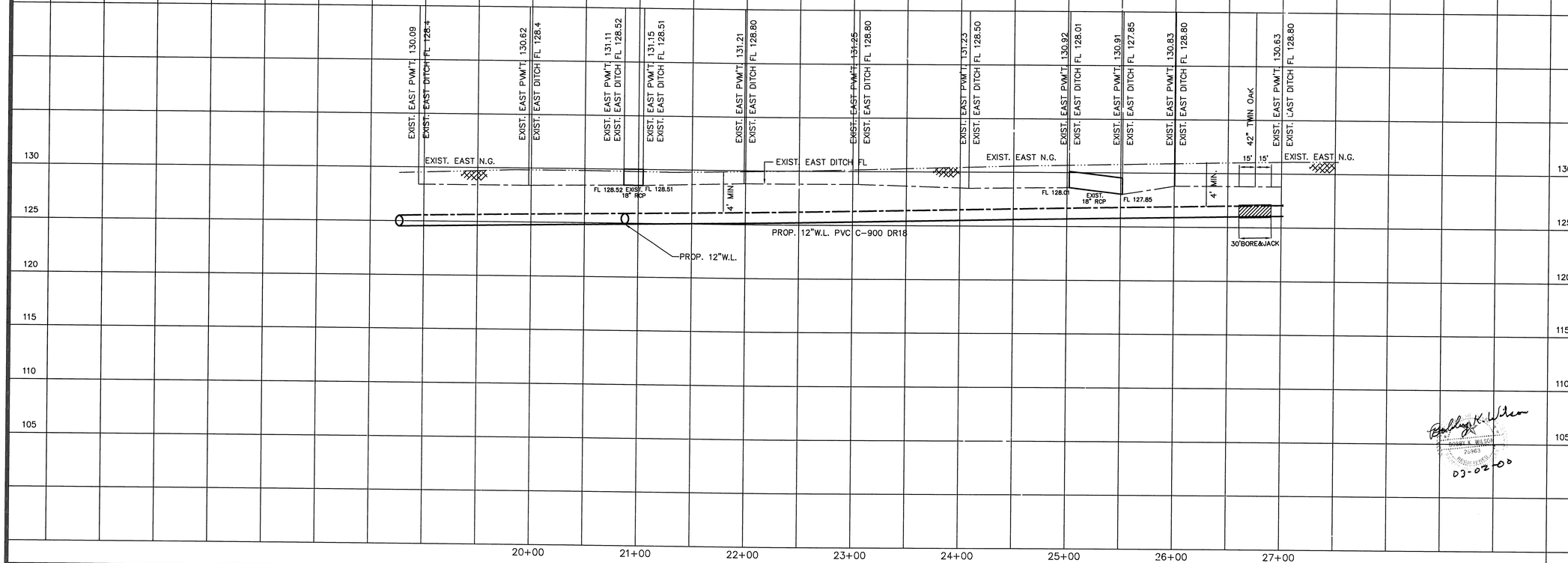
HARGRAVE ROAD (EAST PROFILE)

TREE PRESERVATION NOTES:

1. NO OPEN CUT WITHIN 10' OF A TREE.

2. BORE AND JACK FORCE MAIN FROM DRIP LINE TO DRIP LINE OR A MAXIMUM OF 20' AT EACH TREE UNLESS OTHERWISE SHOWN.

3. OFFSET BORE 5' MINIMUM FROM ANY PINE TREE TRUNK TO AVOID BREAKING TAPROOT.



BENCH MARK

BENCH MARK: NATIONAL GEODETIC SURVEY MARKER
Y1216, 1973 ADJ., ELEV. = 125.994
Y1216, 1978 ADJ., ELEV. = 125.406
Y1216, 1988 ADJ., ELEV. = 123.94 (THIS ADJUSTMENT WAS USED FOR CUTTEN 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 = 128.60

TBM #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

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 = 128.04

TBM #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.C.P AT GRAVEL DRIVE FROM 13627 HARGRAVE ROAD
ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
Date

Approval implied for paving and drainage facilities within Harris County R.O.W. and/or jurisdiction. All other improvements in H.C.R.O.W. and/or jurisdiction are approved as to location only.
The above authorization is valid for one (1) year only.

Rev.	Date	Description	App.
△			
△			
△			

PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC. /ENTEX — 3/1/2000

SOUTHWESTERN BELL TELEPHONE CO. Mike Ballin 3/7/00
Valid for One Year Only

RELIANT ENERGIES, INC./H.L.&P. CO. 3/1/2000
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: Victor Saldivar 3-7-00	
WASTEWATER: 3-2-00	PROJECT MANAGER
STORM WATER: 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER — DATE

DIRECTOR OF PUBLIC WORKS AND ENGINEERING — DATE 3-8-2000

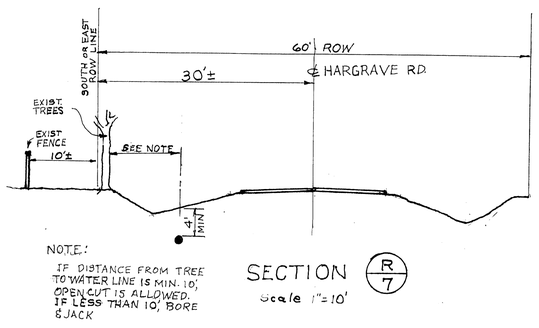
SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: H: 1"=50' V: 1"=5'	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 6 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	CITY DWG. NO. HARDITC1.DWG

Bobby K. Wilson
BOBBY K. WILSON
92963
REGISTERED
DJ-02-00

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(EAST PROFILE)
STA. 20+00 TO STA. 27+00

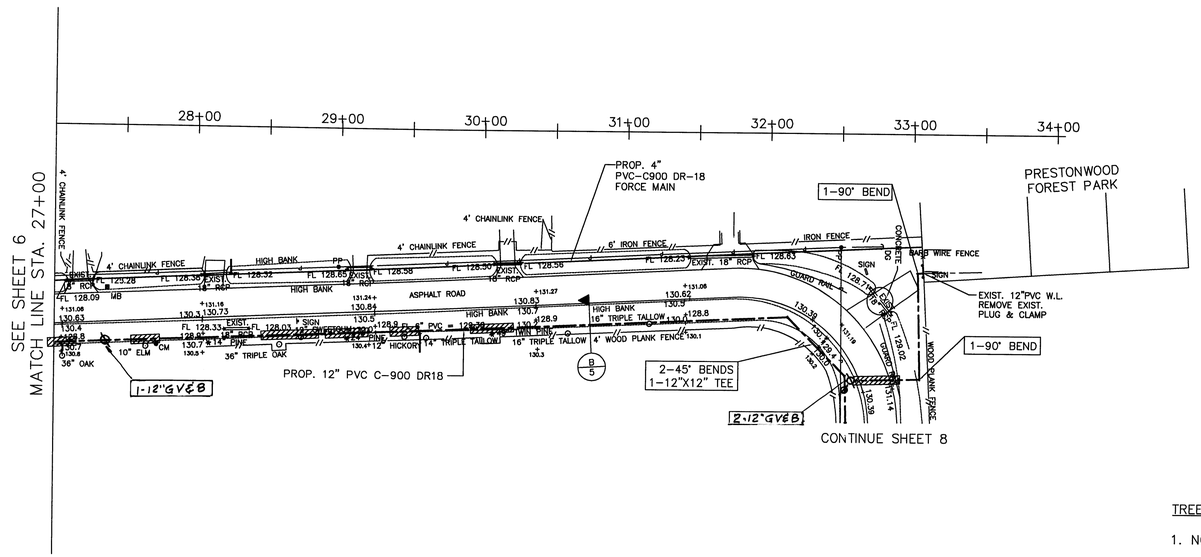
PCI PROVIDENT CONSULTING, INC.
PROVIDENT CONSULTING, INC.
1200 WEST 11TH ST.
HOUSTON, TEXAS 77008
(713)802-1019

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE



NOTE:
IF DISTANCE FROM TREE TO WATER LINE IS MIN. 10', OPEN CUT IS ALLOWED. IF LESS THAN 10', BORE & JACK

SECTION (R 7)
Scale 1"=10'



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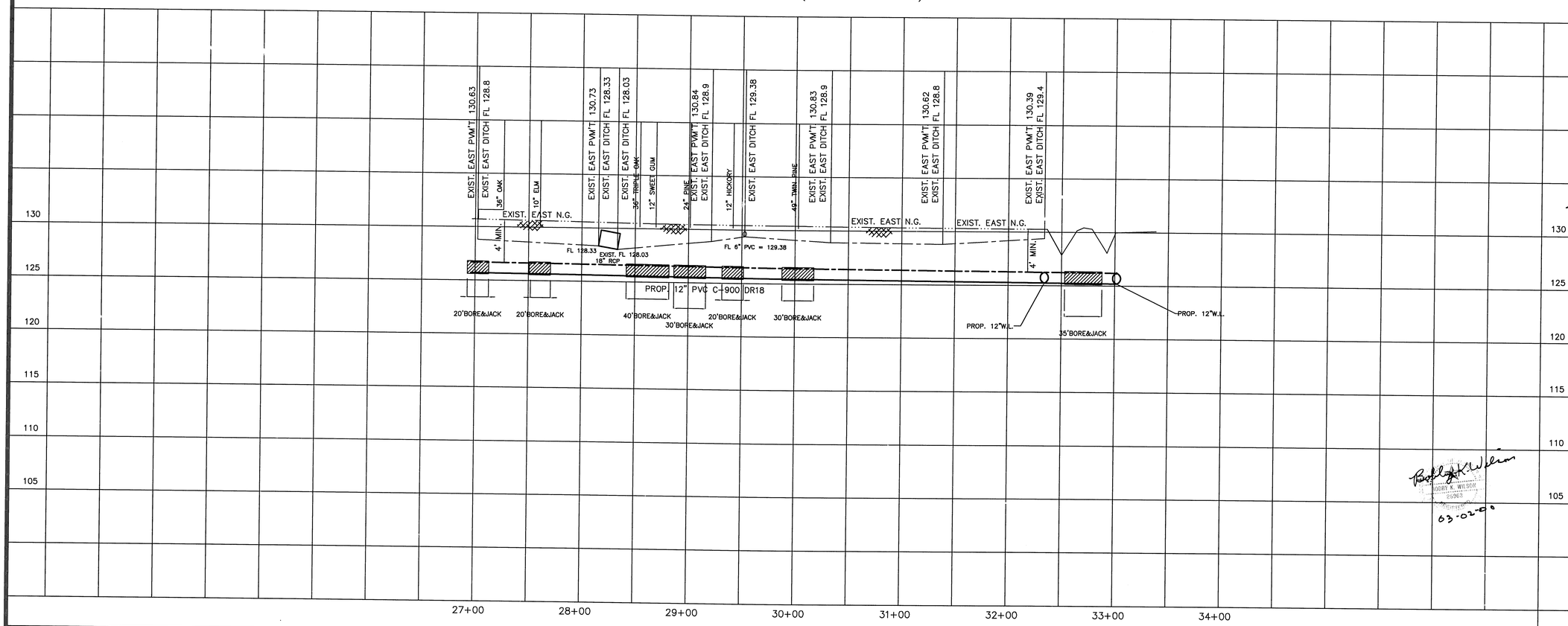
HARGRAVE ROAD (EAST PROFILE)



BENCH MARK

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

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ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
Date

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Rev.	Date	Description	App.
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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX — 3/1/2000
SOUTHWESTERN BELL TELEPHONE CO. Valid for One Year Only — 3/7/00
RELIANT ENERGIES, INC./H.L.&P. CO. Approval Only for Crossing Underground Ductlines Unless Noted. Valid at Time of Review Only. — 3/1/2000

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY

PRIVATELY FUNDED PUBLIC WORKS	CITY FUNDED PUBLIC WORKS
WATER — 3-7-00	
WASTEWATER — 3-2-00	PROJECT MANAGER
STORM WATER — 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER — DATE
DIRECTOR OF PUBLIC WORKS AND ENGINEERING — 3-8-2000 — DATE

SUBMITTED: _____
SCALE: H: 1"=50' V: 1"=5'
DATE: MARCH 2000
SURVEY BY: _____
F B NO: 462U

DESIGNED BY: B K WILSON
DRAWN BY: BILL DORRIS
SHEET NO. 7 OF 14 SHEETS
CITY DWG. NO. HARDITC2.DWG

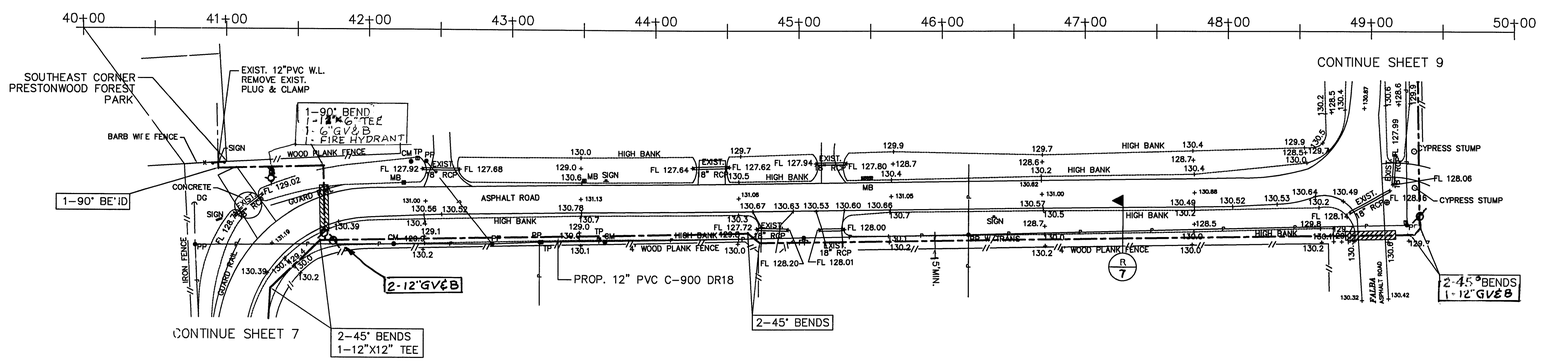
Bobby K. Wilson
BOBBY K. WILSON
25963
LICENSED PROFESSIONAL ENGINEER
03-02-00

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(EAST PROFILE)

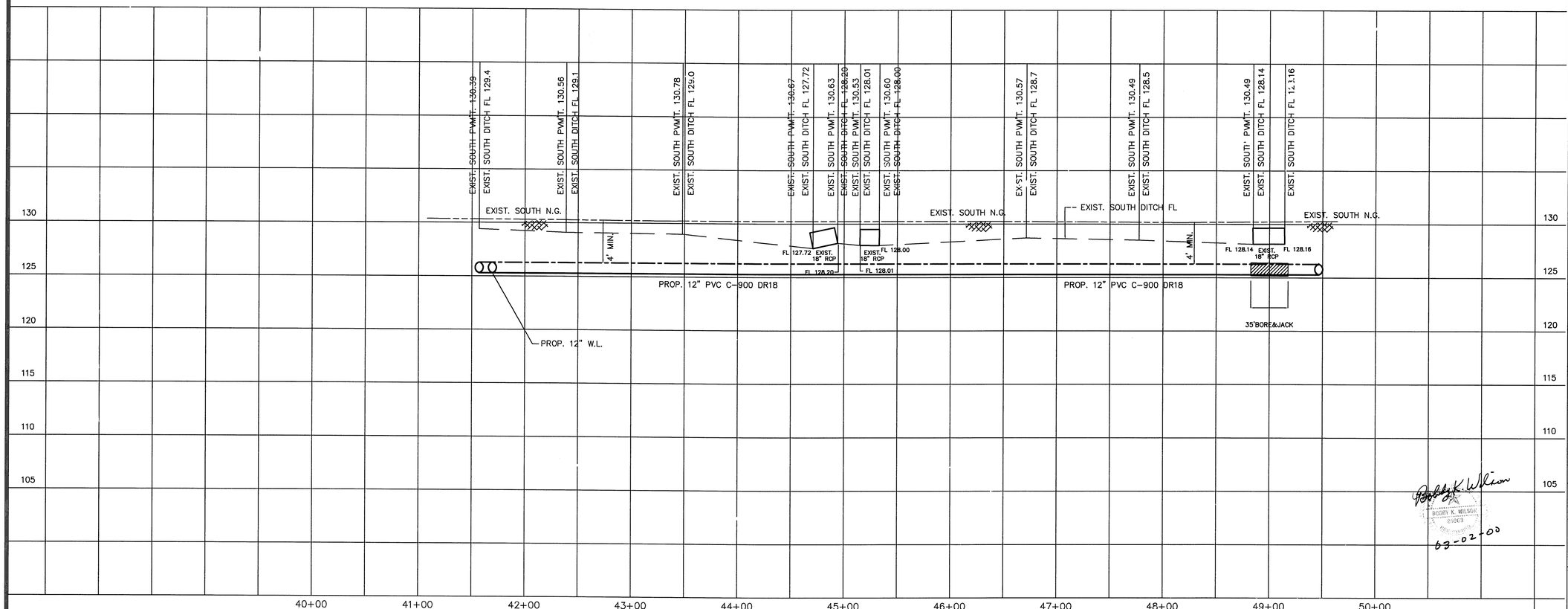
STA. 27+00 TO STA. 34+00

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

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE


40+00
41+00
42+00
43+00
44+00
45+00
46+00
47+00
48+00
49+00
50+00
CONTINUE SHEET 9
SOUTHEAST CORNER PRESTONWOOD FOREST PARK
EXIST. 12"PVC W.L. REMOVE EXIST. PLUG & CLAMP
1-90° BEND
1-12"G"TEE
1-G.V.&B.
1-FIRE HYDRANT
BARB W/E FENCE
WOOD PLANK FENCE
SIGN
CONCRETE
DG
1-90° BEND
2-12"GV&B
CONTINUE SHEET 7
2-45° BENDS
1-12"X12" TEE
PROP. 12" PVC C-900 DR18
ASPHALT ROAD
HIGH BANK
4' WOOD PLANK FENCE
2-45° BENDS
IRON FENCE
WOOD FENCE
CHAIN LINK FENCE
CYPRESS STUMP
2-45° BENDS
1-12"GV&B
FULTON ROAD

HARGRAVE ROAD (SOUTH PROFILE)



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ELEVATION = 128.60

TBM #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

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ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
Date

Approval Implied for paving and drainage facilities within Harris County R.O.W. and/or jurisdiction. All other improvements in H.C.R.O.W. and/or jurisdiction are approved as to location only.
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Rev.	Date	Description	App.
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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX 3/1/2000
SOUTHWESTERN BELL TELEPHONE CO. Mike Babin 3/7/00
Valid for One Year Only
RELIANT ENERGIES, INC./H.L.&P. CO. 3/1/2000
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
Victor Saddler 3-7-00	
WASTEWATER	PROJECT MANAGER
STORM WATER 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER _____ DATE
DIRECTOR OF PUBLIC WORKS AND ENGINEERING for 3-8-2000 DATE

SUBMITTED:		DESIGNED BY:	B K WILSON
SCALE:	H: 1"=50' V: 1"=5'	DRAWN BY:	BILL DORRIS
DATE:	MARCH 2000	SHEET NO.	8 OF 14 SHEETS
SURVEY BY:			
F B NO:	462U	CITY DWG. NO.	HARDITC3.DWG

Bobby K. Wilson
BOBBY K. WILSON 21203 REGISTERED PROFESSIONAL ENGINEER
03-02-00

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(SOUTH PROFILE)
STA. 40+00 TO STA. 50+00

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

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
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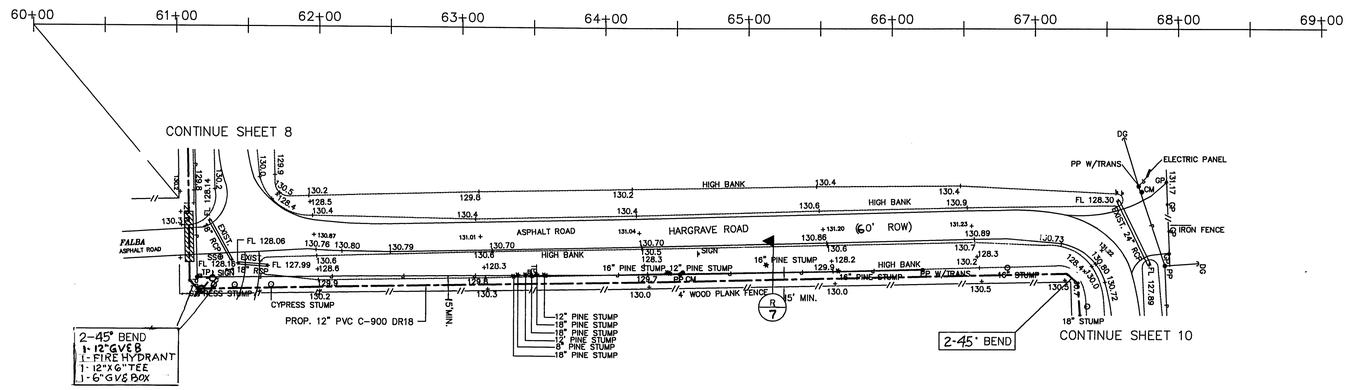

TREE PRESERVATION NOTES:

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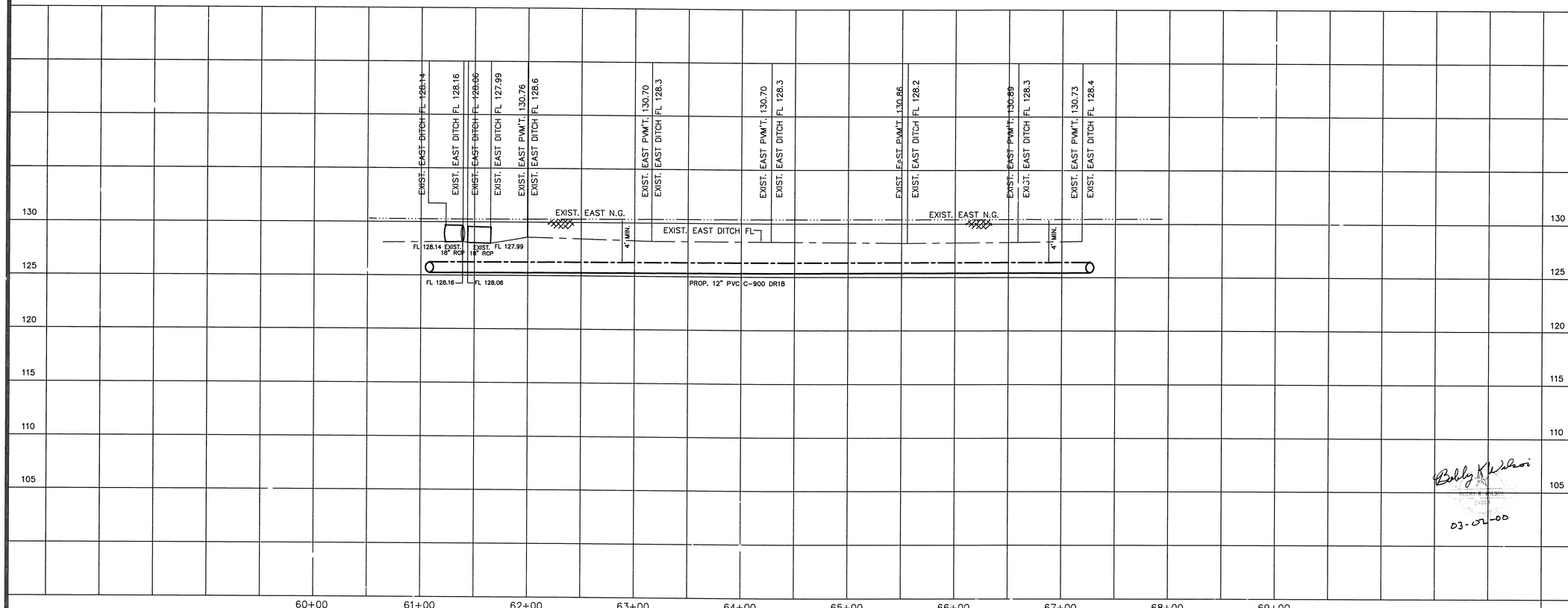
HARGRAVE ROAD (EAST PROFILE)



Bobby K. Wilson
03-02-00

BENCH MARK

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Y1216, 1973 ADJ., ELEV. = 125.994
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ELEVATION = 128.6

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ELEVATION = 130.62

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ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
Date

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Rev.	Date	Description	App.
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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX — 2/1/2000
SOUTHWESTERN BELL TELEPHONE CO. — Mike Balin 3/7/00
Valid for One Year Only
RELIANT ENERGIES, INC./H.L.&P. CO. — 3/1/2000
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 — Victor Saldivar 3-7-00	
WASTEWATER — 3-2-00	PROJECT MANAGER
STORM WATER — 2/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION — SPONSOR DEPARTMENT

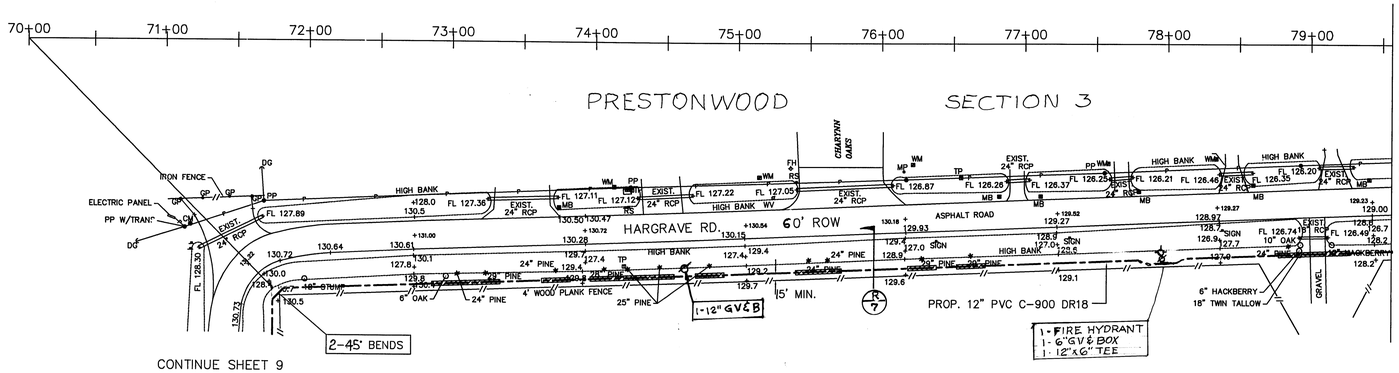
CITY ENGINEER — DATE
DIRECTOR OF PUBLIC WORKS AND ENGINEERING — 3-8-2000 DATE

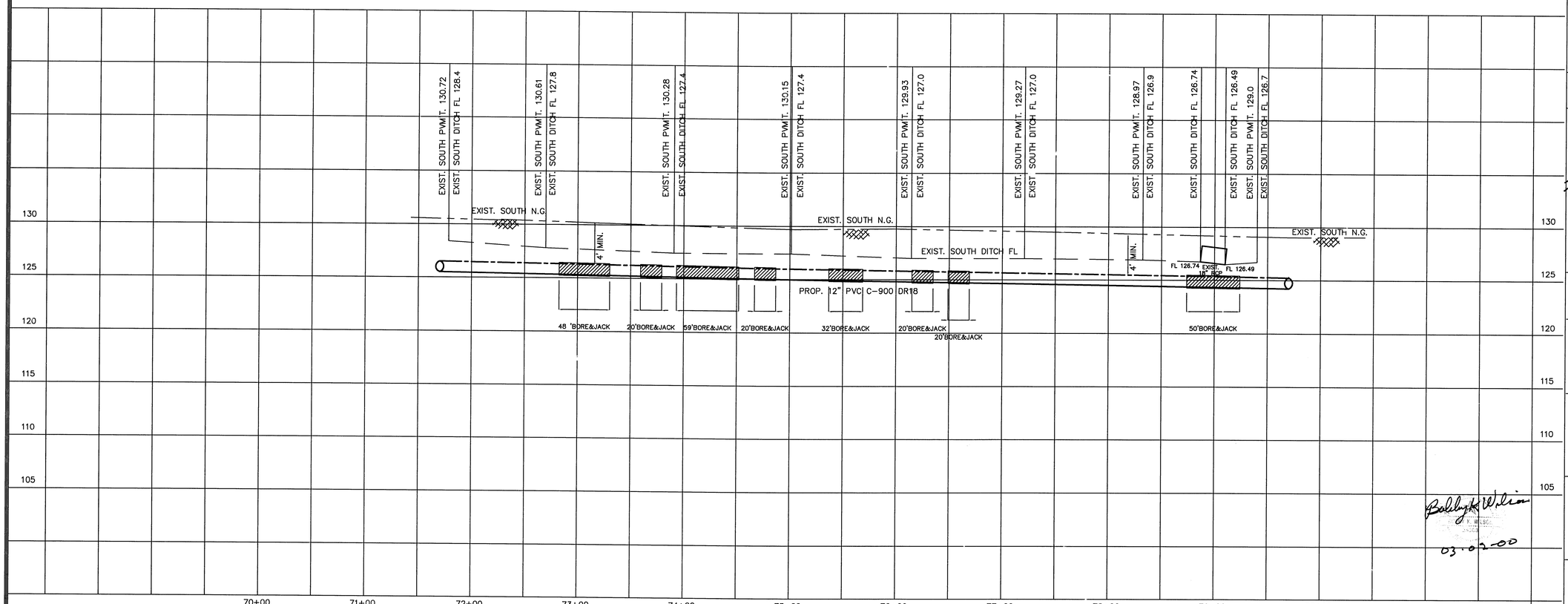
SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: H: 1"=50' V: 1"=5'	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 9 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	CITY DWG. NO. HARDITC4.DWG

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(EAST PROFILE)
STA. 60+00 TO STA. 69+00

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

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE





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APPROVED: _____
for Assistant County Engineer

Date

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PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX 3/1/2000
SOUTHWESTERN BELL TELEPHONE CO. 3/7/00
Valid for One Year Only
RELIANT ENERGIES, INC./HL&P. CO. 3/1/2000
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 Victor Saldivar 3-7-00	
WASTEWATER 3-2-00	PROJECT MANAGER
STORM WATER 2/25/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER _____ DATE _____

DIRECTOR OF PUBLIC WORKS AND ENGINEERING 3-8-2000 DATE

SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: H: 1"=50' V: 1"=5'	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 10 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	CITY DWG. NO. HARDITCS.DWG

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(SOUTH PROFILE)
STA. 70+00 TO STA. 79+56.29

Bobby K. Wilson
REGISTERED
BOBBY K. WILSON
03-02-00

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

LEGEND
C CONCRETE
CLR CENTERLINE OF ROAD
DG DOWN GUY
G GUTTER
GB GRADE BREAK
GP GATE POST
LP LIGHT POLE
NG NATURAL GROUND
PP POWER POLE
TC TOP OF CURB
SN SIGN
WV WATER VALVE

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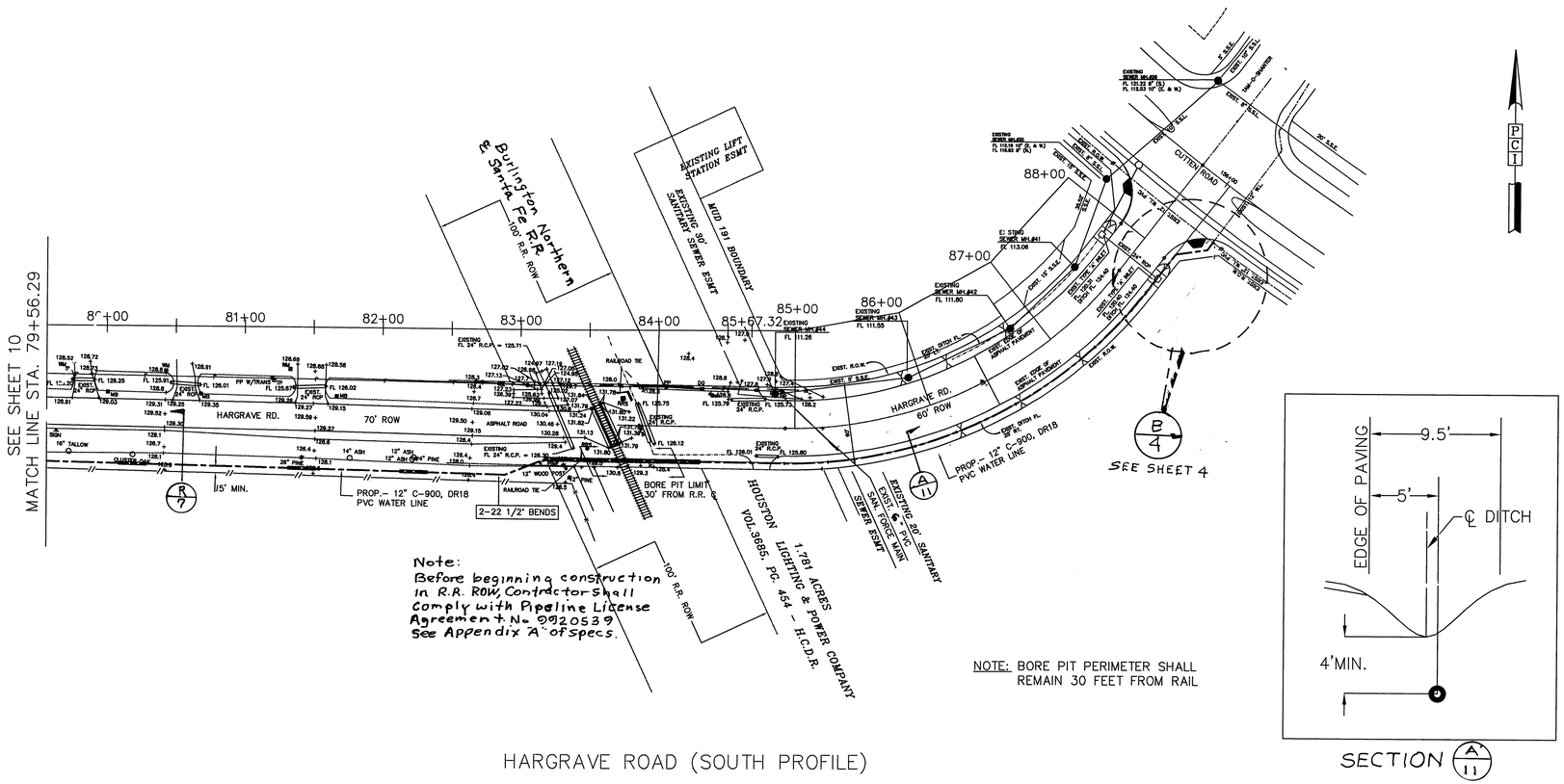
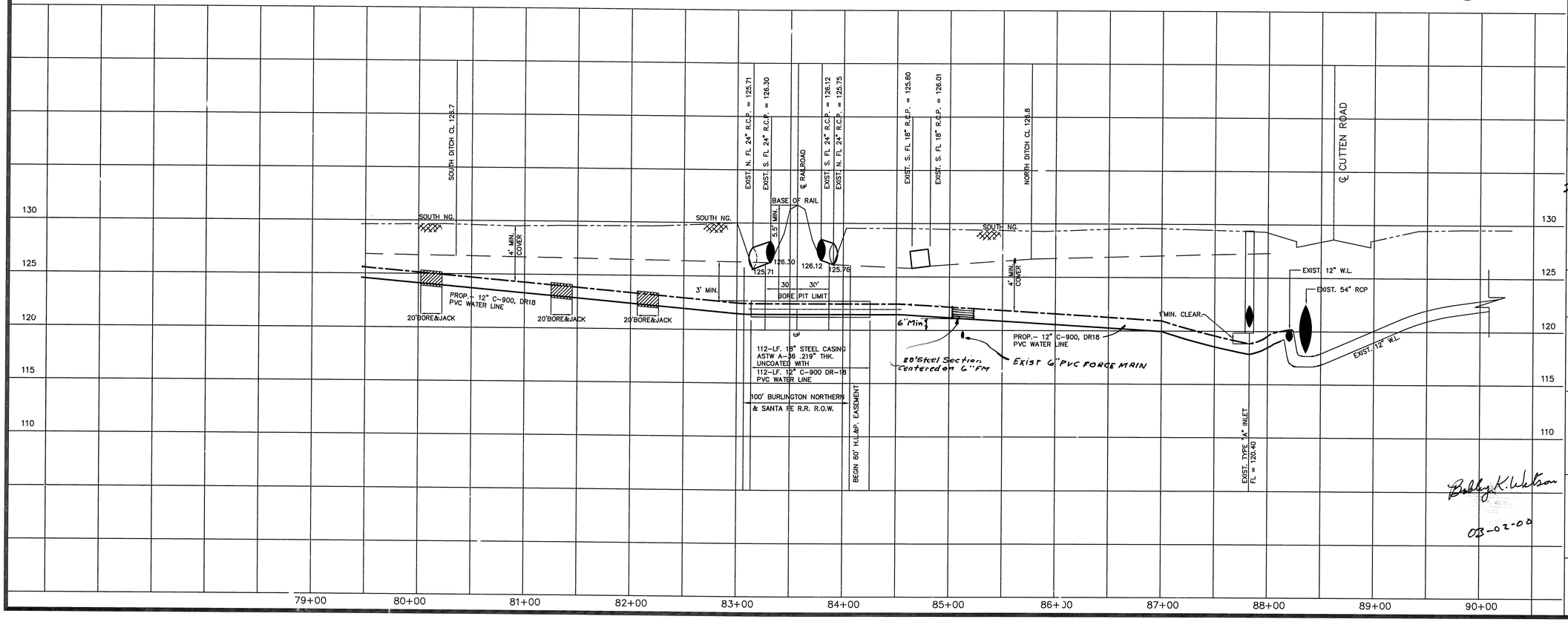


NOTE: BORE PIT PERIMETER SHALL REMAIN 30 FEET FROM RAIL

SECTION A/11

HARGRAVE ROAD (SOUTH PROFILE)



Bobby K. Wilson
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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 = 128.04

TBM #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.C.P AT GRAVEL DRIVE FROM 13627 HARGRAVE ROAD
ELEVATION = 130.56

APPROVED: _____
for Assistant County Engineer
_____
Date

Approval implied for paving and drainage facilities within Harris County R.O.W. and/or jurisdiction. All other improvements in H.C.R.O.W. and/or jurisdiction are approved as to location only.
The above authorization is valid for one (1) year only.

Rev.	Date	Description	App.
△			
△			
△			

PRIVATE UTILITY LINES SHOWN

RELIANT ENERGIES, INC./ENTEX 3/1/2000

SOUTHWESTERN BELL TELEPHONE CO. Mike Balin 3/7/00
Valid for One Year Only

RELIANT ENERGIES, INC./H.L.&P. CO. 3/1/2000
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 Victor Sullivan 3-7-00	
WASTEWATER	PROJECT MANAGER
STORM WATER 3/2/00	CONSTRUCTION
STREET AND BRIDGE	CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION	SPONSOR DEPARTMENT

CITY ENGINEER _____ DATE _____

DIRECTOR OF PUBLIC WORKS AND ENGINEERING 3-8-2000 DATE

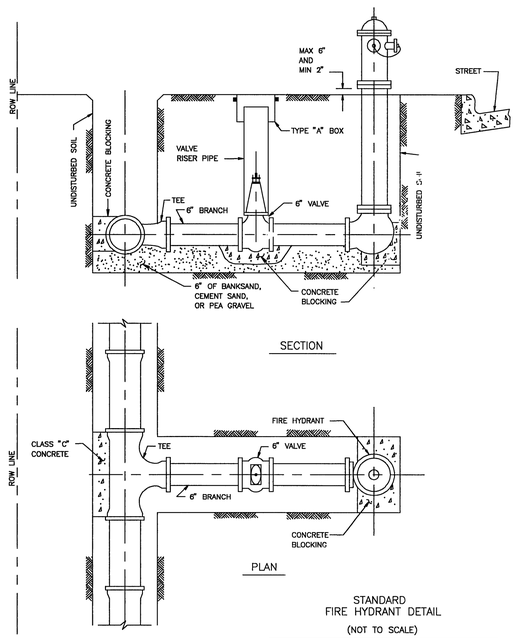
SUBMITTED:		DESIGNED BY:	B K WILSON
SCALE:	H: 1"=50' V: 1"=5'	DRAWN BY:	BILL DORRIS
DATE:	MARCH 2000	SHEET NO.	11 OF 14 SHEETS
SURVEY BY:			
F B NO:	462U	CITY DWG. NO.	HARDITC6.DWG

HARRIS COUNTY MUD 191
WATER LINE ALONG
HARGRAVE ROAD
(SOUTH PROFILE)
STA. 79+56.29 TO 88+27.53

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

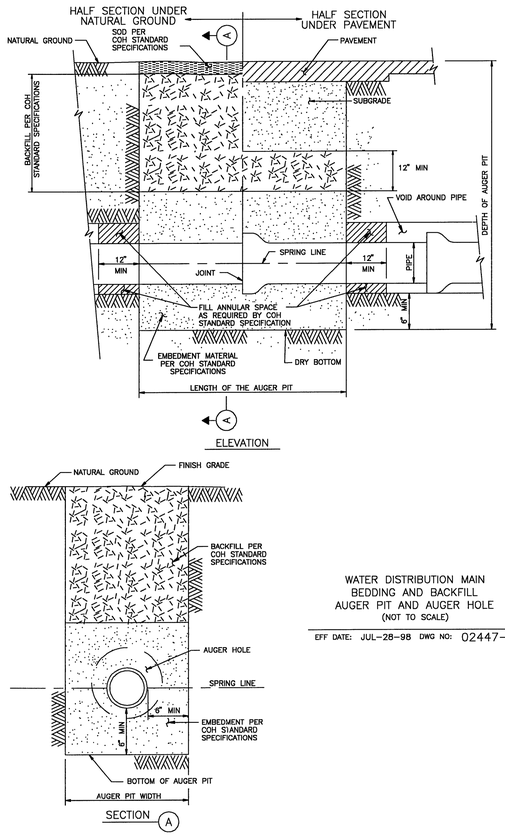
NOTES:

1. LOCATE FIRE HYDRANTS AT PCs OF THE INTERSECTION CURB RADIUS, 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.
2. ON OPEN-DITCH ROADWAYS, SET THE FIRE HYDRANTS WITHIN 3 FEET OF RIGHTS-OF-WAY LINES.
3. THE FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.



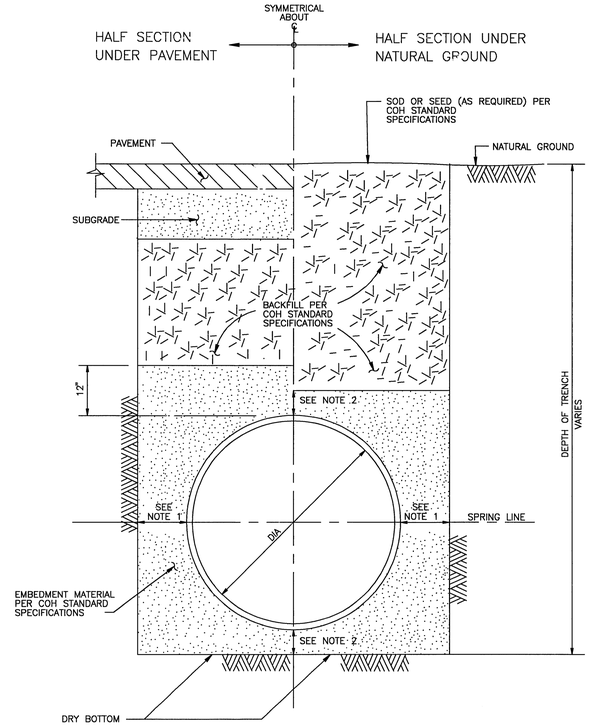
STANDARD
FIRE HYDRANT DETAIL
(NOT TO SCALE)

EFF DATE: JUL-01-97 DWG NO: 02520-01



WATER DISTRIBUTION MAIN
BEDDING AND BACKFILL
AUGER PIT AND AUGER HOLE
(NOT TO SCALE)

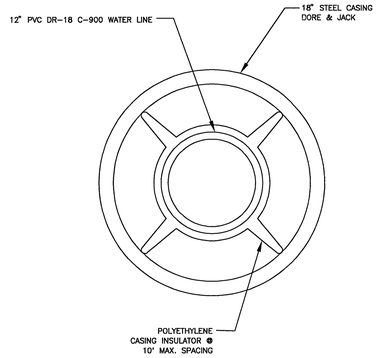
EFF DATE: JUL-28-98 DWG NO: 02447-01



NOTE:
1. SEE COH STANDARD DETAIL
2. 6" MIN. FOR MAIN DIAMETER ≤20"
   12" MIN. FOR MAIN DIAMETER >20"

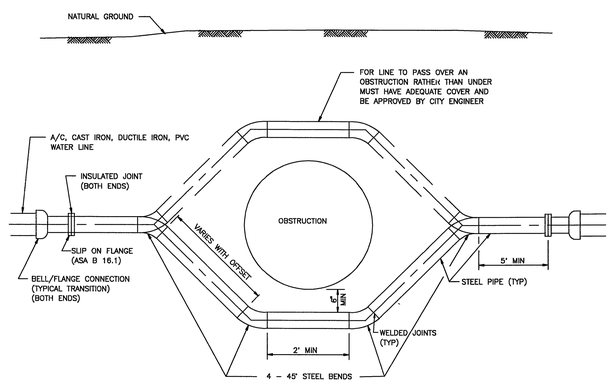
WATER DISTRIBUTION MAIN
BEDDING AND BACKFILL FOR
OPEN CUT TRENCHES
(NOT TO SCALE)

EFF DATE: JUL-28-98 DWG NO: 02511-01



TYPICAL SECTION
AT RAILROAD CROSSING

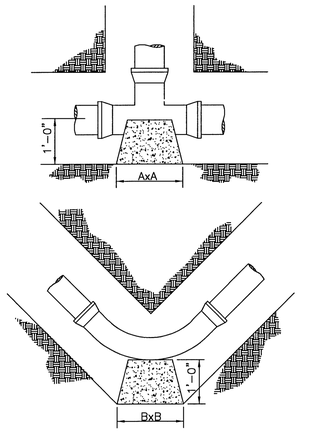
NOTE:
1. MATERIALS AND COATINGS TO BE IN ACCORDANCE WITH WATER MAIN STANDARD SPECIFICATIONS.
2. RESTRAIN EXISTING PIPING BEYOND STEEL SECTION AS REQUIRED TO PREVENT MOVEMENT.



TYPICAL STEEL SECTION FITTINGS
4 - 8"X45° STEEL BENDS
2 - 8" BELL-FLANGE ADAPTERS
2 - 8" SLIP-ON FLANGES 150 #
2 - 8" INSULATED JOINT KITS

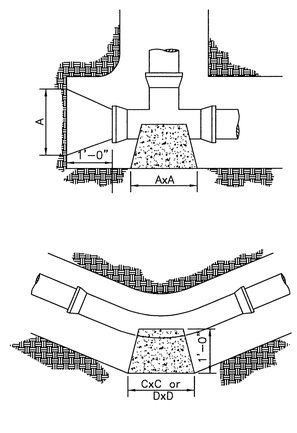
TYPICAL STEEL PIPE OFFSET
SECTION FOR WATER MAINS
(NOT TO SCALE)

EFF DATE: JUL-28-98 DWG NO: 02502-02



PIPE SIZE	"A" Plugs, Wyes, Tees	"B" 90° Bend	"C" 45° Bend	"D" 22°30' Bend
6"	1'-0"	1'-2"	1'-2"	1'-2"
8"	1'-3"	1'-6"	1'-6"	1'-6"
12"	2'-8"	3'-0"	2'-3"	2'-3"

TYPICAL THRUST BLOCK DETAIL
N.T.S.



NOTE: Heights of all blocks shall be equal to the A, B, C, or D dimension called for. All concrete to be poured against firm undisturbed soil.

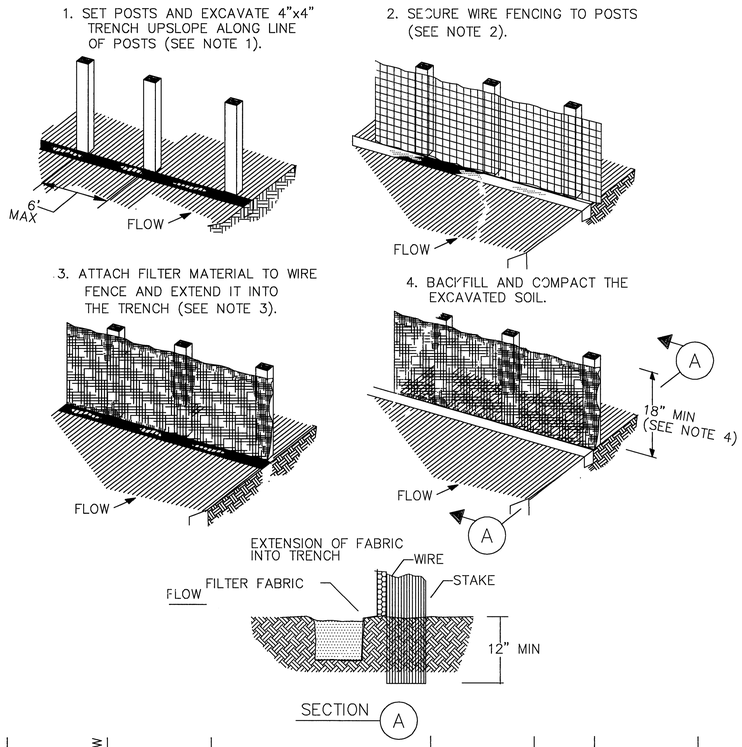
Concrete to be min. 3000 P.S.I. @ 28 days.

Bobby K. Wilson
03-02-00

SUBMITTED:	DESIGNED BY: B K WILSON
SCALE: N/A	DRAWN BY: BILL DORRIS
DATE: MARCH 2000	SHEET NO. 12 OF 14 SHEETS
SURVEY BY:	
F B NO: 462U	CITY DWG. NO: WATERD.DWG

WATER LINE DETAILS

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

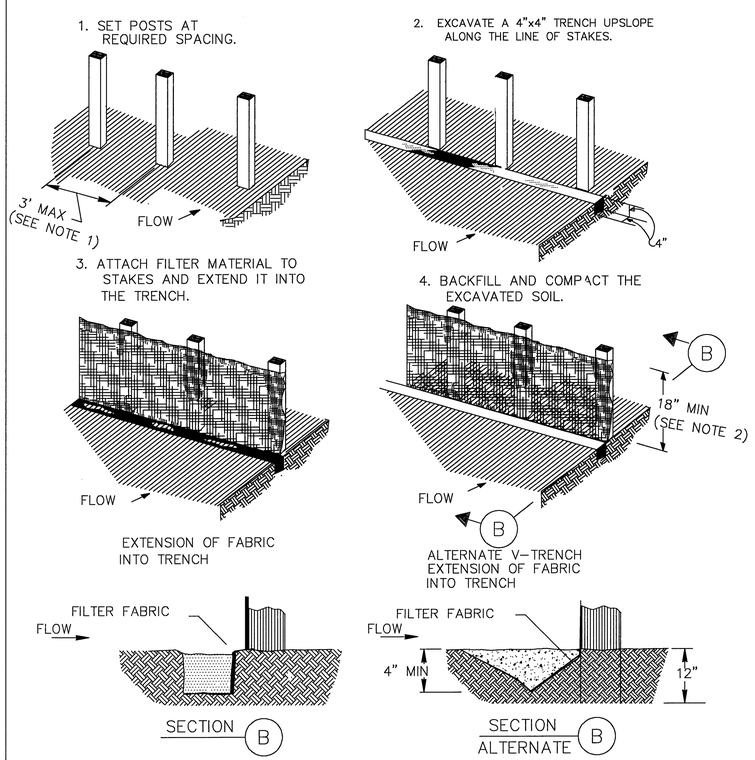


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
6. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

SYMBOL

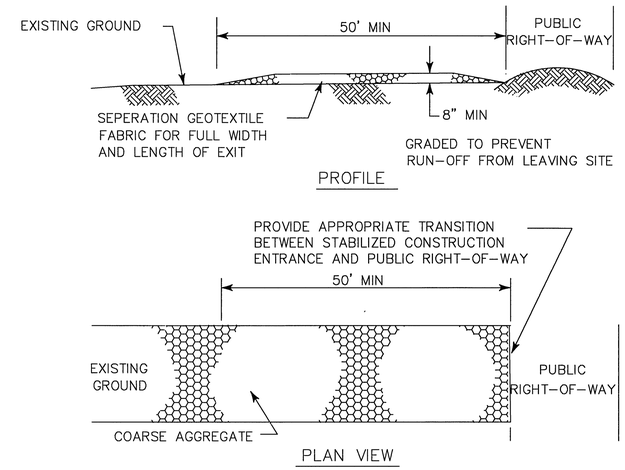
REINFORCED FILTER FABRIC BARRIER



CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC FENCE.

FILTER FABRIC FENCE



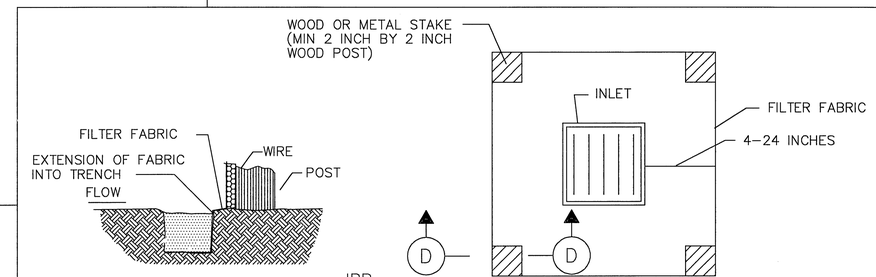
CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
6. SEE COH STANDARD FOR STABILIZED CONSTRUCTION EXIT.
7. STABILIZED CONSTRUCTION EXIT SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

SC

SYMBOL

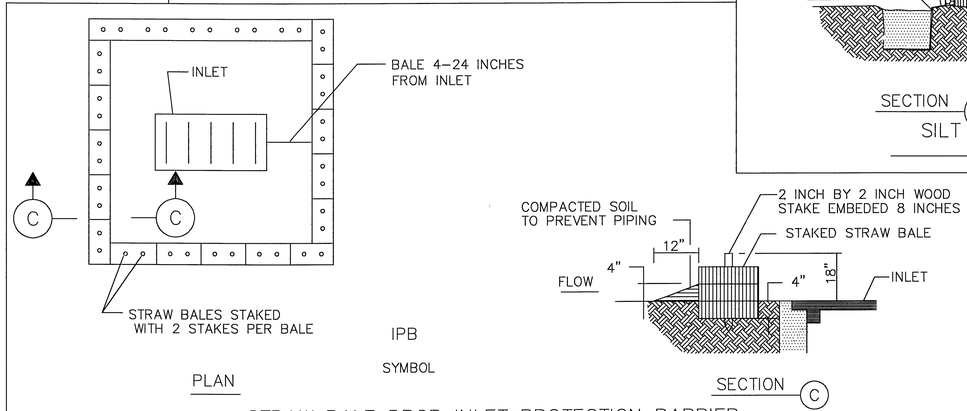
STABILIZED CONSTRUCTION EXIT



CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.

SILT FENCE INLET PROTECTION BARRIER



STRAW BALE DROP INLET PROTECTION BARRIER

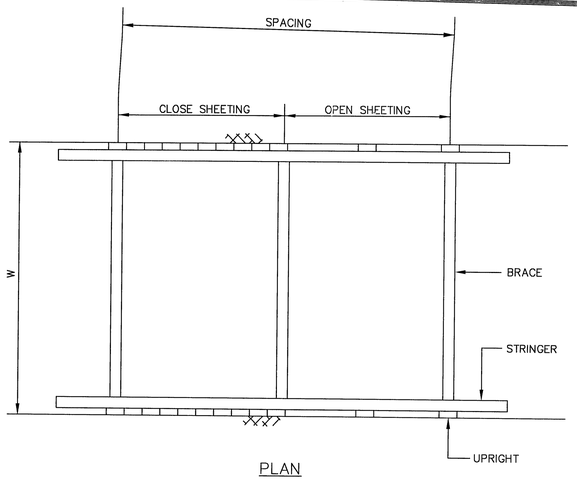
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

STORM WATER POLLUTION PREVENTION PLAN DETAILS

(NOT TO SCALE) 13 OF 14

Bobby K. Wilson 03-02-00

APPROVED BY:	APPROVED BY: 3-8-2000
CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: OCT-01-99	DWG NO: 01571-01



PLAN

TRENCH SHORING – MINIMUM REQUIREMENTS (* *)

DEPTH OF TRENCH	KIND OF CONDITION OF EARTH	SIZE AND SPACING OF MEMBERS											
		UPRIGHTS		STRINGERS		CROSS BRACES [1]							
						WIDTH OF TRENCH					MAXIMUM SPACING		
		MINIMUM DIMENSION	MAXIMUM SPACING	MINIMUM DIMENSION	MAXIMUM SPACING	UP TO 3 FEET	3 TO 6 FEET	6 TO 9 FEET	9 TO 12 FEET	12 TO 15 FEET	VERTICAL	HORIZONTAL
FEET	TYPE	INCHES	FEET	INCHES	FEET	INCHES	INCHES	INCHES	INCHES	INCHES	FEET	FEET
5 TO 10	(A) HARD, COMPACT	3x4 OR 2x6	6		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		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

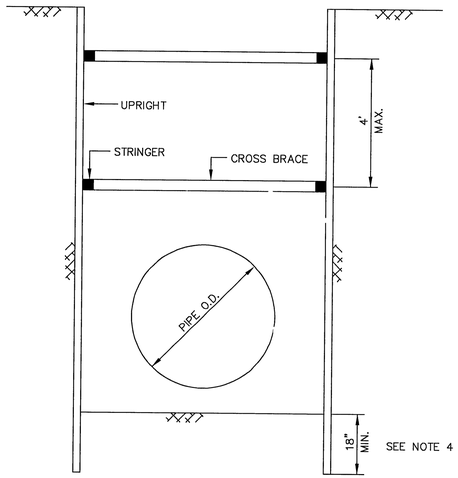
1. TRENCH JACKS MAY BE USED IN LIEU OF, OR IN COMBINATION WITH, CROSS BRACES.
SHORING IS NOT REQUIRED IN SOLID ROCK, HARD SHALE, OR HARD SLAG.
WHERE DESIRABLE, STEEL SHEET PILING AND BRACING OF EQUAL STRENGTH MAY BE SUBSTITUTED FOR WOOD.

( ) DESIGNATION FOR PROPOSAL (BID) PURPOSES

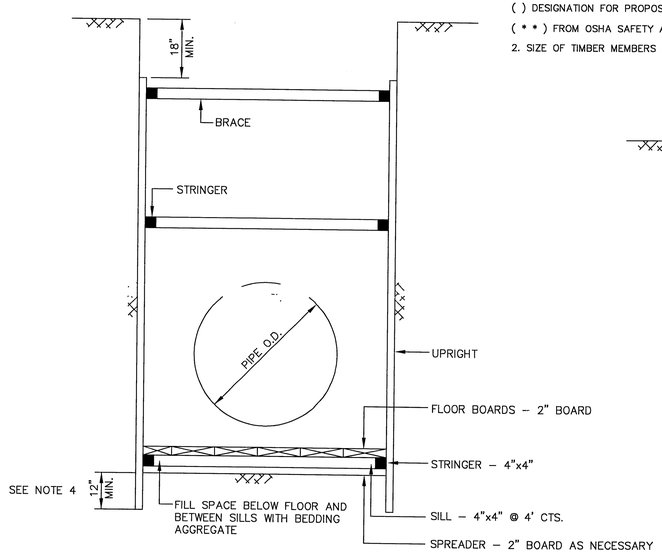
(* *) FROM OSHA SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P

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

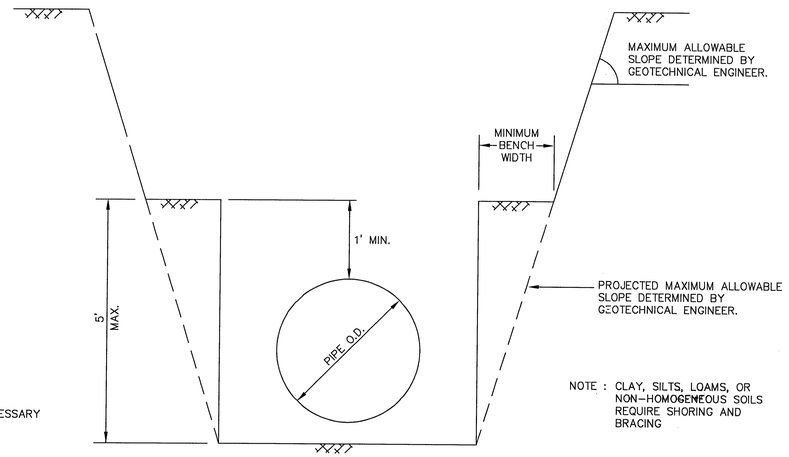
1. TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF O SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P.
2. THE CONTRACTOR MAY ELECT TO USE AN ALTERNATE SYSTEM TO THE TIMBER TREN SHORING SHOWN IN THE TABLE. THE ALTERNATE SYSTEM, BE IT A TRENCH BOX, STEEL SHEET PILING, TRENCH JACKS OR 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.
3. 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.
4. 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.
5. 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)
6. 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.
7. 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.
8. MEASURE "PERMANENT TIMBER TRENCH SHORING" BY LINEAR FOOT OF TRENCH PROTECTED. PAYMENT IS BE STATED DEPTH OF TRENCH AND EARTH CONDITIONS NOTED IN THE PROPOSAL (BID).
9. MEASURE "TRENCH SAFETY SYSTEM" BY LINEAR FOOT OF TRENCH PROTECTED. PAYMENT IS BY STATED DEPTH OF TRENCH AND EARTH CONDTIONS NOTED IN THE PROPOSAL (BID).
10. STINGERS AND BRACES TO BE SECURELY FASTENED.
11. ANY PART OF "TRENCH SAFEY SYSTEM" LEFT IN PLACE TO BE REMOVED A MINIMUM OF 18 INCHES BELOW FINISHED GRADE OR NATURAL GROUND, WHICHEVER IS LOWER.
12. TRENCH SHORING SYSTEM HAS BEEN DESIGNED WITH NO ALLOWANCE FOR LIVE LOAD SURCHARGE. IF LIVE LOAD SURCHASE 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 ACCOMODATE THE ANTICIPATED LIVE LOAD SURCHARGE.
13. TIMBER SIZES ARE BASED ON STRESSES OF 1650 PSI FOR EXTREME FIBER IN BENDING AND 1450 PSI FOR COMPRESSION PARALLEL WITH GRAIN.
14. EARTH TRENCH CONDITIONS FOR THIS PROJECT ARE ANTICIPATED TO BE AS SHOWN IN THE GEOTECHNICAL REPORT.



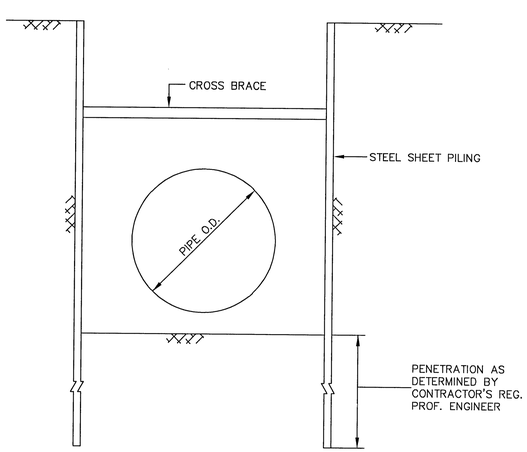
TIMBER TRENCH SHORING



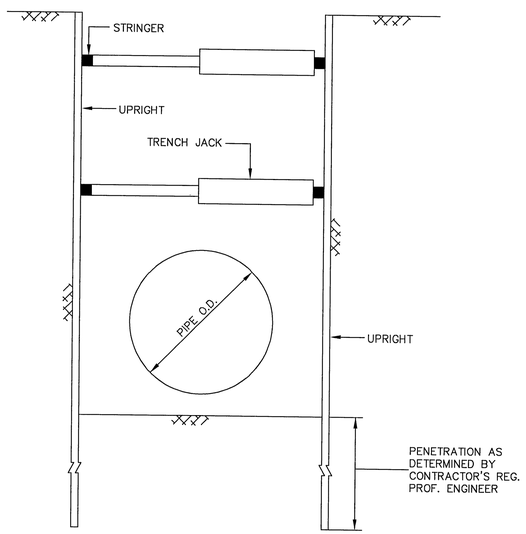
PERMANENT TIMBER TRENCH SHORING



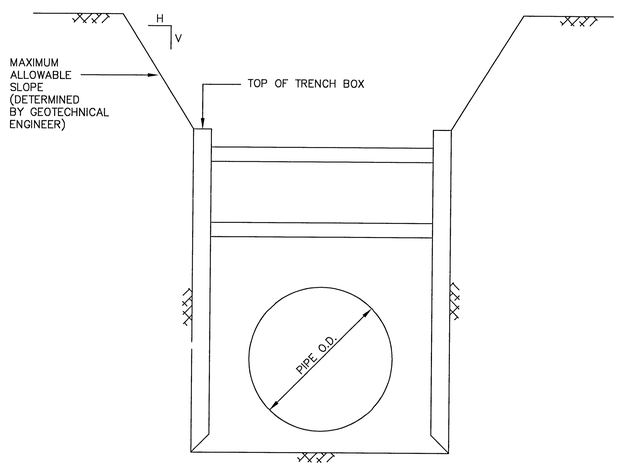
UNSHORED SLOPED TRENCH



STEEL PILING *



TRENCH JACK AND STRINGER *



TRENCH BOX *

Bobby K. Wilson
03.02.00

SUBMITTED:		DESIGNED BY:	B K WILSON
SCALE:	N/A	DRAWN BY:	BILL DORRIS
DATE:	MARCH 2000	SHEET NO.	14 OF 14 SHEETS
SURVEY BY:		CITY DWG. NO:	TRENCH.DWG
F B NO:	462U		

TRENCH SAFETY

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