

# UTILITY EXTENSION TO CHEVRON



## H.C.M.U.D. NO. 191 SANITARY - WATER

APPROVED  
CITY OF HOUSTON

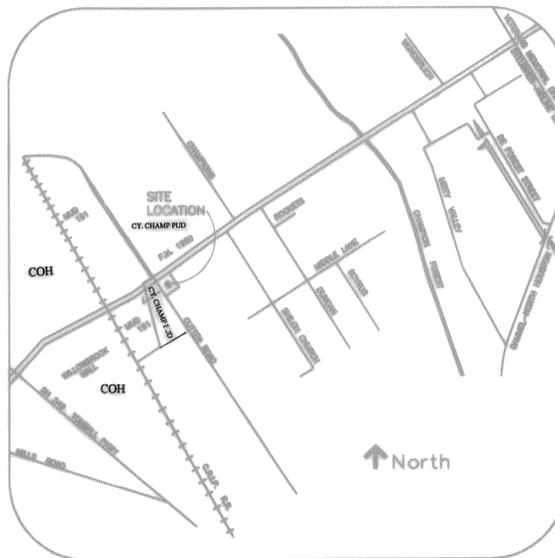
*Richard C. Scott*  
CITY ENGINEER  
RICHARD C. SCOTT, P.E.      7/12/96  
DATE

*Jimme Schindewolf*  
DIRECTOR OF PUBLIC WORKS AND ENGINEERING  
JIMME SCHINDEWOLF, P.E.      7-12-96  
DATE

CITY DWG. NO:

JOB NO. 1000-U  
DATE: MARCH 1996

TITLE	SHEET NO.
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SANITARY & WATER OVERALL	2
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VICINITY MAP  
KEY MAP PG. 370-F  
HARRIS COUNTY, TEXAS  
SCALE: N.T.S.



**PEI** PROVIDENT ENGINEERS, INC.  
12200 N.W. FRWY., SUITE 210  
HOUSTON, TEXAS 77092

LOG. NO. 960042

UTILITY EXTENSION TO CHEVRON

BENCH MARK: NGS DISK STAMPED Y1216 1973  
 BRASS DISK AT CENTER LINE OF H.L.M.P. TOWER  
 1ST TOWER NORTH OF F.M. 1980  
 ELEV. 125.406 (1979 ADJ.)

- LEGEND**
- LT LIGHT POLE
  - SIG TRAFFIC SIGNAL
  - SGN TRAFFIC SIGN
  - PLM PIPELINE MARKER
  - TB TRAFFIC BOX
  - BC BACK OF CURB
  - C CONCRETE
  - GB GRADE BREAK
  - G GUTTER
  - NG NATURAL GROUND
  - P- POWER LINE

Rev.	Date	Description	App.

**PRIVATE UTILITY LINES SHOWN**

*Robert A. Waterwall* 3/12/96  
 INDEX, INC.  
 2-13-96

*Thomas T. Tol* 7-9-96  
 SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only

*Thomas T. Tol* 7-9-96  
 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

**SECTION APPROVALS**

*Wm. H. ...* 7-11-96  
 WATER ENGINEERING TRAFFIC & SIGNAL ENGINEER

*Tom ...* 7-11-96  
 WASTEWATER ENGINEERING STREET, BRIDGE & ROW ENG.

*M. ...* 7-11-96  
 STORM SEWER ENGINEERING CONSTRUCTION

**APPROVAL FOR ROW & EASEMENT WORK ONLY**

**OTHER DEPARTMENTS**

*Charles ...*  
 PLANNING AND DEVELOPMENT SPONSOR DEPARTMENT

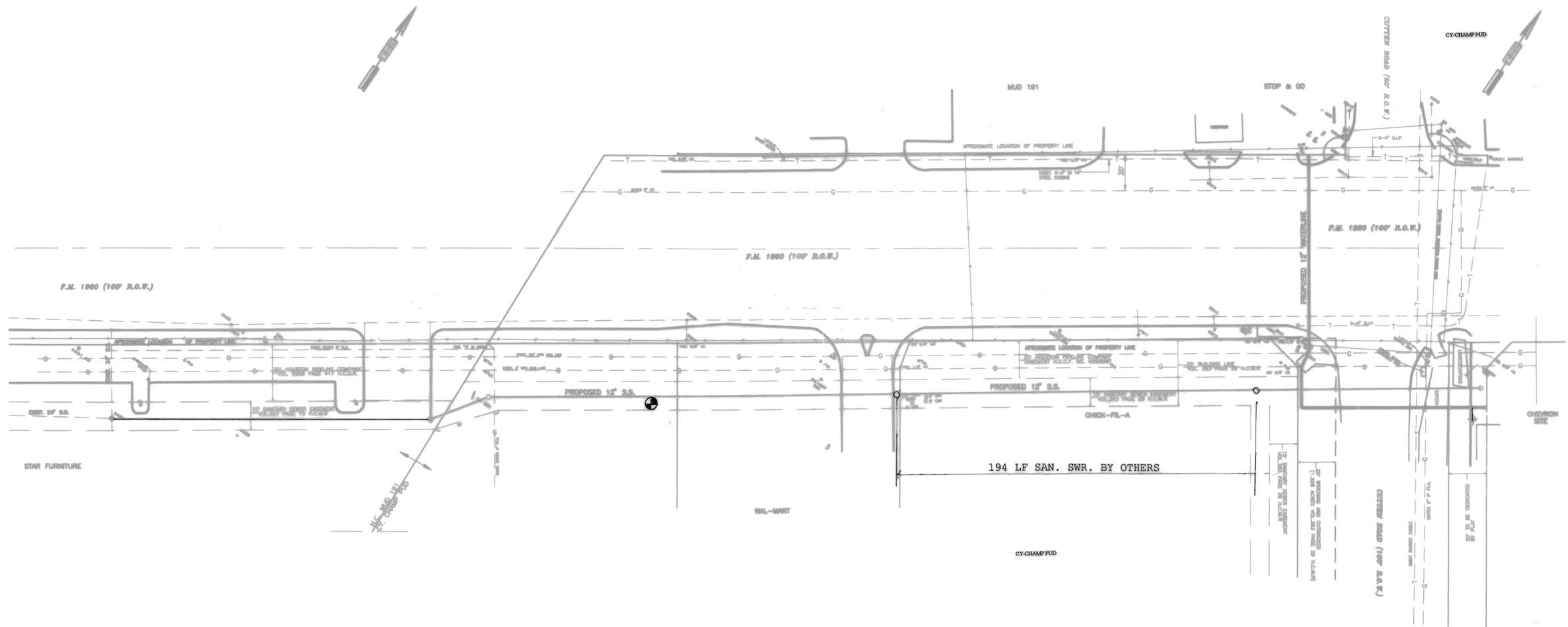
*Al ...* 7/12/96  
 CITY ENGINEER

*...* 7-12-96  
 DIRECTOR OF PUBLIC WORKS AND ENGINEERING

SUBMITTED: \_\_\_\_\_ DESIGNED BY: TM  
 SCALE: 1" = 30' DRAWN BY: TM  
 DATE: 12/19/95 SHEET NO. 2 OF 9 SHEETS  
 SURVEY BY: \_\_\_\_\_ CITY DWG. NO.: OVERALL.DWG  
 JOB NO.: 8100-U

**M.U.D. 191**  
**UTILITY EXTENSION TO CHEVRON**  
**WATER & SANITARY**  
**OVERALL LAYOUT**

**PEI** PROVIDENT ENGINEERS, INC.  
 12200 N.W. FRNH, Suite 210  
 Houston, Texas 77032



**SANITARY SEWER NOTES:**

1. If PVC (ALL TYPES) or any other type sanitary sewer pipe or manhole type not mentioned in the E-14-82 is chosen, then a letter of permission must be obtained from the Wastewater Design Section Capital Projects Dept.
2. Sanitary sewer joints (ALL TYPES PVC INCLUDED) shall be rubber gasket equipped bell and spigot type. Chemically welded sanitary sewer joints are acceptable only on ARMED TRUSS PIPE.
3. Any Pipe types not listed below take modified class "AA" bedding unless otherwise specified in a special letter of permission. Standard bedding for sanitary sewers:  
Concrete Pipe - "A" or Modified "AA"  
ES. Clay - "A" or Modified "AA"  
PVC - Modified "AA"  
Truss - Modified "AA"  
Hobas - Modified "AA"  
Spiralite - Modified Class AA  
Ductile Iron - "C" With Polyethylene Wrap
4. Design and construction of sanitary sewer shall conform to City of Houston publication E-14-82 with all amendments thereto, and city publication General Design Requirements for Sanitary Sewers, Storm Sewers, Water Lines, and Paving, Revision 1.
5. All manhole rims shall be above the 100 year flood elevation or the manhole top shall be sealed and vented with a detail of a vented manhole to be included in the plans.
6. City of Houston Signatures affixed to plans shall be valid for 1 year only after the date of said signatures. Any changes made to the plans after said date will require replacement and/or update of the signatures on the plans. When the signatures are being updated, design changes may be ordered for any unbuild items found on the plans. [Note: this item does not apply to City of Houston Capital Projects Dept. Plans]
7. Deflection Testing shall be performed for all non-rigid pipe types. Deflection testing shall be conducted after the gravity sanitary sewer has been in place for at least 30 days. No pipe shall exceed a deflection of 5%. The deflection test shall be conducted using a rigid ball or mandrel having an inside diameter equal to 85% of the interior diameter of the pipe. The test shall be performed without mechanical pulling devices. I. & E. test for sanitary sewer system shall be in accordance with City of Houston requirements.
8. Special Backfill - See ADDENDUM SEWER SPECIFICATION E-14-82, City of Houston sewer specifications for cement stabilized backfill of sanitary and trenches under or within (1) ft. of proposed or existing pavement.
9. Wye branches, stacks and tees for house service connection shall be centered between side lot lines unless otherwise provided engineer with drawings of actual field ties of the wyes, stacks and tees locating them from the nearest downstream manhole.
10. All manhole rims located outside of the proposed paving will be set 3" above top of curb elevation when within street right-of-way or 3" to 6" above surrounding level of finished grade elsewhere with sloped fill added for storm drainage away from the manhole rim.
11. All sanitary sewer materials, construction, and testing will be in accordance with city of Houston E-14-82 (1977 printing and all subsequent amendments thereto).
12. Contractor to obtain all construction permits required by the "Regulations of Harris County, Texas for Flood Plain Management".
13. For use in wet sand construction areas, use C/H Spec. Sec. No. 5, DWG No. 485-s (E-14-82) (1977 printing and all subsequent amendments thereto).
14. PVC to be SDR-26.

**GENERAL NOTES - STORM SEWERS**

1. STORM SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON E-14-82 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 529-S-1, 530-S-1 and 530-S-2 AS APPLICABLE.
3. ALL SEWERS UNDER OR WITHIN ONE (1) FT. OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED WITH 1 SACK CEMENT STABILIZED SAND TO WITHIN ONE (1) FT. OF SUBGRADE.
4. ALL STORM SEWERS CONSTRUCTED IN SIDELOT EASEMENTS SHALL BE R.C.P. (C-76 CLASS III) AND SHALL BE BEDDED IN ACCORDANCE WITH CITY OF HOUSTON DRAWINGS 529-S-1, 530-S-1 and 530-S-2 AS APPLICABLE. TWENTY (20) FT. WIDE, EASEMENT SHALL BE PROVIDED.
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, (713-755-8210), 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 MANHOLE RIMS LOCATED OUTSIDE OF THE PROPOSED PAVING WILL BE SET 3" TO 6" ABOVE SURROUNDING LEVEL OF FINISHED GRADE WITH SLOPED FILL ADDED FOR STORM WATER DRAINAGE AWAY FROM THE MANHOLE RIM.
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.

**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 SPECIFICATIONS (SEE GENERAL NOTES FOR WATER MAIN PROJECTS IN THE CITY'S ETJ)
3. ALL FLUSHING VALVES SHALL BE SET THREE (3) FEET BEHIND BACK OF CURB.
4. STEEL WATER LINE SECTION TO EXTEND A MINIMUM 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 SANITARY SEWERS CROSS OVER WATER MAINS, AND THE MINIMUM PIPE CLEARANCE IS 24" OR GREATER, A CENTERED 20' SECTION OF CEMENT STABILIZED SAND (2 SACKS OF CEMENT PER CUBIC YARD) SHALL BE INSTALLED FROM THE LOWER 1/4 POINT OF THE SEWER PIPE TO A LEVEL OF 1 PIPE DIAMETER ABOVE THE SEWER PIPE, BUT IN NO CASE SHALL THE DEPTH OF SAND ABOVE THE SEWER PIPE BE LESS THAN 12".
10. ALL P.V.C. WATER MAINS SHALL BE F C-900, DR 16, CLASS 150.
11. ALL WATER METERS MUST HAVE INDIVIDUAL SERVICE LEADS AS PER CITY OF HOUSTON STANDARDS. W.D.-6 (EFFECTIVE 8-28-87).

**GENERAL NOTES FOR WATER MAIN PROJECTS IN THE CITY'S ETJ**

1. Water main/meter construction shall be in accordance with City of Houston Specifications for Water Main Construction and Materials and Specifications for Water Taps and Service Lines, 3/4" through 2", and for Large Meter and Sprinkler Connections with latest addenda and amendments thereto.
2. All A.C. water mains used in this project ranging in size from 6 inches thru 18 inches shall be AWWA C-400-80 class 200 or latest revision with maximum pipe length of 6 feet 6 inches.
3. All water mains under street pavement - 4 inches thru 12 inches in diameter, if not specified otherwise, shall be AWWA C-900 PVC pipe.
4. All water meters sized from 3/4" to 2" must have individual service leads and meter boxes as per City of Houston Specification for Water Taps and Service Lines, 3/4" through 2", and for Large Meter and Sprinkler Connections with latest addenda and amendments thereto.
5. All water meters sized 3" or larger shall have approved plan and profile drawings to be installed in a 10' x 20' Water Meter Easement adjacent to public street R.O.W. as per City of Houston Specifications for Water Taps and Service Lines, 3/4" through 2", and for Large Meter and Sprinkler Connections with latest addenda and amendments thereto.
6. All fire lines (loop) shall have approved plan and profile drawings to be installed in a 10' Water Line Easement inside private property as per City of Houston Specification for Water Taps and Service Lines, 3/4" through 2", and for Large Meter and Sprinkler Connections with latest addenda and amendments thereto.
7. Contractor shall provide adequate thrust blocking to withstand test pressure specified in Specification for Water Main Construction and Materials with latest addenda and amendments thereto.

**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, (713-755-8210), AND WRITTEN NOTIFICATION 48 HOURS IN ADVANCE.
5. STOP SIGN (R1 - 1A) TO BE PLACED AT ALL 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.

**GENERAL NOTES**

1. Existing pavements, curbs, sidewalks, and driveways damaged or removed during construction shall be replaced to City of Houston standards.
2. 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.
3. Approval only for utilities within Public R.O.W.

**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 HLP&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.

Rev.	Date	Description	App.

PRIVATE UTILITY LINES SHOWN	
<i>Colin A. Watwood</i>	3/12/96
ENTEX, INC.	
<i>[Signature]</i>	2-12-96
SOUTHWESTERN BELL TELEPHONE CO.	
Valid for One Year Only	
<i>[Signature]</i>	3-9-96
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	
SECTION APPROVALS	
<i>[Signature]</i>	TRAFFIC & SIGNAL ENGINEERING
<i>[Signature]</i>	STREET, BRIDGE & ROW ENG.
<i>[Signature]</i>	CONSTRUCTION
STORM SEWER ENGINEERING APPROVAL FOR ROW & EASEMENT WORK ONLY	

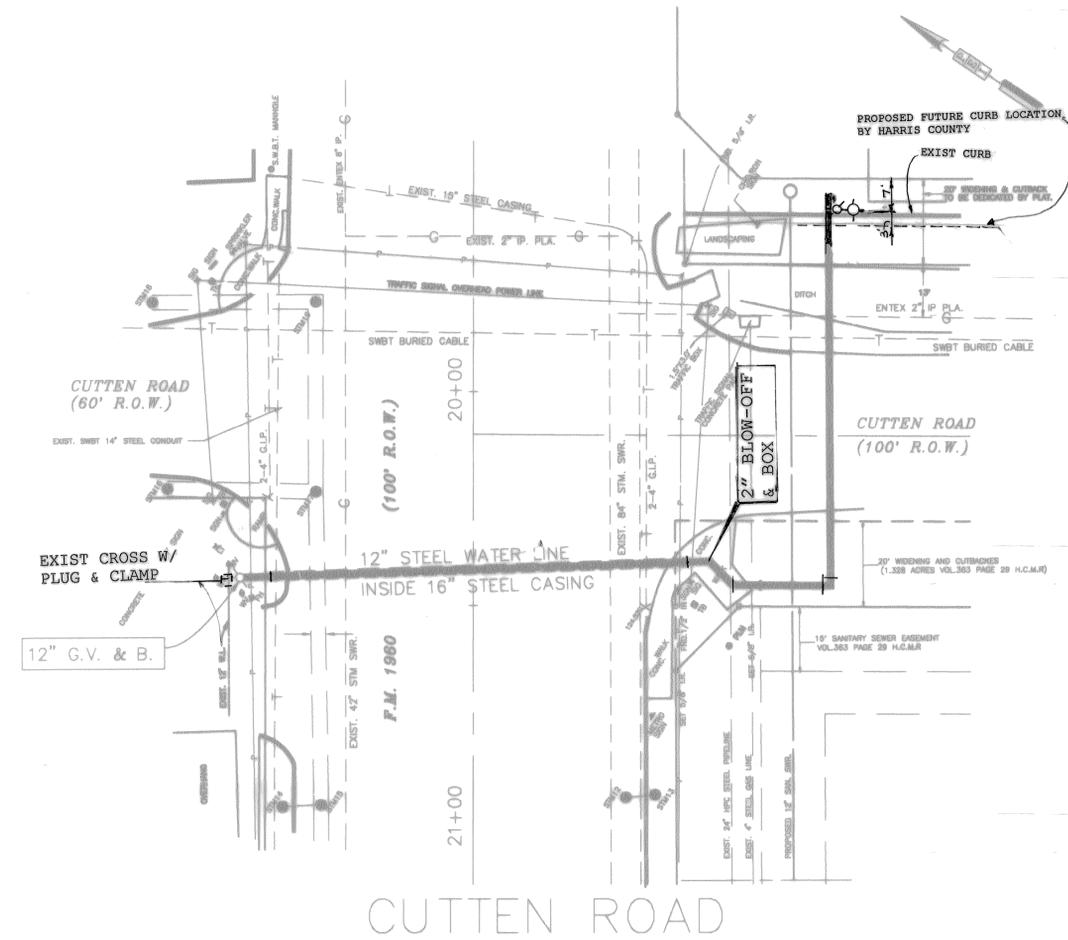
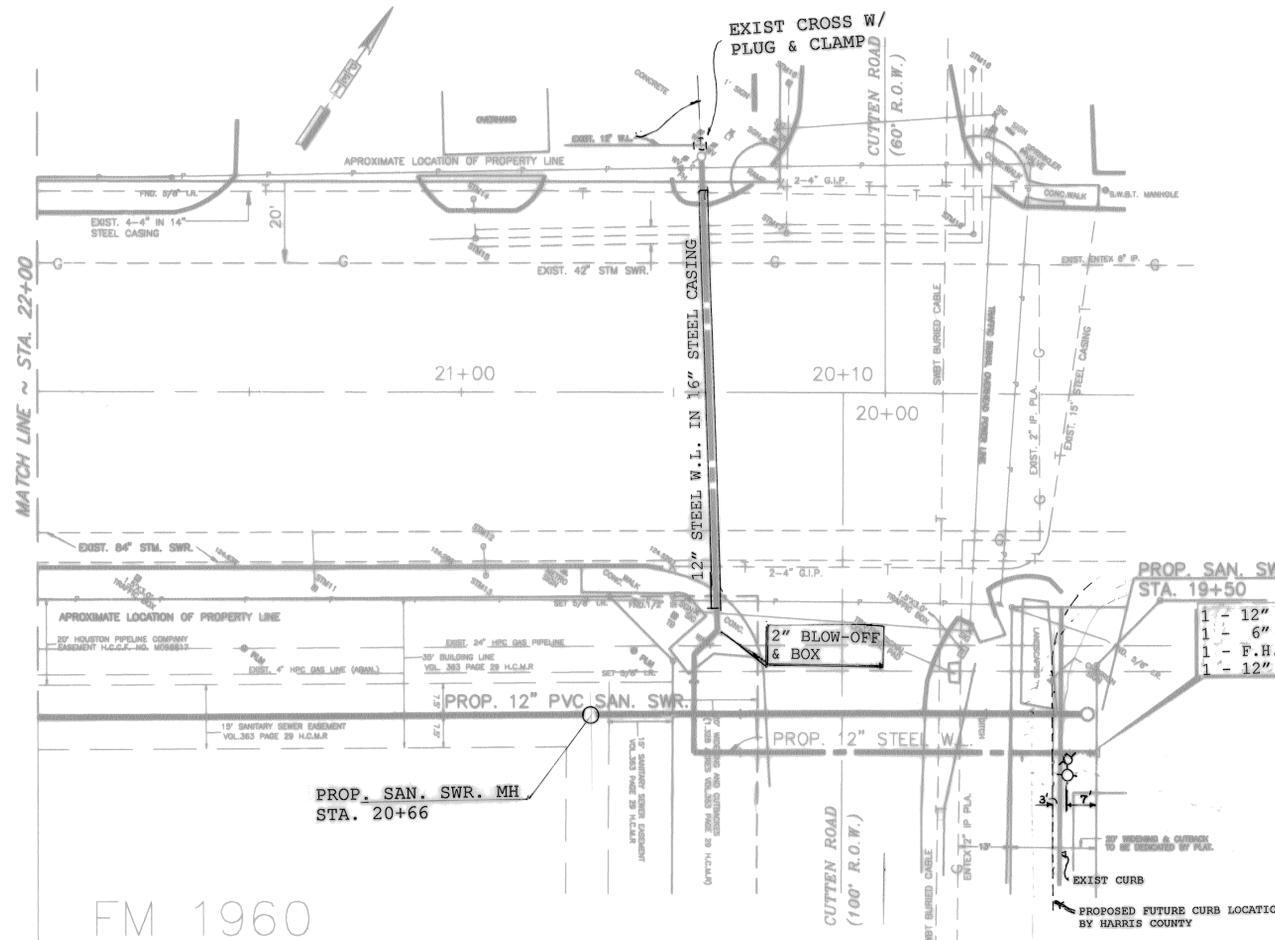
OTHER DEPARTMENTS	
PLANNING AND DEVELOPMENT	SPONSOR DEPARTMENT
<i>[Signature]</i>	7/12/96
CITY ENGINEER	DATE
<i>[Signature]</i>	7/12/96
DIRECTOR OF PUBLIC WORKS	DATE
ENGINEERING	

SUBMITTED:	DESIGNED BY: TIM
SCALE:	DRAWN BY: TIM
DATE: 1/12/96	SHEET NO. 3 OF 9 SHEETS
SURVEY BY:	CITY
JOB NO: 6000	DWG. NO. NOTE.DWG



**MUD 191  
UTILITY EXTENSION TO CHEVRON  
GENERAL NOTES**

**PEI** PROVIDENT ENGINEERS, INC.  
12200 N.W. FRWY, Suite 210  
Houston, Texas 77092



BENCH MARK: MGS DISK STAMPED Y1216 1973  
BRASS DISK AT CENTER LINE OF H.L.&P. TOWER  
1ST TOWER NORTH OF F.M. 1960  
ELEV. 125.406 (1979 ADJ.)

NOTE:  
1. CONTRACTOR TO CONTACT ENTEX TO LOCATE  
LINE - ENTEX WILL WORK UNDER CONTRACTORS  
TEXTOT PERMIT WHEN LOCATING LINE. CALL  
CELESTE WELLWATER AT 654-5161 72 HOURS PRIOR  
TO COMMENCING CONSTRUCTION.  
2. NOTIFY HPL REPRESENTATIVE 48 HOURS PRIOR TO ANY  
WORK (EXCAVATION OR HEAVY EQUIPMENT OPERATION)  
AT OR NEAR THE PIPELINE. PHONE JOE ED JONES AT  
(713) 853-6875 - OFFICE  
(713) 823-7790 - MOBILE  
(713) 938-4513 - PAGER

- LEGEND
- LT LIGHT POLE
  - SIG TRAFFIC SIGNAL
  - SGN TRAFFIC SIGN
  - PLM PIPELINE MARKER
  - TB TRAFFIC BOX
  - BC BACK OF CURB
  - C CONCRETE
  - GB GRADE BREAK
  - G GUTTER
  - NG NATURAL GROUND
  - P- POWER LINE

Rev.	Date	Description	App.

PRIVATE UTILITY LINES SHOWN  
*Robert Waterwall* 3/1/96  
 SOUTHWESTERN BELL TELEPHONE CO. 3-13-96  
 HOUSTON LIGHTING & POWER CO. 3-9-96  
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CITY OF HOUSTON  
 DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

SECTION APPROVALS

*Don Miller* 7/14/96 TRAFFIC & SIGNAL ENGINEERING  
*Tom Amos* 7/14/96 STREET, BRIDGE & ROW ENG.  
*M. Williams* 7/14/96 CONSTRUCTION

APPROVAL FOR ROW & EASEMENT WORK ONLY

OTHER DEPARTMENTS

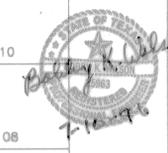
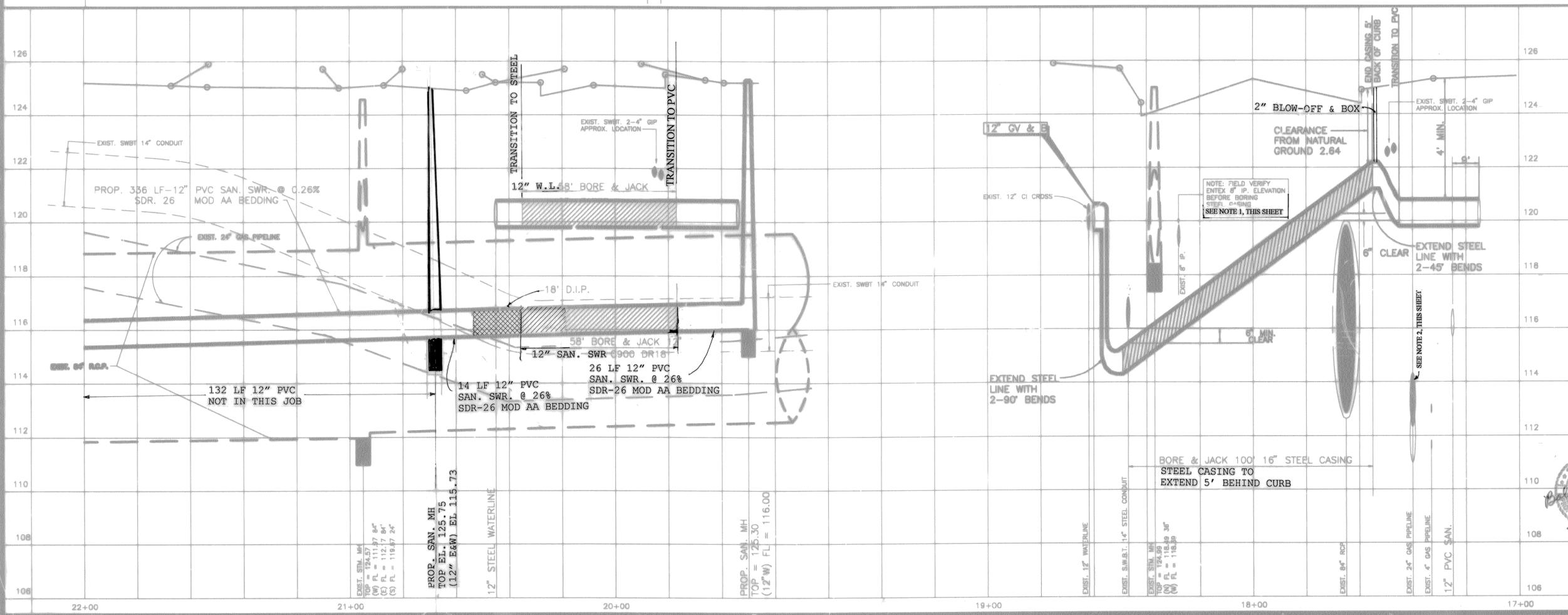
PLANNING AND DEVELOPMENT SPONSOR DEPARTMENT

*Al Chao* 7/14/96 CITY ENGINEER DATE  
*Jim Ed Jones* 7/14/96 DIRECTOR OF PUBLIC WORKS DATE

SUBMITTED: \_\_\_\_\_ DESIGNED BY: TM  
 SCALE: 1" = 20' DRAWN BY: TM  
 DATE: 12/18/95 SHEET NO. 4 OF 9 SHEETS  
 SURVEY BY: \_\_\_\_\_ CITY  
 JOB NO: 9100-U DKS. NO. PROJ1.DWG

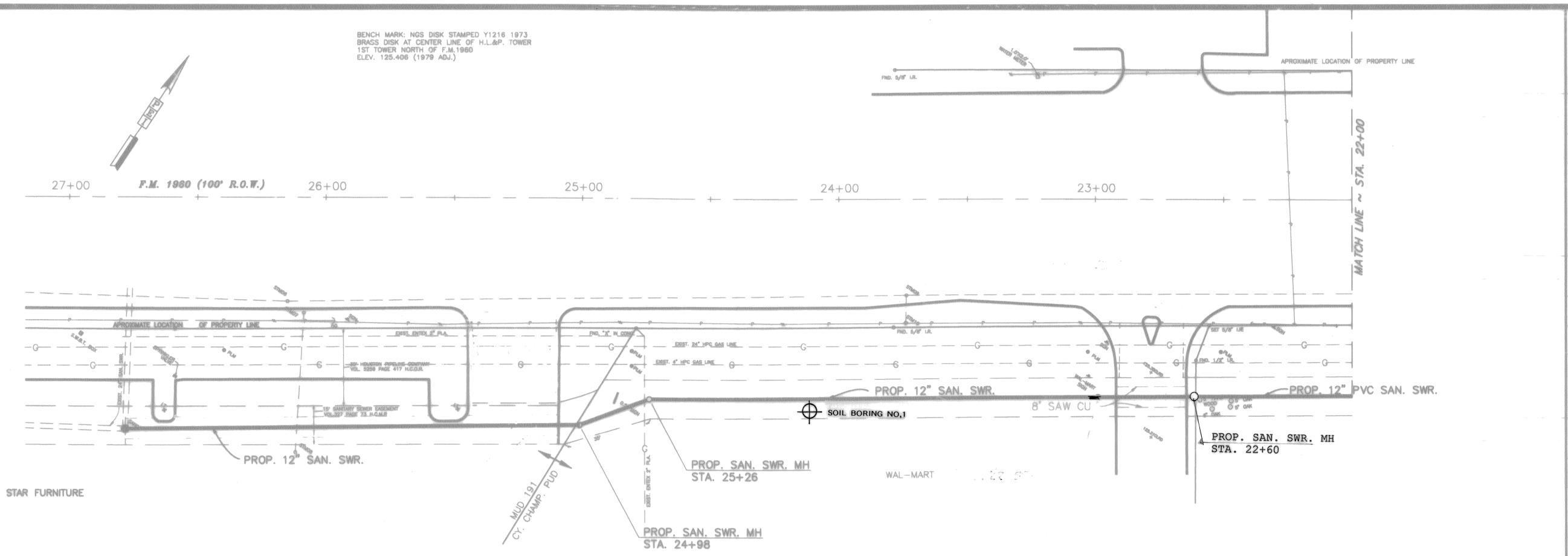
M.U.D. 191  
 UTILITY EXTENSION TO CHEVRON  
 PLAN & PROFILE

PROVIDENT ENGINEERS, INC.  
 12200 N.W. FRWY, Suite 210  
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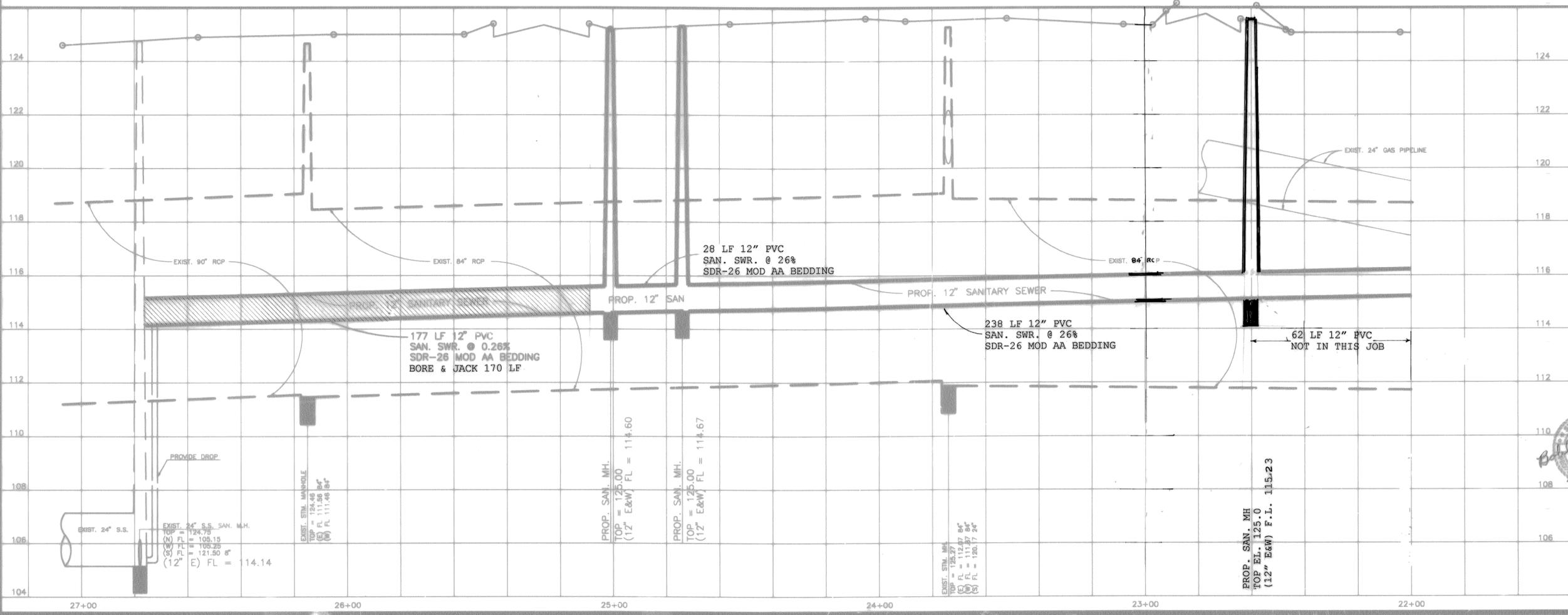


BENCH MARK: NGS DISK STAMPED Y1216 1973  
BRASS DISK AT CENTER LINE OF H.L.&P. TOWER  
1ST TOWER NORTH OF F.M.1960  
ELEV. 125.406 (1979 ADJ.)

BENCH MARK: NGS DISK STAMPED Y1216 1973  
BRASS DISK AT CENTER LINE OF H.L.&P. TOWER  
1ST TOWER NORTH OF F.M.1960  
ELEV. 125.406 (1979 ADJ.)



FM 1960



- LEGEND**
- LT LIGHT POLE
  - SIG TRAFFIC SIGNAL
  - SGN TRAFFIC SIGN
  - PLM PIPELINE MARKER
  - TB TRAFFIC BOX
  - BC BACK OF CURB
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  - GB GRADE BREAK
  - G GUTTER
  - NG NATURAL GROUND
  - P- POWER LINE

Rev.	Date	Description	App.
1			
2			
3			

**PRIVATE UTILITY LINES SHOWN**  
*Celeste A. Balthasar* 3/2/96  
 INDEX NO. *B-11* 8-13-96  
 SOUTHWESTERN BELL TELEPHONE CO.  
 Valid for One Year Only  
*Shane Rob* 3-9-96  
 HOUSTON LIGHTING & POWER CO.  
 Approval Only for Creating Underground  
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 ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

**SECTION APPROVALS**

<i>Kevin...</i> 7/12/96 TRAFFIC & SIGNAL ENGINEERING	TRAFFIC & SIGNAL ENGINEERING
<i>Jim...</i> 7/11/96 WASTEWATER ENGINEERING	STREET, BRIDGE & ROW ENG.
<i>M....</i> 7/11/96 STORM SEWER ENGINEERING	CONSTRUCTION

**OTHER DEPARTMENTS**

PLANNING AND DEVELOPMENT	SPONSOR DEPARTMENT
<i>Al...</i> 7/12/96 CITY ENGINEER	DATE
<i>Jim...</i> 7/12/96 DIRECTOR OF PUBLIC WORKS	DATE

SUBMITTED: \_\_\_\_\_ DESIGNED BY: TM  
 SCALE: 1" = 20' DRAWN BY: TM  
 DATE: 12/16/95 SHEET NO. 5 OF 9 SHEETS  
 SURVEY BY: \_\_\_\_\_ CITY: \_\_\_\_\_ PROJ. NO.: \_\_\_\_\_  
 JOB NO.: 8100-U Dwg. No.: \_\_\_\_\_

**M.U.D. 191**  
**UTILITY EXTENSION TO CHEVRON**  
**PLAN & PROFILE**

**PEI** PROVIDENT ENGINEERS, INC.  
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BENCH MARK: NGS DISK STAMPED Y1216 1973  
 BRASS DISK AT CENTER LINE OF H.L.&P. TOWER  
 1ST TOWER NORTH OF F.M. 1880  
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- LEGEND**
- Exst. Contours
  - Exst. Storm Sewer Line & Manhole
  - Exst. Inlet
  - PROP. STORM SEWER LINE & MANHOLE
  - PROP. INLET
  - DRAINAGE AREA D-VIDE
  - 1.81 AREA AT INLET IN ACRES
  - 18.81 AREA CONTRIBUTION TO LINE IN ACRES
  - STABILIZED CONSTRUCTION EXIT w/ CONC. TRUCK WASHOUT SITE
  - INLET PROTECTION LOCATION

- LEGEND**
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*Ken Adams* 7-11-96 WASTEWATER ENGINEERING

*M. Leamm* 7-11-96 STORM SEWER ENGINEERING

APPROVAL FOR ROW & EASEMENT WORK ONLY

OTHER DEPARTMENTS

PLANNING AND DEVELOPMENT SPONSOR DEPARTMENT

*Alto Chao* 7/12/96 CITY ENGINEER DATE

*J. J. ...* 7/12/96 DIRECTOR OF PUBLIC WORKS AND ENGINEERING

SUBMITTED: \_\_\_\_\_ DESIGNED BY: TM

SCALE: 1"=50' DRAWN BY: TM

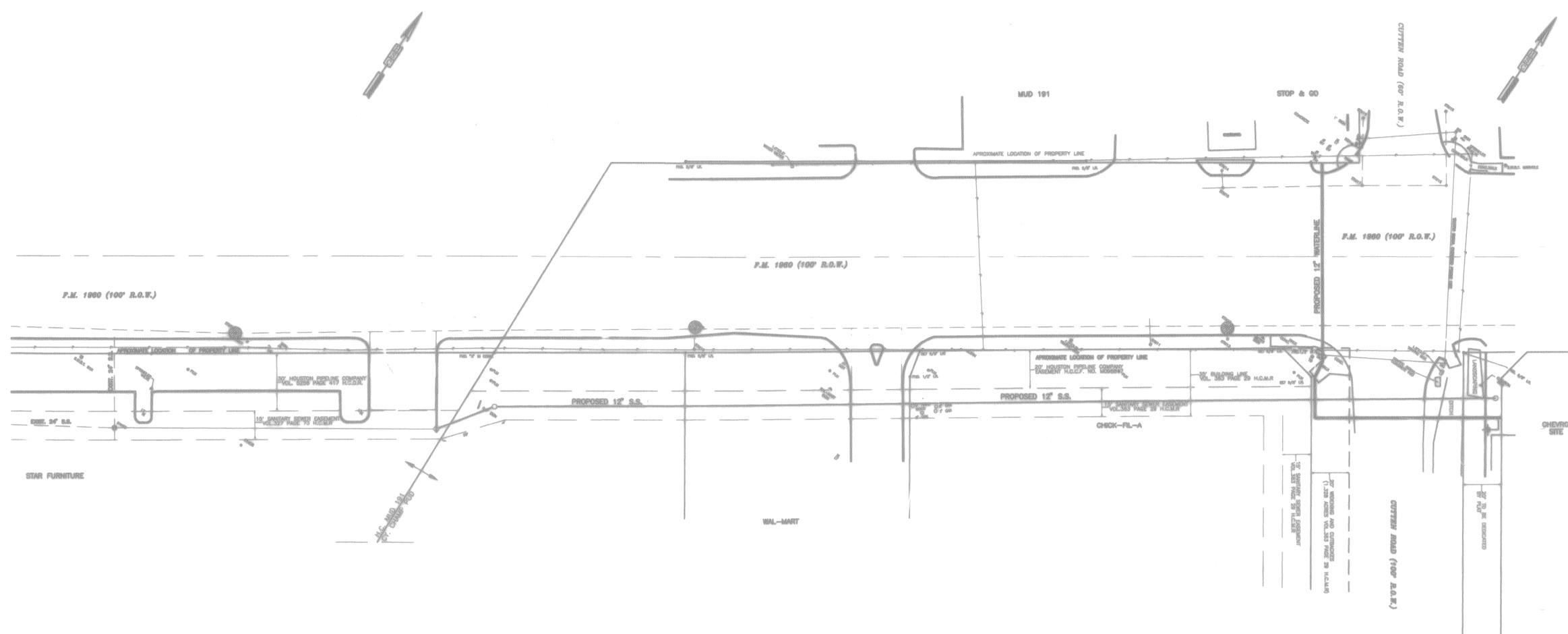
DATE: 12/18/95 SHEET NO. 6 OF 9 SHEETS

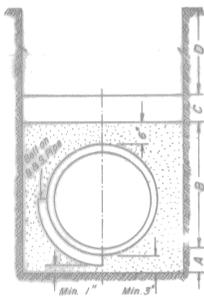
SURVEY BY: \_\_\_\_\_ CITY

JOB NO: 8100-U Dwg. No. POLLUTE.DWG

M.U.D. 191  
 UTILITY EXTENSION TO CHEVRON  
 POLLUTION CONTROL  
 OVERALL LAYOUT

**PEI** PROVIDENT ENGINEERS, INC.  
 12200 N.W. FRWY, Suite 210  
 Houston, Texas 77082

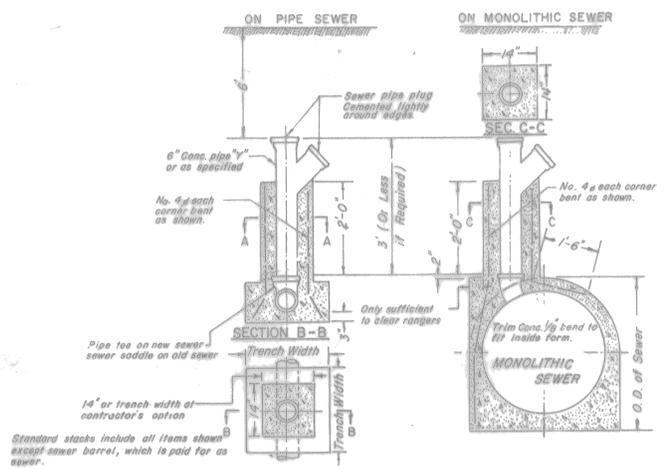




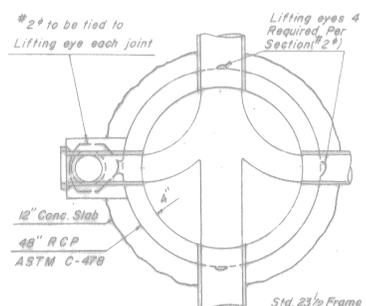
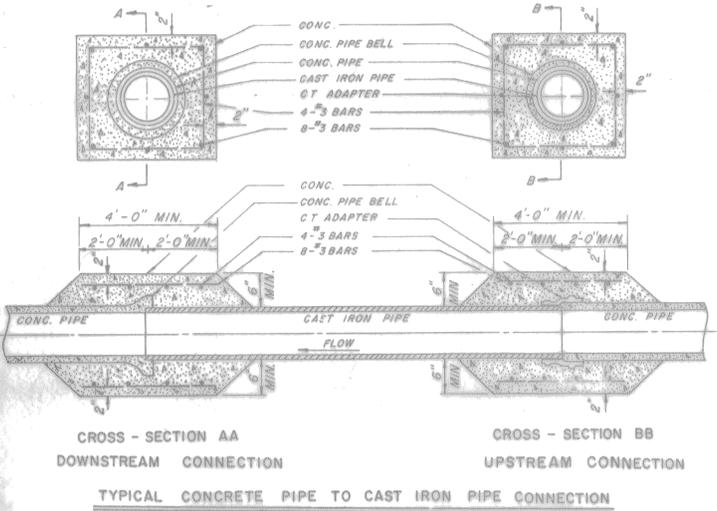
**CLASS AA**

1'-Cement Stabilized Sand Placed Before Pipe is Laid up to Flow Line of Pipe or Above - Minimum Depth 6"  
 2'-Cement Stabilized Sand, Thoroughly Riddled, Placed After Pipe is Laid.  
 3'-Earth Fill Placed Same Day as Pipe is Laid.  
 4'-Earth Fill Placed next day (or later) After Pipe is Laid.

**BEDDINGS FOR PIPE SEWERS**

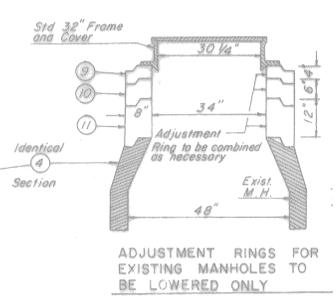
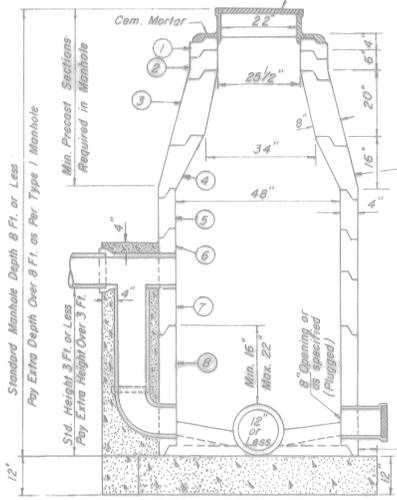


**STANDARD CITY OF HOUSTON SANITARY SEWER STACKS**



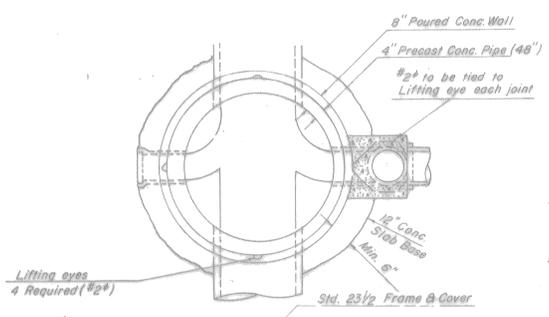
**STD. PRECAST CONC. SECTIONS**

NO.	L	W	H	D	DESCRIPTION
1	4'	8"	8"	25 1/2"	REINF. CONC. RING
2	6'	8"	8"	25 1/2"	" " "
3	20'	8"	8"	25 1/2"	" " TAPER
4	16'	8"	4"	34"	" " PIPE
5	8'	4"	4"	48"	" " "
6	12'	4"	4"	48"	" " "
7	24'	4"	4"	48"	" " "
8	36'	4"	4"	48"	" " "
9	4'	8"	8"	34"	ADJUSTM. RING
10	6'	8"	8"	34"	" " "
11	12'	8"	8"	34"	" " "

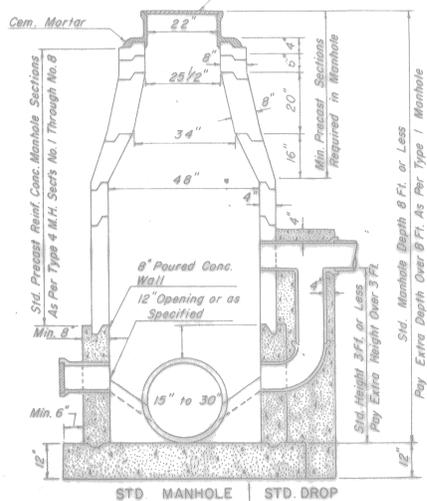


- Notes:**
- All Precast Sections to be ASTM C-478
  - Lifting eyes #2 to be set off ground as shown in above detail (4 Required per Section) and shall be used to tie Std. Drop to Manhole.
  - Joints shall be sealed with "RAM-NEK" or approved equal.
  - No Steps Required in Manhole
  - Depth of Manhole determines Sections Required.

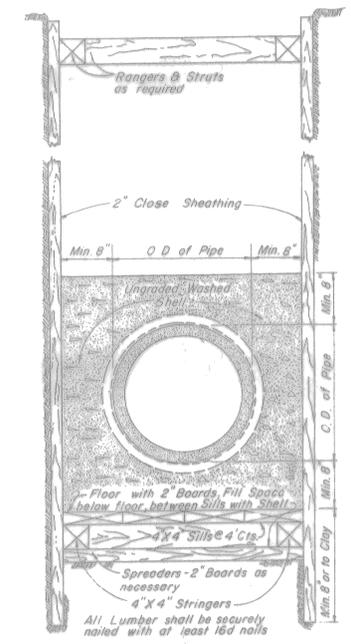
**SANITARY SEWER MANHOLE TYPE 4 FOR 6" TO 12" SEWERS**



- Notes:**
- See Manhole Type 4 For Standard Precast Concrete Sections, Details and Schedule of Dimensions
  - No Manhole Steps Required.
  - Lifting eyes #2 shall be used to tie Standard Drop to Manhole
  - Joints shall be sealed with "RAM-NEK" or Approved equal
  - Depth of Manhole Determines Sections Required

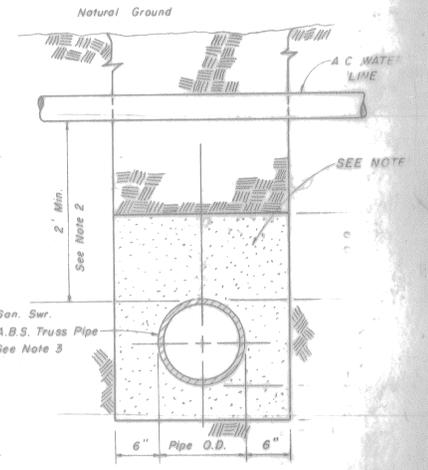


**SANITARY SEWER MANHOLE TYPE 5 FOR 15" TO 30" SEWERS**



**Note:**  
 Necessary for use of this Section will be determined by the Engineer as the Construction Progresses, and the details hereof may be modified by him to suit conditions encountered.  
 Ungraded washed shell dimensions shown here are typical but are to be varied as ordered by the Engineer.  
 Wall points shall be installed and trench pumped dry prior to excavation and kept dry during construction and until at least 3' of earth backfill has been placed.

**SPECIAL SECTION No. 5**

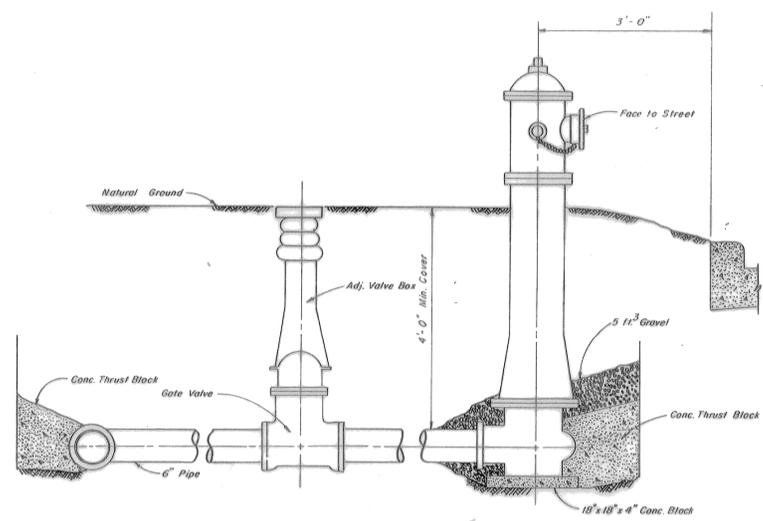


- NOTES**
- 18 L.F. of cement stabilized sand (2 or more bags of cement per cubic yard of sand), centered on the water line.
  - When depth is less than 2 feet O.D. to O.D., 18 J.T. of San. Swr. (Thk. C150, 100 p.s.i.) shall be used at all water line crossings, centered on the water line.
  - If San. Swr. is above water main, 1-18 J.T. of D.L.P. (Thk. C150, 150 p.s.i.) shall be used at all water line crossings, centered on the water line.

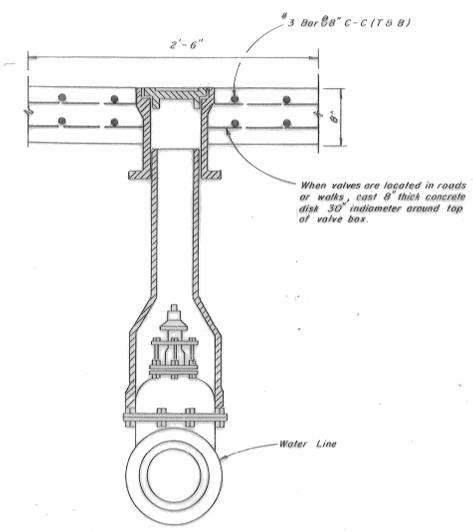
**SPECIAL BACKFILL FOR WATER LINES**

*Handwritten signature and date: 1-10-96*

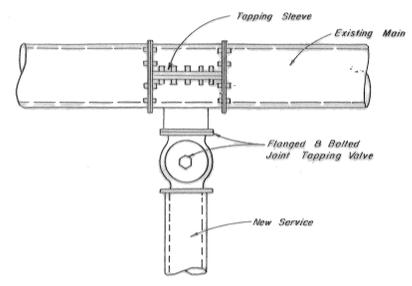
Rev.	Date	Description
		MUD 191 UTILITY EXTENSION TO CHEVRON
<b>SANITARY SEWER DETAILS</b>		
Design By:	Job No:	Sheet 7
Drawn By:	Scale:	of 9
Checked By:	Date:	
PROVIDENT ENGINEERS, INC. 11500 N.W. FRWY. Houston, Texas		



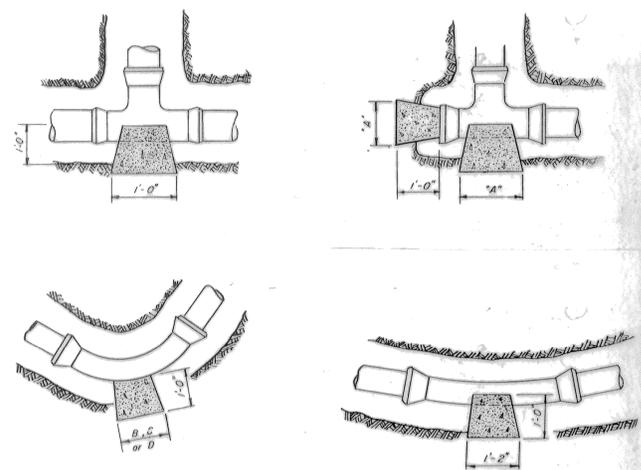
TYPICAL GATE VALVE & HYDRANT INSTALLATION



VALVE BOX DETAIL



WATER SERVICE CONNECTION

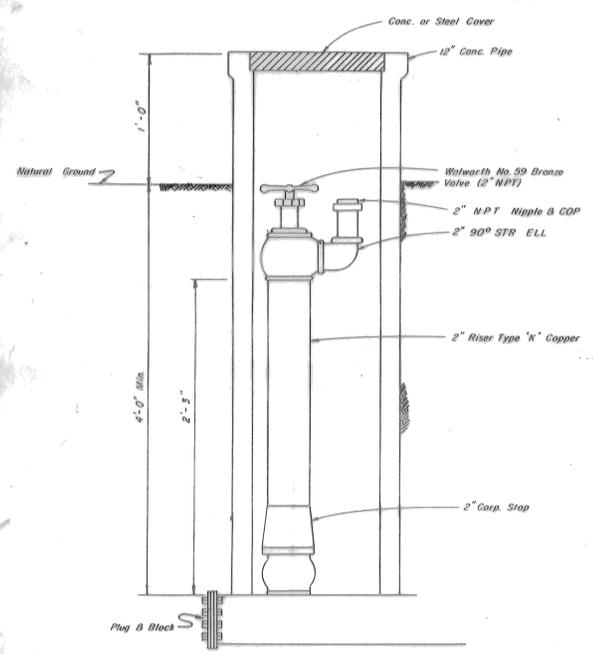


PIPE SIZE	"A" PLUGS & TEES	"B" 90° BEND	"C" 45° BEND	"D" 22 1/2° BEND
4" - 6"	1' - 0"	1' - 3"	1' - 0"	1' - 0"
8"	2' - 0"	2' - 6"	1' - 6"	1' - 0"
12"	4' - 0"	4' - 0"	2' - 6"	1' - 6"

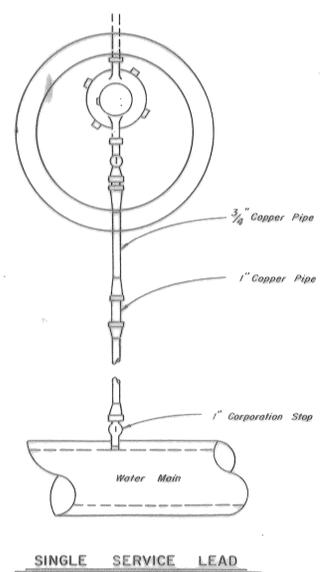
NOTE: Safe Bearing Load

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

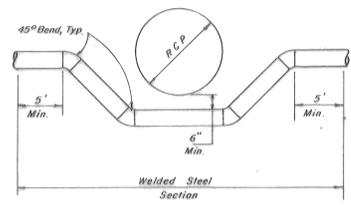
THRUST BLOCK DETAIL



2" BLOW-OFF VALVE ASSEMBLY



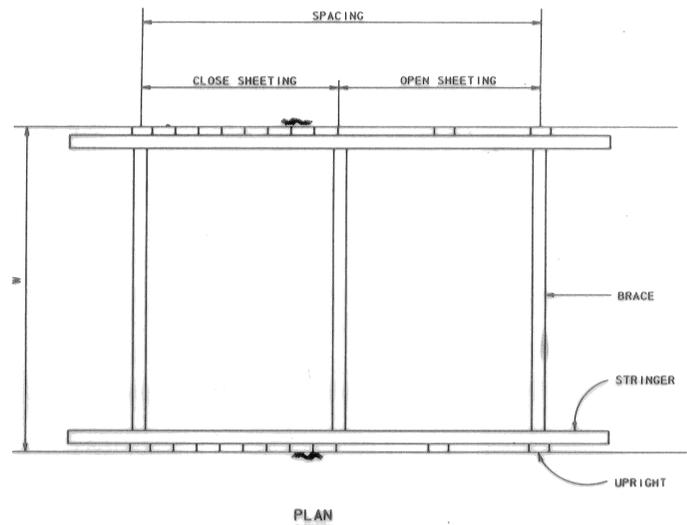
SINGLE SERVICE LEAD



WELDED STEEL SECTION



Rev.	Date	Description	App.
MUD 191 UTILITY EXTENSION TO CHEVRON			
<b>WATER DETAILS</b>			
Design By:	C. O. H.	Job No.:	Sheet <b>8</b>
Drawn By:	R. T.	Scale:	of <b>9</b>
Checked By:	D. C. L.	Date:	
<b>PROVIDENT ENGINEERS, INC.</b> 11500 N.W. FRWY, Suite 570 Houston, Texas 77032			



PLAN

**TRENCH SHORING - MINIMUM REQUIREMENTS ( @ @ )**

DEPTH OF TRENCH	KIND OR CONDITION OF EARTH	SIZE AND SPACING OF MEMBERS										
		UPRIGHTS		STRINGERS		CROSS BRACES <sup>1</sup>						
		MINIMUM DIMENSION	MAXIMUM SPACING	MINIMUM DIMENSION	MAXIMUM SPACING	WIDTH OF TRENCH				MAXIMUM SPACING		
FEET	TYPE	INCHES	FEET	INCHES	FEET	INCHES	INCHES	INCHES	INCHES	INCHES	FEET	FEET
5 TO 10	(A) HARD, COMPACT.....	3x4 OR 2x6	6	4x6	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	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

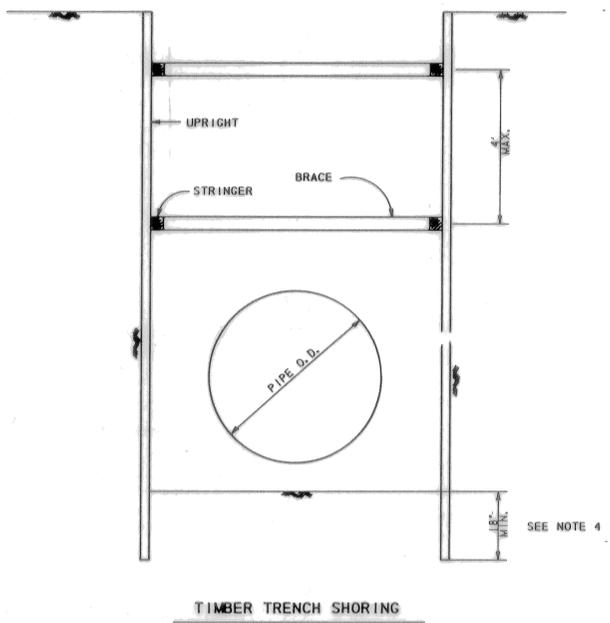
<sup>1</sup> TRENCH JACKS MAY BE USED IN LIEU OF, OR IN COMBINATION WITH, CROSS BRACES. SHORING IS NOT REQUIRED IN SOLID ROCK, HARD SHALE, OR HARD SLAG. WHERE DESIRABLE, STEEL SHEET PILING AND BRACING OF EQUAL STRENGTH MAY BE SUBSTITUTED FOR WOOD.

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

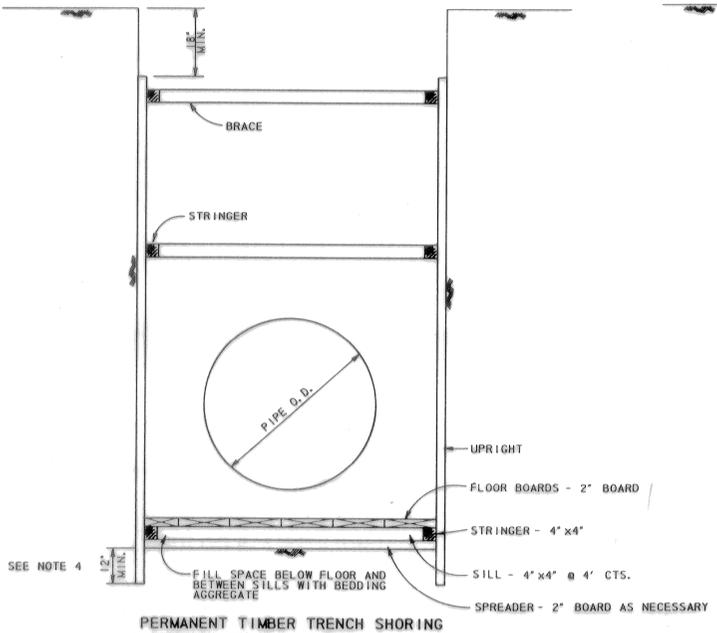
2. SIZE OF TIMBER MEMBERS ARE ROUGH CUT DIMENSIONS (FULL SIZE)

**GENERAL NOTES**

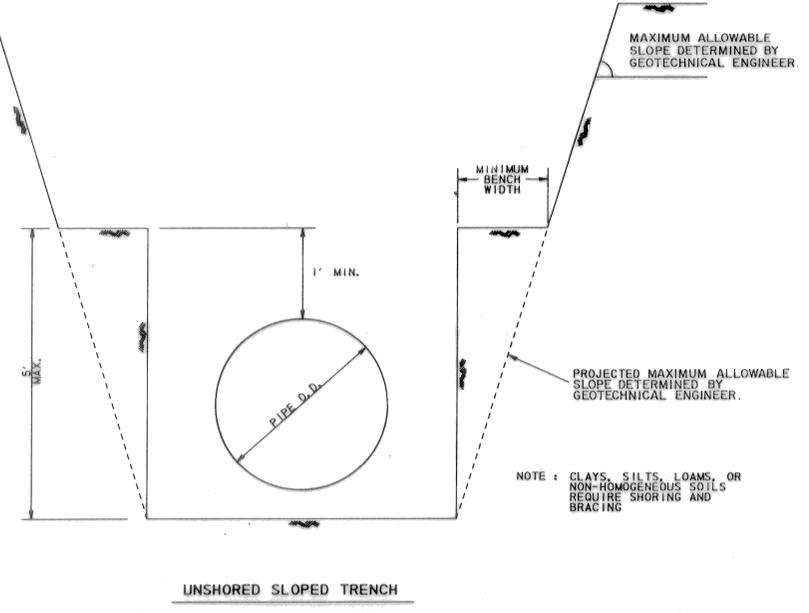
- TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATIONS PART 1926, SUBPART P.
- THE CONTRACTOR MAY ELECT TO USE AN ALTERNATE SYSTEM TO THE TIMBER TRENCH SHORING SHOWN IN THE TABLE. THE ALTERNATE SYSTEM, BE IT A TRENCH BOX, STEEL SHEET PILING, TRENCH JACKS OR A COMBINATION OF THE ABOVE, MUST BE CERTIFIED BY THE CONTRACTOR'S REGISTERED PROFESSIONAL ENGINEER THAT IT PROVIDES EQUAL OR GREATER PROTECTION THAN THE TIMBER TRENCH SHORING SHOWN ON THIS DETAIL SHEET.
- CONTRACTOR SHALL PERFORM DAILY TRENCH SAFETY SYSTEM INSPECTIONS TO INSURE THAT THE SYSTEM MEETS OSHA REQUIREMENTS AND IS APPROPRIATE FOR SPECIFIC SITE CONDITIONS OF THE OPEN TRENCH. INSPECTIONS ARE REQUIRED AFTER RAINSTORMS OR ANY CHANGE IN CONDITIONS THAT MAY INCREASE THE POSSIBILITY OF A CAVE-IN OR SLIDE.
- IN THE EVENT THAT TRENCH UPRIGHTS CAN NOT BE PLACED BELOW TRENCH BOTTOM AS SHOWN ON DETAIL, CONTRACTOR MUST PROVIDE ENGINEER WITH PLANS THAT DEMONSTRATE THAT THE UPRIGHTS WILL BE BRACED AND MAINTAINED IN A VERTICAL POSITION.
- WHERE THE TRENCH SAFETY SYSTEM CROSSES A UTILITY, THE UTILITY LINE MUST BE ADEQUATELY SUPPORTED TO PREVENT ANY DAMAGE. IN 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.



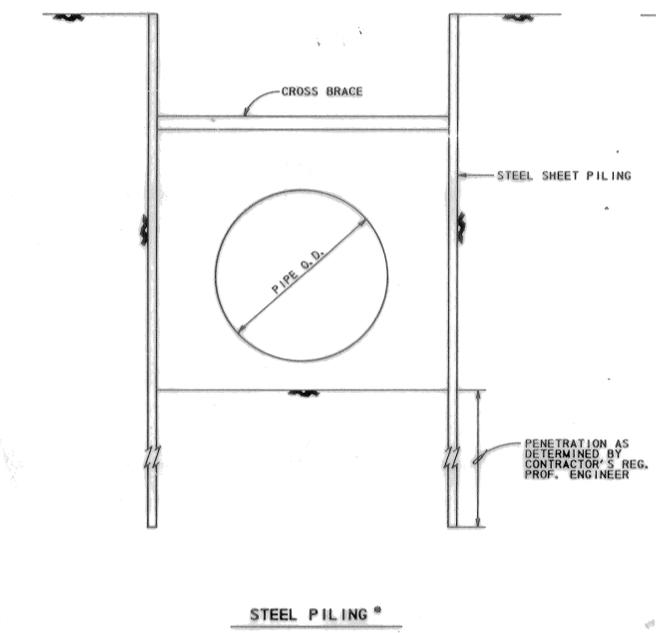
TIMBER TRENCH SHORING



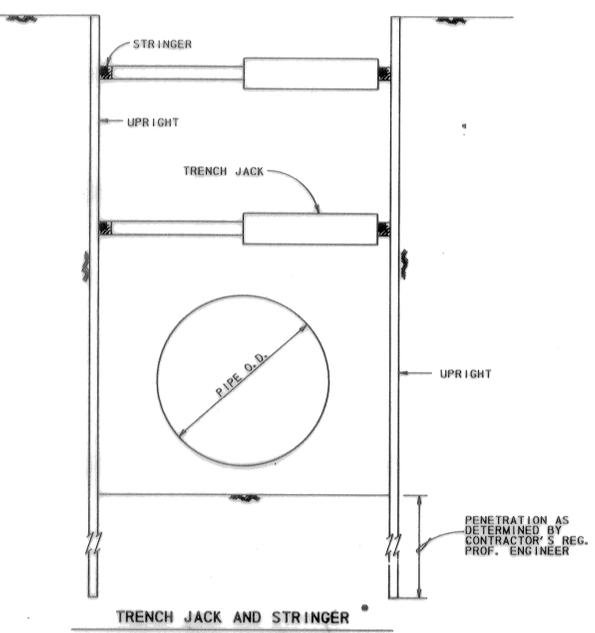
PERMANENT TIMBER TRENCH SHORING



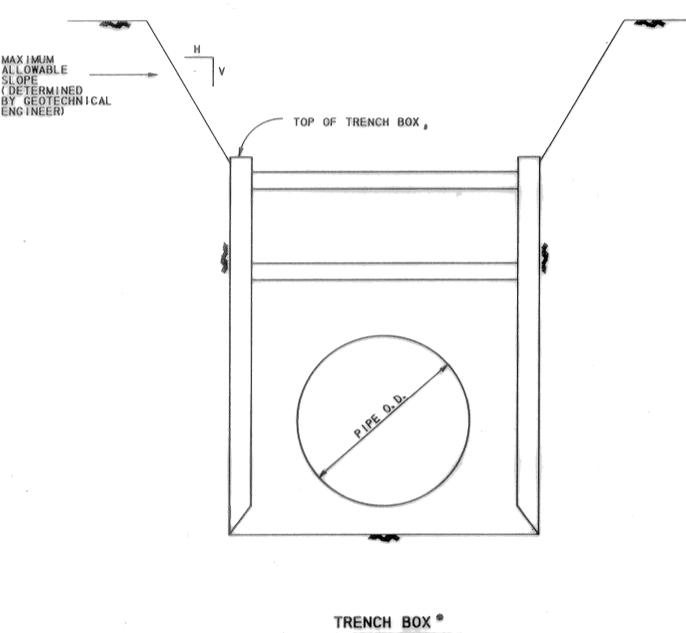
UNSHORED SLOPED TRENCH



STEEL PILING



TRENCH JACK AND STRINGER



TRENCH BOX

Rev.	Date	Description	App.
MUD 191 UTILITY EXTENSION TO CHEVRON			
<b>TRENCH SAFETY SYSTEM</b>			
Design By:	Job No.:	Sheet <b>9</b>	
Drawn By:	Scale: 1" = 50'	of <b>9</b>	
Checked By:	Date:		
<b>PEI</b> PROVIDENT ENGINEERS, INC.		PROVIDENT ENGINEERS, INC. 11500 N.W. FRWY, Suite 570 Houston, Texas 77092	

ALTERNATE SYSTEM