CONSTRUCTION PLANS
FOR
LAKEWOOD
ON LAKE CONROE

PAVING, STORM SEWER
AND WATER DISTRIBUTION

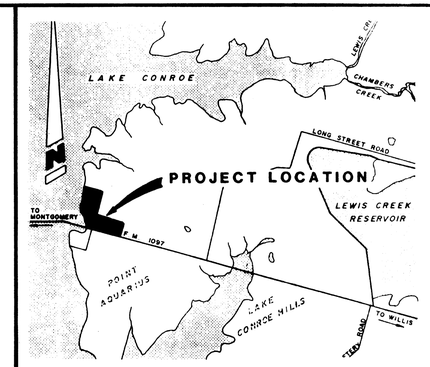
MONTGOMERY COUNTY
TEXAS

OWNER:

64 LAKE CONROE REAL ESTATE
A JOINT VENTURE
P.O. BOX 525
WILLIS, TEXAS 77378

PLANS PREPARED
BY

D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947



VICINITY MAP
N.T.S. KEY MAP PAGE No. 125C

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APPROVED
2/11/87
APPROVED
MONTGOMERY COUNTY ENGINEER

LAKEWOOD
ON LAKE CONROE

COVER SHEET

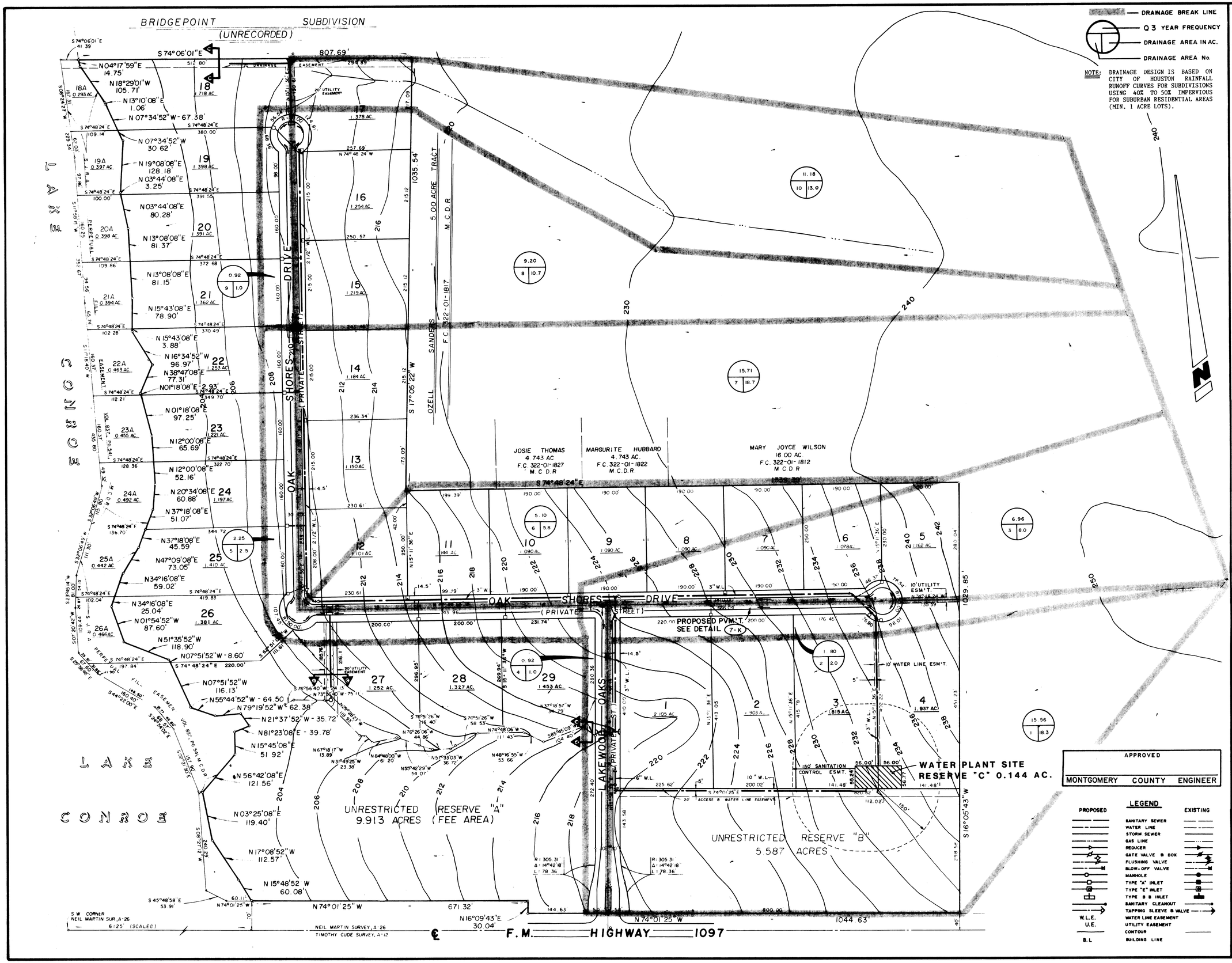
D.A. VOGT ENGINEERING
1544 Sawdust Road Suite 180 The Woodlands, Texas 77380
(713) 367-0947

DATE JAN., 1987	
DRAWN BY S. F. S.	CHECKED BY D. J. M.
SCALE NONE	JOB NO. 136-01
SHEET 1 OF 8	

#1604

FEB 03 1987

D.A.V. # 136-01-01



CONSTRUCTION NOTES

01. The Contractor shall give the Owner at least two (2) working days notice for construction staking.

02. The location of existing utilities shown on these Plans are based on the best information available. The Owner, the City of Conroe, Montgomery County, and the Engineer assumes no responsibilities for the accuracy of the information shown, or for the inadvertent omission of any such information. The Contractor shall verify all utility locations. 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.

03. All work shall be completed in accordance to the Plans, Texas Department of Health's Rules and Regulations for Public Water Systems, and shall be completed to the satisfaction of the Owner, the Engineer, and any agencies having jurisdiction.

04. The Contractor shall notify Ed Eharbat, Inspector for the City of Conroe, at (409) 539-4431, and J. D. Blanton, Inspector for the County of Montgomery, at (409) 539-7833, at least forty-eight (48) hours prior to construction.

05. All areas disturbed shall be properly backfilled, compacted and regraded.

06. The Contractor shall be responsible for protecting, maintaining and restoring, at his expense, any existing utilities disturbed as a result of his work.

07. Construction in wet sand or unstable soils shall be accomplished utilizing Special Section No. 4, as per Detail S-E.

08. Traffic Control shall comply with the Texas Manual of Uniform Traffic control Devices.

09. The contractor shall remove and stockpile sufficient topsoil to replace over backfilled areas.

10. Backfill around and outside of structures shall be deposited in layers not to exceed eight (8") inches in uncompacted thickness and mechanically compacted, using platform type tampers, to at least ninety-five (95%) percent of maximum density at optimum moisture content as determined by ASTM D698. Compaction of structure backfill by rolling will be permitted provided the desired compaction is obtained and damage to the structure is prevented. Compaction of structure backfill by inundation with water will not be permitted. Materials for structure backfill shall be composed of earth only and shall contain no wood, grass, roots, broken concrete, stones, trash or debris of any kind, with a P.I. of 8-20 (subject to approval by the Engineer). No tamped, rolled or otherwise mechanically compacted backfill shall be deposited or compacted in water. All backfill materials shall consist of loose, damp (not wet) earth having a moisture content such that maximum density of the compacted soil will be obtained. Moisture content shall be distributed uniformly and water for correction of moisture content shall be added sufficiently in advance that proper moisture distribution and compaction will be obtained. Particular care shall be taken to compact structure backfill which will be beneath pipes, drives, roads, parking areas, walks, curbs, gutters or other surface construction or structures. Compacted areas, in each case, shall be adequate to support the item to be constructed or placed thereon.

11. All designated disposal areas shown on the Plans or marked on the ground by the Engineer, shall be stripped to a depth of three (3") inches to remove weeds, roots, trees, brush and other unsuitable materials. Stripped materials shall be stockpiled to be disposed of later by the Contractor as designated by the Engineer. All designated disposal areas shall be scarified or plowed to a depth of not less than four (4") inches before placement of the first lift. Excavated material shall be placed in uniform lifts not exceeding eight (8") inches of loose material and shall be compacted. Each structural fill lift shall be compacted to ninety-five (95%) percent standard proctor maximum dry density (ASTM-698) at a moisture content with two (2%) percent of optimum. Material for structural backfill should be composed of earth only, with a P.I. of eight (8) to twenty (20), subject to approval by the Engineer, and shall contain no wood, grass, roots, concrete, stones, or debris of any kind. Upon completion of placing compacted fill in the designated disposal areas, the fill areas shall be crowned slightly to shed rainfall.

12. Rim elevations, if shown on the Plans, are approximate only. Utility Contractor shall adjust rim elevations after final completion of Project, at no separate pay. Slope the fill for storm water drainage away from the Manhole rim. All Manholes falling within pavement area shall be adjusted to finished grade by the Paving Contractor, with no separate pay.

13. All Storm Sewer Pipes shall be reinforced concrete pipe ASTM C76 Class III including inlet leads crossing under existing or proposed pavements.

14. All Storm Sewers under or within one (1') foot of proposed or future pavements shall be backfilled with 1 1/2" - rock cement stabilized sand, to within one (1') foot of subgrade.

15. All Storm Sewer Manholes shall be City of Houston Type "B", unless otherwise noted. Rack over Manhole to match proposed curb if conflict exists (maximum back of one (1") inch per course of brick).

16. All returns have twenty-five (25") foot radius at back of curb, unless otherwise noted.

17. When the top of curb elevation or bottom of pavement slab is above natural ground, the Paving Contractor shall backfill from natural ground to top of curb in layers not exceeding eight (8") inches in depth and each layer compacted to not less than ninety-five (95%) percent standard proctor density and shall fill from top of curb to front building line.

18. All outfalls shall be properly backfilled and compacted and all disturbed areas shall be regraded.

19. The Contractor shall backfill to within two (2") inches of top of pavement or top of curb, within twenty-four (24) hours after removing the forms.

20. All concrete shall have a seven (7) day beam strength of 500 psi, and twenty-eight (28) day compressive strength of 3,000 psi, with maximum aggregate size of 1 1/2", and shall be properly reinforced.

21. Blo-out shall be provided for drainage structures in paving areas to allow final adjustments. Paving of blo-out areas after adjustments, shall be performed under this Contract.

22. Any paving over a subgrade having a P.I. value greater than fifteen (15), shall have six (6") inches of lime stabilized, and not less than five (5%) percent lime content, or as recommended by the soils testing laboratory.

23. All streets shall be constructed according to Details 7H and 7K.

24. Water lines will be C-900 P.V.C. for ten (10") inch, Schedule 40 P.V.C. for three (3") inch and two and one-half (2 1/2") inch.

LAKEWOOD
ON LAKE CONROE

OVERALL PAVING AND DRAINAGE AND WATER SHEET

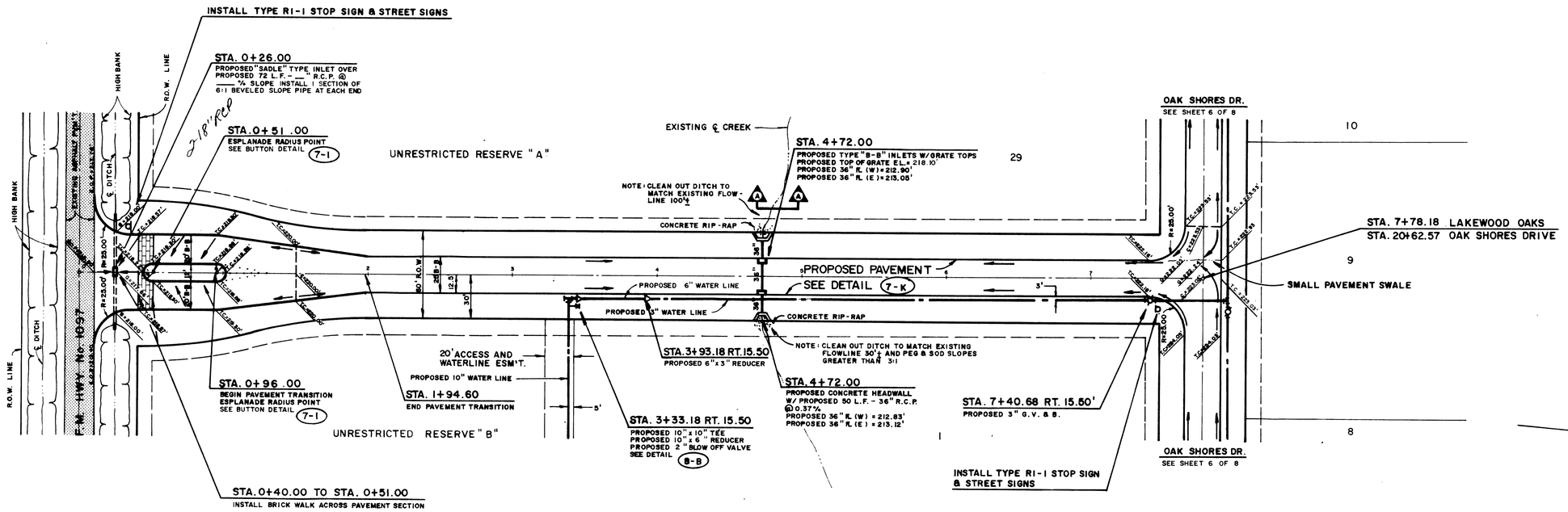
D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

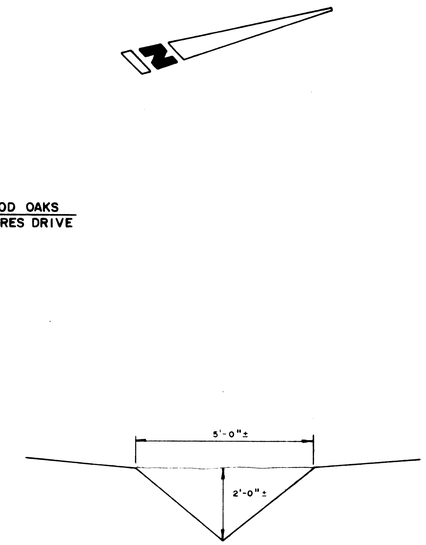
DATE	JAN., 1987
DRAWN BY S.F.S.	CHECKED BY D.J.M.
SCALE 1" = 100'	JOB NO. 136-01
SHEET 2 OF 8	

4/2/87

FEB 03 1987

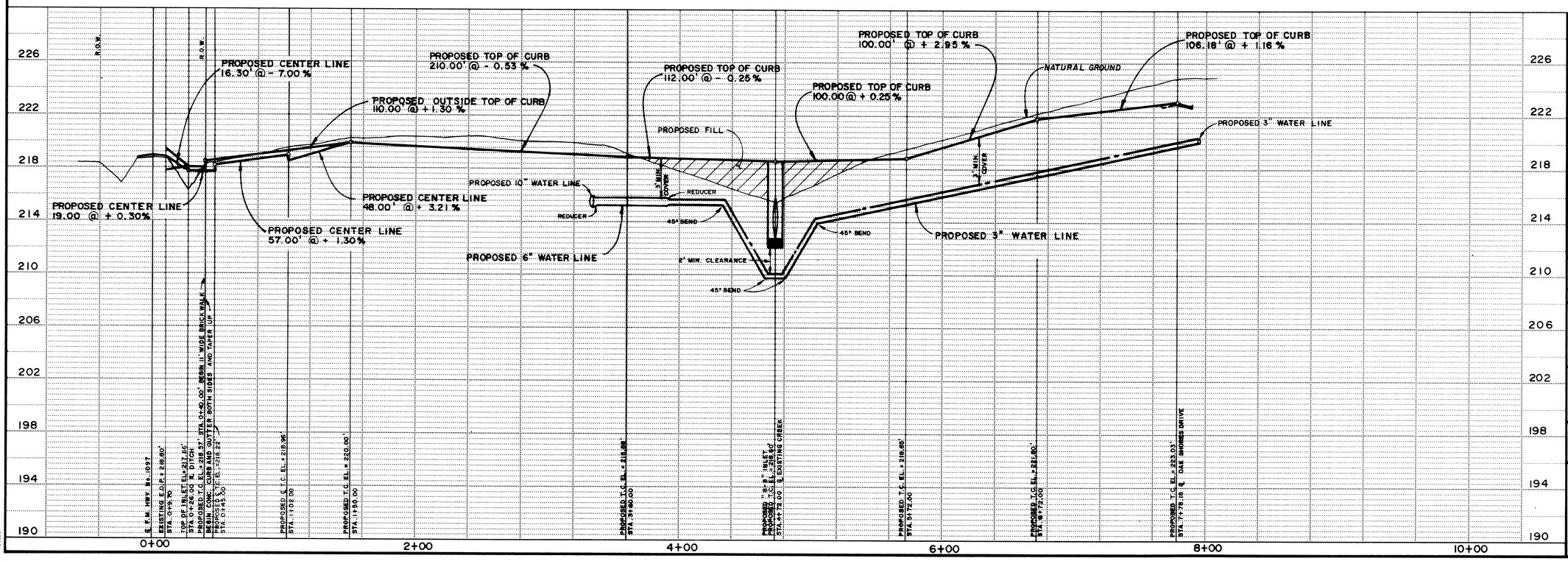
D.A.V.# 136-01-02





SECTION "A-A"
N.T.S.

LAKEWOOD OAKS



BENCH MARK

Lake Conroe Water Surface Elevation, 1957 Adjustment, call the San Jacinto River Authority at (409) 588-1111.

T.B.M. 136-01 A — P.K. Nail set at a 40 Foot Offset on F.M. 1097, at the intersection of Lakewood Oaks. Station 0+00 Lakewood Oaks. Elevation 218.86

T.B.M. 136-01 B — 60D Nail set in a 6 Inch Pine Tree in the North R.O.W. of Oak Shores Drive at the intersection of Lakewood Oaks. Station 20+63 Oak Shores Drive. Elevation 226.14

T.B.M. 136-01 C — 60D Nail set in a 12 Inch Pine Tree on the East side of the Easterly most cul-de-sac of Oak Shores Drive. Station 27+29 Oak Shores Drive. Elevation 240.39

T.B.M. 136-01 D — 60D Nail Set in a 24 Inch Water Oak Tree on the South side of the South westerly most cul-de-sac of Oak Shores Drive. Station 13+19 Oak Shores Drive. Elevation 210.04

T.B.M. 136-01 E — 60D Nail in a 14 Inch Pine Tree in the East R.O.W. of Oak Shores Drive. Station 7+04 Oakshores Drive. Elevation 211.34

T.B.M. 136-01 F — 60D Nail in a 6 Inch Pine Tree on the East side of the most Northerly cul-de-sac of Oak Shores Drive. Station 1+81 Oak Shores Drive. Elevation 212.28

APPROVED

MONTGOMERY COUNTY ENGINEER

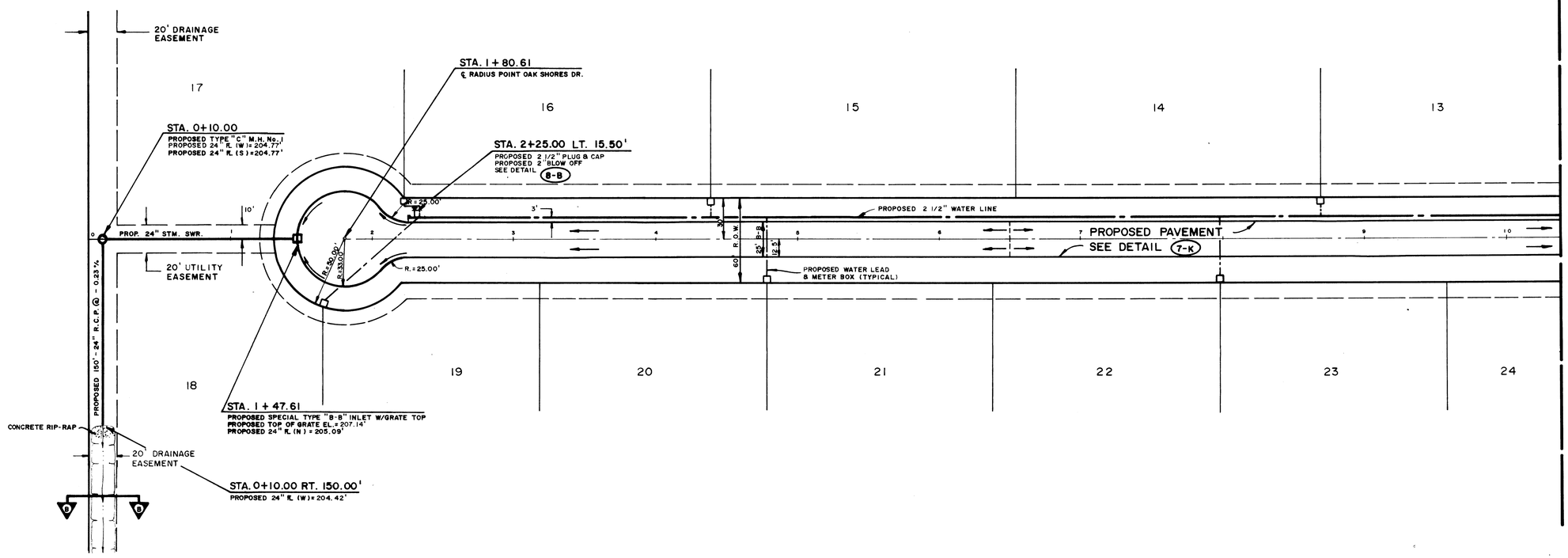
LAKEWOOD
ON LAKE CONROE

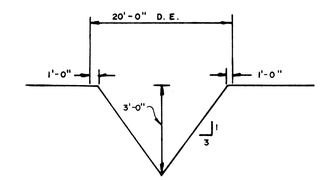
LAKEWOOD OAKS
STA. 0+00 TO STA. 7+80

D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

DATE	JAN., 1987
DRAWN BY S. F. S.	CHECKED BY D. J. M.
SCALE H.1"=40' V.1"=4'	JOB NO. 136-01
SHEET 3 OF 8	

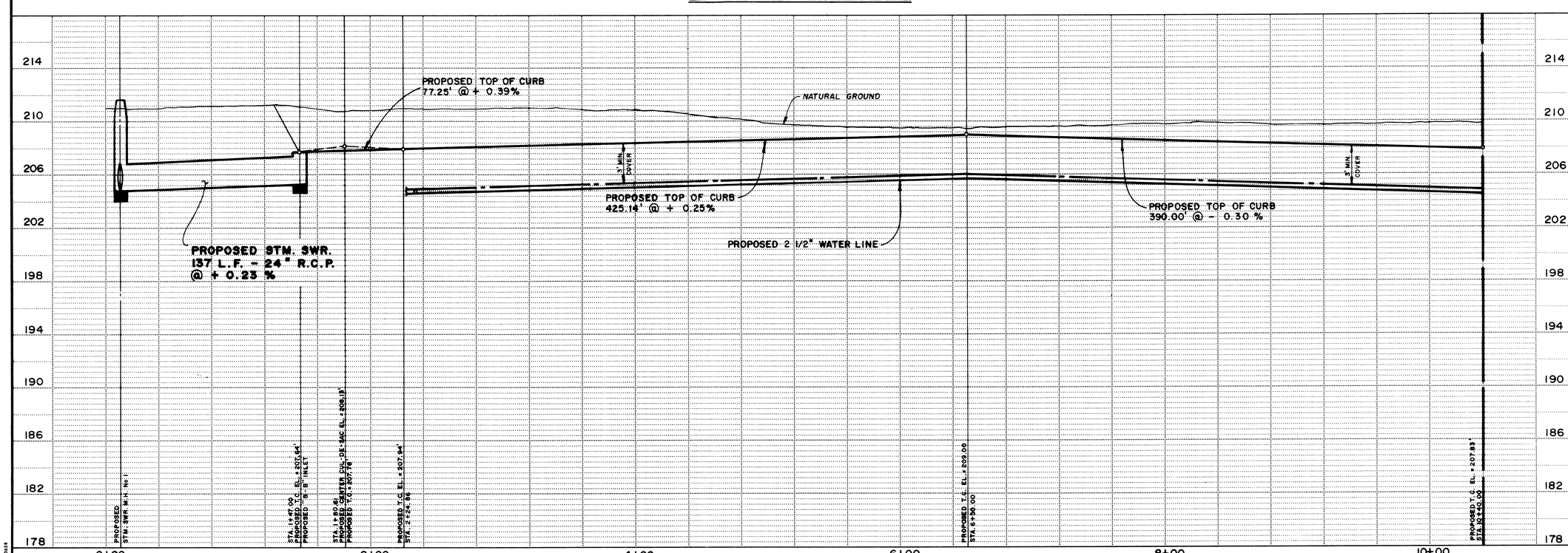
D.A.V.# 136-01-03





SECTION "B-B"
N.T.S.

OAK SHORES DRIVE



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T.B.M. 136-01 C	60D Nail set in a 12 Inch Pine Tree on the East side of the Easterly most cul-de-sac of Oak Shores Drive. Station 27+29 Oak Shores Drive. Elevation 240.39
T.B.M. 136-01 D	60D Nail Set in a 24 Inch Water Oak Tree on the South side of the South westerly most cul-de-sac of Oak Shores Drive. Station 13+19 Oak Shores Drive. Elevation 210.04
T.B.M. 136-01 E	60D Nail in a 16 Inch Pine Tree in the East R.O.W. of Oak Shores Drive. Station 7+04 Oakshores Drive. Elevation 211.34
T.B.M. 136-01 F	60D Nail in a 6 Inch Pine Tree on the East side of the most Northerly cul-de-sac of Oak Shores Drive. Station 1+81 Oak Shores Drive. Elevation 212.28

APPROVED

MONTGOMERY COUNTY ENGINEER

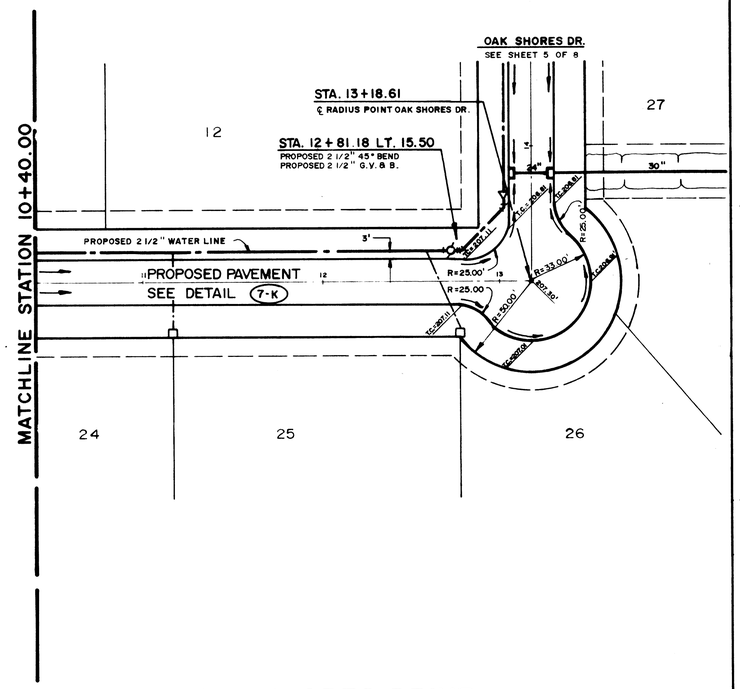
LAKEWOOD
ON LAKE CONROE

OAK SHORES DRIVE
STA. 0+00 TO STA. 10+40

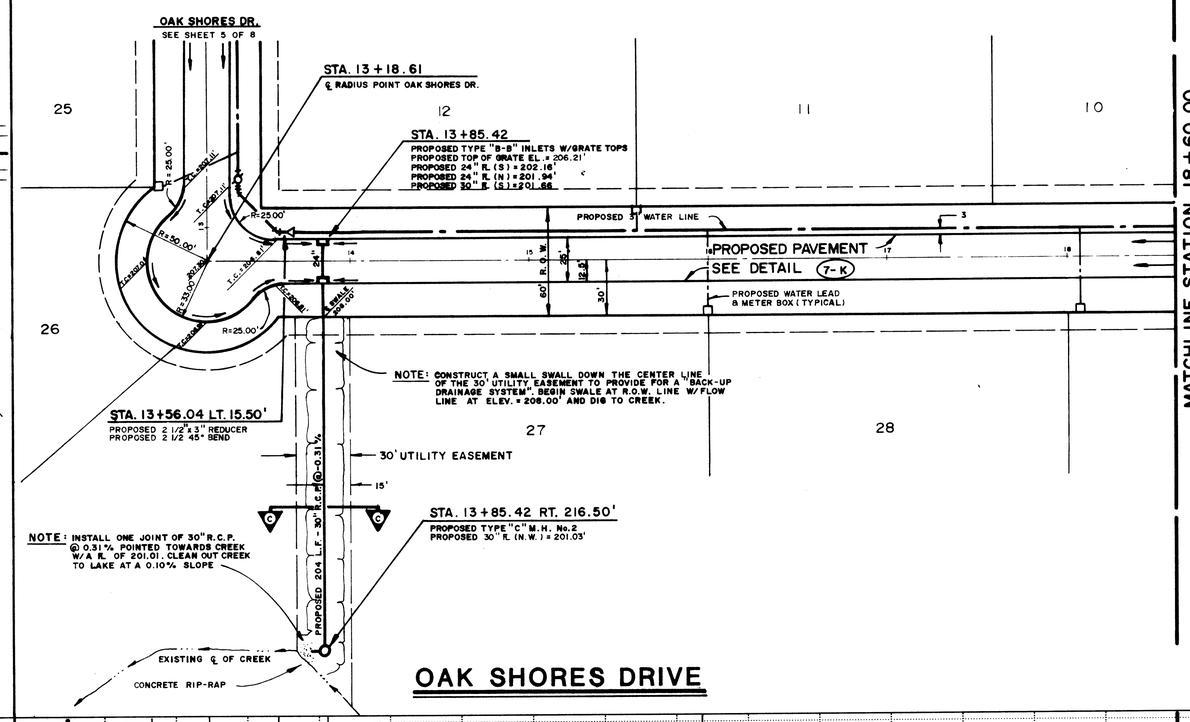
D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

DATE	JAN., 1987
DRAWN BY S.F.S.	CHECKED BY D.J.M.
SCALE H:1"=40' V:1"=4'	JOB NO. 136-01
SHEET 4 OF 8	

JUN 3 1987 D.A.V.# 136-01-04



OAK SHORES DRIVE



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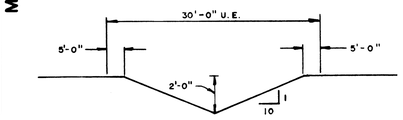
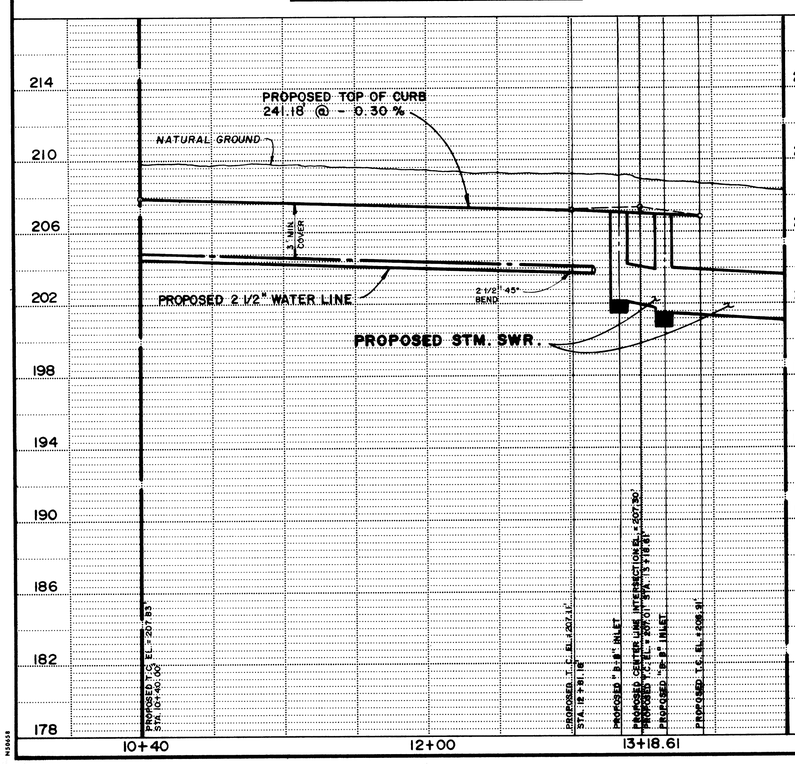
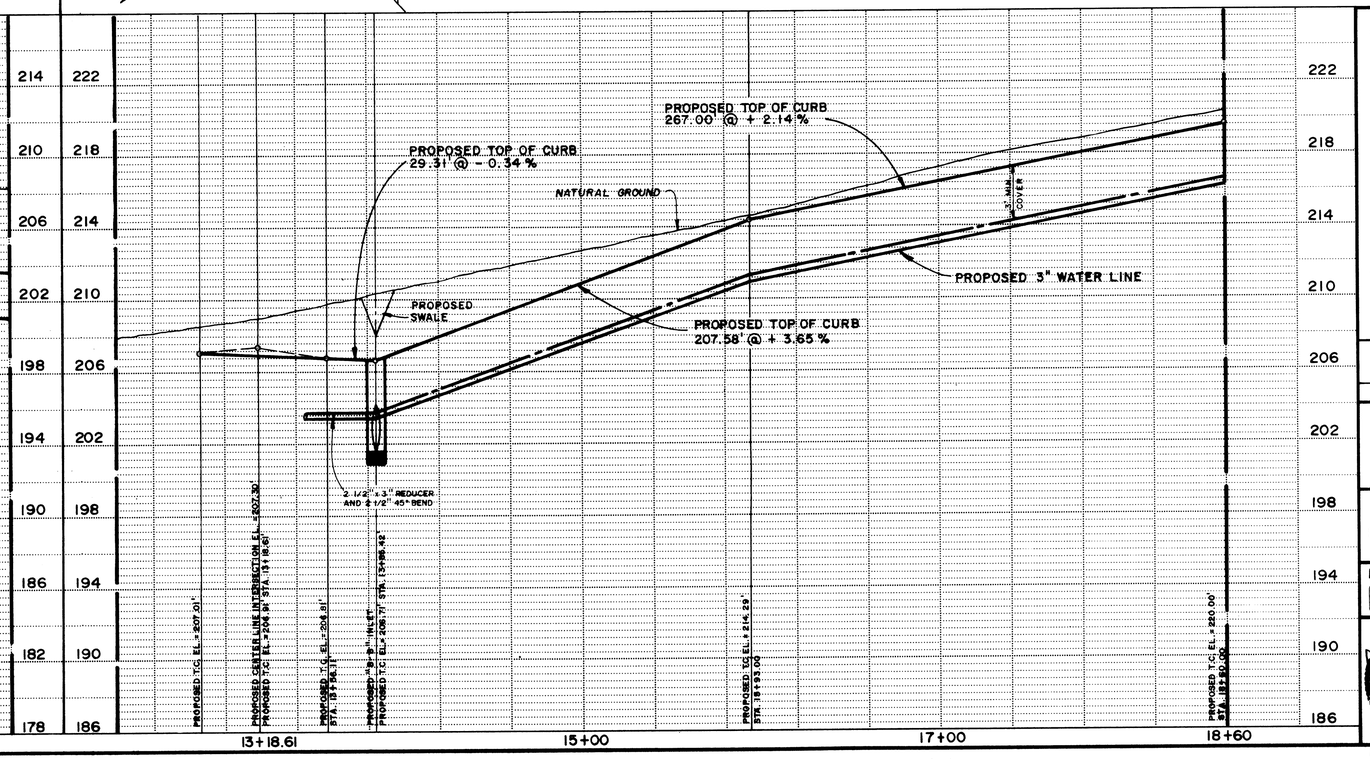


SECTION "C-C"

N.T.S.





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T.B.M. 136-01 E	60D Nail in a 14 Inch Pine Tree in the East R.O.W. of Oak Shores Drive. Station 7+04 Oakshores Drive. Elevation 211.34
T.B.M. 136-01 F	60D Nail in a 6 Inch Pine Tree on the East side of the most Northerly cul-de-sac of Oak Shores Drive. Station 1+81 Oak Shores Drive. Elevation 212.28

APPROVED

MONTGOMERY COUNTY ENGINEER

LAKEWOOD
ON LAKE CONROE

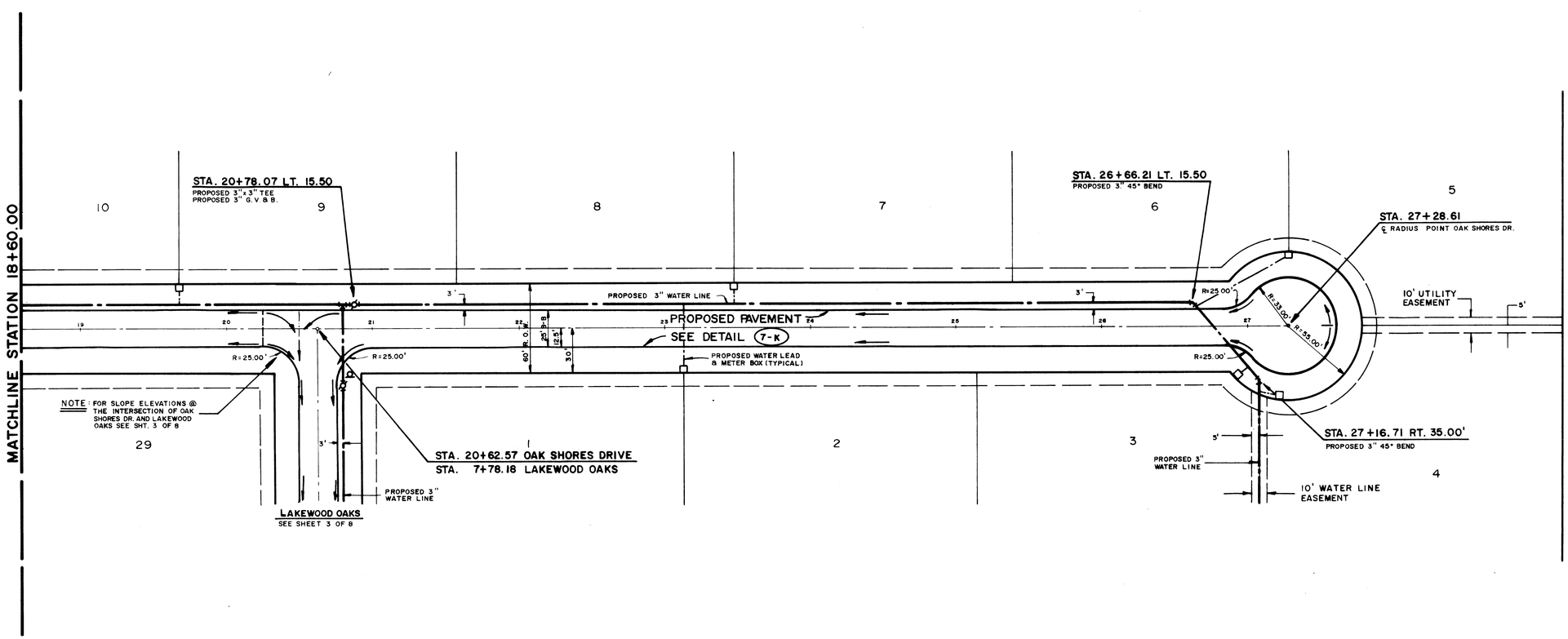
OAK SHORES DRIVE
STA. 10+40 TO STA. 18+60

D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

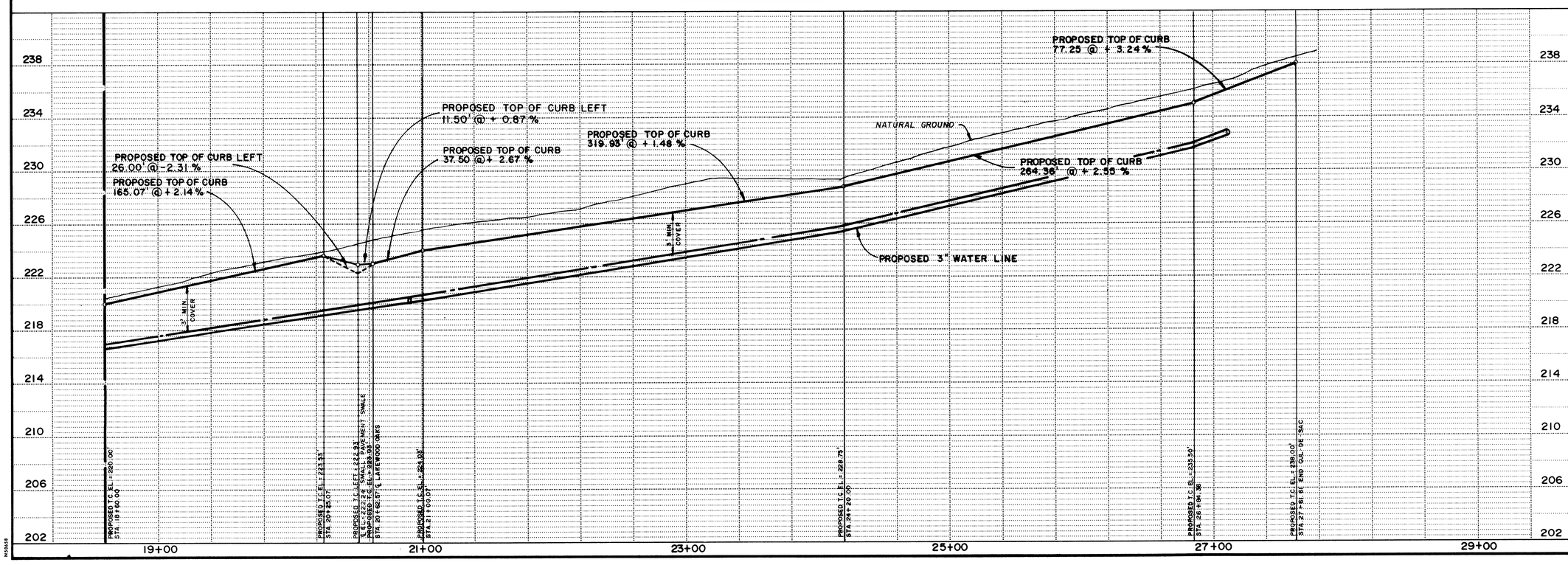
DATE	
JAN., 1987	
DRAWN BY S.F.S.	CHECKED BY D.J.M.
SCALE H.1"=40' V.1"=4'	JOB NO. 136-01
SHEET 5 OF 8	

FEB 03 1987

D.A.V.# 136-01-05



OAK SHORES DRIVE



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T.B.M. 136-01 F — 60D Nail is a 6 Inch Pine Tree on the East side of the most Northerly cul-de-sac of Oak Shores Drive. Station 1+81 Oak Shores Drive. Elevation 212.28

APPROVED

MONTGOMERY COUNTY ENGINEER

LAKEWOOD
ON LAKE CONROE

OAK SHORES DRIVE

STA. 18+60 TO STA. 29+00

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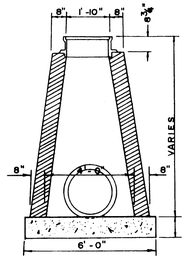
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

DATE	JAN., 1987
DRAWN BY S.F.S.	CHECKED BY D.J.M.
SCALE H.I"=40' V.I"=4'	JOB NO. 136-01
SHEET 6 OF 8	

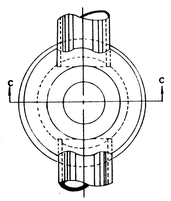
FEB 03 1987

D.A.V.# 136-01-06



SECTION C-C

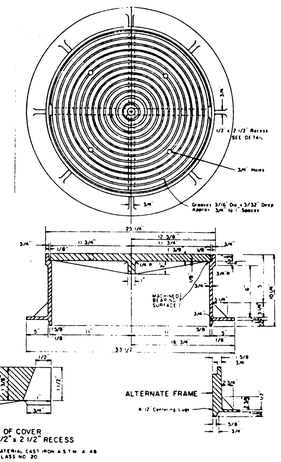
NOTE:
BRICK WALLS 12'-0" BELOW TOP OF CASTING TO BE 12" THICK



PLAN OF SECTION C-C
(COVER NOT SHOWN)

TYPE "C" STORM SEWER MANHOLE

7-A

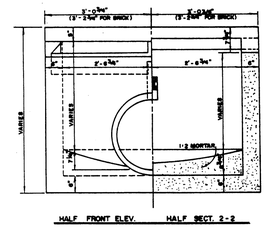


SECT. OF COVER
THRU 1/2" x 2 1/2" RECESS

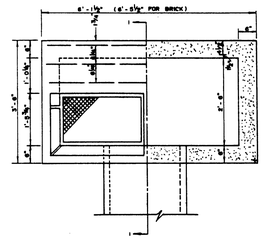
NOTE MATERIAL CAST IRON A.S.T.M. A 48 CLASS NO. 20

23 1/2" MANHOLE FRAME & COVER

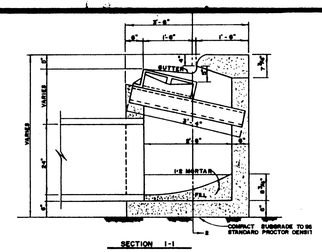
7-D



HALF FRONT ELEV. HALF SECT. 2-2



HALF PLAN HALF HORIZ. SECT.

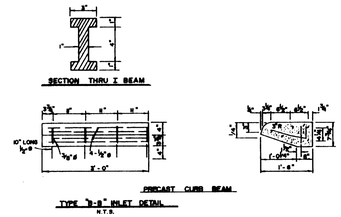


SECTION 1-1

GENERAL NOTES

USE STD. CAST IRON FRAME & PLATES
LEAD SHALL LEAVE INLET AT LOCATION AND GRADE REQUIRED
WHEN BRICK INLETS ARE BUILT EXTEND CORNELS 4" FROM CURB BEAM INTO BRICKWORK. WHEN BRICK INLETS ARE B.R.T. WALL SHALL BE INCREASED TO 8", AND INLET BEAMS TO BE 4" LONGER

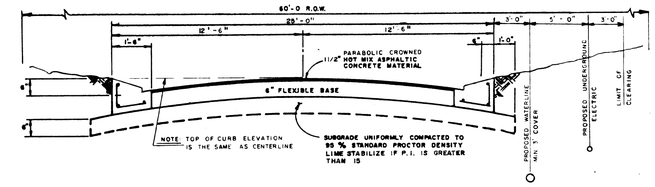
BAR LIST				
NO	SIZE	LENGTH	SHP	LOC.
4	1/2 ø	8'-10"	ST.	HOR.
7	1/2 ø	0'-10"	ST.	VERT.
7	3/8 ø	1'-6"	BT.	



TYPE "B-B" INLET DETAIL
N.T.S.

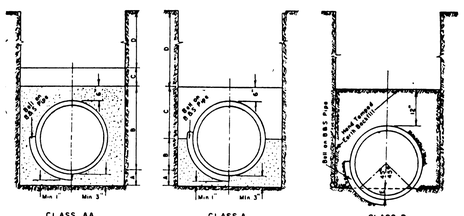
TYPE "B-B" INLET

7-F



TYPICAL ASPHALT STREET WITH CONCRETE CURB & GUTTER

7-K



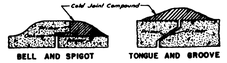
Size of Pipe (in)		6	8	10	12	15	18	21	24	27	30	33	36	42	48
A	C-14 (ft.)		03	05	07	08	11	13	17						
	C-76 (ft.)				03	05	07	09	12	14	16	18	20	23	29

"A" Cement stabilized sand placed before pipe is laid up to flow line of pipe
"B" Cement stabilized sand, thoroughly rodded, placed after pipe is laid
"C" Earth fill placed same day as pipe is laid
"D" Earth fill placed next day (or later) after pipe is laid.

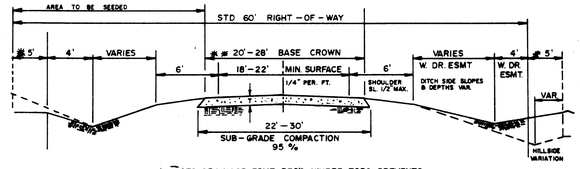
Note: Class A bedding used on all sewers 18" and larger unless otherwise specified

BEDDINGS FOR PIPE SEWERS

7-B



DETAIL OF PIPE JOINTS



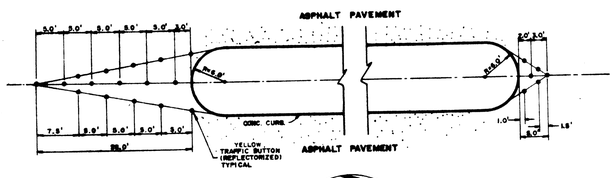
5' STD. DRAINAGE ESMT. REQ'D WHERE TOPO PREVENTS ACCEPTABLE DITCH SIDE SLOPES EXTREME SITUATION MAY REQUIRE ADDL. WIDTHS AS DETERMIND BY THE COUNTY ENGINEER

20' MIN. WIDTH REQ'D FOR BASE REGARDLESS OF TYPE OF ASPHALT SURFACE

T = 6" MIN. COMPACTED SURFACE MAY BE 1) 2" H.M.A.C., 2) ONE COURSE TREATMENT IF 8" BASE IS USED, 3) 2" ASPH. STAB. BASE (Road mix) IF IRON ORE BASE IS USED.

TYPICAL ASPHALT STREET WITH OPEN CUT DITCHES

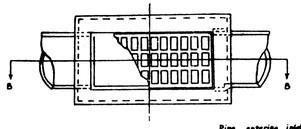
7-G



TRAFFIC BUTTON
(REFLECTORIZED)

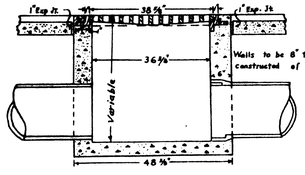
BUTTON DETAIL

7-I



Pipe entering inlet shall have a covering of not less than 12" below Paving Base.

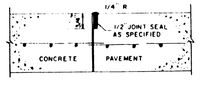
PLAN



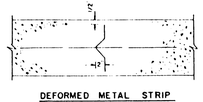
SEC. BB

TYPE SADDLE INLET

7-L



CONSTRUCTION JOINT SEAL

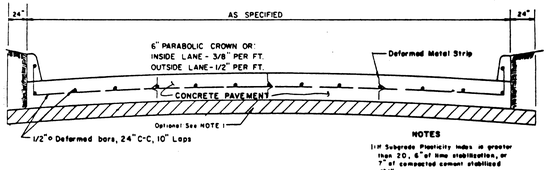


DEFORMED METAL STRIP

The location of construction joints and deformed metal strips may be varied. They will also have a maximum spacing of 20 feet

DEFORMED METAL STRIP & CONSTUCTION JOINT SEAL DETAIL

7-C



NOTES

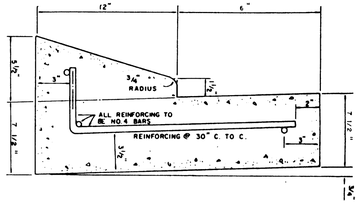
1: If Subgrade Plasticity Index is greater than 20, 6" of lime stabilization, or 7" of compacted cement stabilized shell

2: Pavement shall be cored each 1200 Sq. Yd., alternating section of pavement

3: All slabs are to be provided with acceptable load transmission device at expansion joints, with expansion joints at approximately 80 feet intervals. Expansion joints to be placed at all structures and at curb returns at street intersections.

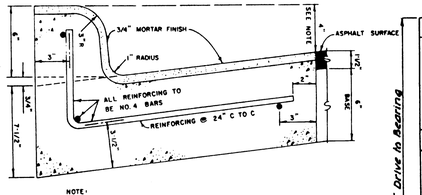
TYPICAL CONCRETE STREET WITH CONCRETE CURB & GUTTER

7-E



STANDARD MOUNTABLE CURB & GUTTER

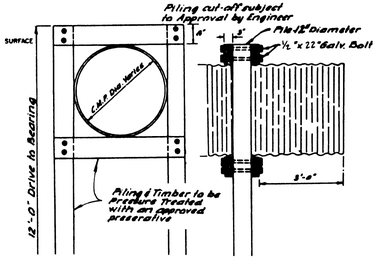
7-H



NOTE:
Where necessary to fit existing construction and/or provide proper drainage, the height of the top of the curb above the gutter may be varied by the Engineer.

STANDARD MONOLITHIC CURB & GUTTER

7-J



TIMBER BENT DETAIL

7-M

APPROVED

MONTGOMERY COUNTY ENGINEER

LAKEWOOD
ON LAKE CONROE

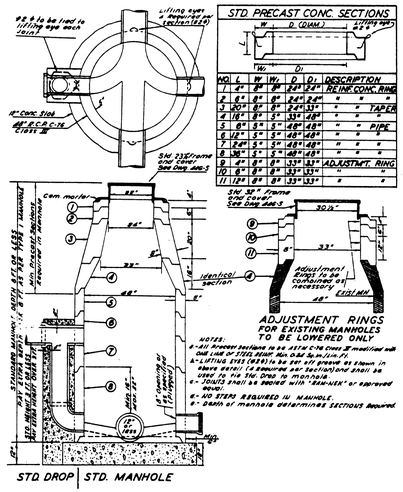
MONTGOMERY COUNTY
PAVING AND DRAINAGE
DETAIL SHEET

D.A. VOGT ENGINEERING
1544 Sawdust Road, Suite 180 The Woodlands, Texas 77380
(713) 367-0947

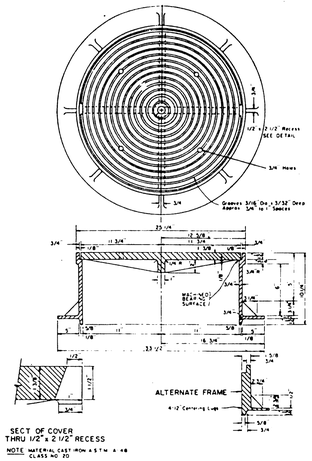
DATE	JAN., 1987
DRAWN BY S.F.S.	CHECKED BY D.J.M.
SCALE AS SHOWN	JOB NO. 136-01
SHEET 7 OF 8	

FEB 03 1987

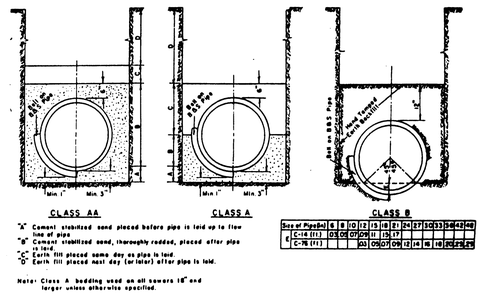
D.A.V. 136-01-07



8-A TYPE "4" SANITARY SEWER MANHOLE



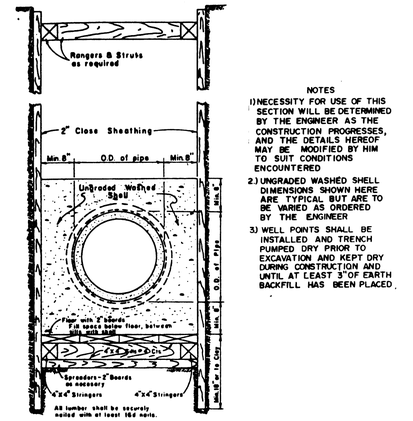
8-E 23 1/2" MANHOLE FRAME & COVER



"A" Cement stabilized sand placed before pipe is laid up to flow line of pipe.
"B" Cement stabilized sand, thoroughly rodded, placed after pipe is laid.
"C" Earth fill placed same day as pipe is laid.
"D" Earth fill placed next day (or later) after pipe is laid.

Note: Class A bedding used on all sewers 18" and larger unless otherwise specified.

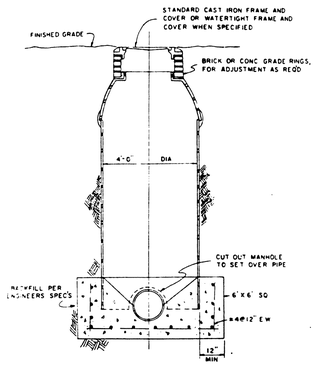
8-I BEDDINGS FOR PIPE SEWER



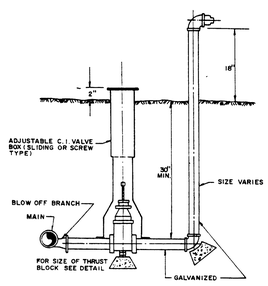
NOTES

1) NECESSITY 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
2) UNGRADED WASHED SHELL DIMENSIONS SHOWN HERE ARE TYPICAL BUT ARE TO BE VARIED AS ORDERED BY THE ENGINEER
3) WELL 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.

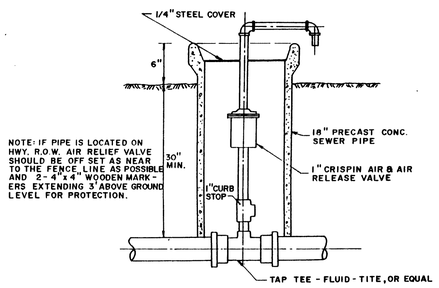
8-K SPECIAL WET SAND CONST. FOR PIPE SEWERS



8-L TYPICAL FIBERGLASS MANHOLE



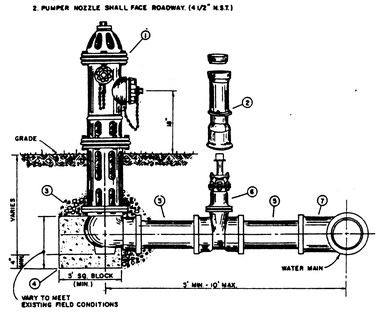
8-B BLOW OFF VALVE DETAIL



NOTE: IF PIPE IS LOCATED ON HWY. R.O.W. AIR RELIEF VALVE SHOULD BE OFF SET AS NEAR TO THE FENCE LINE AS POSSIBLE AND 2-4"x4" WOODEN MARKERS EXTENDING 3' ABOVE GROUND LEVEL FOR PROTECTION.

8-F AIR RELIEF VALVE DETAIL

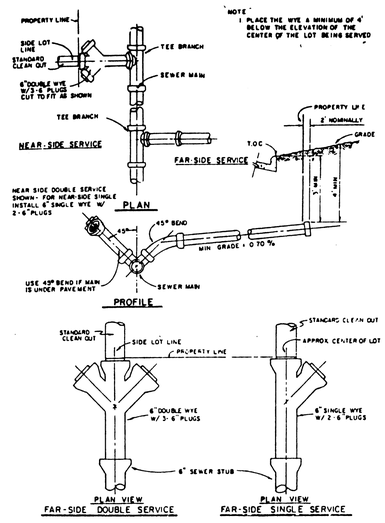
NOTE:
1. OIL SHALL BE PLACED IN HYDRANT AT THE TIME OF INSTALLATION.
2. PUMPER NOZZLE SHALL FACE ROADWAY. (4 1/2" N.S.T.)



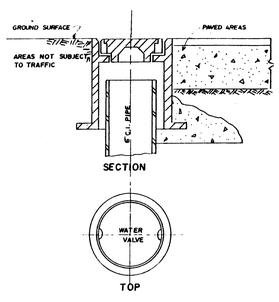
MUELLER FIRE HYDRANT A-423

FIRE HYDRANT UNIT SHALL INCLUDE:
1. 1 - MUELLER FIRE HYDRANT A-423 (W/ 4 1/2" PUMPER NOZZLE)
2. 1 - MUELLER VALVE BOX H-10314
3. 3 CU. FT. GRAVEL
4. 3 CU. FT. CONCRETE
5. 2 - 6" CAST IRON LEADS
6. 1 - 6" MUELLER RESILIENT SEAT GATE VALVE A-2370-24
7. 1 - x" x 6" CAST IRON WYE
x" = WATER MAIN DIA.

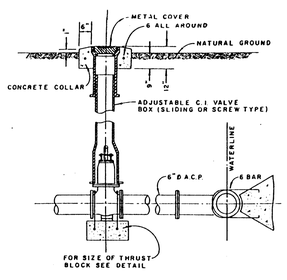
8-J TYPICAL FLUSHING VALVE DETAIL



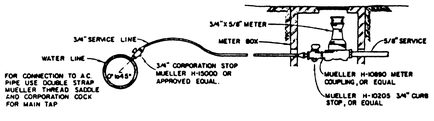
8-M SANITARY SEWER SERVICE CONNECTIONS



8-C VALVE COVER DETAIL

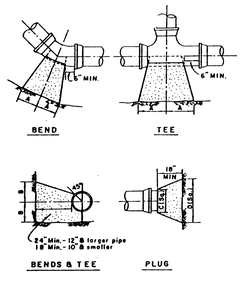


8-G VALVE BOX DETAIL



NOTES
SERVICE LINES SHALL CONSIST OF ONE CONTINUOUS RUN OF POLY BUTYLENE

8-D TYPICAL 3/4" SERVICE CONNECTION



8-H THRUST BLOCKING DETAIL

APPROVED

MONTGOMERY COUNTY ENGINEER

LAKEWOOD
ON LAKE CONROE

MONTGOMERY COUNTY
SANITARY SEWER
AND WATER SERVICE
DETAIL SHEET

D.A. VOGT ENGINEERING
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