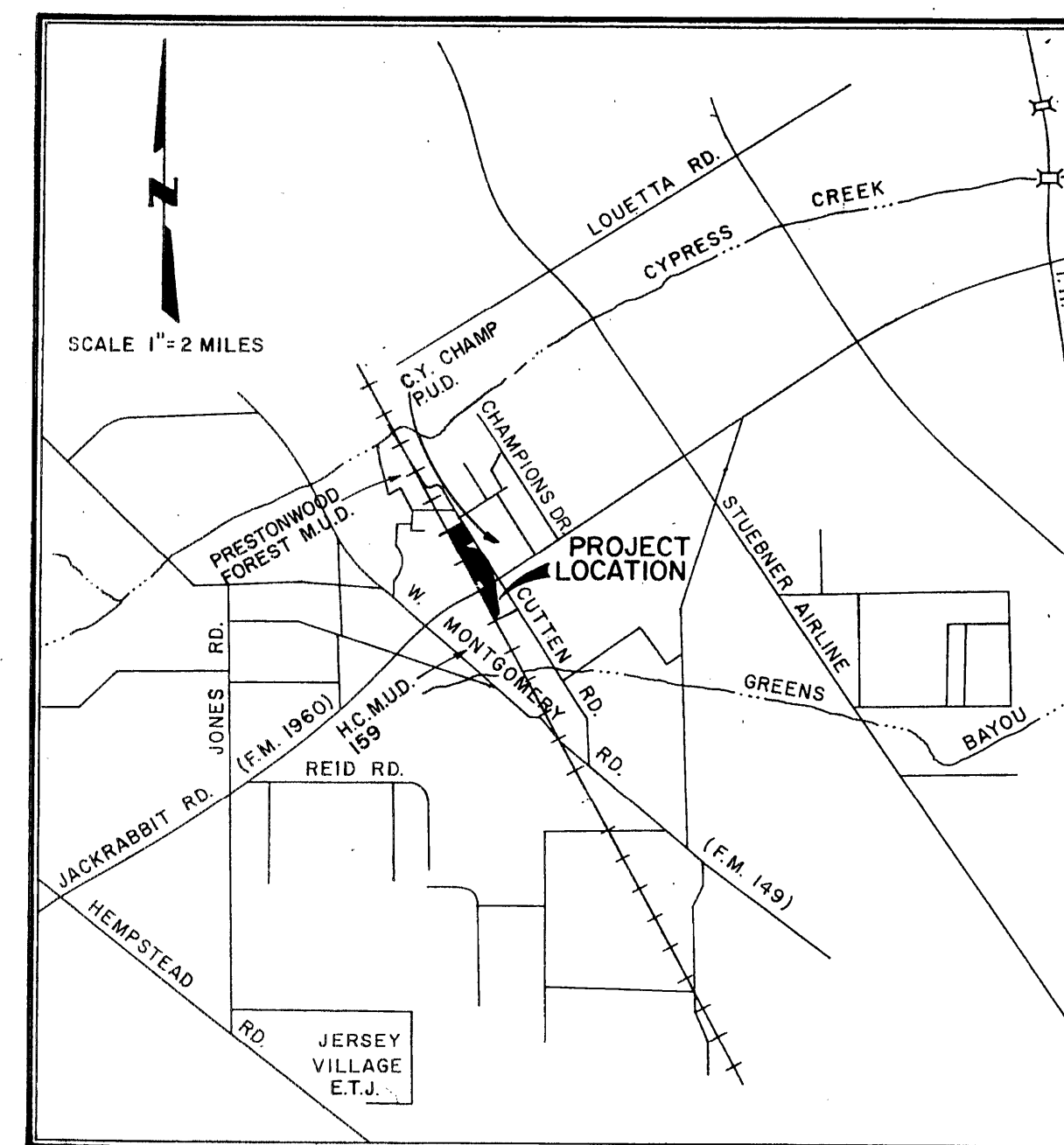


CHAMPIONS CENTRE SECTION ONE AND WILLOW CENTRE SECTION ONE

HARRIS COUNTY MUNICIPAL UTILITY DISTRICT 191

PAVING, DRAINAGE, SANITARY, & WATER

| SHEET | DESCRIPTION |
|-------|-----------------------------------|
| 1 | OVERALL LAYOUT (SAN. SWR. SYSTEM) |
| 2 | " (STM. SWR. SYSTEM) |
| 3 | GENERAL NOTES |
| 4 | GENERAL NOTES |
| 5-15 | PLAN & PROFILES |
| 16-17 | STM. SWR. DETAILS |
| 18 | SAN. SWR. |
| 19 | WATER DETAILS |
| 20 | PAVING DETAILS |
| 21 | BUTTON DETAILS |



LOCATION MAP

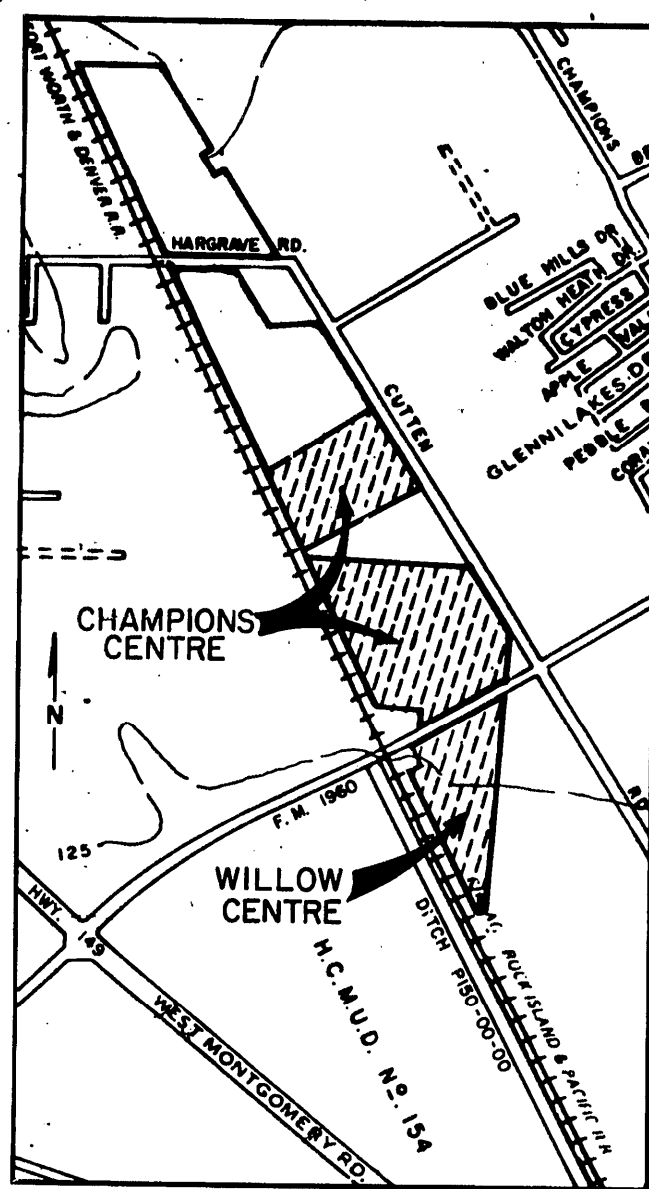
KEY MAP 370 - F/L 639 - 9

J.O. 85003

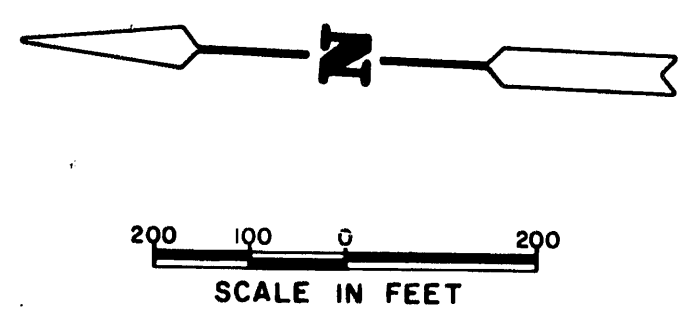
LANDEV ENGINEERS, INC.
1706 SEAMIST DRIVE
Houston, Texas 77008

HARRIS COUNTY, TEXAS

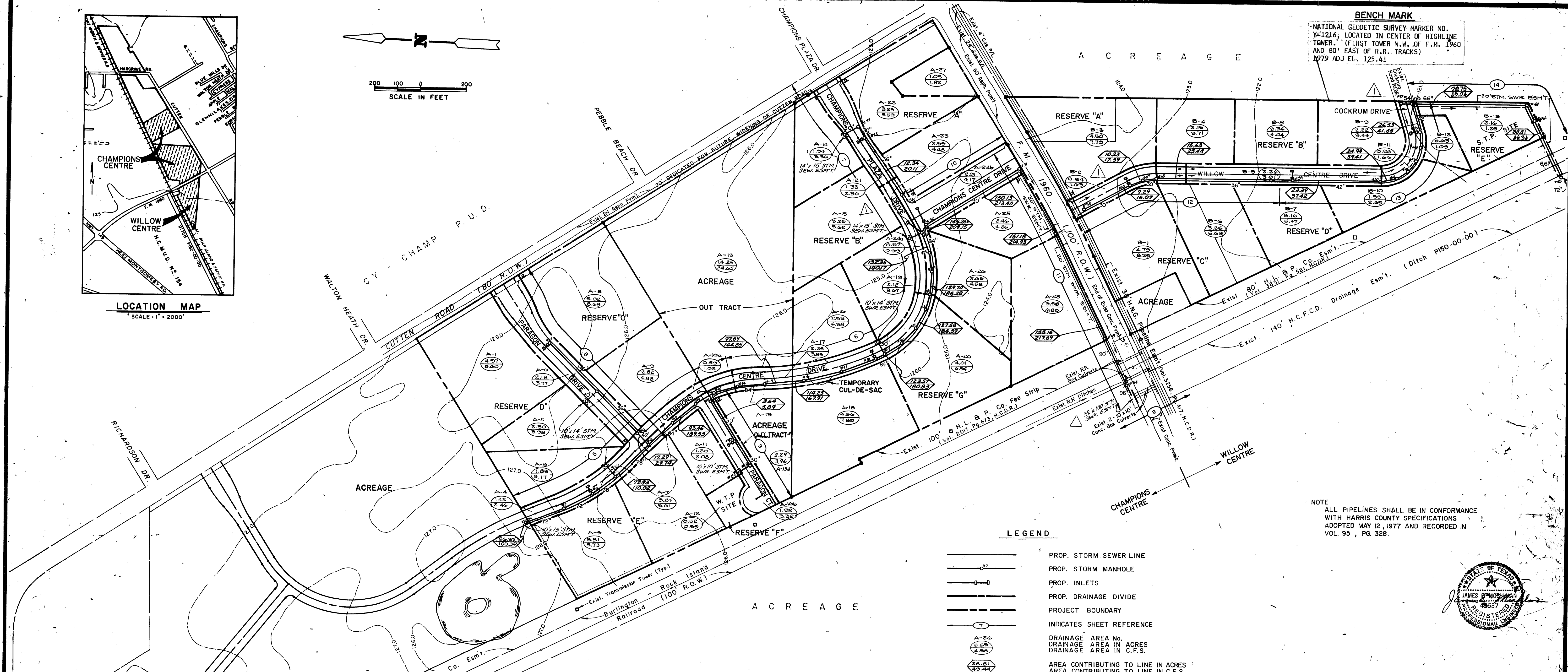
WILLOW CENTRE SEC 1



LOCATION MAP
SCALE: 1" = 2000'

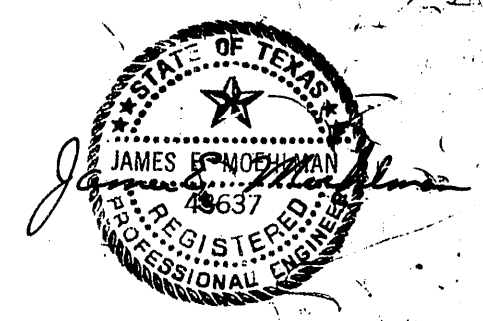


BENCH MARK
NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGH LINE TOWER, (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS) 1979 ADJ. EL. 125.41



- LEGEND**
- PROP. STORM SEWER LINE
 - PROP. STORM MANHOLE
 - PROP. INLETS
 - PROP. DRAINAGE DIVIDE
 - PROJECT BOUNDARY
 - INDICATES SHEET REFERENCE
 - DRAINAGE AREA No.
 - DRAINAGE AREA IN ACRES
 - DRAINAGE AREA IN C.F.S.
 - AREA CONTRIBUTING TO LINE IN ACRES
 - AREA CONTRIBUTING TO LINE IN C.F.S.
 - ▽ STOP SIGNS (R1-1A)

NOTE:
ALL PIPELINES SHALL BE IN CONFORMANCE WITH HARRIS COUNTY SPECIFICATIONS ADOPTED MAY 12, 1977 AND RECORDED IN VOL. 95, PG. 328.



APPROVED FOR CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS

APPROVED: *R.L. McMillan* 10/28/82
APPROVED: *James B. McMillan* 10/28/82
APPROVED: *John J. McMillan* 10/28/82

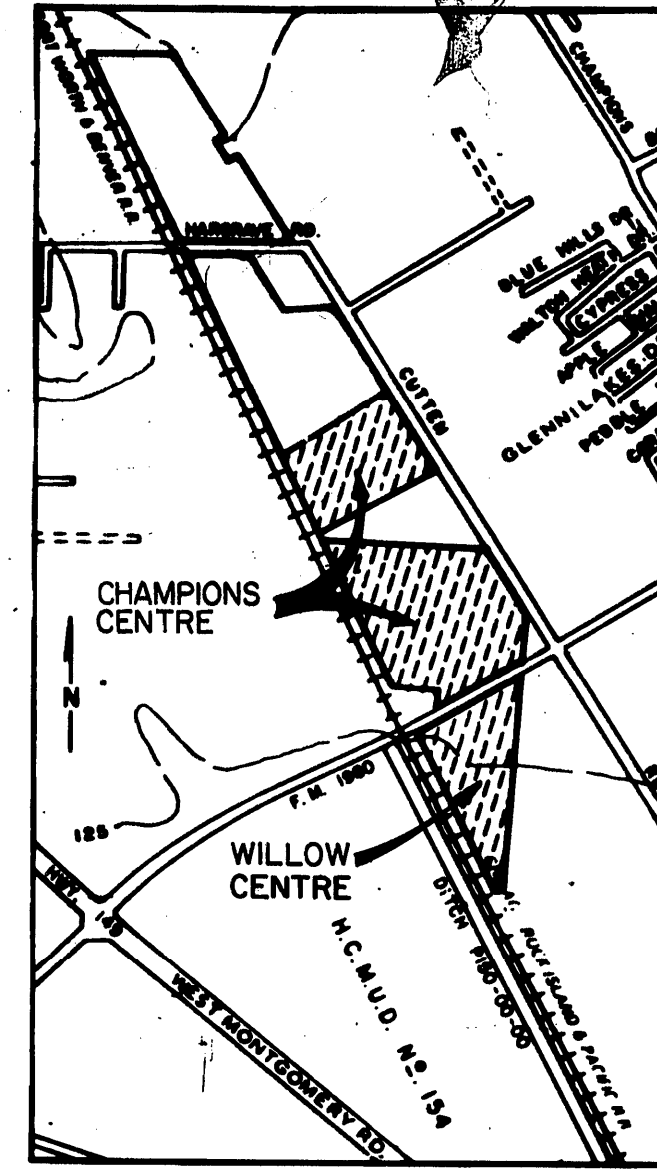
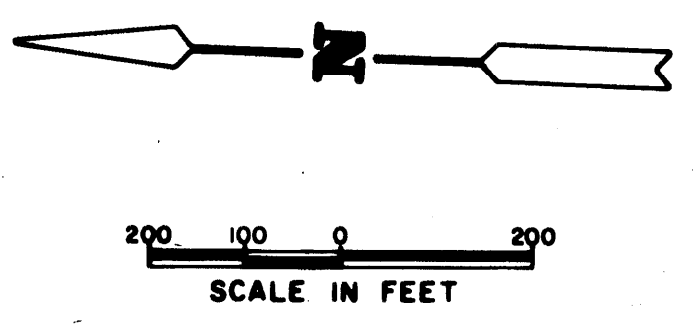
APPROVED: *R.L. McMillan* 10/5/82

DATE: 2/13/84

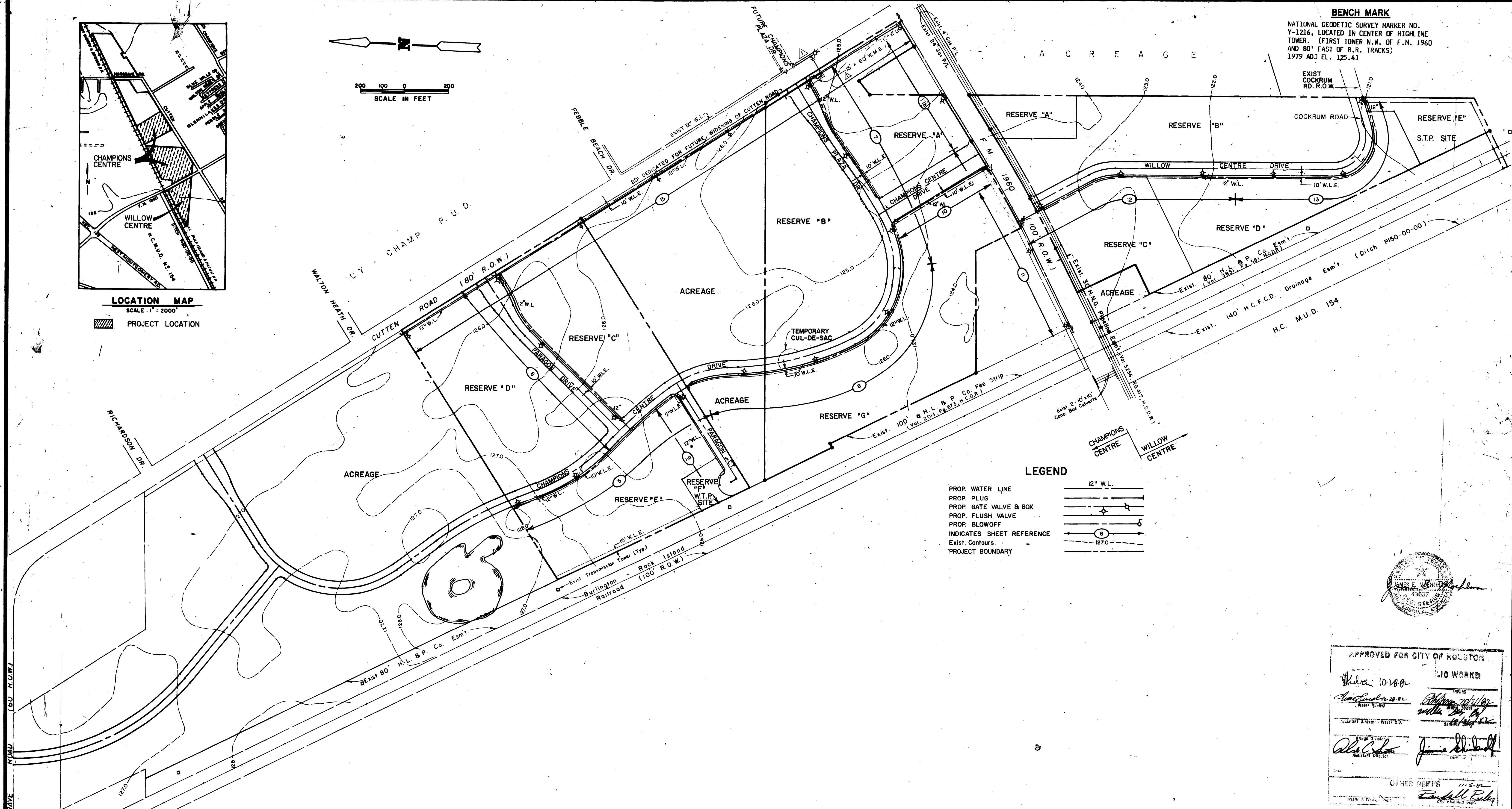
| Rev. | Date | Description | App. |
|--|--------|--|------------|
| 3-2-83 | | Rev'd. shd. flow arrows, stm. swr. esmt. size, stm. swr. line sizes and added stm. MH #5 | |
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE H.C. M.U.D. No. 191 OVERALL LAYOUT STORM SEWER SYSTEM | | | |
| Design By: | J.W. | Job No: | 85003 |
| Drawn By: | J.A.M. | Scale: | 1" = 200' |
| Checked By: | J.E.M. | Date: | SEPT. 1982 |
| | | Sheet | 2 |
| | | of | 21 |

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

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

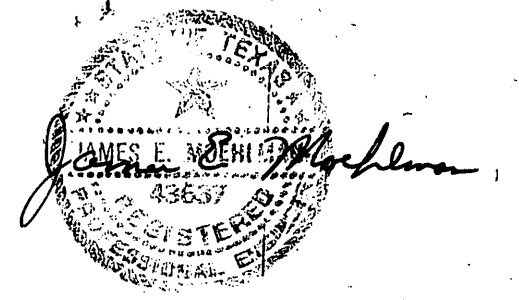
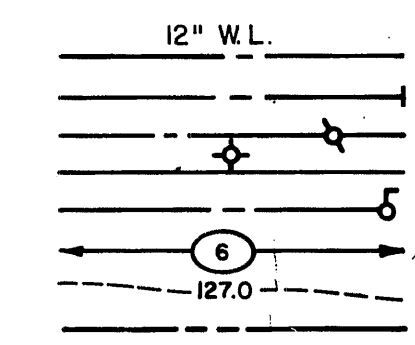


LOCATION MAP
 SCALE: 1" = 2000'
 PROJECT LOCATION



LEGEND

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



APPROVED FOR CITY OF HOUSTON

10/20/83

James H. Schmitt
 Assistant Director, Water Div.

James H. Schmitt
 Assistant Director

OTHER DEPTS
 Traffic & Vehicle Dept. [Signature]

| | | |
|-------------------------------------|-------------------------------|----------|
| 3-1-83 | ADDED WATER LINE INTERCONNECT | |
| CHAMPIONS CENTRE SECTION ONE | | |
| WILLOW CENTRE SECTION ONE | | |
| H.C. M.U.D. No. 191 | | |
| OVERALL LAYOUT | | |
| WATER DISTRIBUTION SYSTEM | | |
| Design By: J.W. | Job No: 85003 | Sheet |
| Drawn By: R.K. | Scale: 1"=200' | 3 |
| Checked By: J.E.M. | Date: SEPT. 1982 | of 21 |

LANDEV ENGINEERS, INC.
 1700 SEAMIST DRIVE
 Houston, Texas 77008

THIS SHEET NOT FOR CONSTRUCTION PURPOSES

GENERAL NOTES - SANITARY SEWER

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

GENERAL NOTES-STORM SEWERS

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

GENERAL NOTES - WATER

- ALL WATER LINES TO HAVE A MINIMUM OF FOUR (4) FEET OF COVER TO TOP OF CURB.
- WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATIONS WD-3 AND WD-5 & 6 AS CURRENTLY AMENDED.
- ALL FLUSHING VALVES SHALL BE SET THREE (3) FEET BEHIND BACK OF CURB.
- STEEL WATER SECTION TO EXTEND FIVE (5) FEET MINIMUM BEYOND 45° BENDS.
- THE CONTRACTOR MAY USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
- WHENEVER SANITARY SEWERS CROSS OVER WATER MAINS, ONE 18" JOINT OF DUCTILE IRON PIPE SHALL BE INSTALLED IN THE SEWER LINE AND CENTERED AT THE WATER LINE CROSSING WITH 6-INCH MINIMUM CLEARANCE.
- DUCTILE IRON PIPE SHALL BE A MINIMUM THICKNESS CLASS 50. THE PRESSURE RATINGS FOR BOTH THE PIPE AND THE JOINTS SHALL BE 150 PSI OR GREATER.
- WHENEVER SANITARY SEWERS CROSS UNDER WATER MAINS, AND THE OUT-TO-OUT PIPE CLEARANCE IS LESS THAN 24-INCHES, A CENTERED 18" JOINT OF DUCTILE IRON PIPE SHALL BE USED.
- WHENEVER SANITARY SEWERS CROSS UNDER WATER MAINS, AND THE MINIMUM PIPE CLEARANCE IS 24-INCHES 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-INCHES.

GENERAL NOTES - PAVING

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

HARRIS COUNTY FLOOD CONTROL GENERAL NOTES


- BACKFILL TO BE COMPACTED IN NO GREATER THAN 1' LIFTS TO THE DENSITY OF THE UNDISTURBED ADJACENT SOIL.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTENANCE AND RESTORING BACKSLOPE DRAINAGE SYSTEM.
- ALL DISTURBED AREAS SHALL BE HYDRO-MULCH SEEDING AS PER HARRIS COUNTY FLOOD CONTROL SPECIFICATION ENTITLED "HYDRO-MULCH SEEDING," (EXCEPT CHANNEL BOTTOM).
- "HARRIS COUNTY FLOOD CONTROL DISTRICT SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION (221-5162)."
- "ENGINEER SHALL SUBMIT LETTER TO HARRIS COUNTY FLOOD CONTROL DISTRICT REQUESTING INSPECTION AND ACCEPTANCE OF ITEMS CONSTRUCTED IN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY."

Jamie E. Washburn

*Shivan 10/28/82
 Eric Fred 10/28/82
 Willie 10/28/82
 10/28/82*

Alvin C. Lewis Jamie Shindoff

*11-6-82
 Randall Riley*

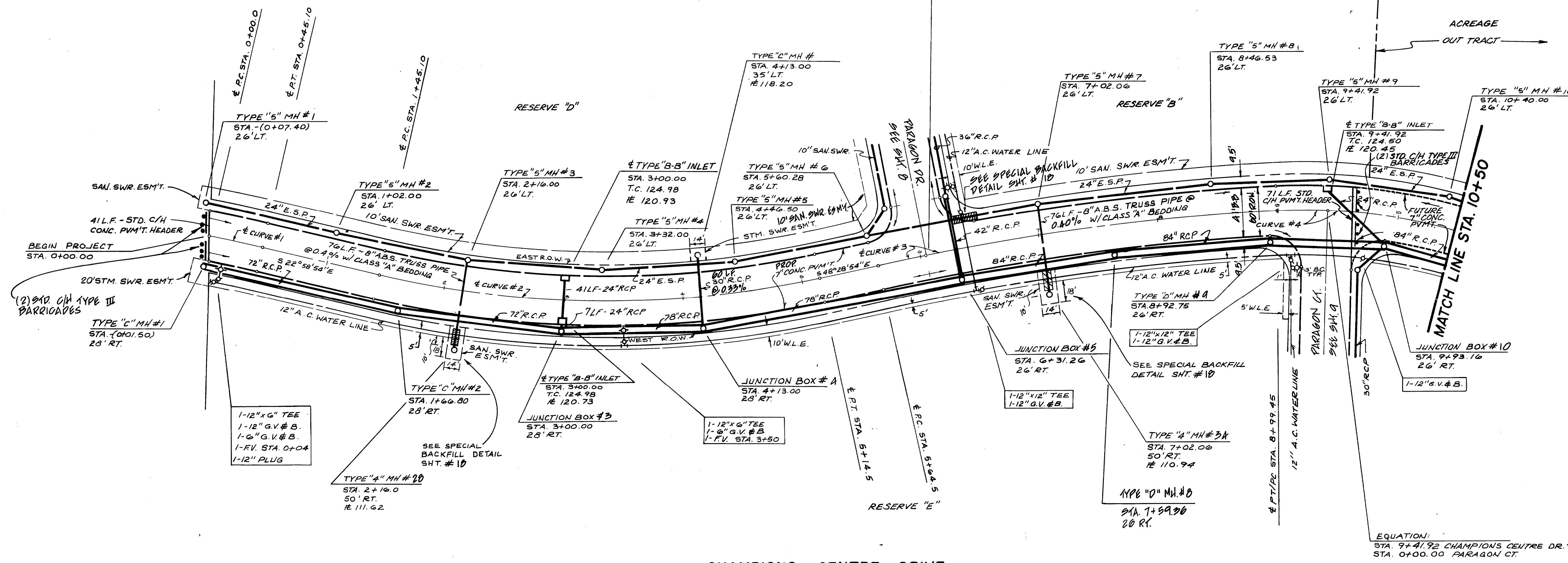
| | | | |
|---|------------------|----------------|------|
| Rev. | Date | Description | App. |
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE H. C. M.U.D. No. 191 GENERAL NOTES | | | |
| Design By: | Job No: 85003 | Sheet 4 | |
| Drawn By: | Scale: | | |
| Checker By: | Date: SEPT. 1982 | of 21 | |
|  LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008 | | | |

| CURVE DATA | | | |
|-------------------|--------------|--------------|--------------|
| CURVE #1 | CURVE #2 | CURVE #3 | CURVE #4 |
| R = 1530.00' | 830.00' | 1770.00' | 470.00' |
| Δ = 0°41'20" | 25°30'00" | 09°44'30" | 34°15'00" |
| L = 45.10' | 369.40' | 334.95' | 280.95' |
| C = 45.10' | 366.36' | 334.54' | 276.79' |
| CB = S 23°49'35"E | S 35°43'54"E | S 43°36'39"E | S 21°36'54"E |

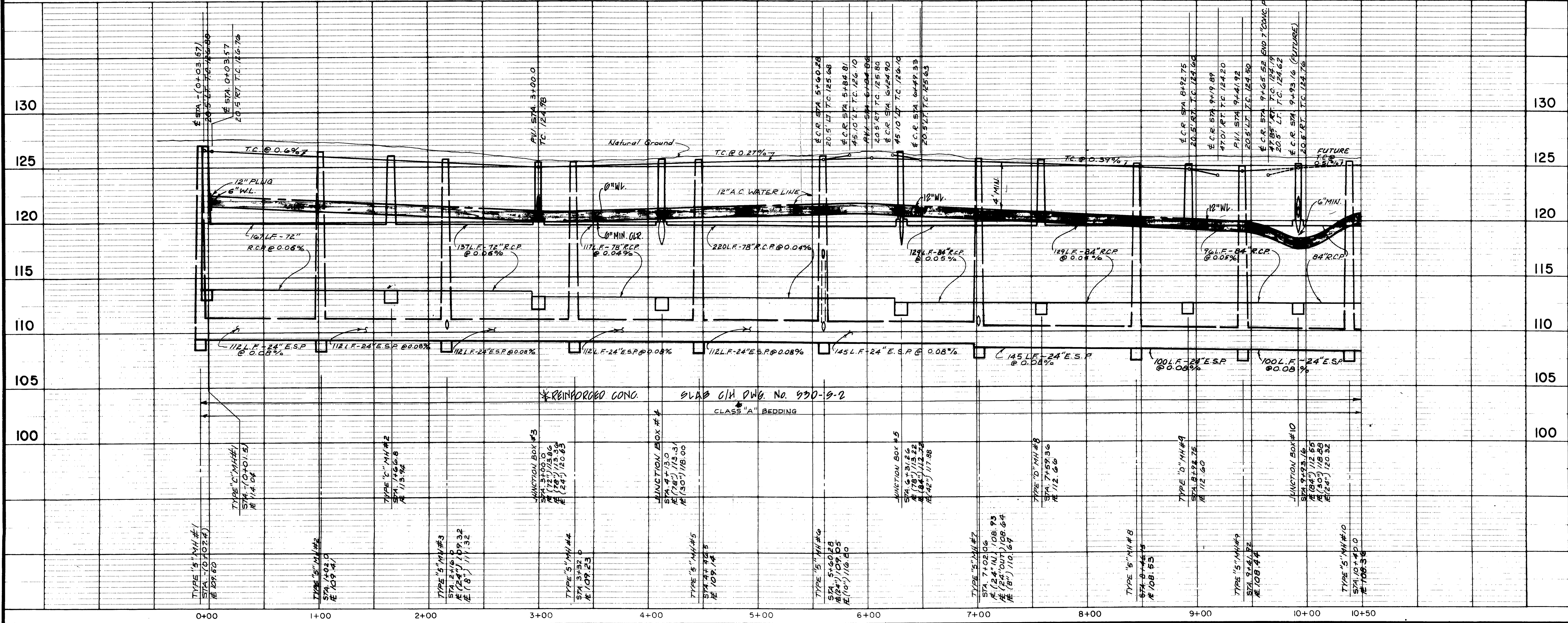
EQUATION:
 STA. 6+04.86 CHAMPIONS CENTRE DR. =
 STA. 0+00.00 PARAGON DR.

BENCH MARK

NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGHLINE 10KILR. (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS) 1979 ADJ. LL. 125.41



CHAMPIONS CENTRE DRIVE



APPROVED: *[Signature]*
 County Engineer
 APPROVED: 12-16-82
 Engineer in Charge
 Water & Sanitary Sewer Lines Approval
 as to location only.

Jamie Morlow

*Drawn 10-16-82
 Checked 10-20-82
 10/12/82
 11-5-82
 Randall Polley*

| Rev. | Date | Description | App. |
|------|------|-------------|------|
| | | | |

CHAMPIONS CENTRE SECTION ONE
 & WILLOW CENTRE SECTION ONE
 H. C. M.U.D. No. 191
CHAMPIONS CENTRE DRIVE
 STA. 0+00 TO STA. 10+50

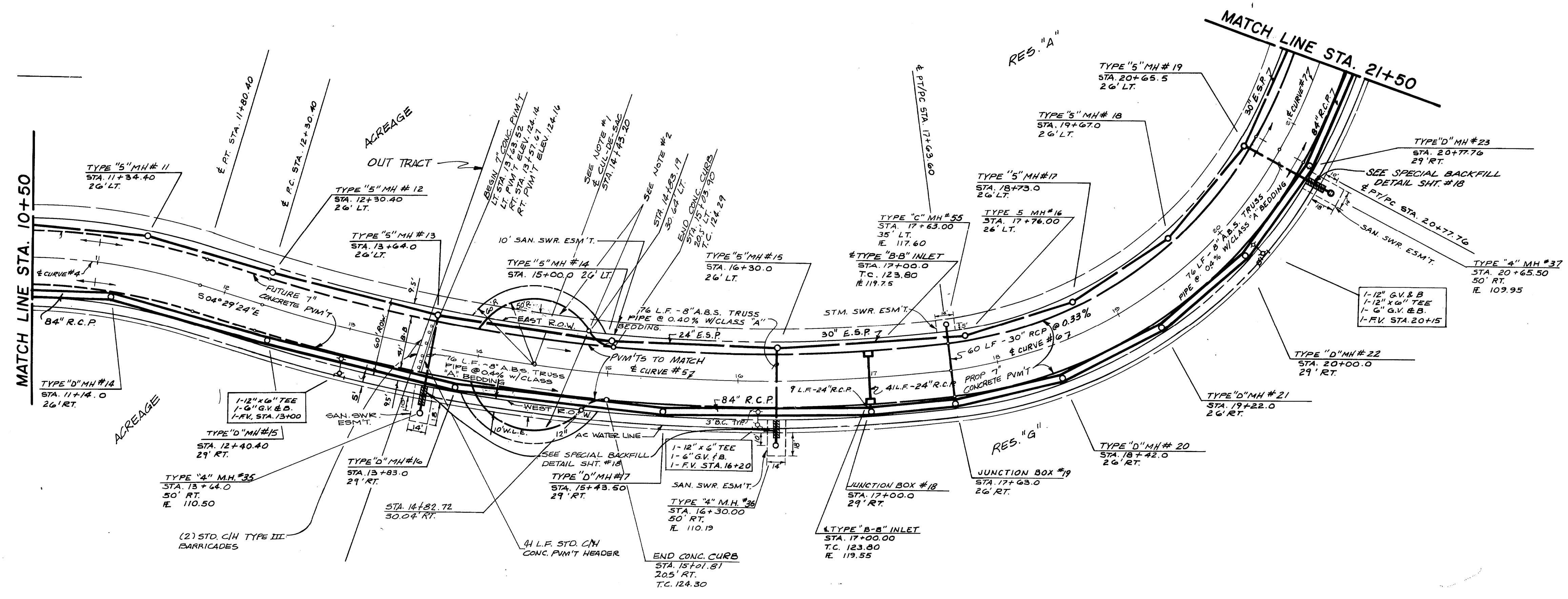
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| Design By: J.W. | Job No: 85003 | Sheet |
| Drawn By: R.K. | Scale: HORIZ. 1"=50' | 5 |
| Checked By: J.E.M. | Date: SEPT. 1982 | of 21 |

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

| CURVE DATA | | | |
|-----------------|-------------|-------------|-------------|
| CURVE #4 | CURVE #5 | CURVE #6 | CURVE #7 |
| R = 470.00' | 1300.00' | 330.00' | 460.00' |
| Δ = 34°15'00" | 23°30'00" | 54°32'53" | 41°00'00" |
| L = 280.95' | 533.20' | 314.17' | 329.17' |
| C = 276.79' | 529.47' | 302.44' | 322.19' |
| CB = 92°13'54"E | 516°14'24"E | 555°15'51"E | N76°57'43"E |

BENCH MARK

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

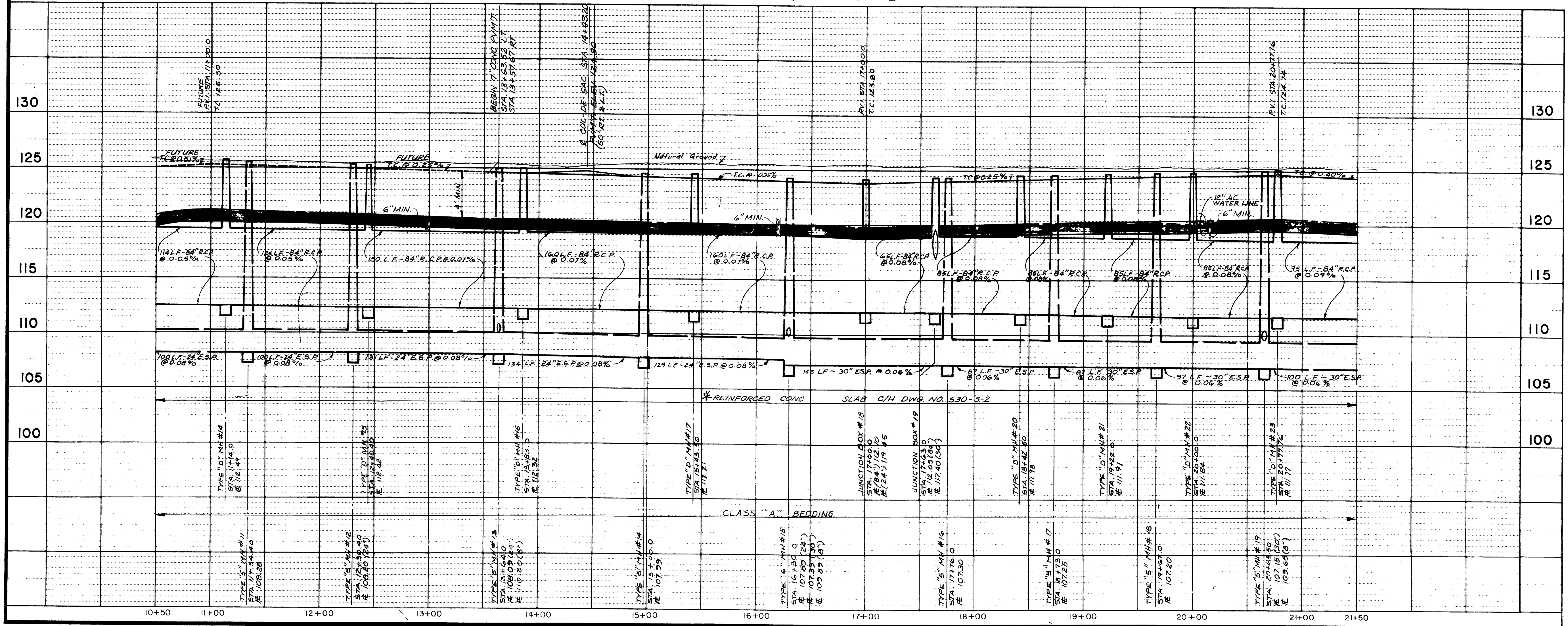


- NOTES**
1. TEMPORARY CUL-DE-SAC UNTIL CHAMPIONS CENTRE DRIVE IS EXTENDED ACROSS OUT TRACT
 2. ASPHALT PVM'T TO BE 2" H.M.A.C. W/10% CEMENT STABILIZED BASE; PVM'T TO BE REMOVED WHEN CHAMPIONS CENTRE DRIVE IS EXTENDED ACROSS OUT TRACT
 3. ASPHALT PVM'T TO SLOPE TO PROP. CONC. PVM'T.

Richard P. Smith
 County Engineer
 12-16-82
 Engineer in Charge

Sanitary Sewer Lines Approved
 as Shown Location Only.

CHAMPIONS CENTRE DRIVE



James E. Mockler

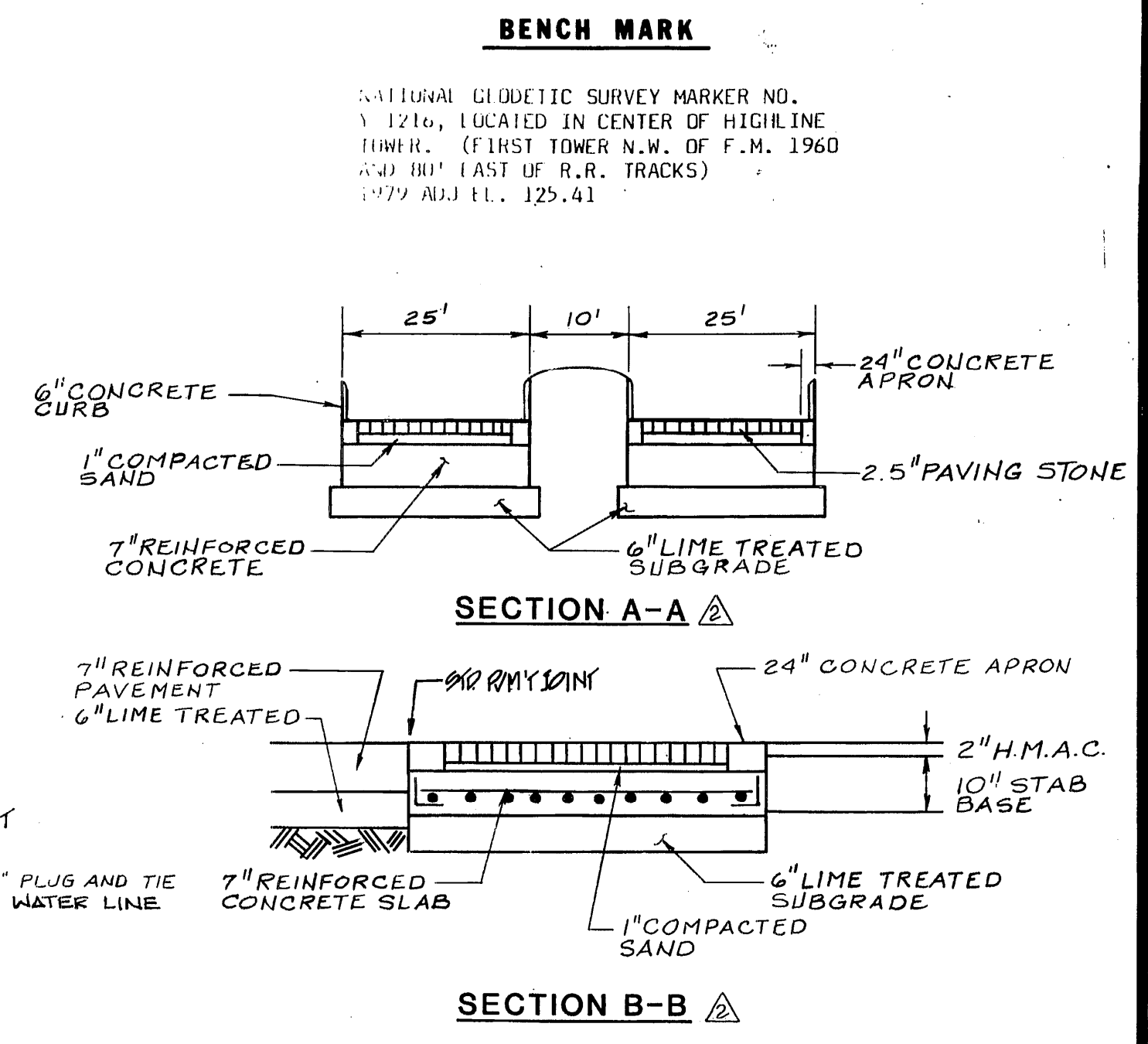
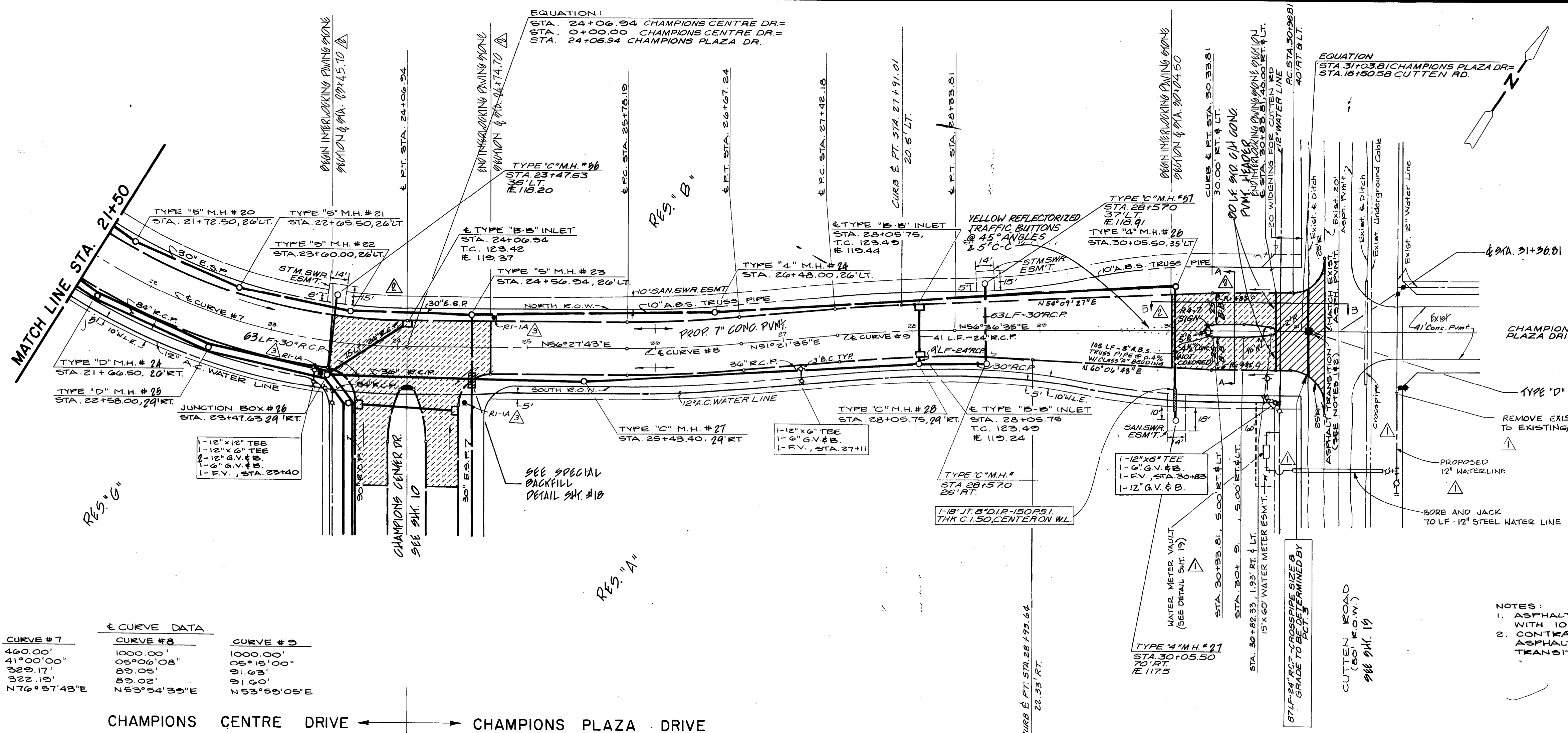
Brain 10/18/82
Amel 12/20/82
William 10/21/82
10/24/82

Alan Carter *James Schuff*

11-5-82
Randall P. Kelly

| Rev. | Date | Description | App. |
|--|----------------------|--------------------|------|
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE | | | |
| H. C. M.U.D. No. 191 | | | |
| CHAMPIONS CENTRE DRIVE STA. 10+50 TO STA. 21+50 | | | |
| Design By: J.W. | Job No: 85003 | Sheet | 6 |
| Drawn By: R.K. | Scale: HORIZ. 1"=50' | Scale: VERT. 1"=5' | |
| Checked By: J.E.M. | Date: SEPT. 1982 | of | 21 |

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

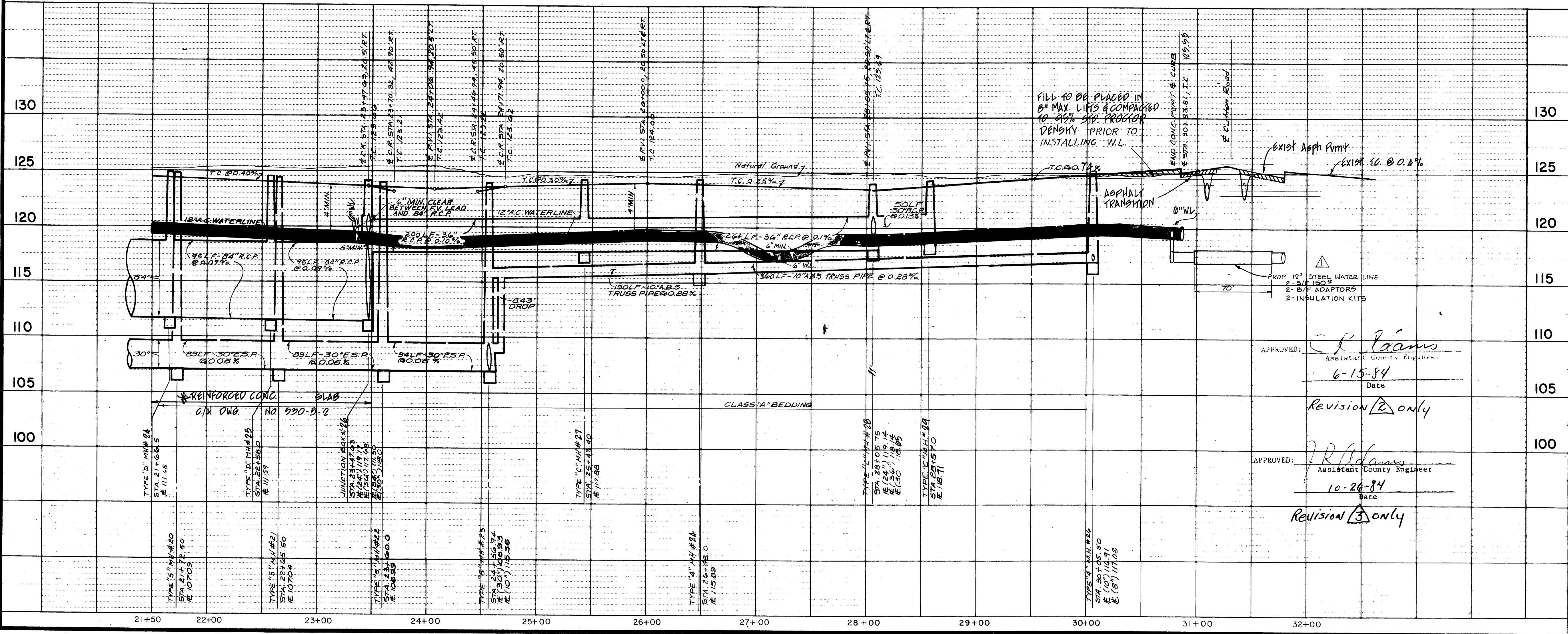


± CURVE DATA

| CURVE #7 | CURVE #8 | CURVE #9 |
|-------------|-------------|-------------|
| 460.00' | 1000.00' | 1000.00' |
| 41°00'00" | 06°06'08" | 06°15'00" |
| 329.17' | 89.08' | 91.68' |
| 322.15' | 89.02' | 91.60' |
| N76°57'43"E | N53°54'35"E | N53°55'05"E |

- NOTES:
- ASPHALT TRANSITION TO BE 2" H.M.A.C. WITH 10% CEMENT STABILIZED BASE
 - CONTRACTOR TO MAKE PROPOSED ASPHALT P.V.M.T. TO FORM A SMOOTH TRANSITION WITH EXIST. P.V.M.T.

APPROVED: *Richard P. Davis*
County Engineer
APPROVED: *12-16-82*
Engineer in Charge
Water & Sanitary Sewer Lines Approved as to location only.



APPROVED: *R Adams*
Assistant County Engineer
6-15-84
Date
Revision 2 only

APPROVED: *J.R. Adams*
Assistant County Engineer
10-26-84
Date
Revision 3 only

James E. Mochlen

Hubert 10/28/82
Amiquil 10/20/82 & Robinson 10/11/82
with 24' for 6/16/82

Old School James E. Mochlen

11-5-84
Russell Riley

| Rev. | Date | Description | App. |
|------|--------|---|------|
| △ | 10/84 | ADDED STOP SIGNS FOR THREE WAY STOP | |
| △ | 9/84 | ADDED INTERLOCKING PAVING STONE SECTION | MWB |
| △ | 3-1-83 | ADDED WATER LINE INTERCONNECT | MWB |

CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE

H. C. M.U.D. No. 191

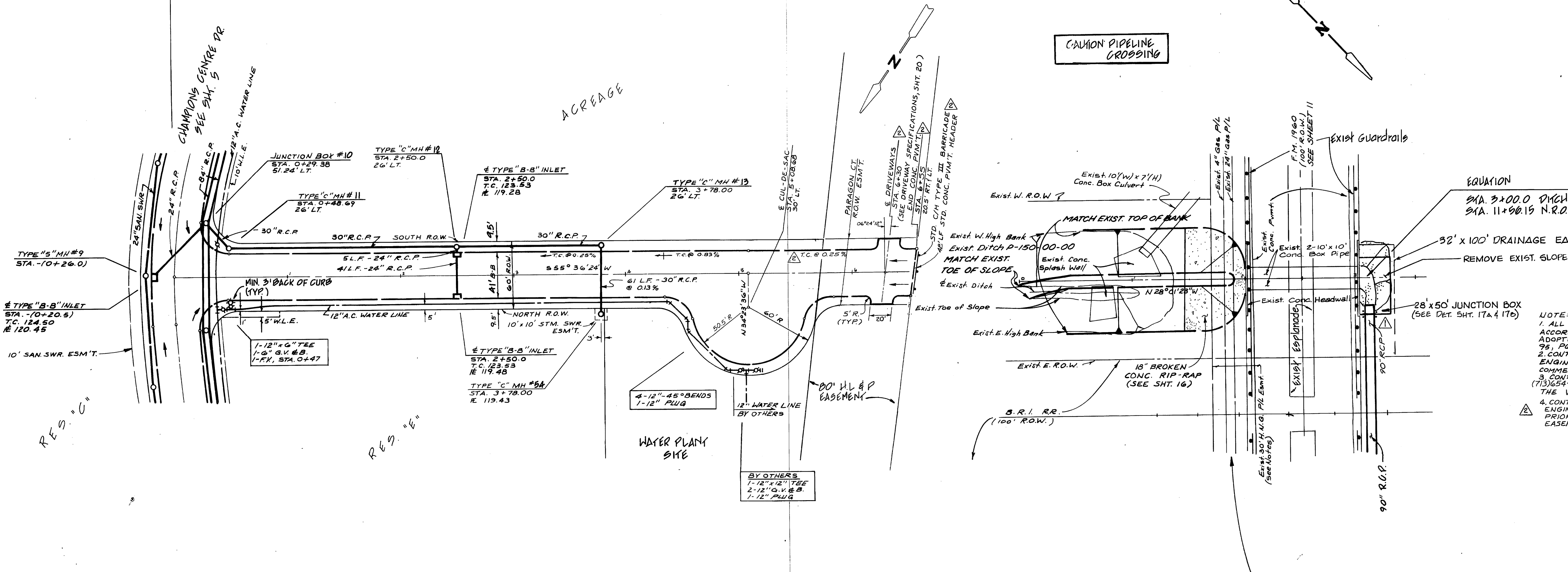
CHAMPIONS CENTRE DRIVE
CHAMPIONS PLAZA DRIVE
STA. 21+50 TO STA. 32+00

Design By: J.W. Job No: 85003 Sheet 7
Drawn By: J.A.M. Scale: HORIZ. 1"=50' Scale: VERT. 1"=25'
Checked By: J.E.M. Date: SEPT. 1982 of 21

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

EQUATION:
STA. 0+00.0 PARAGON CT.
= STA. 9+41.92 CHAMPIONS CENTRE DR.

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



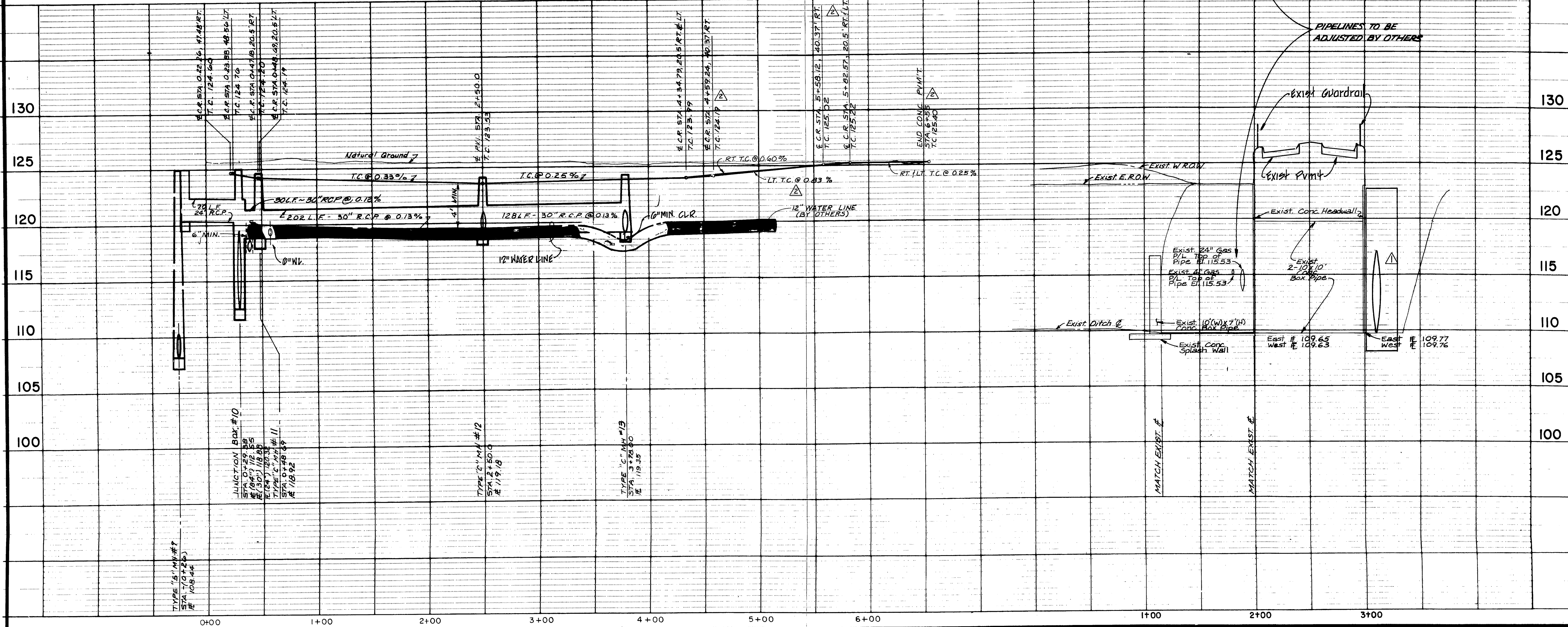
APPROVED: *Richard P. Koss*
County Engineer

APPROVED: *12-16-82*
Engineer in Charge

Water & Sanitary Sewer Lines Approved
as to location only.

PARAGON COURT

H.C.F.C.D. DITCH P-150-00-00



James E. Mockler

Shirley 10-28-82
Approved 10-28-82
William J. [unclear]
10/26/82

Alan [unclear] *James [unclear]*

Randall [unclear]

| Rev. | Date | Description | App. |
|---------|------|---------------------------------------|------|
| 7-13-83 | | EXTEND P.V.M.T. THROUGH H.L.P. ESM.T. | M.B. |
| 4-11-83 | | CHANGE 96" G.C.M.P. TO 90" RCP | M.B. |

**CHAMPIONS CENTRE SECTION ONE
& WILLOW CENTRE SECTION ONE**

H.C. M.U.D. No. 191
PARAGON COURT
STA. 0+00 TO STA. 5+41.92
H.C.F.C.D. DITCH P-150-00-00

| | | |
|--------------------|----------------------|-------|
| Design By: J.W. | Job No: 85003 | Sheet |
| Drawn By: R.K. | Scale: HORIZ. 1"=50' | 9 |
| Checked By: J.E.M. | Date: SEPT. 1982 | |

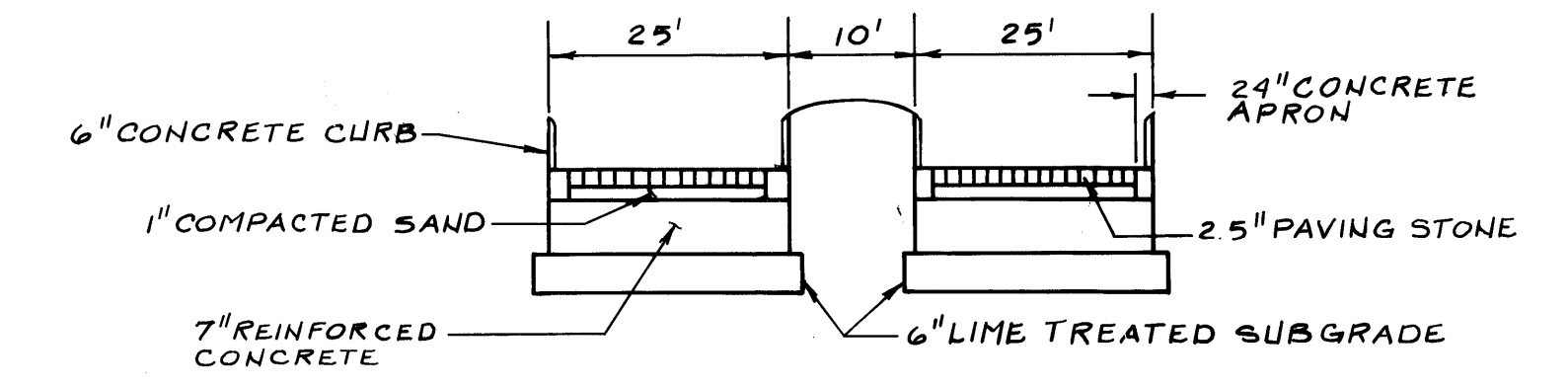
LANDEV ENGINEERS, INC.
1706 SEAMIST DRIVE
Houston, Texas 77008

EQUATION:
 STA 0+00 CHAMPIONS CENTRE DR
 STA 0+00 CHAMPIONS CENTRE DR
 STA 0+00 CHAMPIONS PLAZA DR

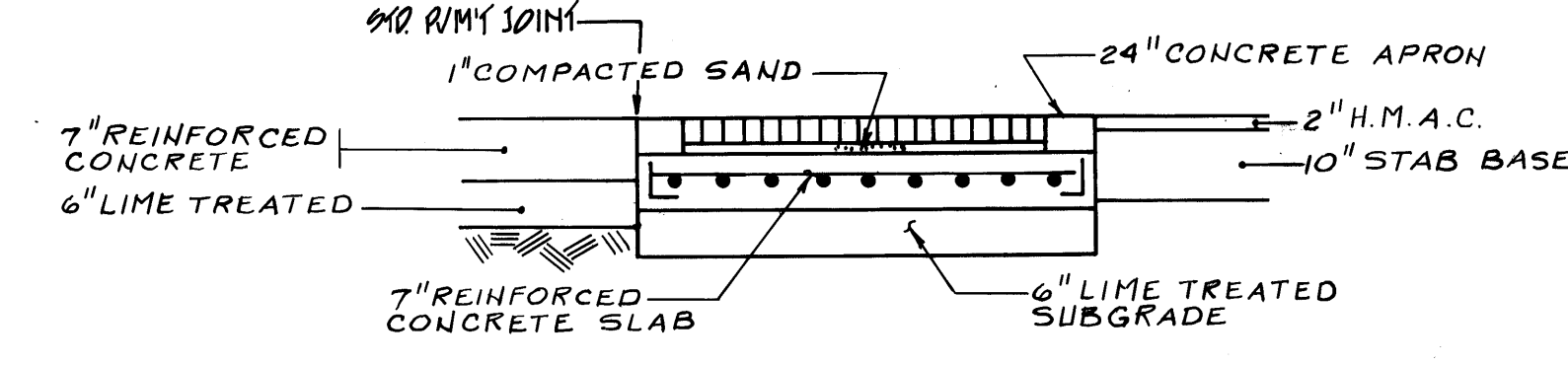
EQUATION:
 STA 5+30.00 CHAMPIONS CENTRE DR =
 STA 0+00.00 FM 1960
 END INTERLOCKING PAVING STONE SECTION
 BEGIN APPROXIMATE TRANSITION

BENCH MARK

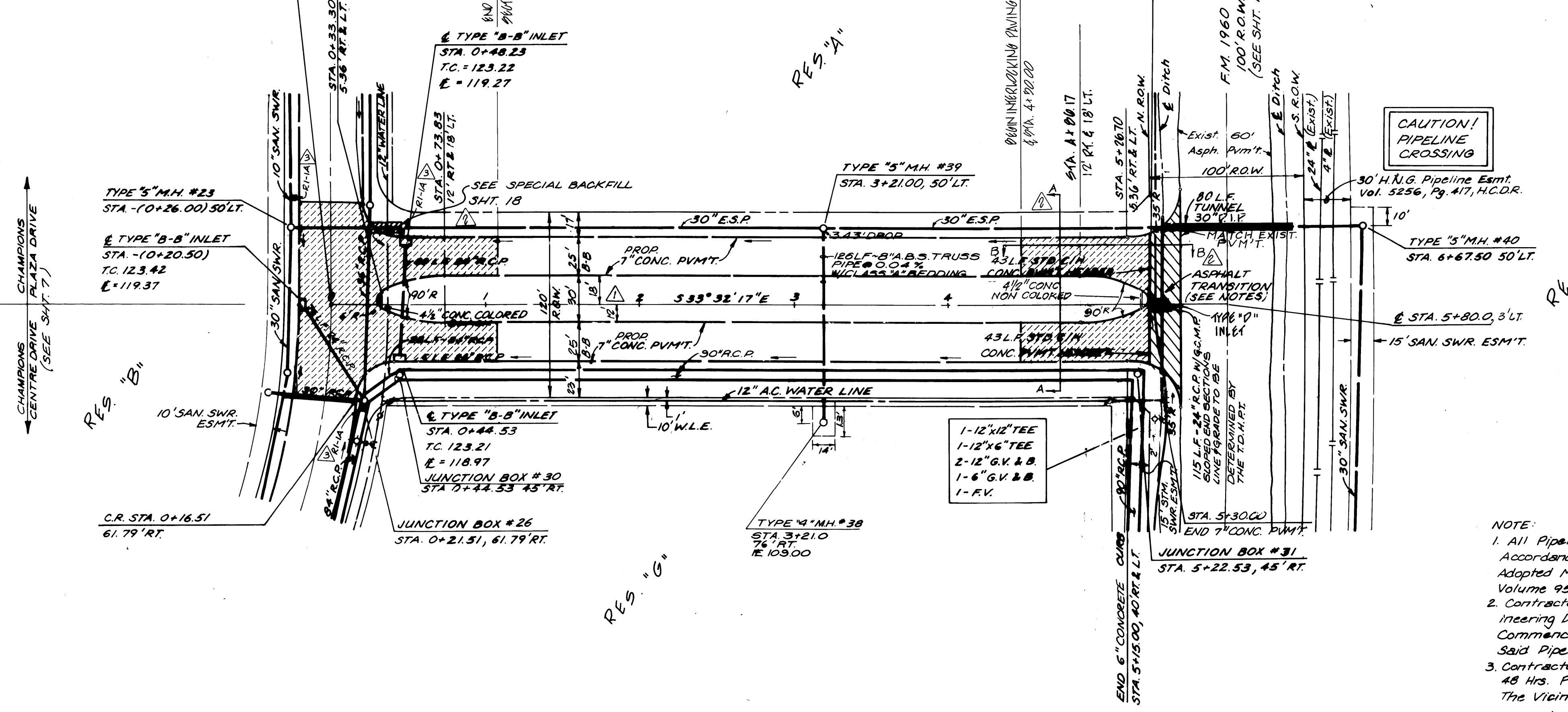
NATIONAL GEODETIC SURVEY MARKER NO. Y-1216, LOCATED IN CENTER OF HIGHLINE TOWER. (FIRST TOWER N.W. OF F.M. 1960 AND 80' EAST OF R.R. TRACKS) 1979 ADJ EL. 125.41



SECTION A-A



SECTION B-B



- NOTE:
- All Pipelines Shall Be Protected In Accordance With Harris Co. Specifications Adopted May 12, 1977 and Recorded in Volume 95, Pg. 328.
 - Contractor to Notify Harris Co. Engineering Dept. 48 Hrs. in Advance of Commencing Construction Around Said Pipeline.
 - Contractor to Notify MR. GENE GEBARGE 48 Hrs. Prior to Working Over Or In The Vicinity of Houston Pipeline Co.
4. Contractor to Notify Mr. W.N. Taylor T.D.H.R.T. 48 Hours Prior to Starting Const. in The Vicinity of FM 1960. Phone: 713-446-2822
5. Contractor To Werp Proposed Asphalt Pvm't. To Form Smooth Transition With Existing Pvm't.
6. Pavement Transition Shall Consist of 6" Stabilized Subgrade (W/6% Lime By Wt.), 10" Cement Stabilized Base (W/3% Lime By Wt.), MC-30 Prime Coat At 0.15 Gal./S.Y. and 2" H.M.A.C. Type "D".
- PHONE: 713-092-0101

APPROVED: *Richard N. Doss*
 County Engineer

APPROVED: 12-16-82
 Engineer in Charge

Water & Sanitary Sewer Lines Approved as to location only.

APPROVED: *Richard N. Doss*
 County Engineer

APPROVED: 2-14-84
 Engineer in Charge

Revision A Only

Juanita Mallon

APPROVED: *R. Adams*
 Assistant County Engineer

6-15-84
 Date

Revision B Only

APPROVED: *R. Adams*
 Assistant County Engineer

10-26-84
 Date

Revision C Only

Phillips 10/28/84
Phillips 10/28/84
Phillips 10/28/84

Alto *James*

Randall Kelly

| Rev. | Date | Description | App. |
|---------|------|--|--------|
| 10/84 | | ADDED STOP SIGNS FOR THREE WAY STOP | |
| 9/84 | | MOVED INTERLOCKING PAVING STONE SECTION | M.H.P. |
| 1/20/84 | | OFFSET CENTERLINE OF CHAMPIONS CENTRE DRIVE 3'-0" EAST OF R.O.W. CENTERLINE. | M.H.P. |

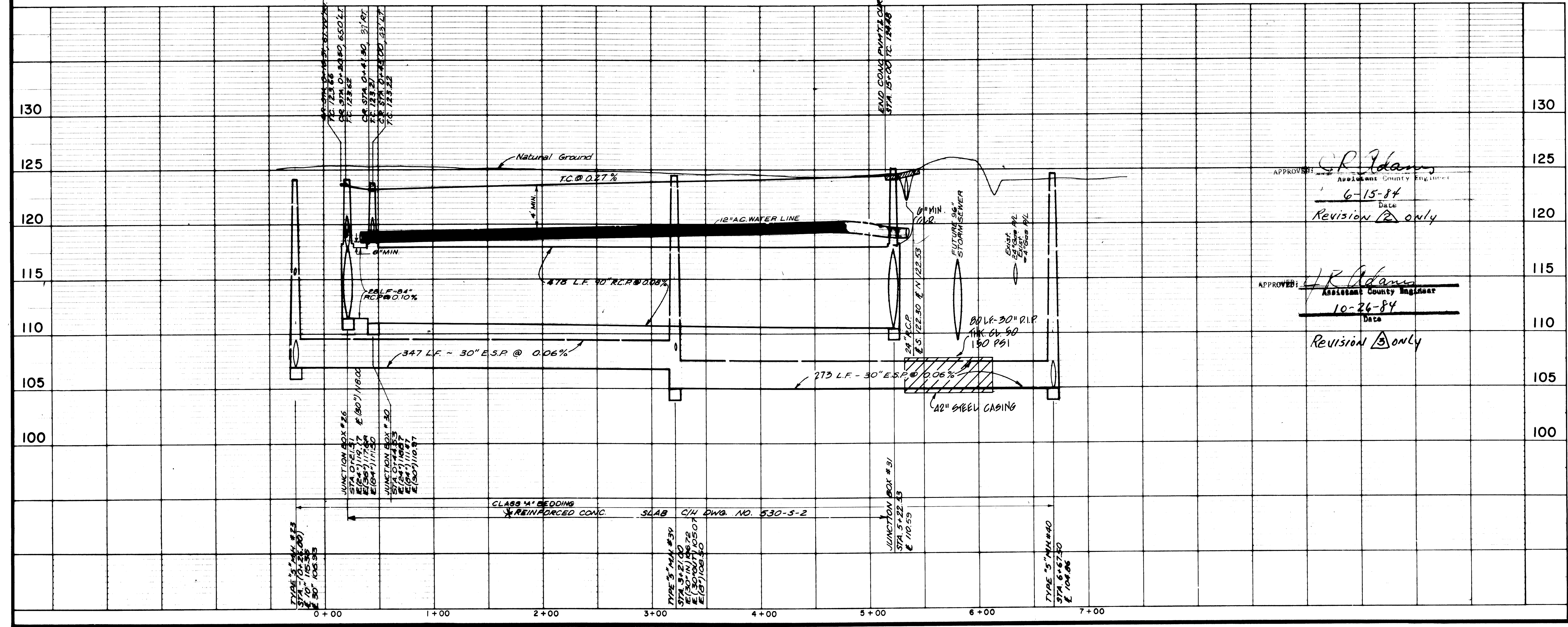
CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE

H. C. M.U.D. No. 191

CHAMPIONS CENTRE DR.
 STA 0+00 TO STA 7+00

Design By: J.W. Job No: 85003 Sheet 10
 Drawn By: S.S. Horiz: 1"=50' Scale: VERT: 1"=5'
 Checked By: J.E.M. Date: SEPT. 1982 of 21

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

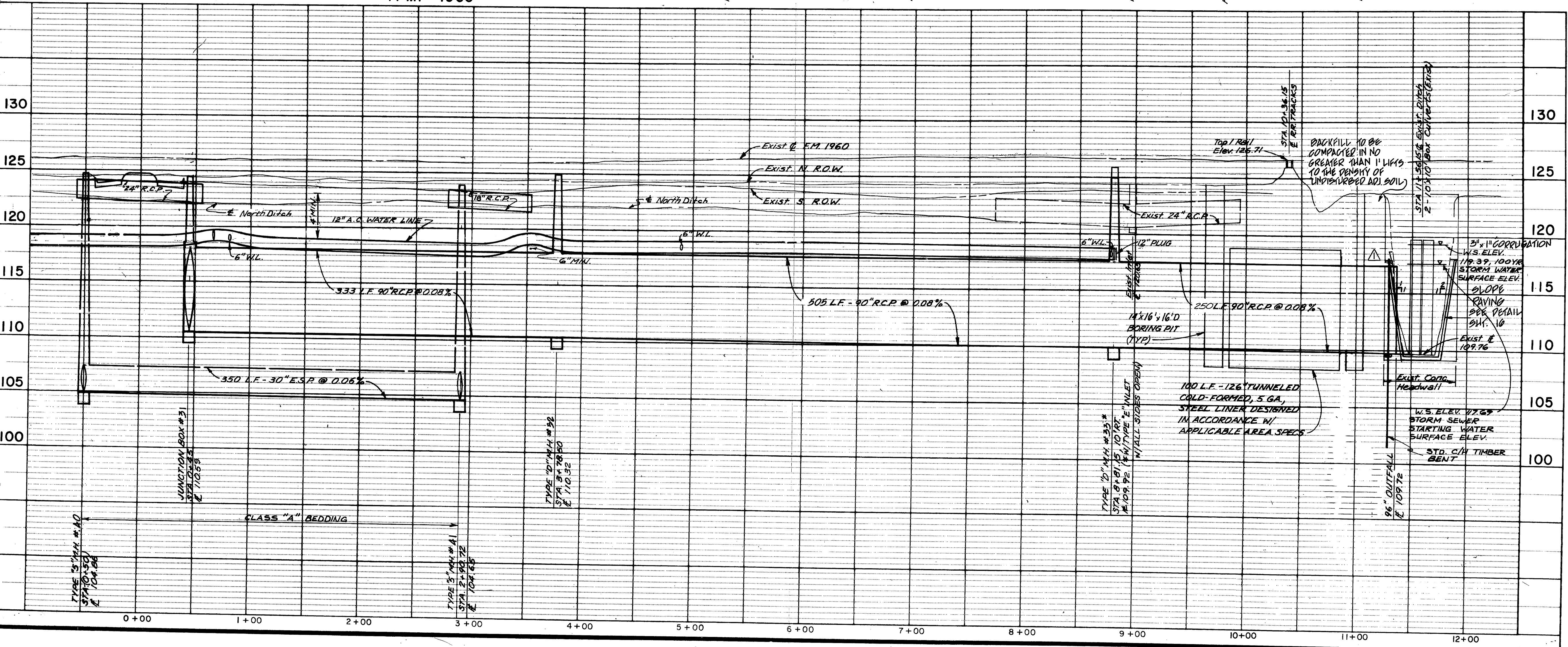
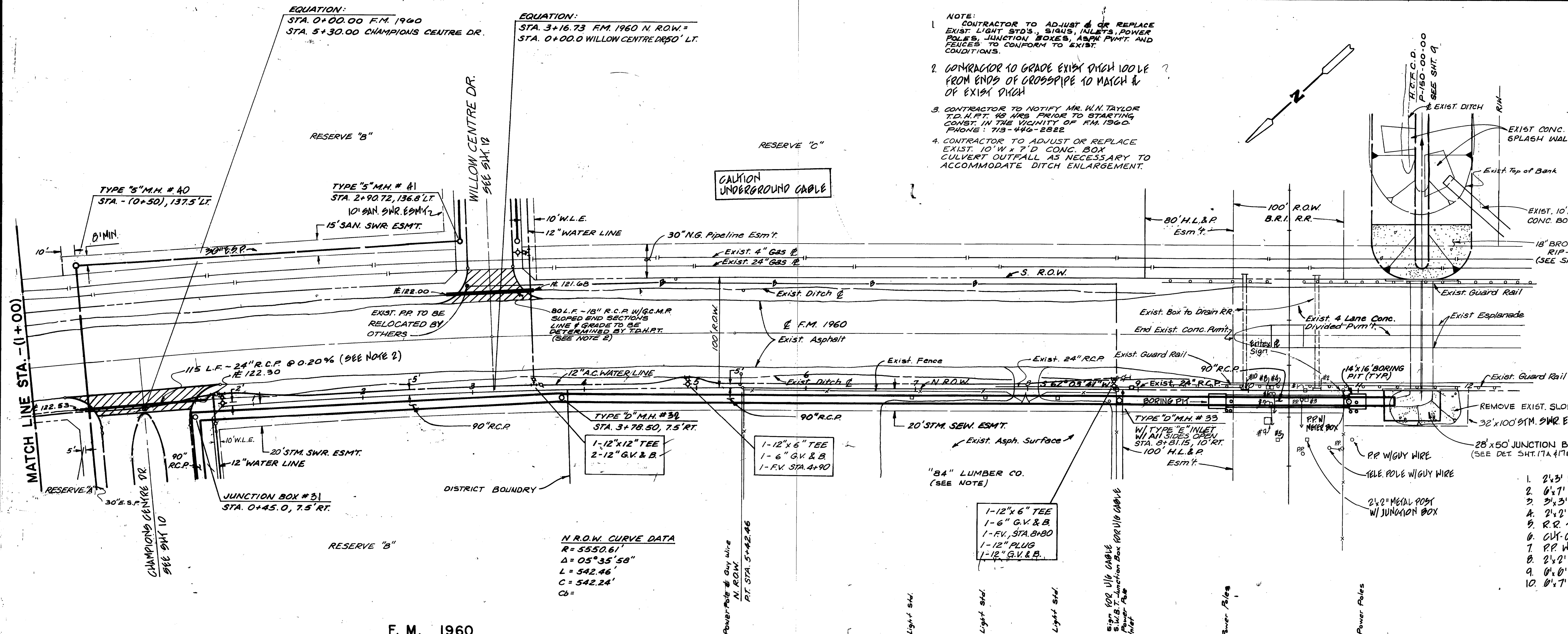


EQUATION:
 STA. 0+00.00 F.M. 1960
 STA. 5+30.00 CHAMPIONS CENTRE DR.

EQUATION:
 STA. 3+16.73 F.M. 1960 N.R.O.W.
 STA. 0+00.0 WILLOW CENTRE DR. 150' LT.

- NOTE:
- CONTRACTOR TO ADJUST & OR REPLACE EXIST. LIGHT STDS., SIGNS, INLETS, POWER POLES, JUNCTION BOXES, ASPH. PAVT. AND FENCES TO CONFORM TO EXIST. CONDITIONS.
 - CONTRACTOR TO GRADE EXIST. DITCH 100' FROM ENDS OF CROSSPIPE TO MATCH & OR EXIST. DITCH
 - CONTRACTOR TO NOTIFY MR. W.N. TAYLOR T.O. H. P.T. 10 HRS. PRIOR TO STARTING CONST. IN THE VICINITY OF RR. 1960. PHONE: 713-440-2882
 - CONTRACTOR TO ADJUST OR REPLACE EXIST. 10' W x 7' D CONC. BOX CULVERT OUTFALL AS NECESSARY TO ACCOMMODATE DITCH ENLARGEMENT.

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



APPROVED: *[Signature]*
 County Engineer

APPROVED: 12-16-82
 Engineer in Charge

Water & Sanitary Sewer Lines Approved as to location only.

- EXISTING
- 2'x3' METAL SIGNAL BOX
 - 6'x7' CONC. HEADWALL
 - 3'x3' CONC. BOX W/ METAL LID ELEC.
 - 2'x2' CONC. BASE FOR R.R. GATE
 - R.R. TRACK SWITCH
 - CUT-OFF P.P. W/ GUY WIRE
 - P.P. W/ GUY WIRE
 - 2'x2' CONC. BASE FOR R.R. SIGNAL LIGHT
 - 0'x0' METAL PORTABLE BUILDING
 - 0'x7' CONC. HEADWALL

APPROVED: *[Signature]*
 M.T.S.

2/13/84

THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY

APPROVED: *[Signature]*
 M.T.S.

10/5/82

THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY

SDF

[Signatures]
 10/28/82
 10/28/82
 11/2/82
 11-5-82
 Randall Riley

| Rev. | Date | Description | App. |
|---------|------|------------------------------|------|
| 4-26-83 | | ADDED 28' x 50' JUNCTION BOX | |
| 4-11-83 | | CHANGE 96\"/> | |

**CHAMPIONS CENTRE SECTION ONE
 B & WILLOW CENTRE SECTION ONE**

H. C. M.U.D. No. 191

F.M. 1960
 STA. (1+00) TO STA. 12+00

| | | |
|--------------------|---------------------|-------|
| Design By: J. W. | Job No: 85003 | Sheet |
| Drawn By: J.A.M. | Scale: HORIZ. 1\"/> | |
| Checked By: J.E.M. | Date: SEPT. 1982 | of 21 |

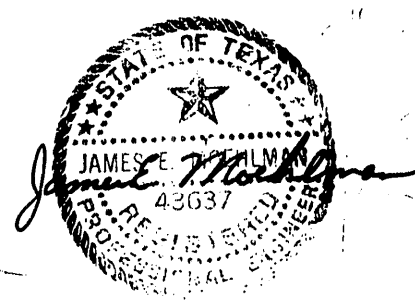
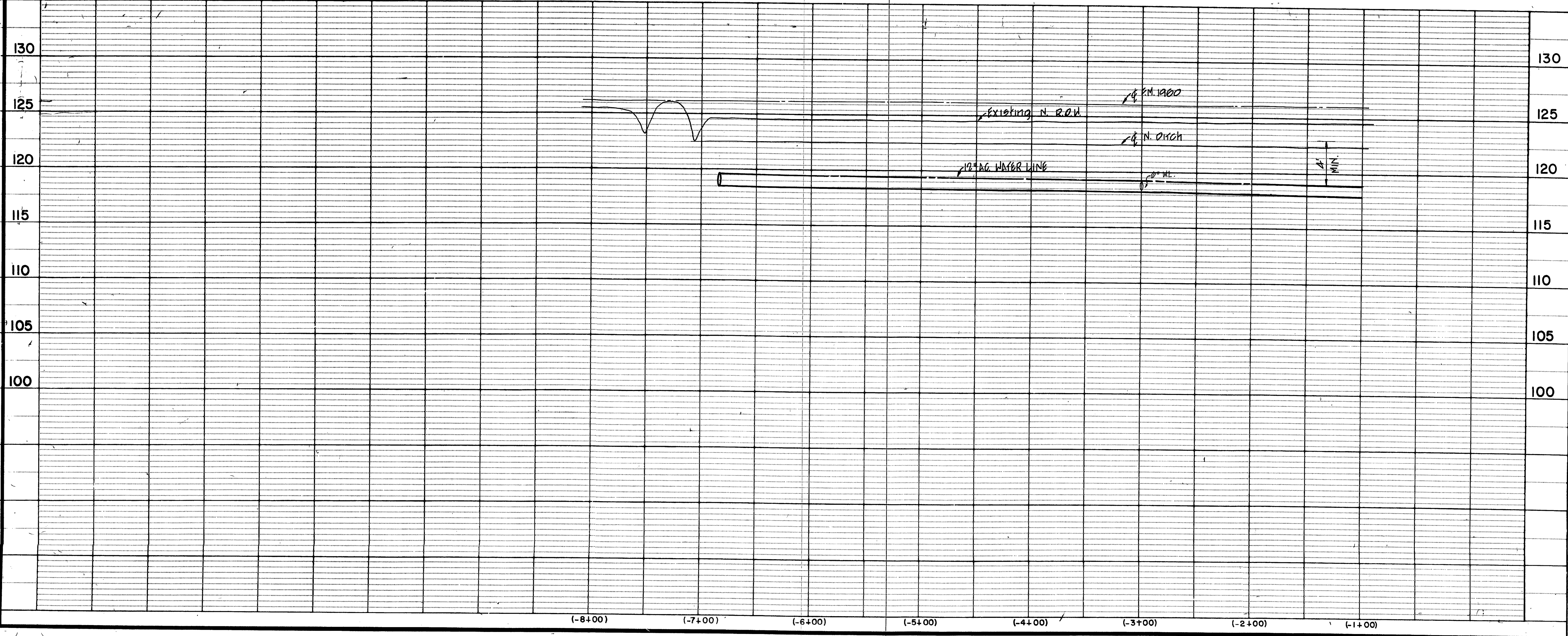
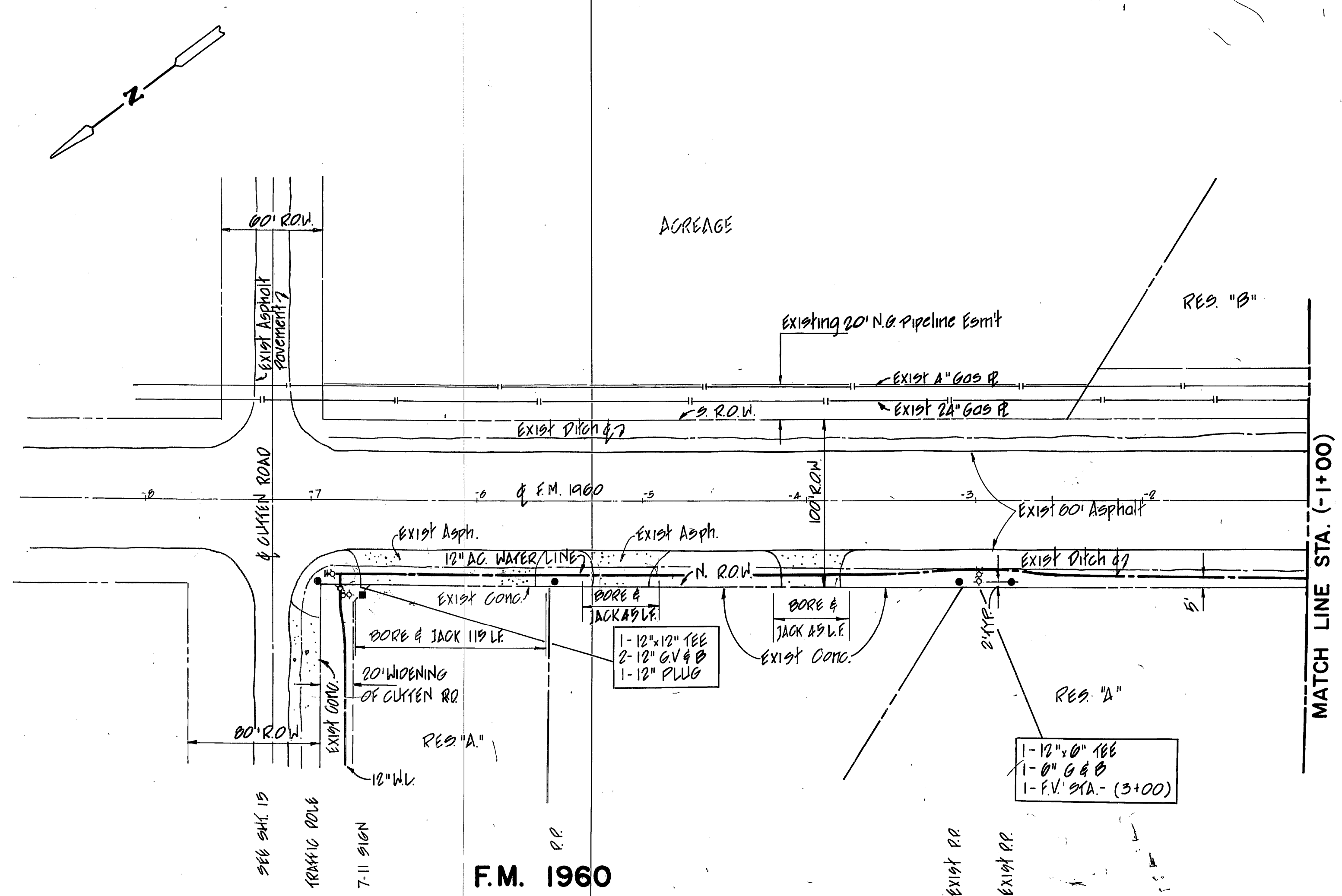
LANDEV ENGINEERS, INC.
 1706 SEAMIST DRIVE
 Houston, Texas 77008

BENCH MARK

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

NOTES:

- 1. CONTRACTOR SHALL VERIFY ALL LOCATIONS & DEPTHS OF ALL UTILITIES, POLES & PUMPS IN THE FIELD.
- 2. CONTRACTOR TO NOTIFY MR. W.N. TAYLOR T.O. H.P.T. 48 HRS. PRIOR TO STARTING WORK IN THE VICINITY OF F.M. 1960. PHONE: 713-446-2822



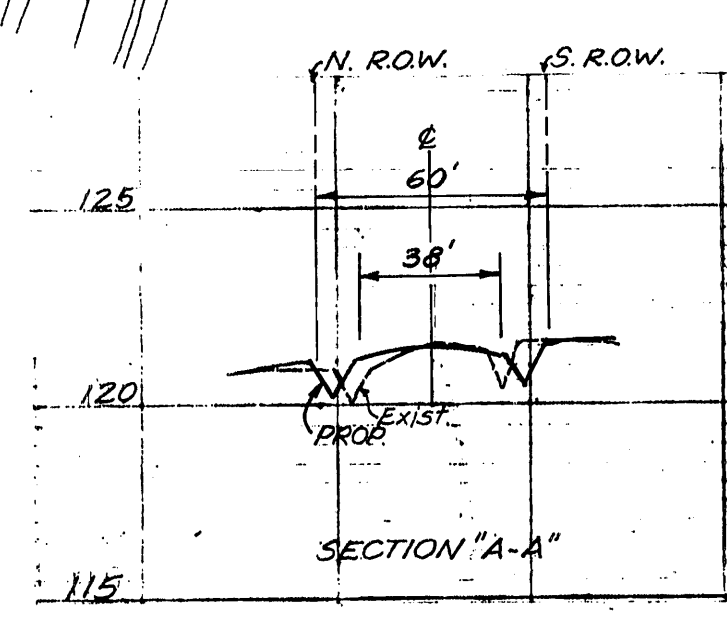
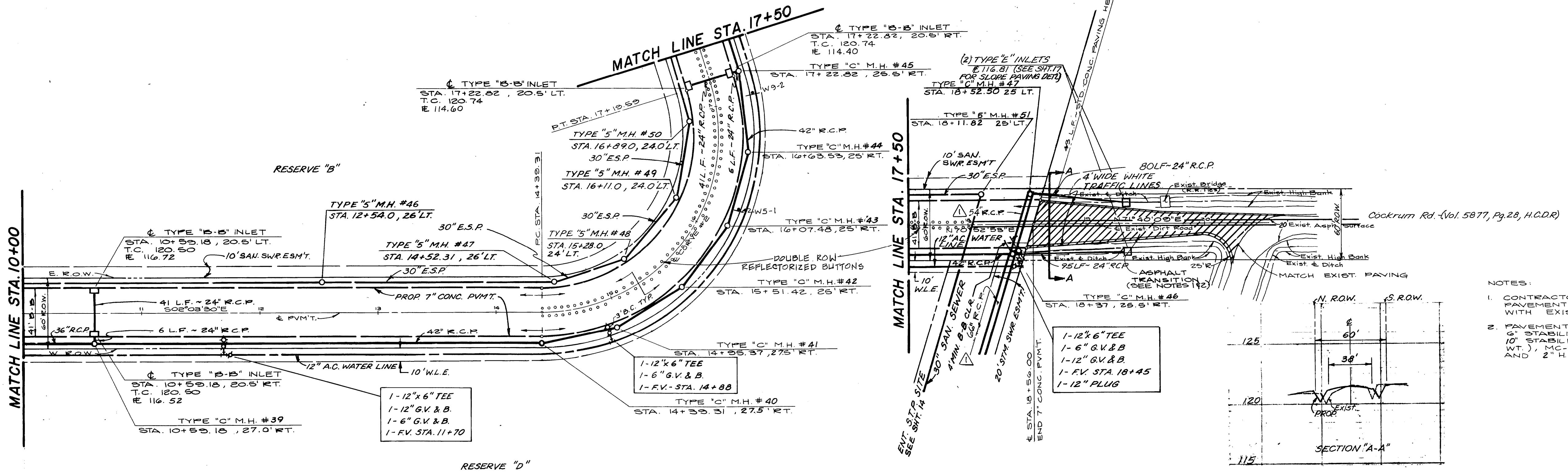
APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS
 Water Dept.
 Planning
 Assistant Director Water Use
 Sanitary Engineer
 Date: 11-5-87
 OTHER DEPT'S
 Randall R. Ritz

| Rev. | Date | Description | App. |
|---|-------------------------------------|------------------|--------------|
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE | | | |
| H.C. M.U.D. No. 191 | | | |
| FM 1960 STA. (-1+00) TO STA. (-7+00) | | | |
| Design By: J.W. | Job No: 85003 | Sheet | 11a of 21 |
| Drawn By: M. W. [Signature] | Scale: HORIZ. 1"=50' VERT. 1"=5' | Date: SEPT. 1982 | |
| Checked By: J.E.M. | | Date: SEPT. 1982 | |
| LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008 | | | |

± CURVE DATA
 CURVE # 2
 P.C.T. = 107°09'37"
 P.T. = 150.00'
 L = 808.08'
 R = 841.25'
 ELEV. = 55.16 E

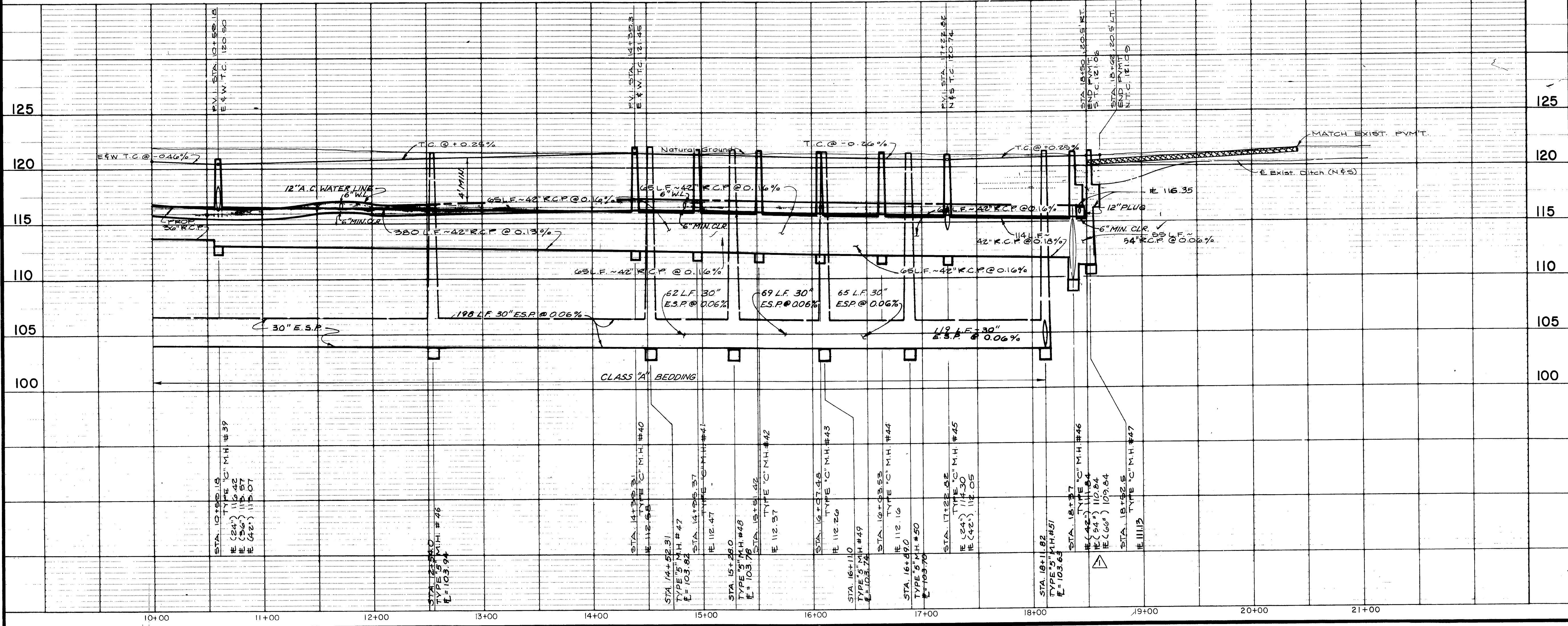
BENCH MARK

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



NOTES:
 1. CONTRACTOR TO WARP PROPOSED ASPHALT PAVEMENT TO FORM SMOOTH TRANSITION WITH EXISTING PAVEMENT.
 2. PAVEMENT TRANSITION SHALL CONSIST OF 6" STABILIZED SUBGRADE (W/ 6% LIME BY WT.), 10" STABILIZED CRUSHED STONE (W/ 3% LIME BY WT.), MC-30 PRIME COAT AT 0.25 GAL./SY., AND 2" H.M.A.C. TYPE 'D'.
 APPROVED: *Richard L. Reed*
 County Engineer
 APPROVED: *12-16-82*
 Engineer in Charge
 Water & Sewer Lines Approved as to Location Only.

WILLOW CENTRE DRIVE COCKRUM ROAD

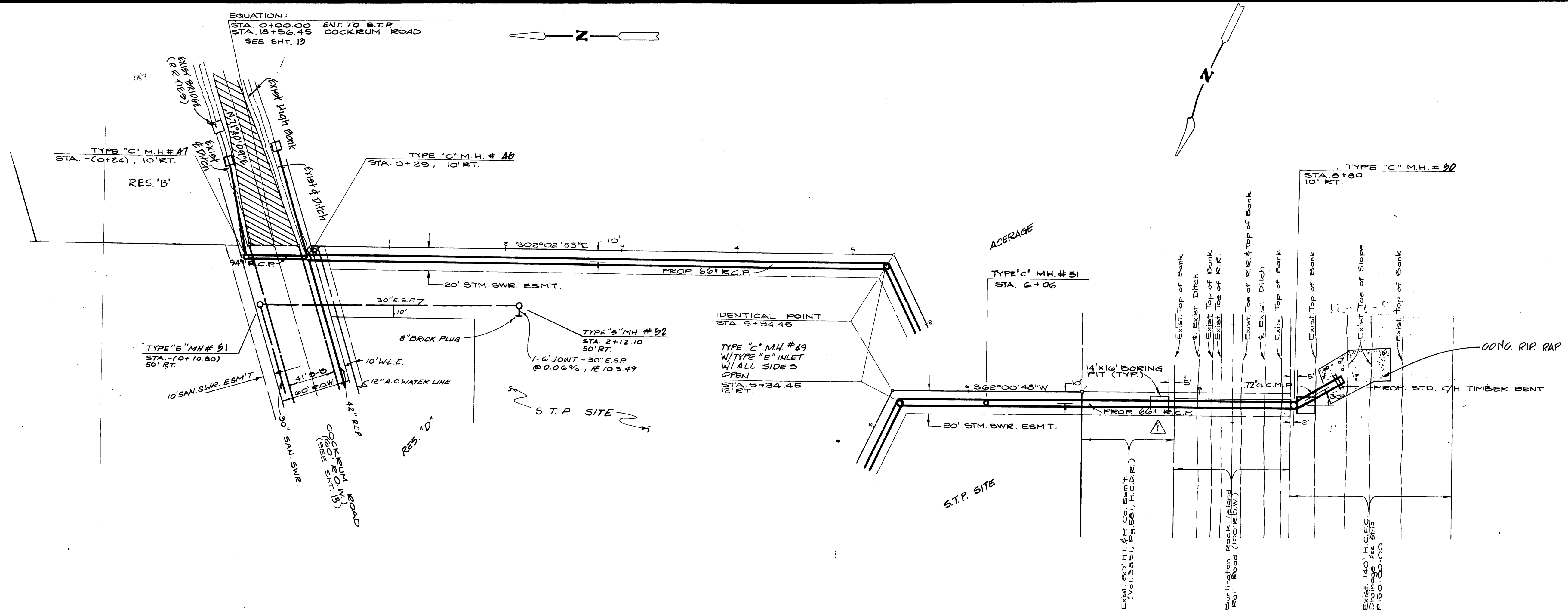


Jimm E. Madson
 10-28-82
 10/24/82
John Smith
John W. Weger
Willie H. P.
10/24/82
Alvin Adams
James Shiloh
Randall Riley

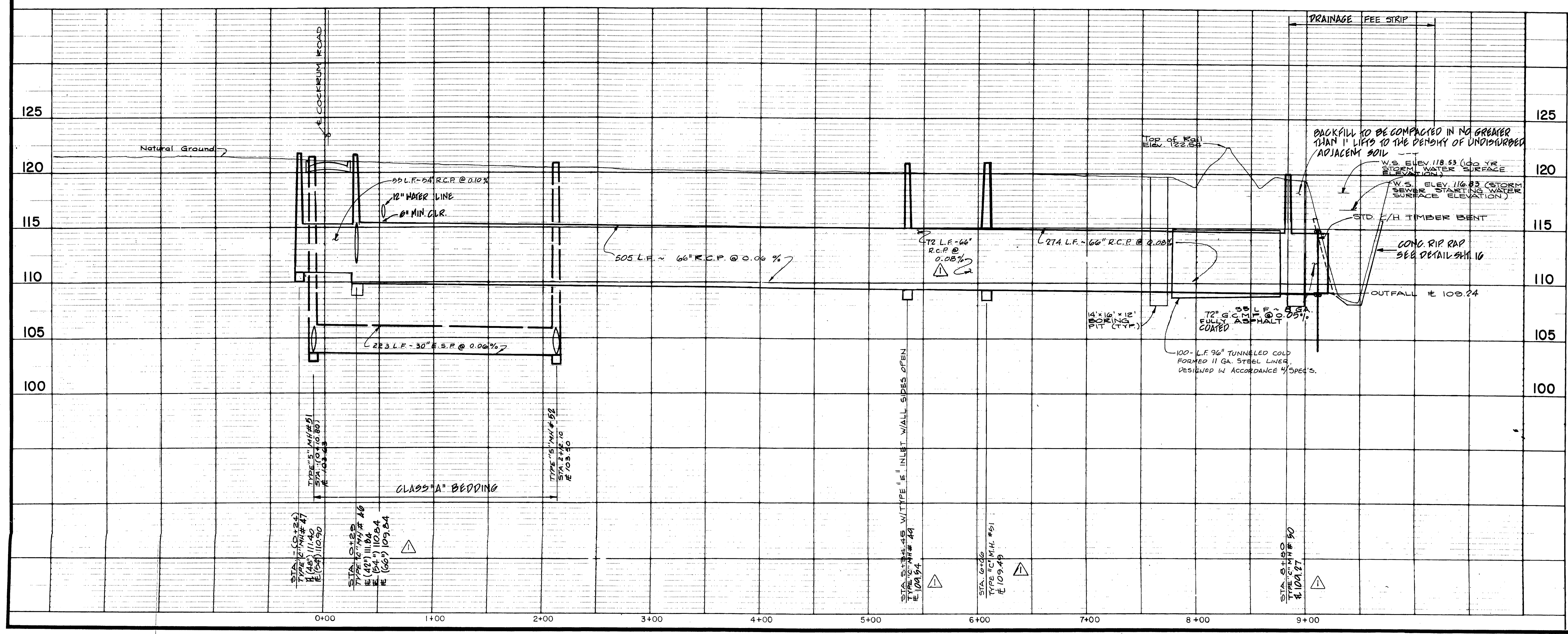
| | | | |
|--|--------------------|---------------------------------------|------|
| Rev. | Date | Description | App. |
| 3-3-83 | | REV'D. STM. SWR. PIPE SIZES & ELEV'S. | |
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE H. C. M.U.D. No. 191 WILLOW CENTRE DRIVE COCKRUM ROAD STA. 10+00 TO STA. 21+00 | | | |
| Design By: J.W. | Job No: 85002 | Sheet | |
| Drawn By: J.A.M. | HORIZ. 1"=50' | 13 | |
| Checked By: J.E.M. | Scale: VERT. 1"=5' | of 21 | |
| Date: SEPT. 1982 | | | |
| LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008 | | | |

BENCH MARK

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



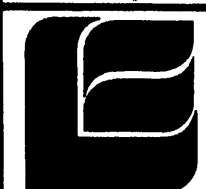
APPROVED: *Richard P. Kroll*
County Engineer
APPROVED: *12-16-82*
Engineer in Charge
Water & Sanitary Sewer Lines Approved as to location only.



APPROVED: *R.L. Mellish*
County Engineer
2/13/84
APPROVED: *Jane E. Mockler*
Engineer in Charge
10/5/82
FOR ONE (1) YEAR ONLY SOF

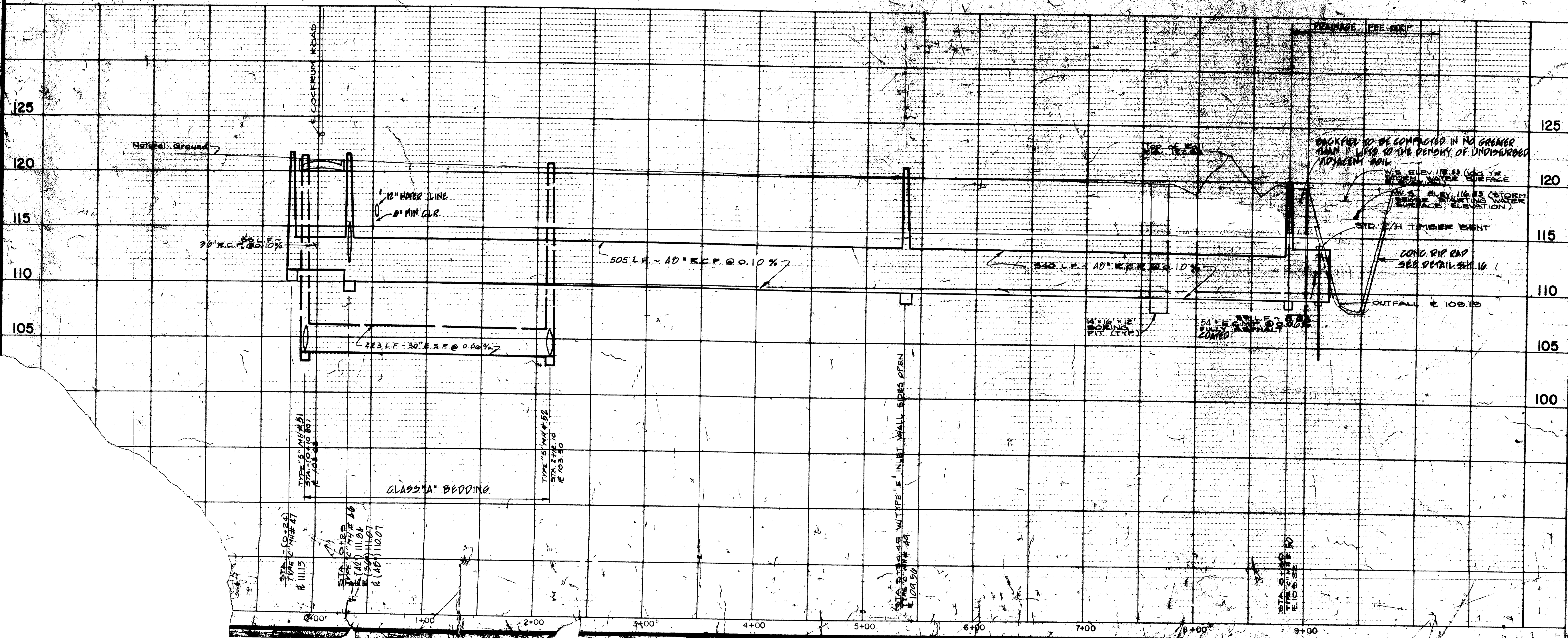
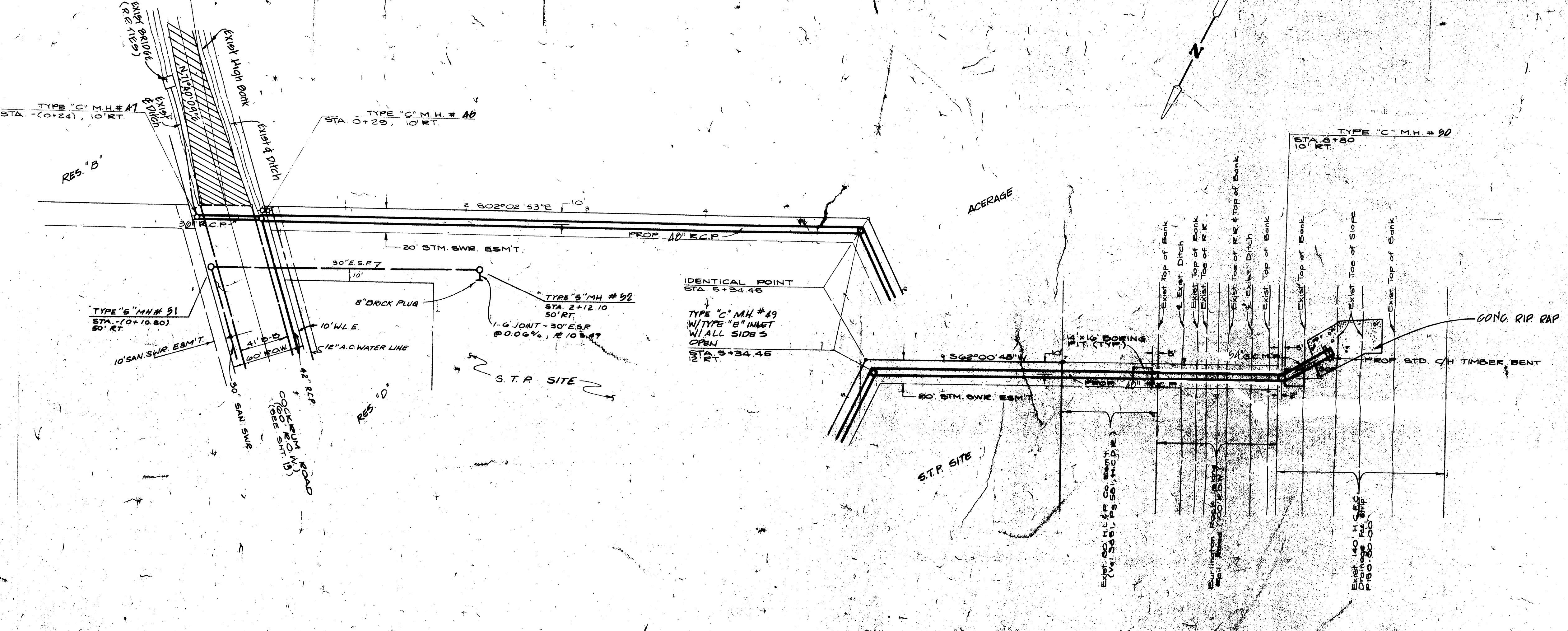
Submittal 10/28/80
Amendment 10/28/80
William H. Neal
10/28/80

John C. ...
Jane E. Mockler
Randall Kelly

| | | | |
|---|--------|--------------------------------------|------------------------------|
| Rev. | Date | Description | App. |
| 3-5-83 | | REV'D STM. SEWER PIPE SIZES & SLOPES | |
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE H.C. M.U.D. No. 191 20' STM. SWR. ESM'T FROM COCKRUM RD. TO P150.00.00 | | | |
| Design By: | J.W. | Job No: | 85003 |
| Drawn By: | J.A.M. | Scale: | HORZ. 1"=50' VERT. 1"=5' |
| Checked By: | J.E.M. | Date: | SEPT. 1982 |
| | | | Sheet 14 of 21 |
|  LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008 | | | |

EQUATION:
 STA 10+00.00 ENT. TO S.T.P.
 STA 18+36.45 COCKRUM ROAD
 SEE SHT. 13

BENCH MARK
 NATIONAL GEODETIC SURVEY MARKER NO.
 Y-1216, LOCATED IN CENTER OF HIGHLINE
 TOWER, (FIRST TOWER N.W. OF F.M. 1960 A
 AND 80' EAST OF R.R. TRACKS)
 1979 ADJ. FL. 125.43



APPROVED: *R. M. [Signature]*
 2/13/84
 THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY

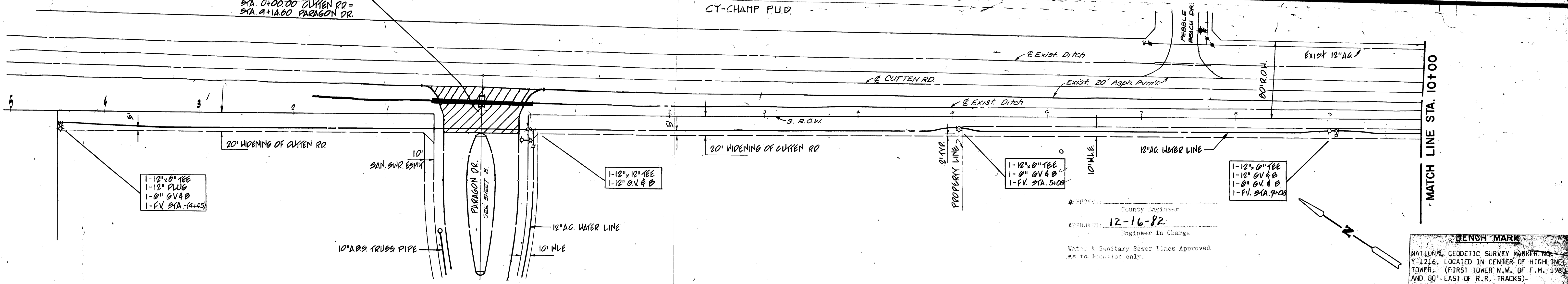
APPROVED: *J. E. [Signature]*
 10/5/82
 THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY

NOTE:
 FOR BIDDING PURPOSES ONLY ON ADDENDUM NO. 1

| | | |
|---|--------|-----------------|
| Rev. | Date | Description |
| CHAMPIONS CENTER & WILLOW CENTER | | |
| H.C. M.U.D. No. 181 | | |
| 20' STM. SWR. ESMT FROM COCKRUM RD. TO P. 180-80 | | |
| Design By: | J.W. | Job No.: 85903 |
| Drawn By: | J.A.M. | Scale: AS SHOWN |
| Checked By: | J.E.M. | Date: SEPT 1984 |
| LANDEV ENGINEERS 1708 SEAMIST HOUSTON, TEXAS | | |

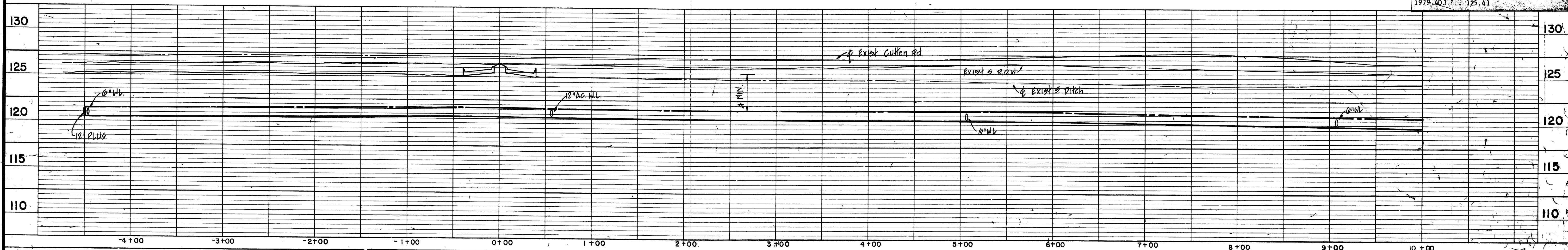
EQUATION:
 STA. 0+00.00 CUTTEN RD =
 STA. 9+18.60 PARAGON DR.

CY-CHAMP P.U.D.



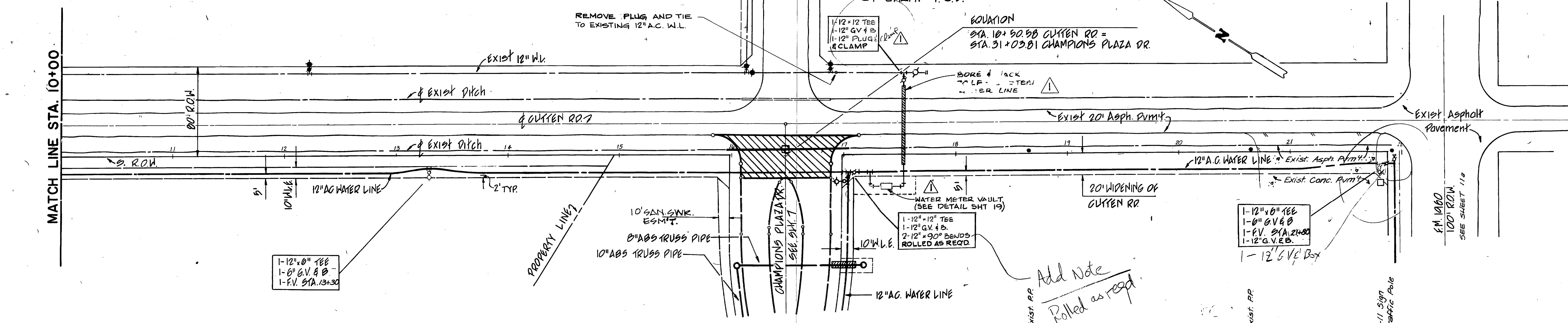
APPROVED: County Engineer
 12-16-82
 Engineer in Charge
 Water & Sanitary Sewer Lines Approved
 as to location only.

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



CY-CHAMP P.U.D.

CY-CHAMP P.U.D.

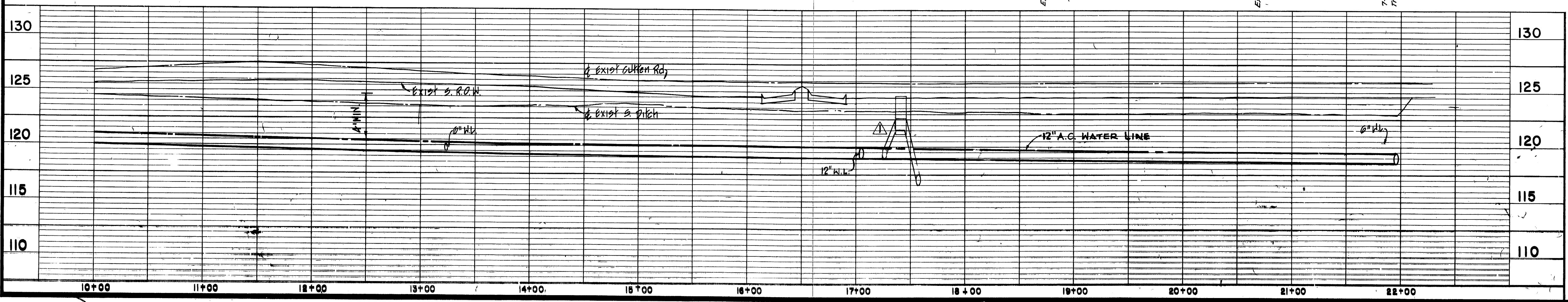


Note: Contractor shall verify all Locations & Depths of All Utilities, Poles & Rvnts. in the Field!

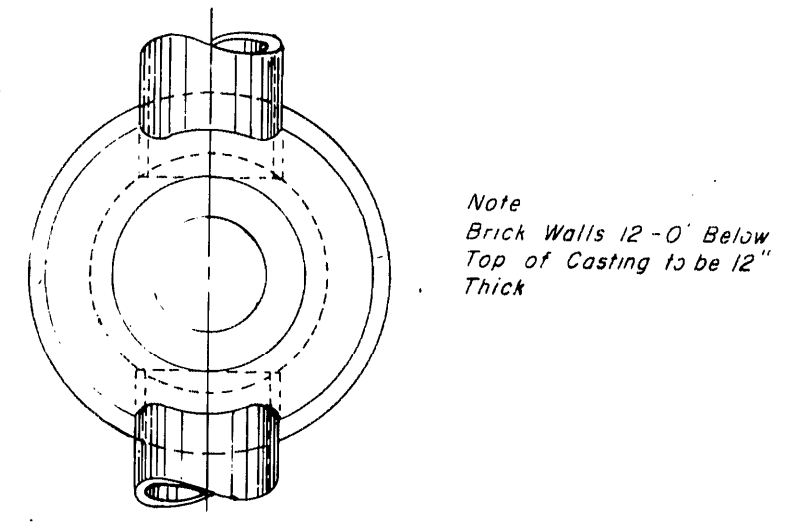
James M. Miller
 Director

APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS
 10-20-82
 Assistant Director - Water Div.
 Assistant Director

Add Note
 Rolled as reqd.

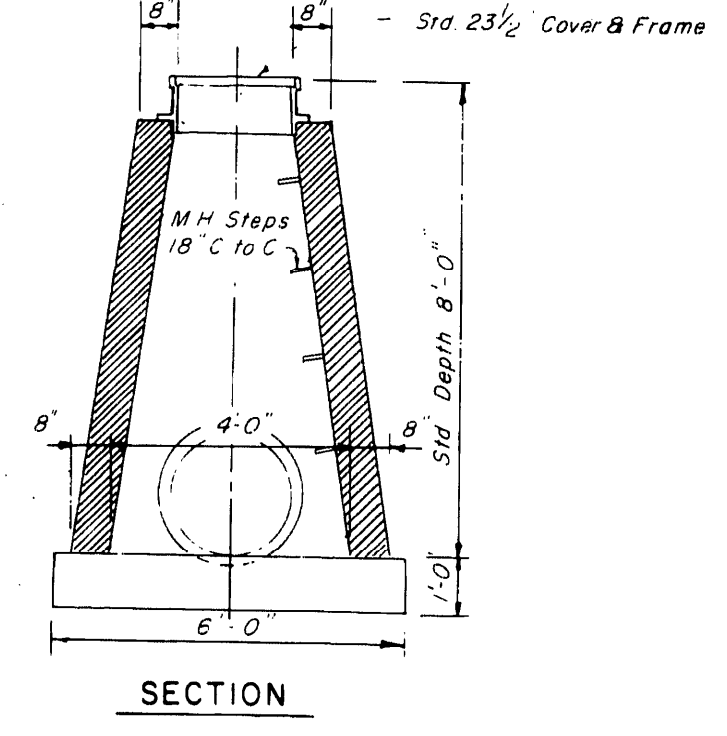


| | | | |
|---|-------------|-------------------------------|---------------------------------|
| Rev. | Date | Description | App. |
| 3-1-83 | | ADDED WATER LINE INTERCONNECT | |
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE | | | |
| H.C. M.U.D. No. 191 | | | |
| CUTTEN ROAD | | | |
| STA. 10+150 TO STA. 22+00 | | | |
| Design By: | J.W. | Job No: | 85003 |
| Drawn By: | S.S. & J.P. | Scale: | HORZ. 1" = 50' VERT. 1" = 5' |
| Checked By: | J.E.M. | Date: | SEPT. 1982 |
| LANDEV ENGINEERS, INC. | | | Sheet 15 of 21 |
| 1708 SEAMIST DRIVE Houston, Texas 77008 | | | |



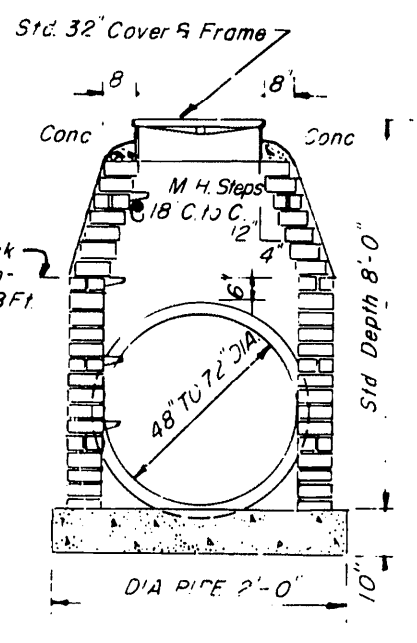
Note
Brick Walls 12'-0" Below
Top of Casing to be 12"
Thick

PLAN OF TYPE "C"
(COVER NOT SHOWN)

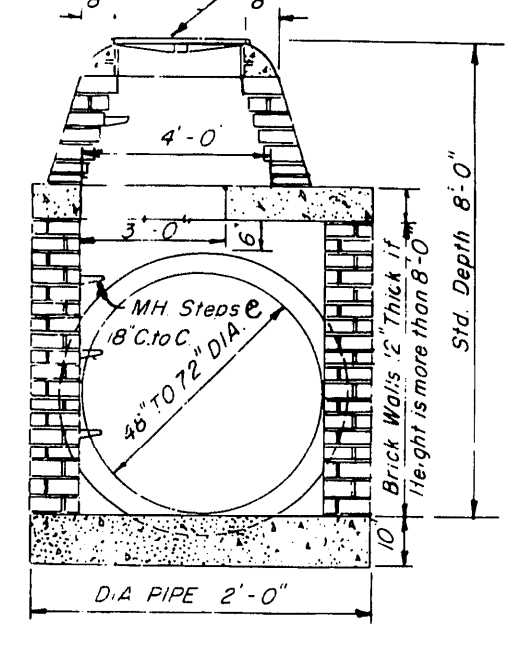


SECTION

STANDARD TYPE "C" MANHOLE FOR
24" TO 42" CONCRETE PIPE STORM SEWER



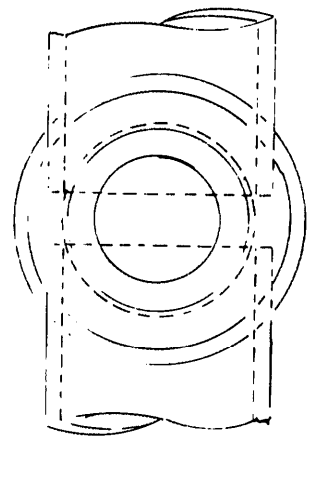
SECTION



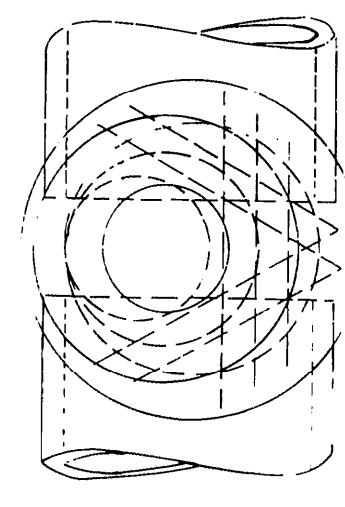
SECTION

When Manhole is less depth
than Min. Shown on Chart,
Above Manhole will be built.

| Size of Pipe | Min Depth |
|-----------------|--------------|
| 48" | 8'-0" |
| 54" | 9'-4" |
| 60" | 10'-7" |
| 66" | 11'-10" |
| 72" | 13'-2" |

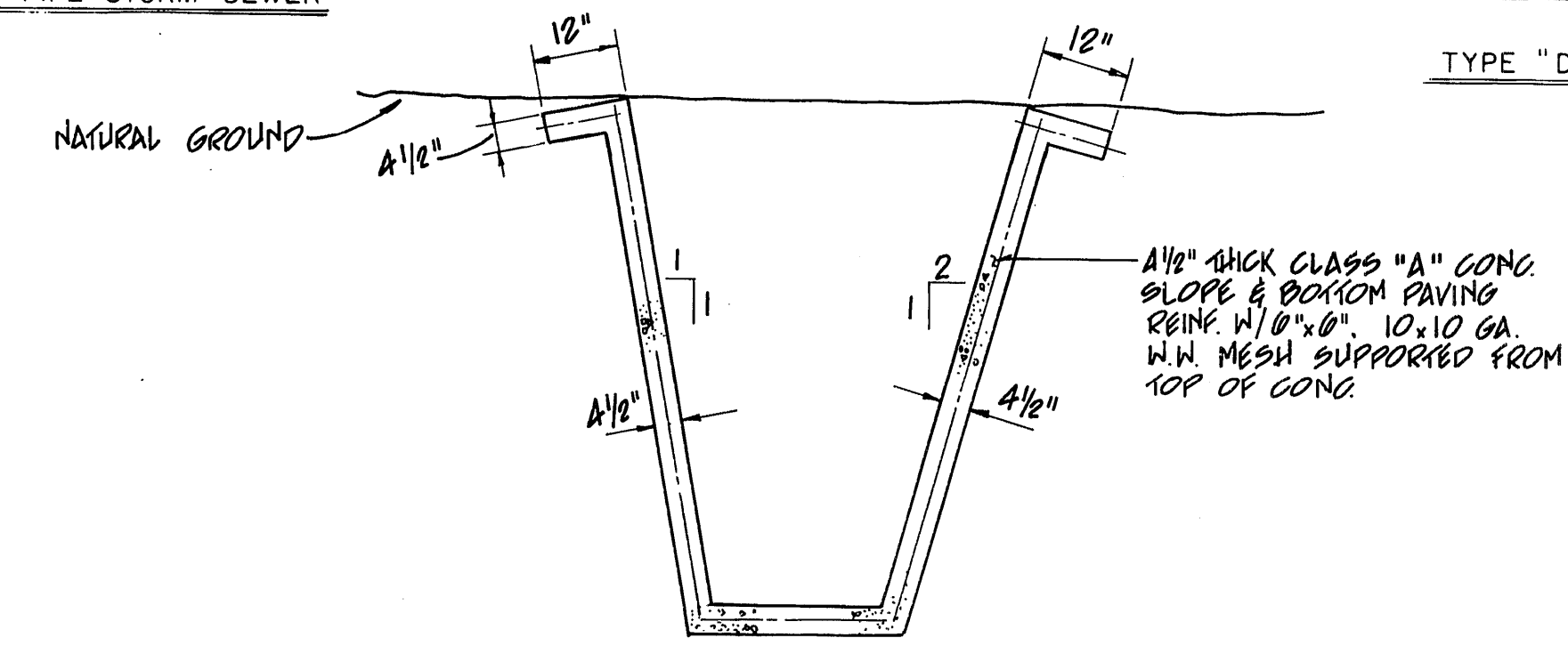


PLAN



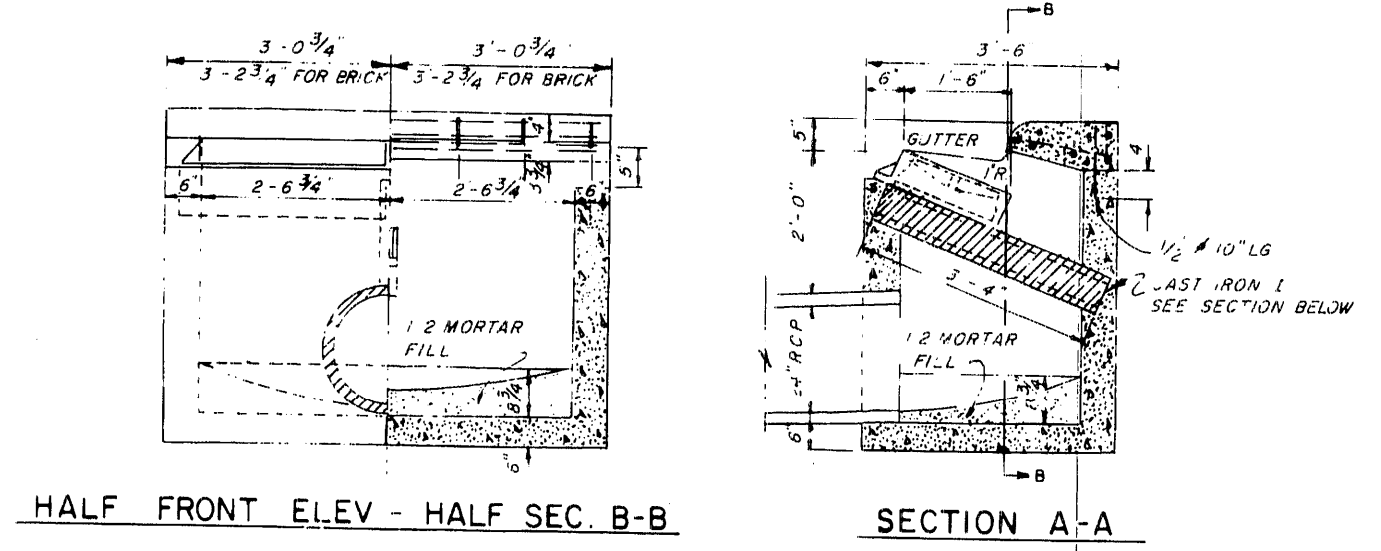
PLAN

STANDARD TYPE "C" MANHOLE FOR
48" TO 72" CONCRETE PIPE STORM SEWER

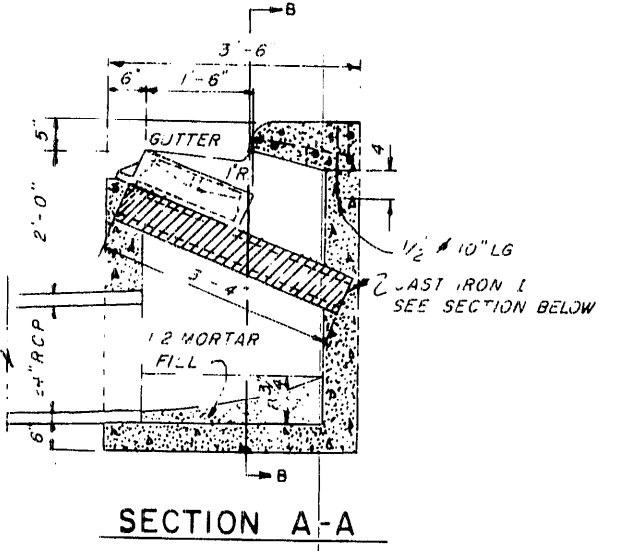


CONC. SLOPE PAVING DETAIL

N.T.S.



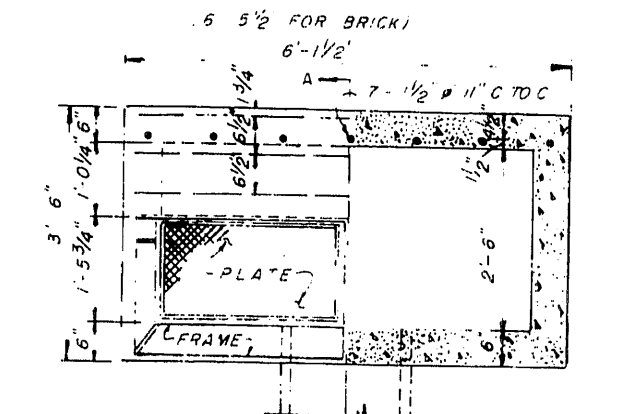
HALF FRONT ELEV - HALF SEC B-B



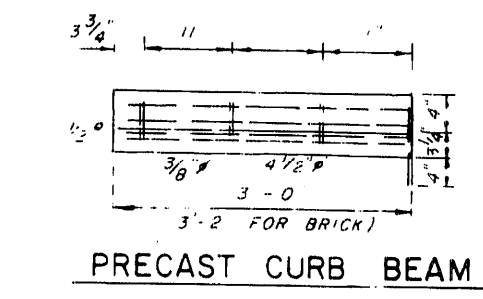
SECTION A-A

GENERAL NOTES

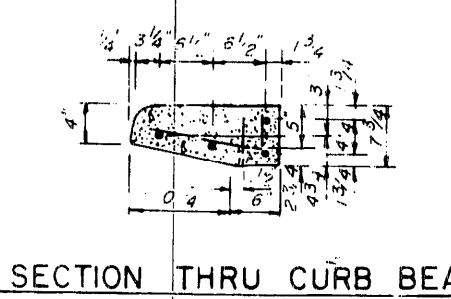
- 1 Use Std City of Houston Cast Iron Frame & Plates.
- 2 Lead shall leave in at location and grade required.
- 3 When brick inlets are built extend dowels 4" from cut beam into brickwork, walls shall be increased to 8" and inlet beams shall be 4" angle.



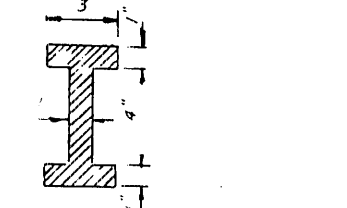
HALF PLAN HALF HOR. SEC.



PRECAST CURB BEAM



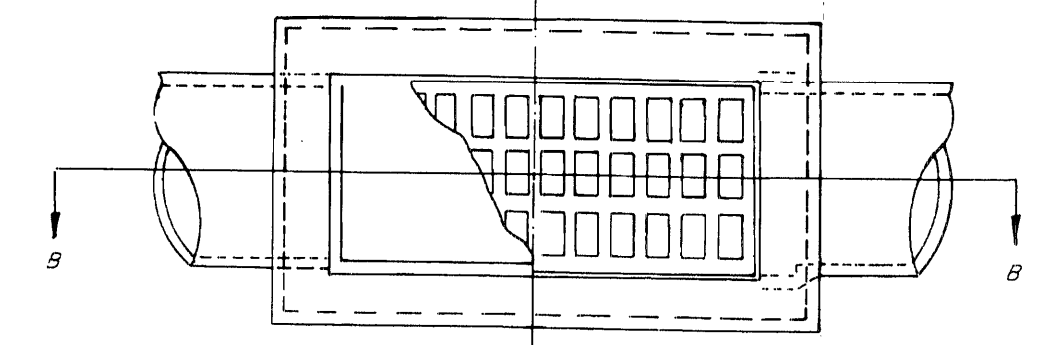
SECTION THRU CURB BEAM



SECTION THRU I BEAM

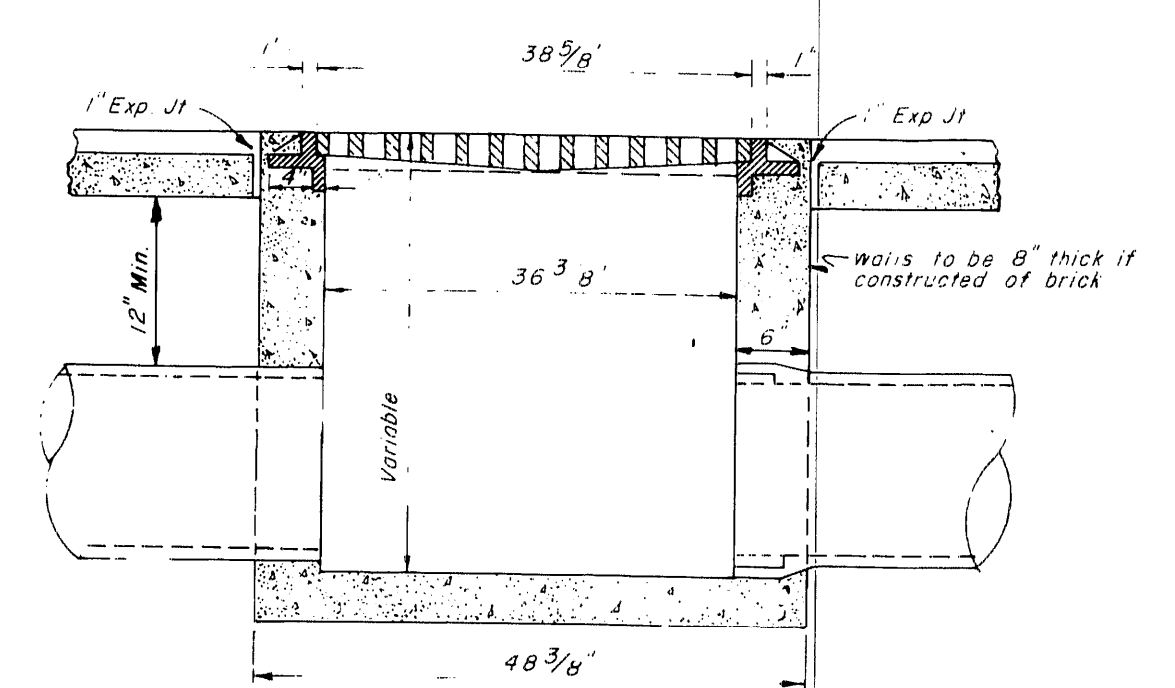
| BAR | SIZE | LENGTH | NO. | LOC. |
|-----|------|--------|-----|------|
| 1 | 1/2" | 5'-0" | 5 | TOP |
| 2 | 1/2" | 5'-0" | 5 | BOT |
| 3 | 1/2" | 5'-0" | 5 | TOP |
| 4 | 1/2" | 5'-0" | 5 | BOT |

TYPE B-B INLET



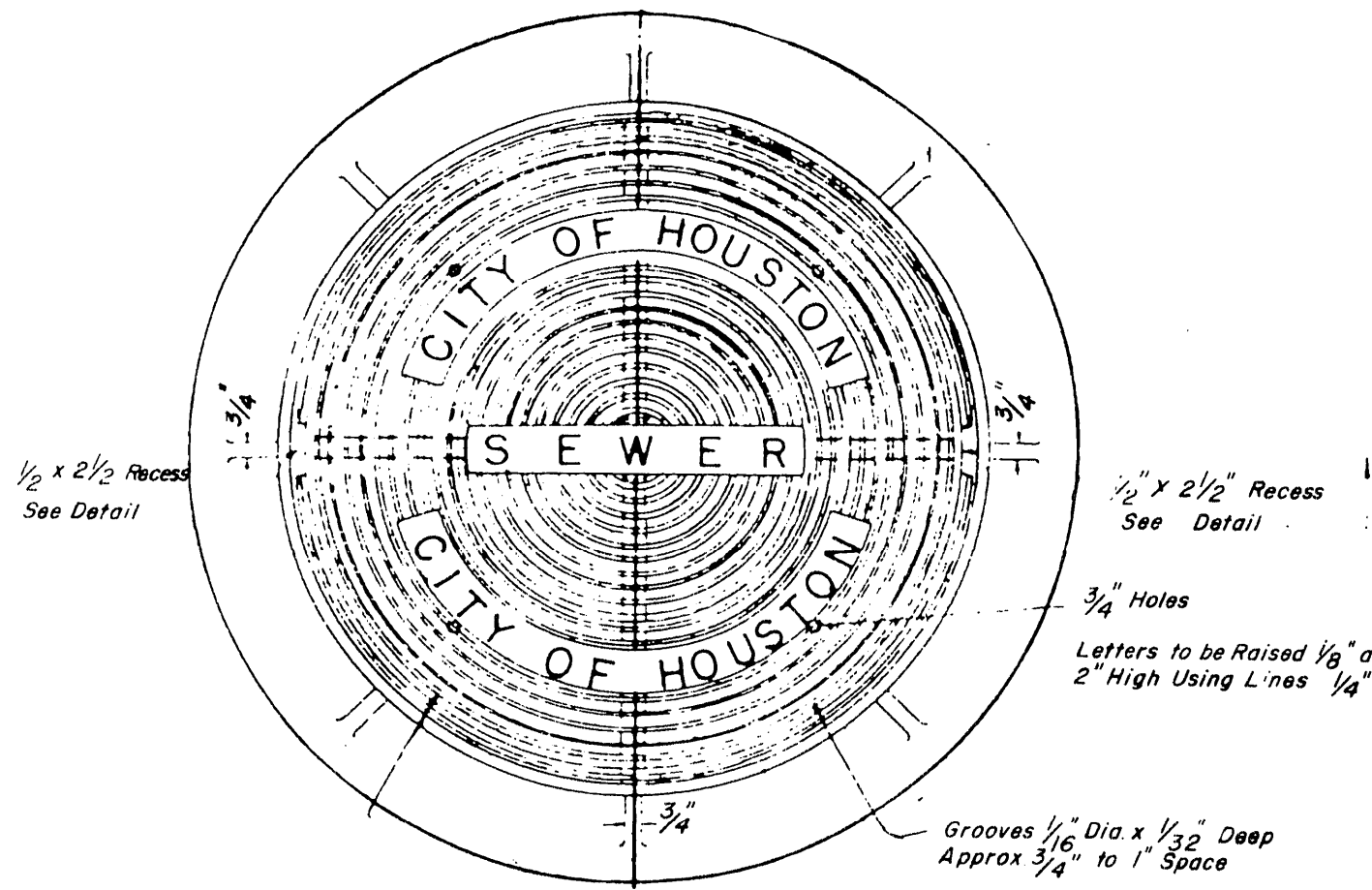
PLAN

Pipe entering inlet shall have a cover lip of not less than 12" below setting base



SECTION B-B

TYPE "D" INLET

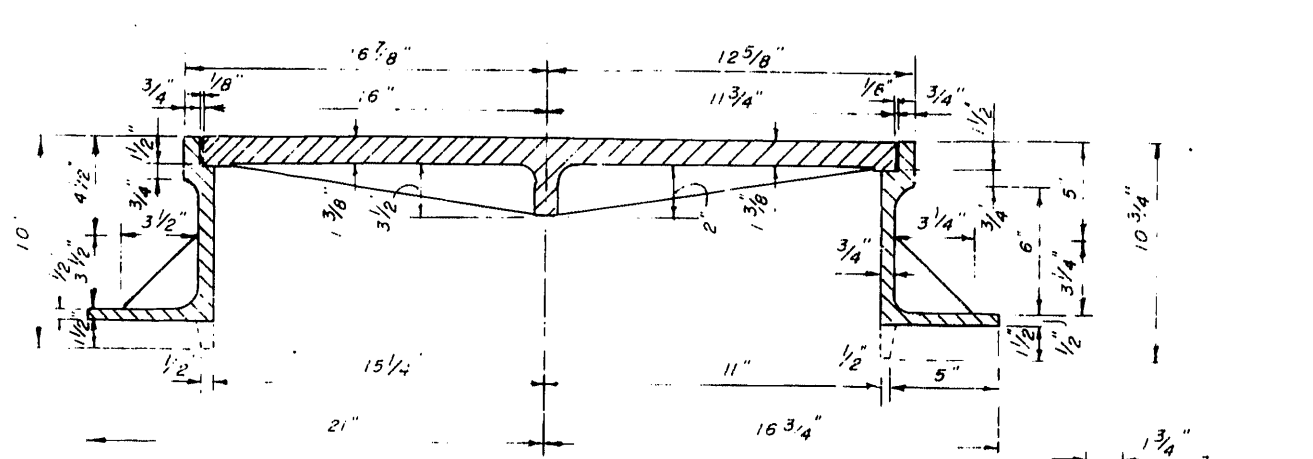


1/2" x 2 1/2" Recess See Detail

1/2" x 2 1/2" Recess See Detail

3/4" Holes Letters to be Raised 1/8" and 2" High Using Lines 1/4" Wide

Grooves 1/6" Dia x 1/32" Deep Approx 3/4" to 1" Space



HALF SECTION 32" MANHOLE COVER WITH FRAME

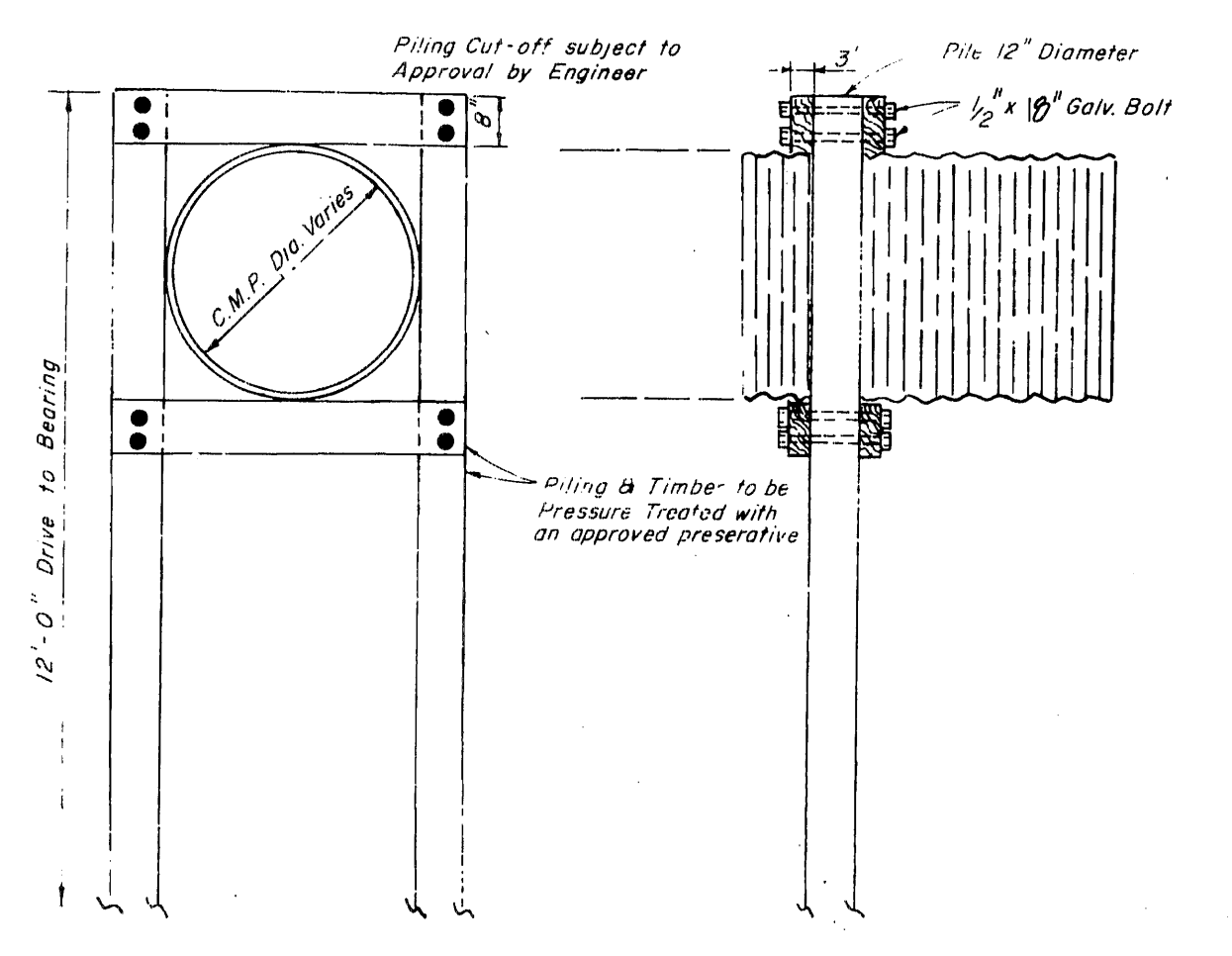
HALF SECTION 23 1/2" MANHOLE COVER WITH FRAME

ALTERNATE FRAME

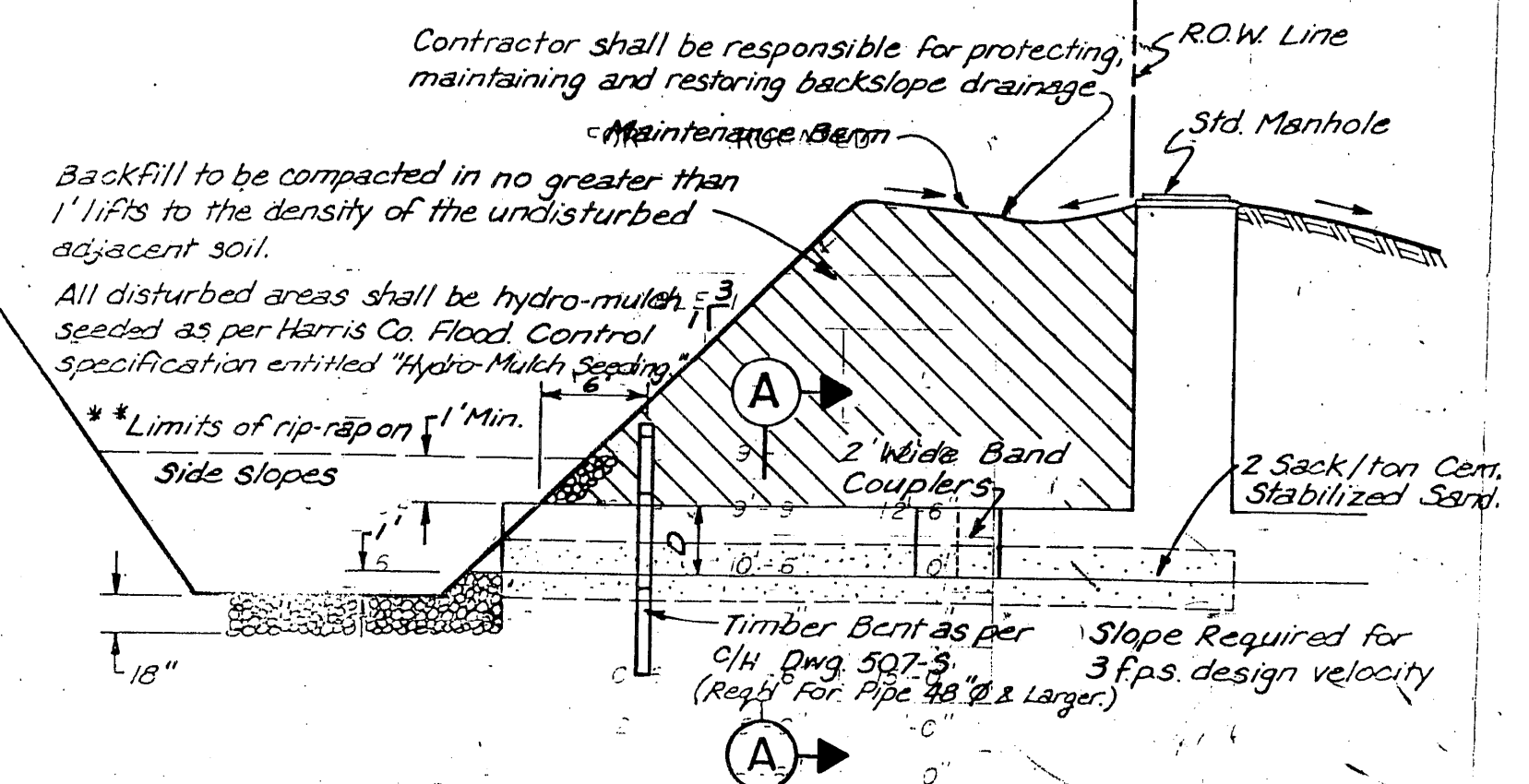
NOTE MATERIAL: CAST IRON A.S.T.M. A-48 CLASS NO. 20

STANDARD CITY OF HOUSTON MANHOLE FRAME AND COVER

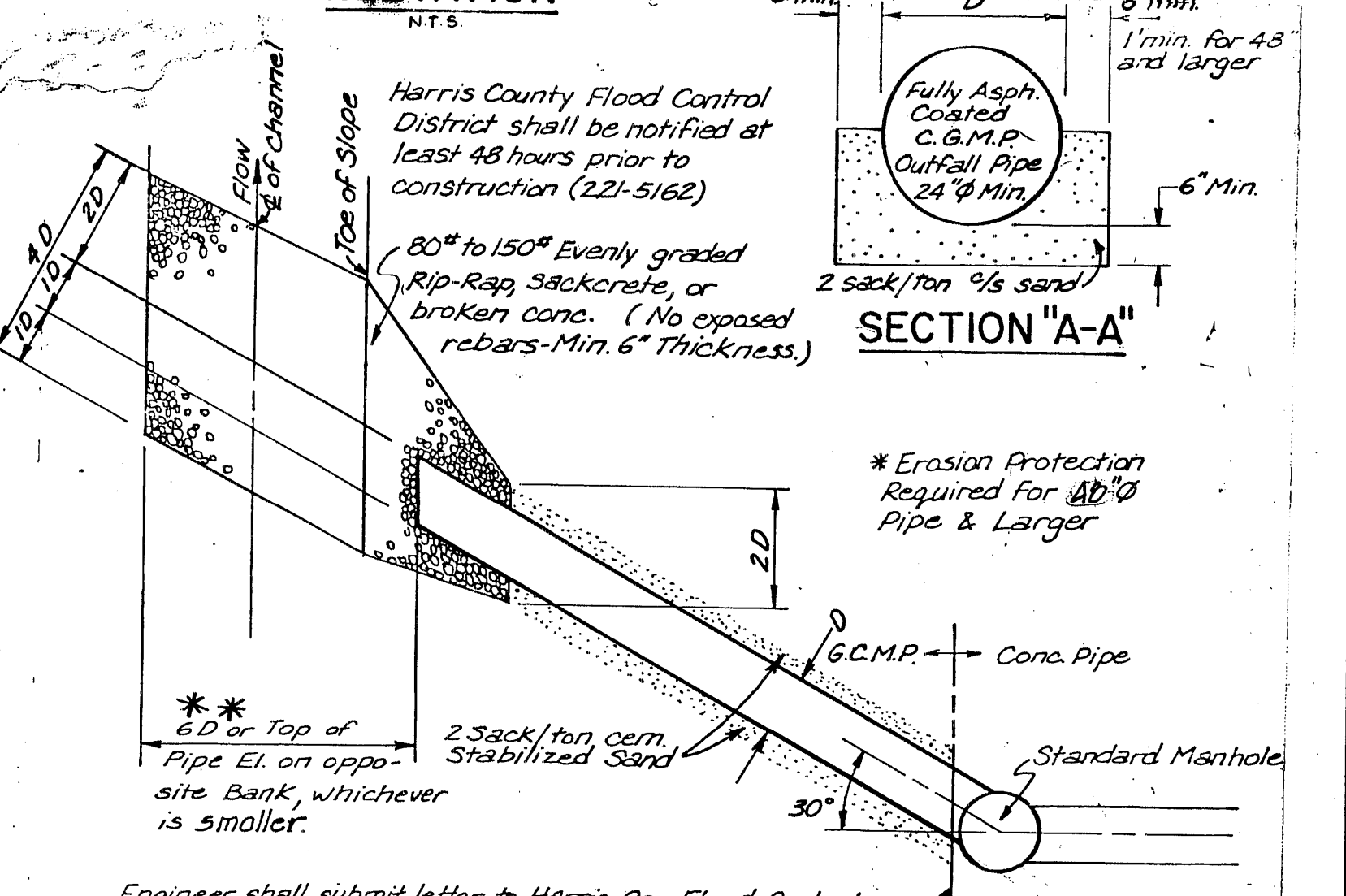
APPROVED: *[Signature]* 2/13/84
APPROVED: *[Signature]* 10/5/82
THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY



BENT FOR CORRUGATED METAL PIPE OUTFALL



ELEVATION



TYPICAL OUTFALL-DRAIN STRUCTURE

| Rev. | Date | Description | App. |
|------|------|-------------|------|
| | | | |

CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE

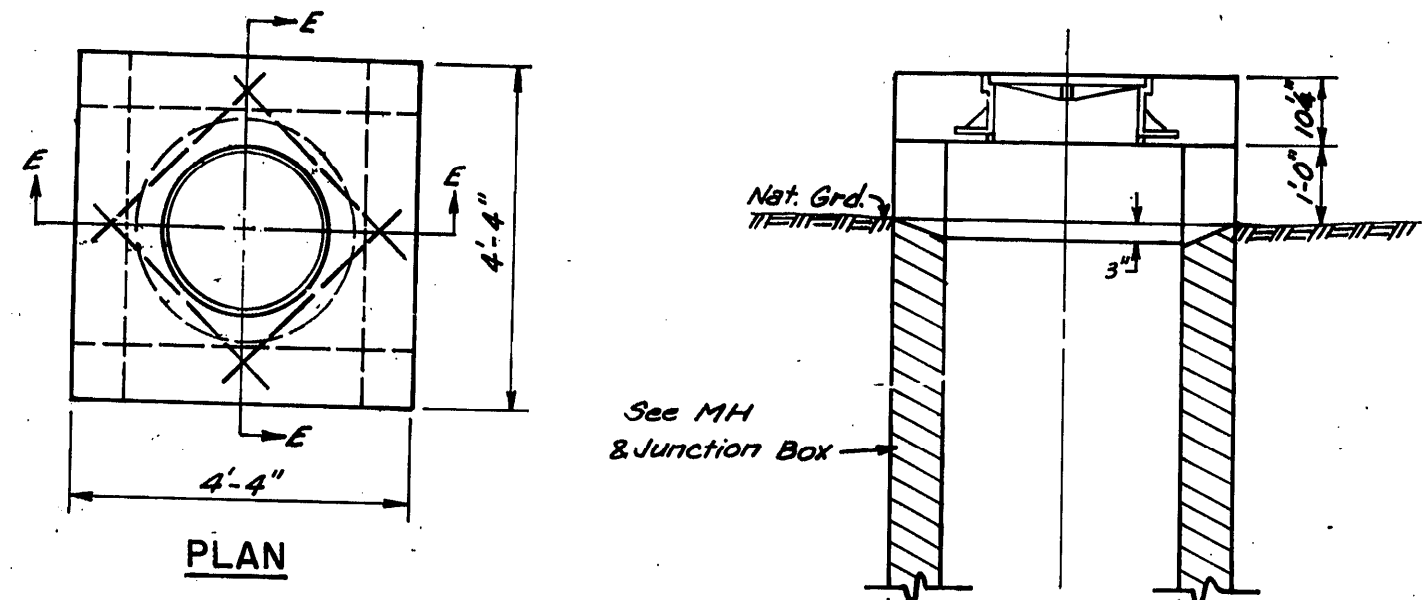
H. C. M.U.D. No. 191

STORM SEWER DETAILS

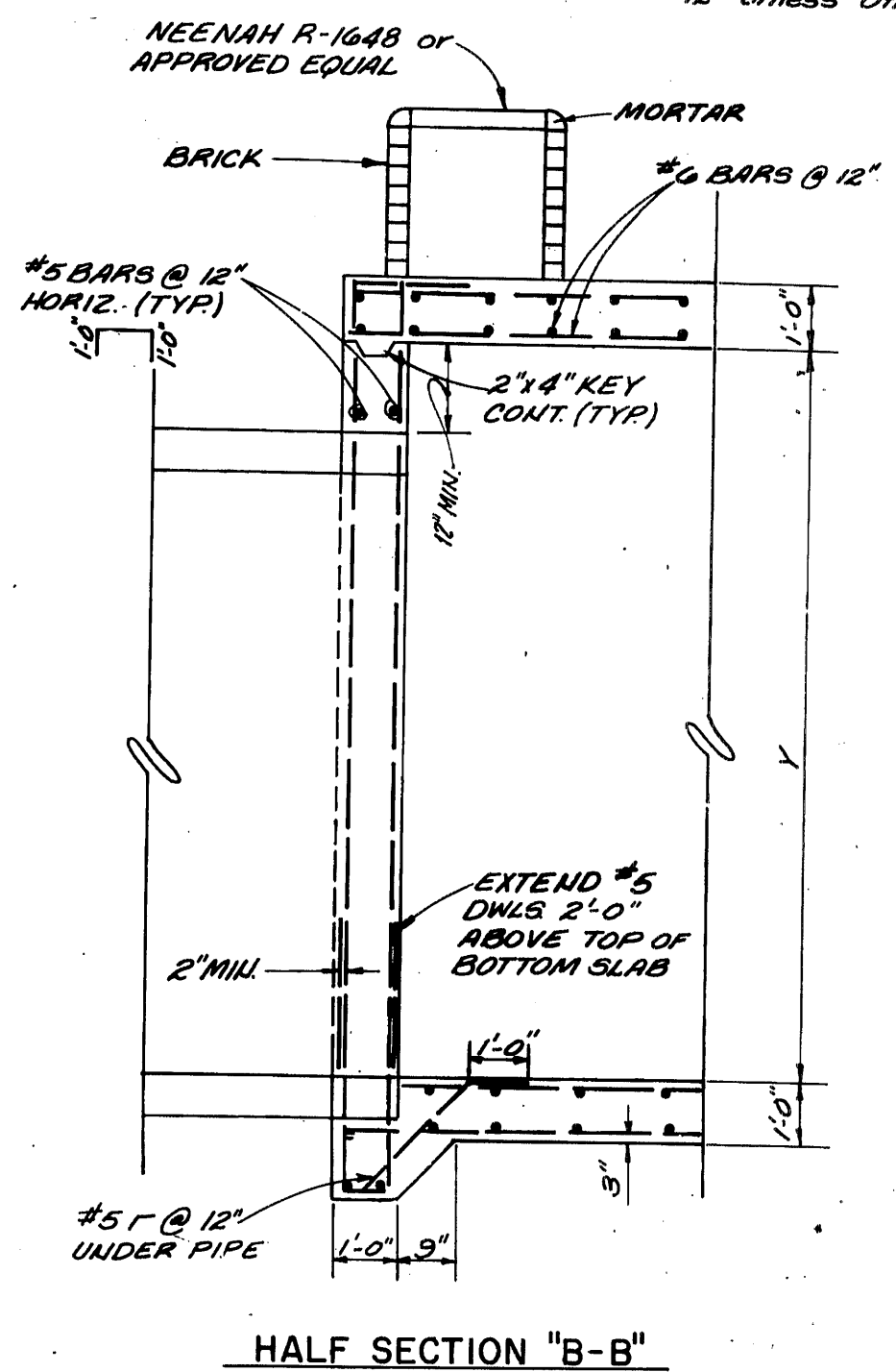
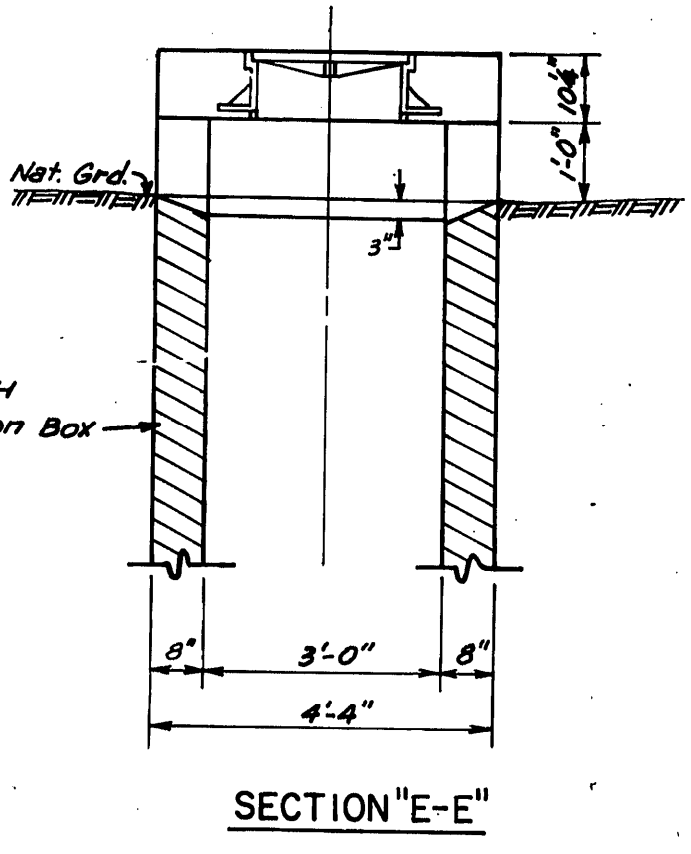
Design By: C/H Job No: 85003 Sheet 16
Drawn By: Scale: NONE
Checked By: DCL Date: SEPT. 1982 of 21

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

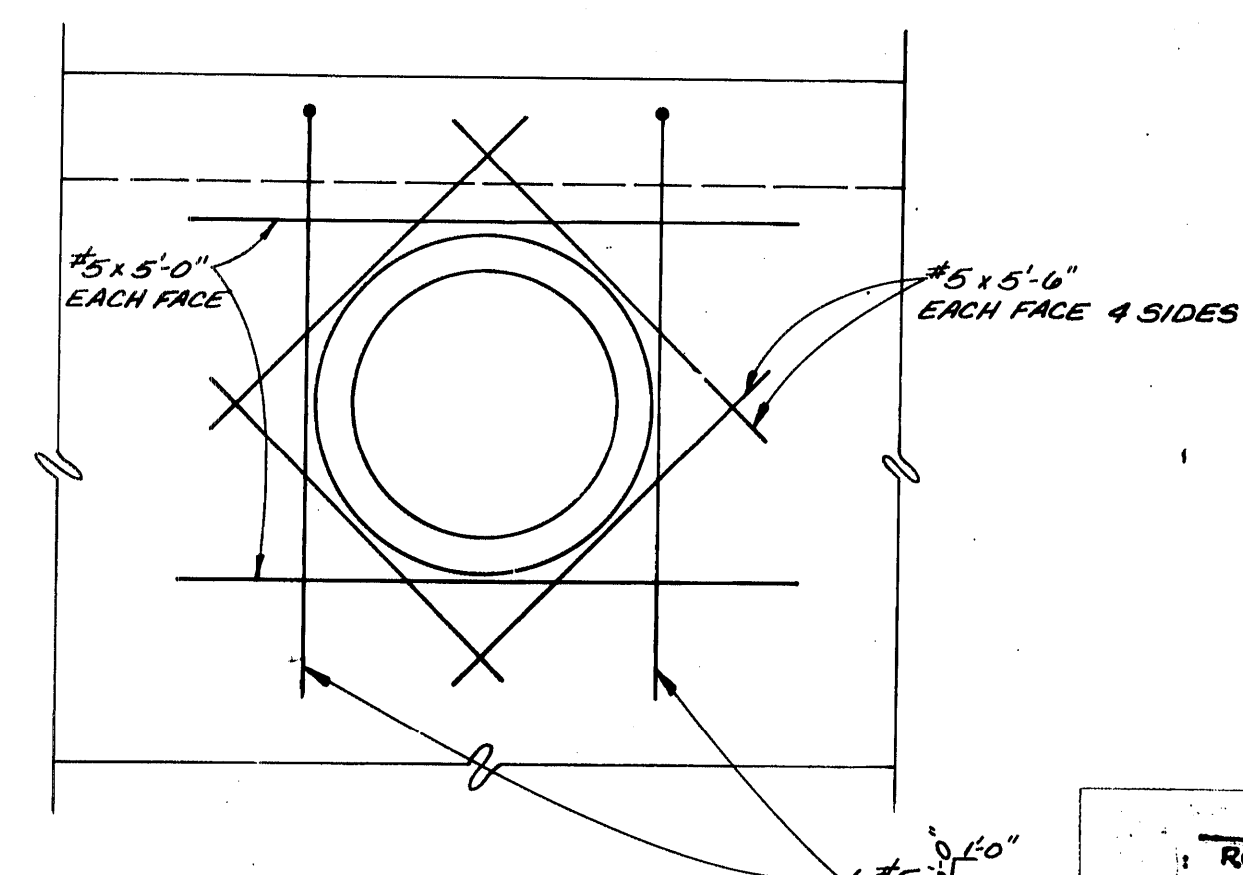
| SHEET NO. | STATION | STORM SEWER MH. — PIPE SIZES, F. ELEVATIONS, & BOX DIMENSIONS | | | | | | | | DIMENSIONS | | |
|-----------|----------|---|--------|--------------|--------|-------------|--------|-------------|--------|------------|------|------|
| | | SOUTH PIPE 1 | | NORTH PIPE 2 | | EAST PIPE 3 | | WEST PIPE 4 | | W | X | Y |
| | | I.D. | INV. | I.D. | INV. | I.D. | INV. | I.D. | INV. | | | |
| 5 | 3+00.00 | 78" | 113.36 | 72" | 113.86 | 24" | 120.63 | N/A | N/A | 118" | 54" | 98" |
| 5 | 4+13.00 | 78" | 113.31 | 78" | 113.31 | 30" | 118.00 | N/A | N/A | 118" | 61" | 98" |
| 5 | 6+31.26 | 84" | 112.72 | 78" | 113.22 | 42" | 117.88 | N/A | N/A | 126" | 76" | 105" |
| 5 | 9+93.16 | 84" | 112.55 | 84" | 112.55 | 24" | 120.52 | 30" | 118.88 | 126" | 54" | 105" |
| 6 | 17+00.00 | 84" | 112.15 | 84" | 112.15 | 24" | 119.45 | N/A | N/A | 126" | 54" | 105" |
| 7 | 23+47.63 | 84" | 111.55 | 24" | 119.17 | 36" | 117.68 | 84" | 111.55 | 126" | 126" | 105" |
| 10 | 0+44.53 | 90" | 111.02 | 84" | 111.52 | 24" | 118.87 | N/A | N/A | 132" | 54" | 111" |
| 10 | 5+22.53 | N/A | N/A | 90" | 110.64 | N/A | N/A | 90" | 110.64 | 132" | 132" | 111" |
| 11 | 10+91.15 | N/A | N/A | N/A | N/A | 90" | 109.80 | 96" | 109.80 | 132" | 48" | 117" |



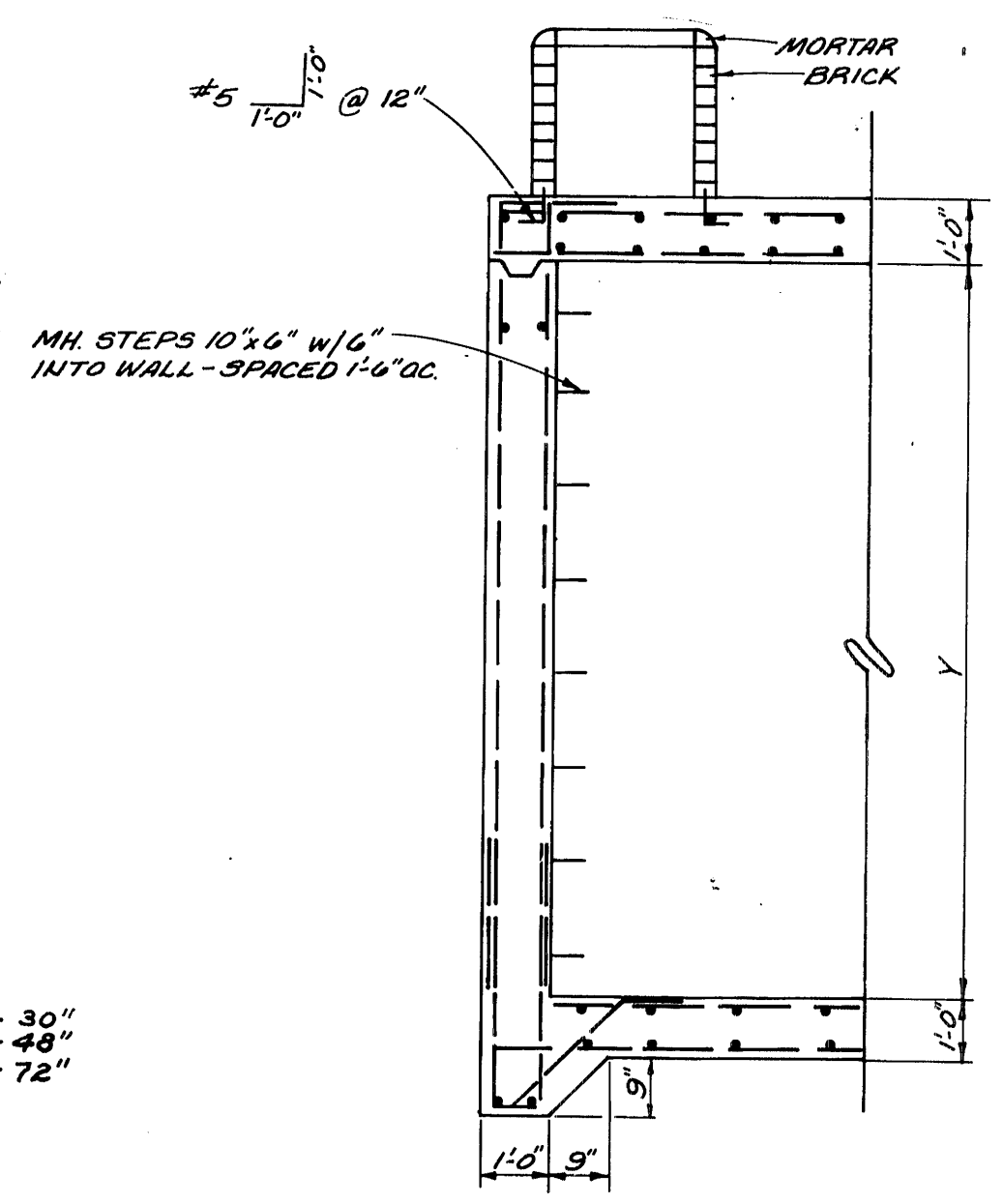
TYPE "E" INLET



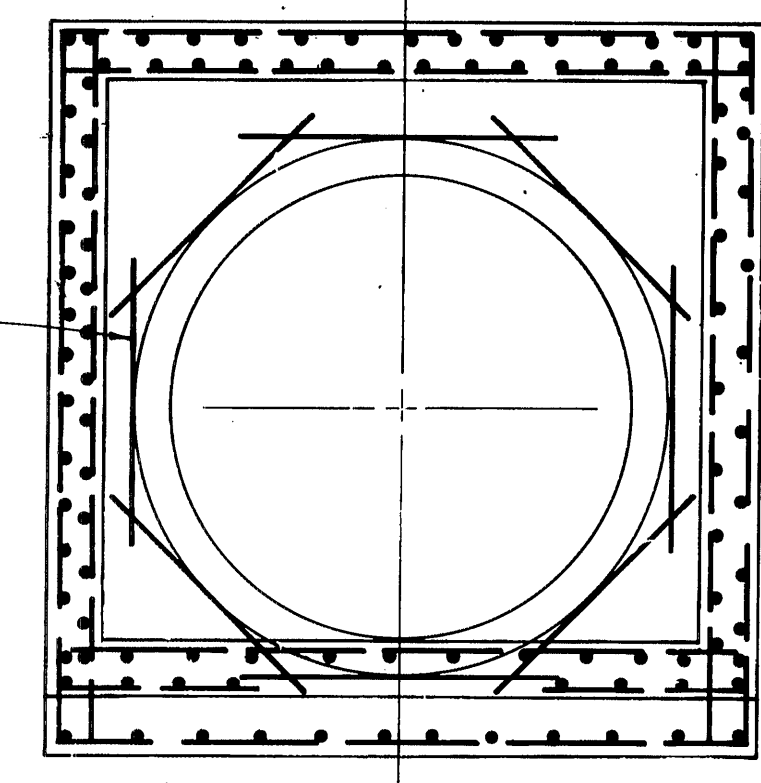
HALF SECTION "B-B"



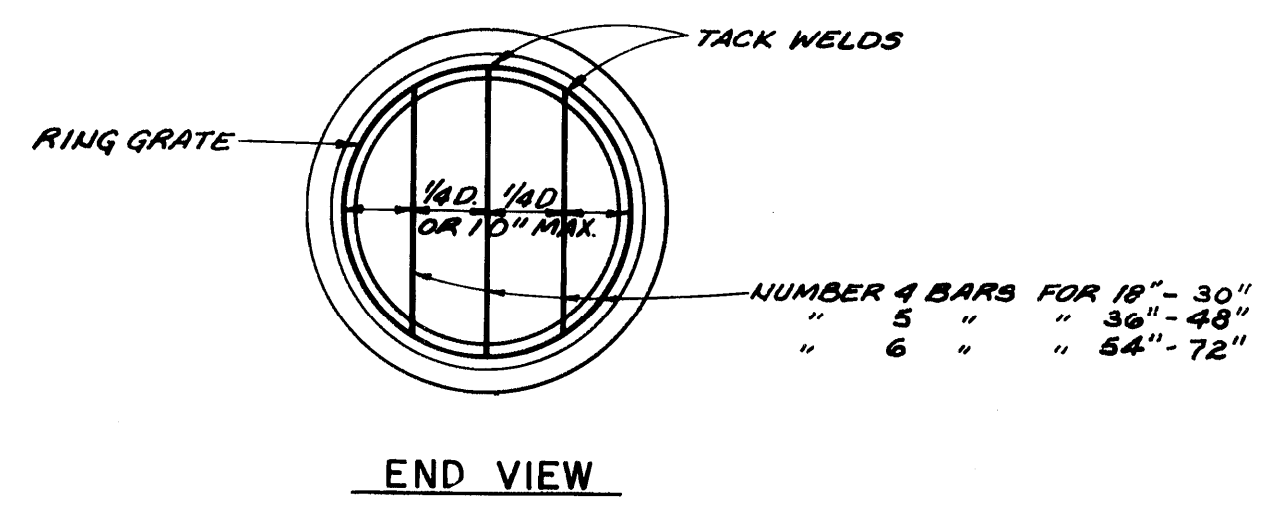
SECTION "D-D"
REINFORCEMENT AROUND
30" x 24" PIPE



HALF SECTION "A-A"

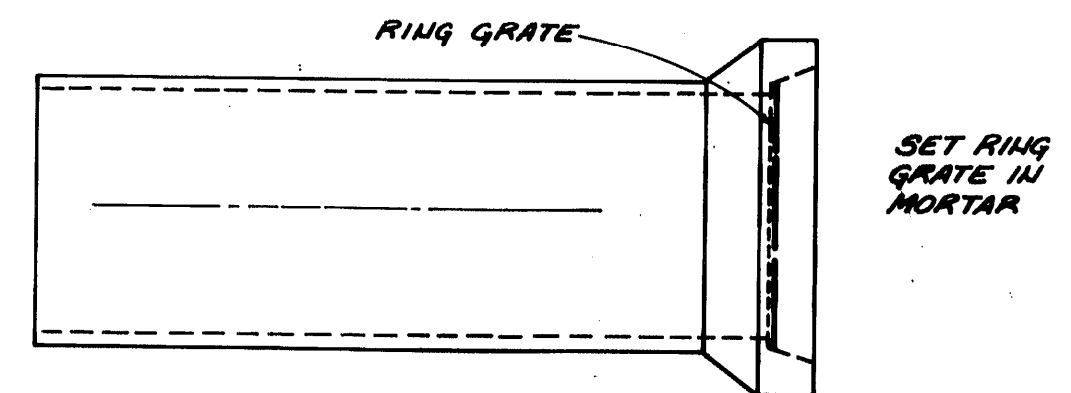


SECTION "C-C"
REINFORCEMENT AROUND
LARGER PIPE



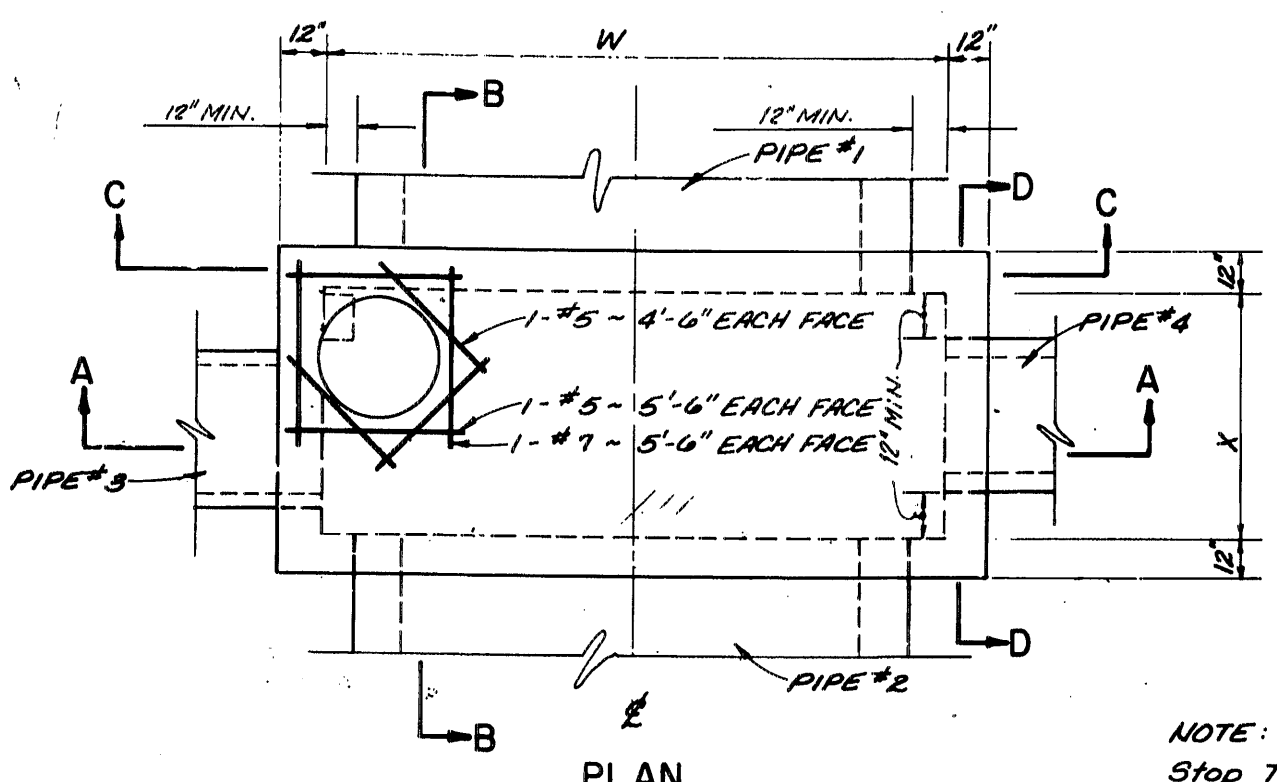
END VIEW

NOTE:
Proposed 18" Conc. Pipe Stub w/Ring Grate to Pick Up Exist. Ditch with Flow Line 0.5' Min. Below Exist. Ditch; Realign Exist. Ditch as Necessary.



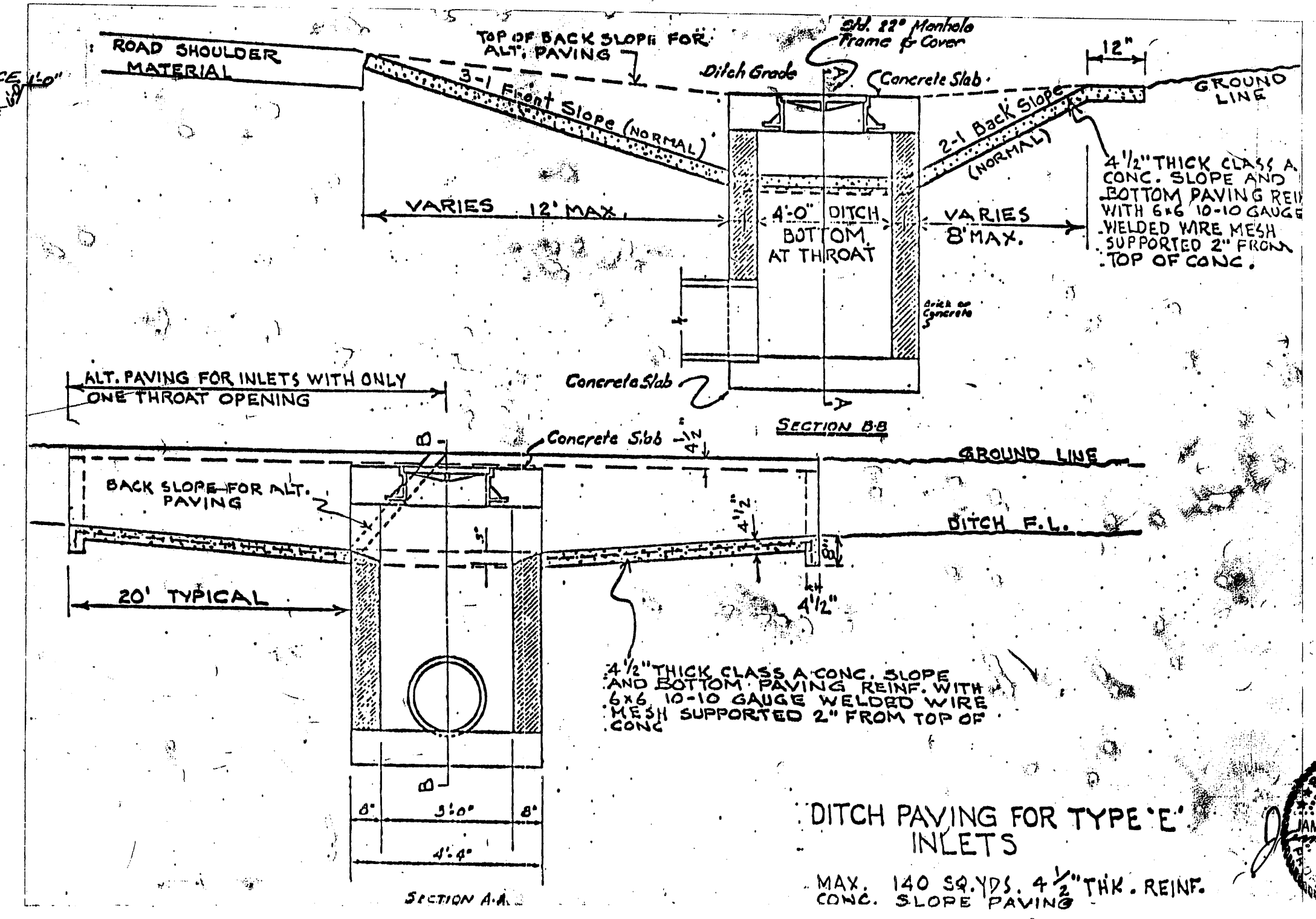
SIDE VIEW

RING GRATE FOR OPEN END OF 18" STUBS TO DITCH
N.T.S.



PLAN
(JUNCTION BOX)
STORM SEWER MANHOLE
78" & LARGER PIPE
N.T.S.

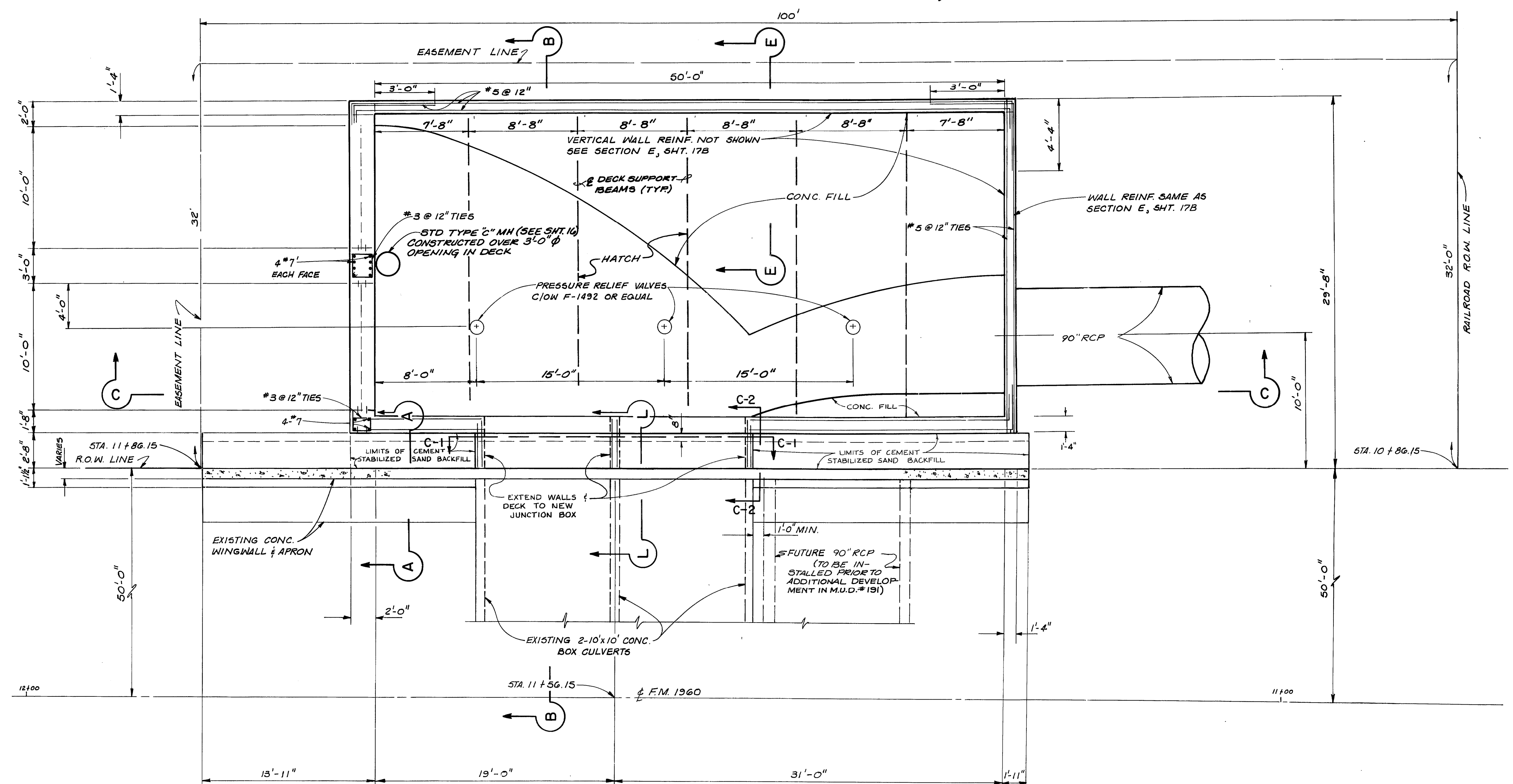
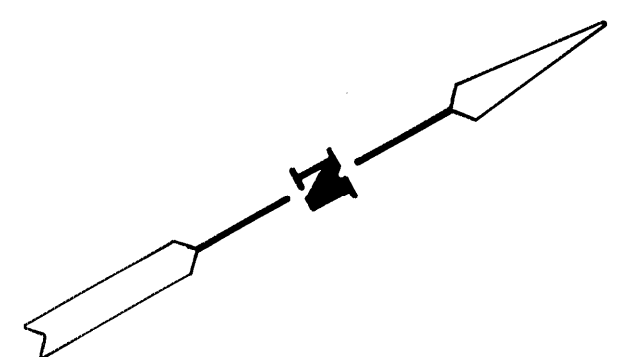
NOTE:
Stop Typical Slab Reinf. 2" Clear of Opening & Provide Additional Reinf. as shown for MH. Opening.



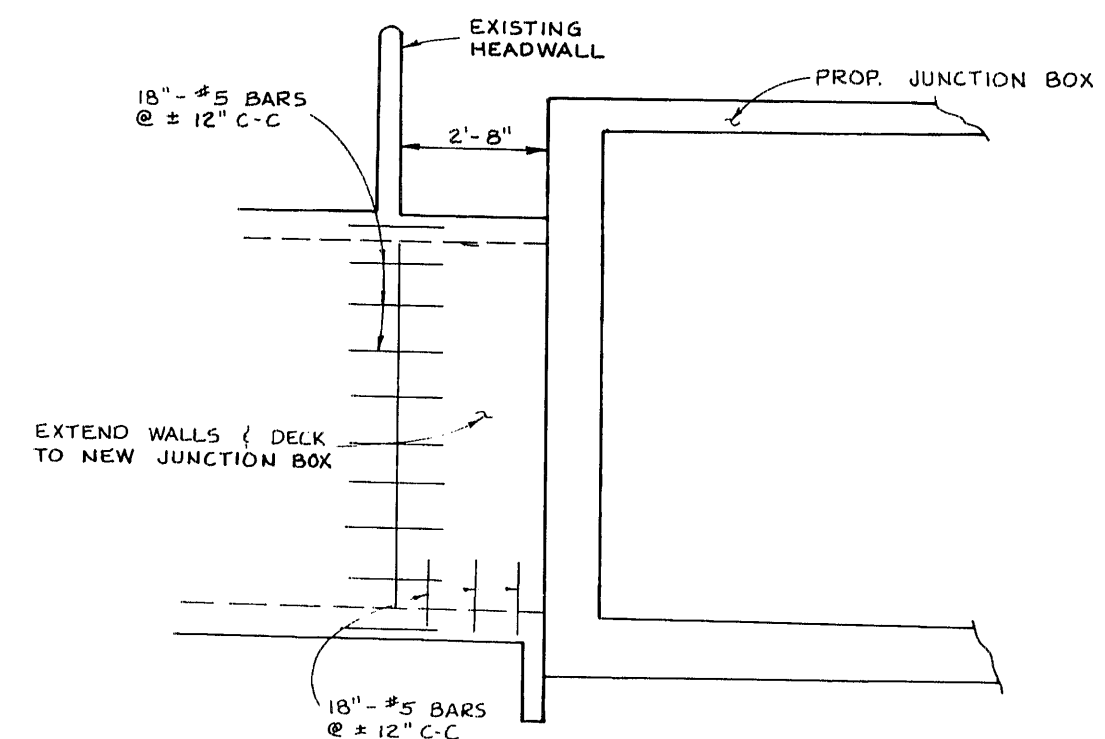
DITCH PAVING FOR TYPE "E" INLETS
MAX. 140 SQ. YDS. 4" THK. REINF. CONC. SLOPE PAVING

APPROVED FOR CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS
Water Design
Checked By: J.E.M.
Date: SEPT. 1982

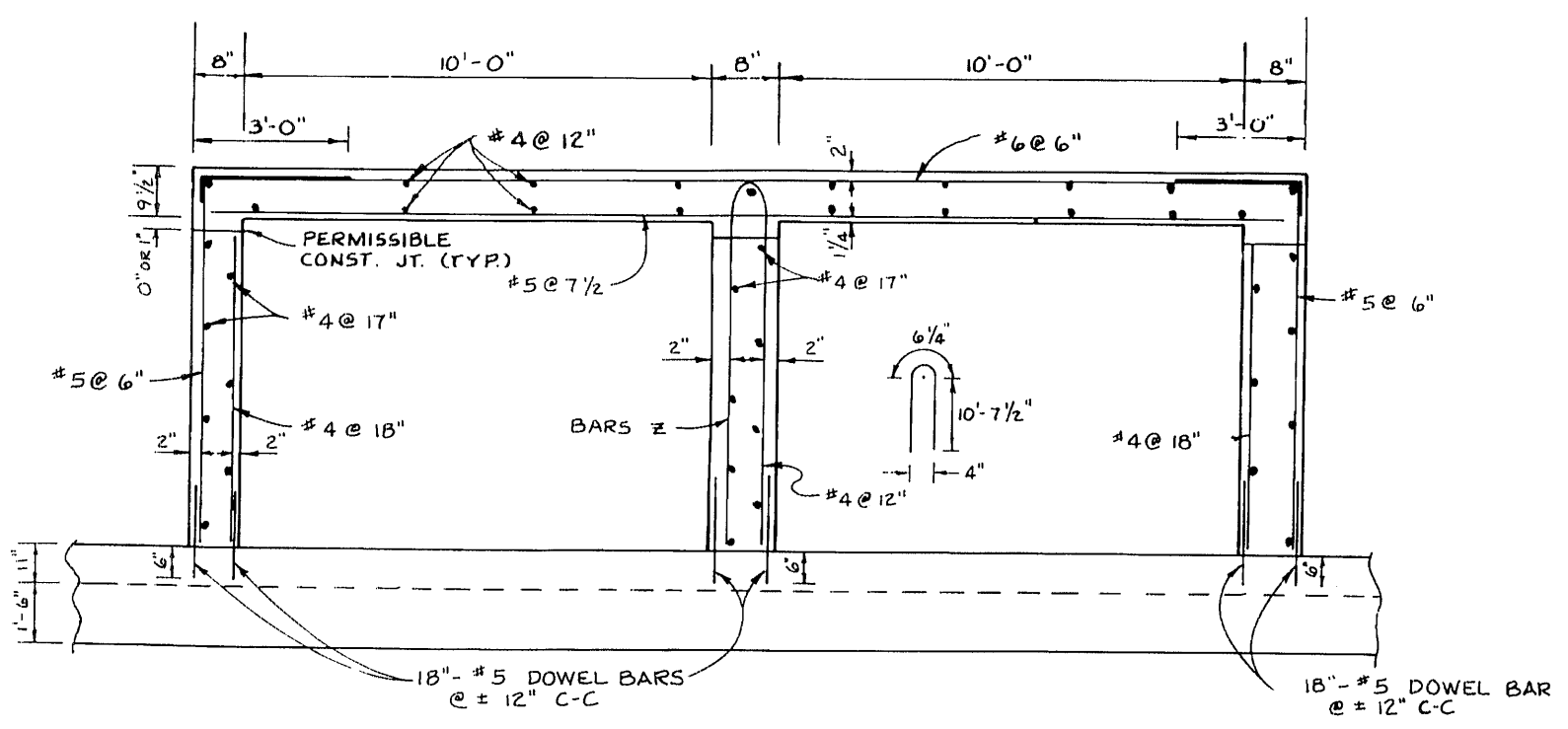
CHAMPIONS CENTRE SECTION ONE
& WILLOW CENTRE SECTION ONE
H.C.M.U.D. No. 191
STORM SEWER DETAILS
Designed By: J.W.
Drawn By:
Checked By: J.E.M.
Date: SEPT. 1982
LANDEV ENGINEERS, INC.
1706 SEANIST DRIVE
Houston, Texas 77002



LOWER PLAN
SCALE: 1" = 5'



SECTION C-2

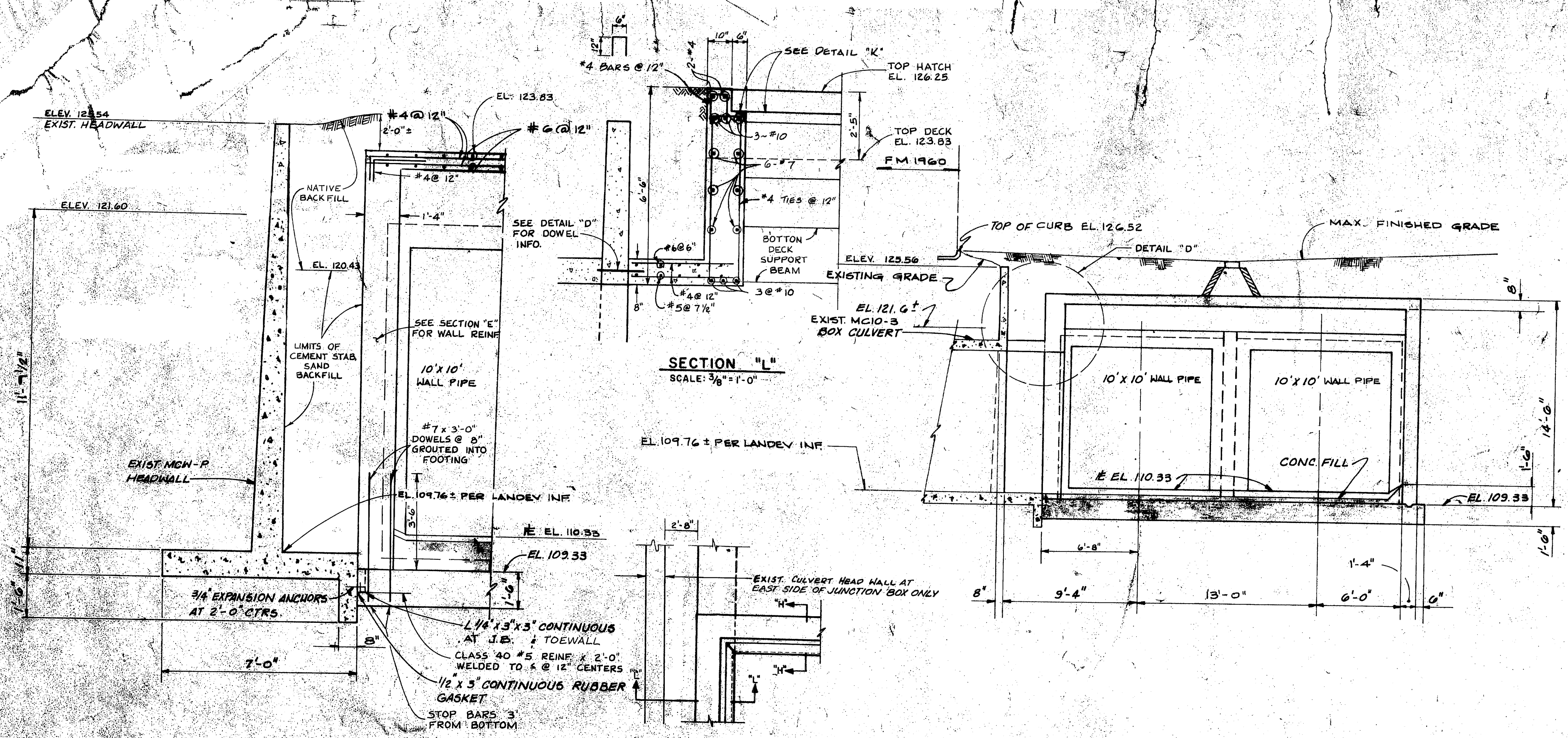


SECTION C-1



| | | | |
|--|-------------------|---|--------|
| Rev. | Date | Description | App. |
| △ | 9-21-83 | CONSTRUCT JUNCTION BOX SEPARATE FROM EXIST HEADWALL EXCEPT FOR BARREL EXTENSION | B.T.W. |
| CHAMPION CENTRE SECTION No. 1 WILLOW CENTRE SECTION No. 1 H.C.M.U.D. # 191 | | | |
| JUNCTION BOX DETAILS | | | |
| Design By: | Job No: | Sheet | |
| Drawn By: J.R.P. | 85003 | 17A | |
| Checked By: | Date: MARCH, 1983 | Scale: 1" = 5' | of 21 |

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

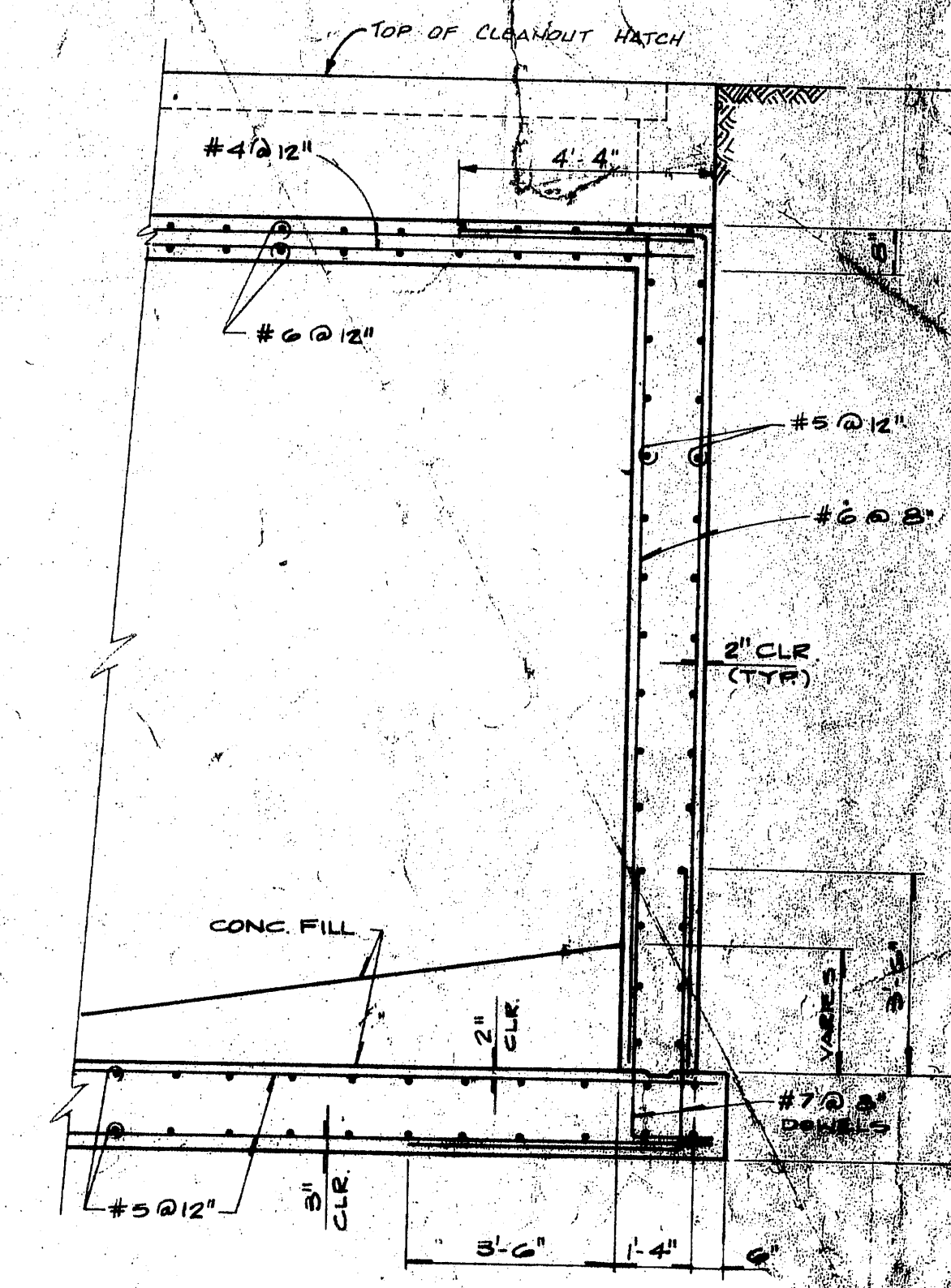


SECTION "A"
SCALE: 3/8" = 1'-0"

SECTION "L"
SCALE: 3/8" = 1'-0"

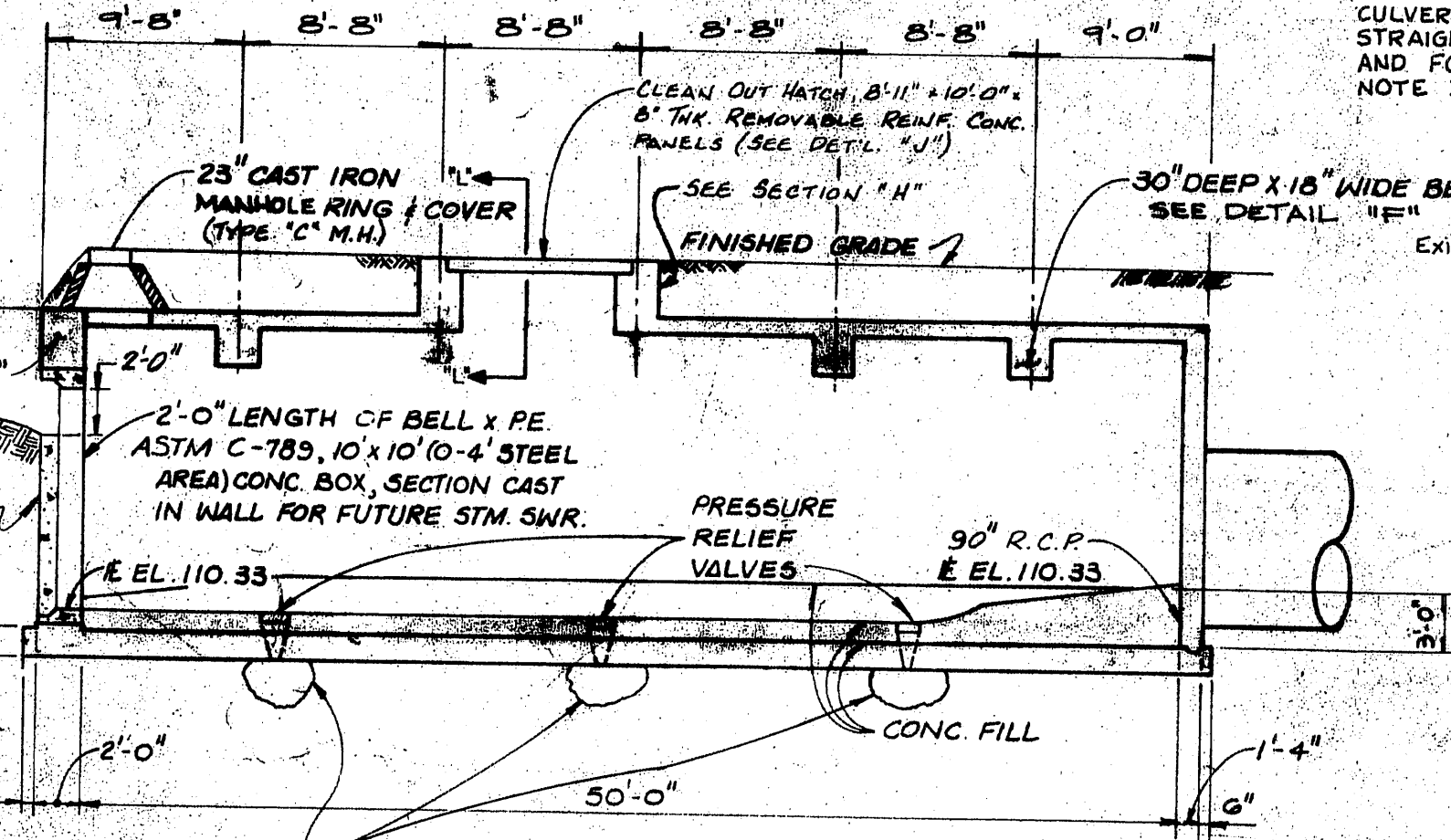
PLAN
DETAIL "M"
(TYPICAL CORNER AT CLEANOUT HATCH)
SCALE: 3/8" = 1'-0"

SECTION "B"
SCALE: 3/16" = 1'-0"

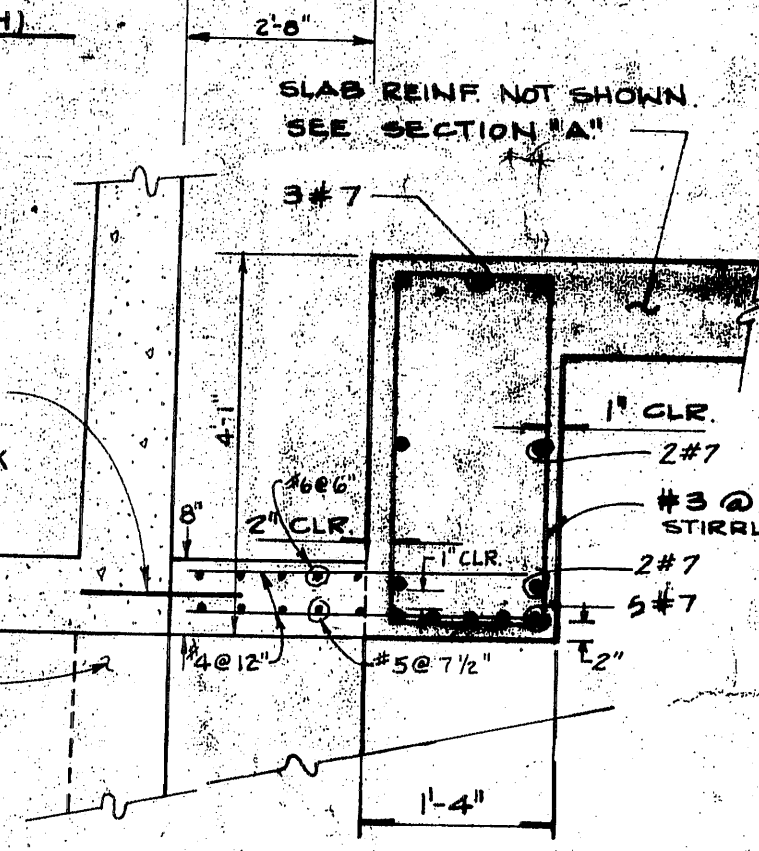


SECTION "E"
SCALE: 3/8" = 1'-0"

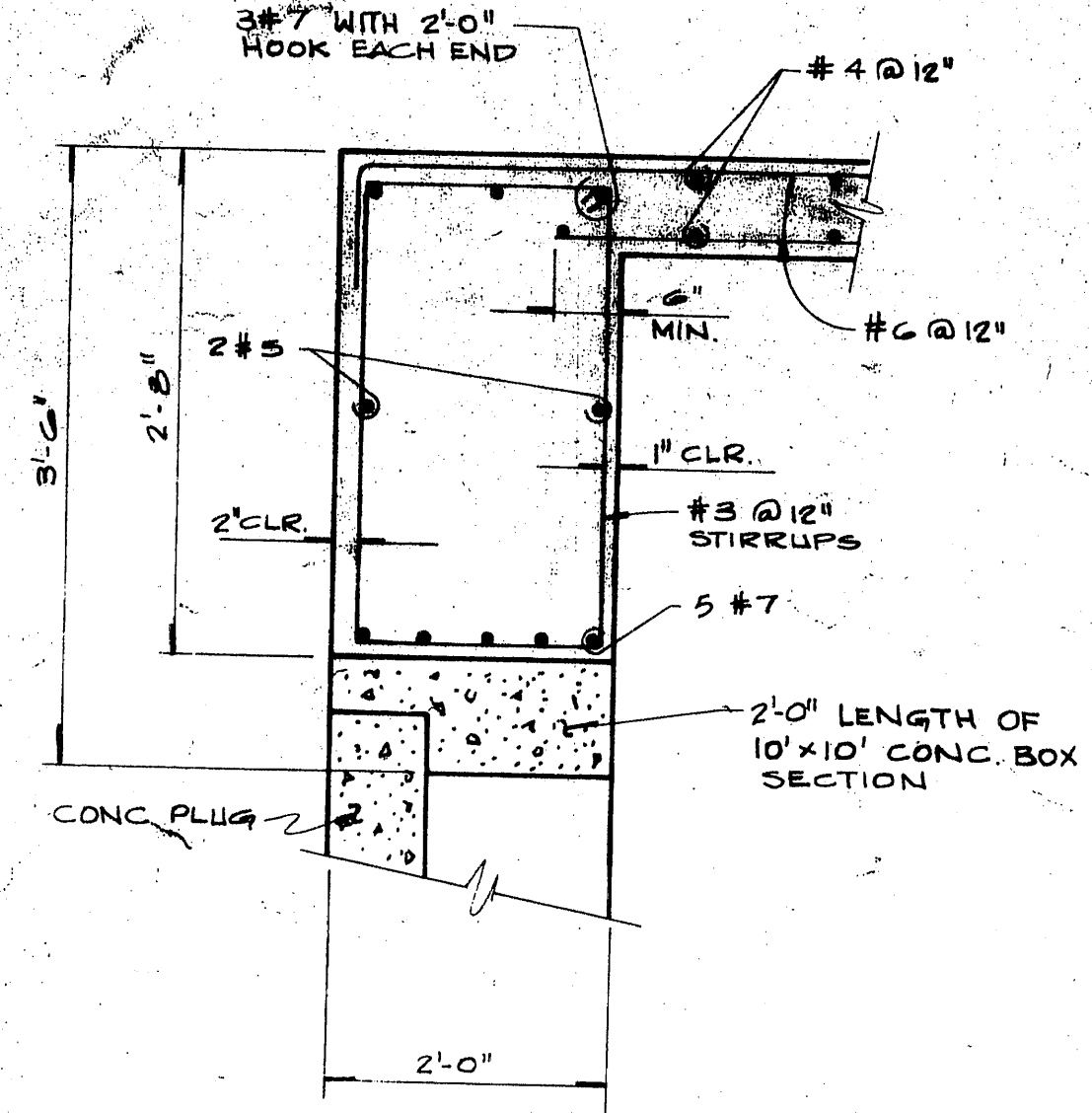
ALL WORK TO BE TEMPORARILY MARKED AS SHOWN AS PART OF THE CONTRACT. INSTALLATION OF PROPOSED 10' X 10' BOXES AND BACKFILL TO FINAL GRADE BY OTHERS.



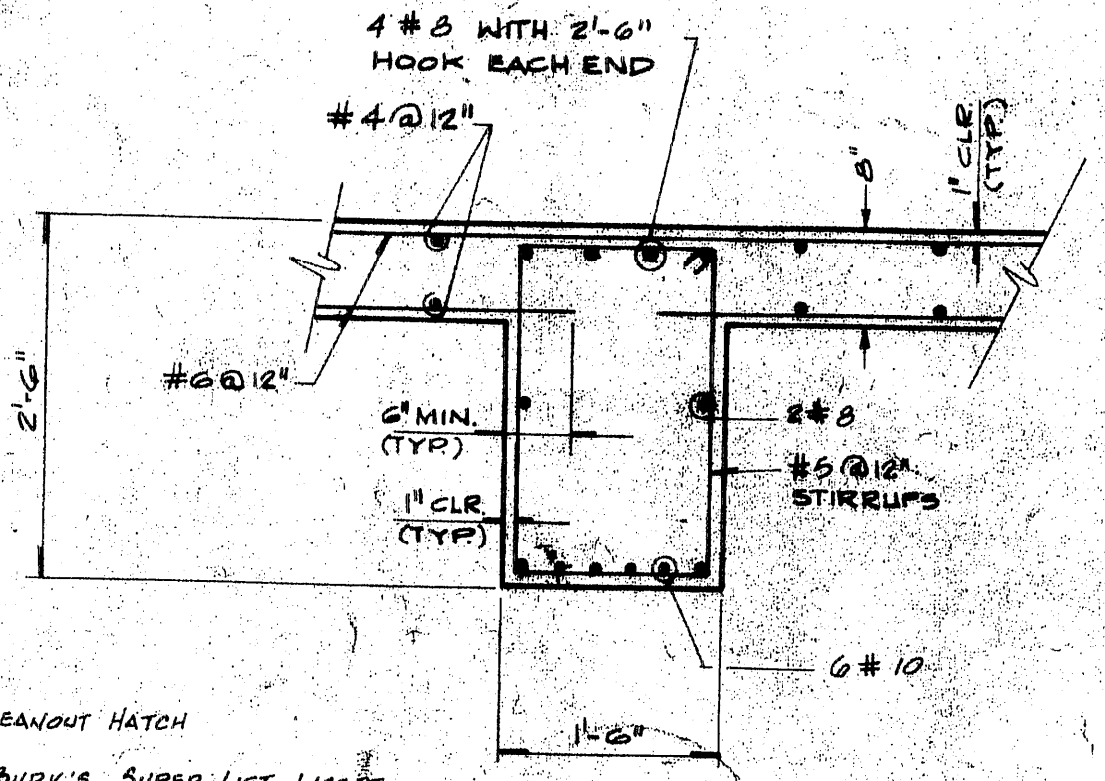
SECTION "C"
SCALE: 1/8" = 1'-0"



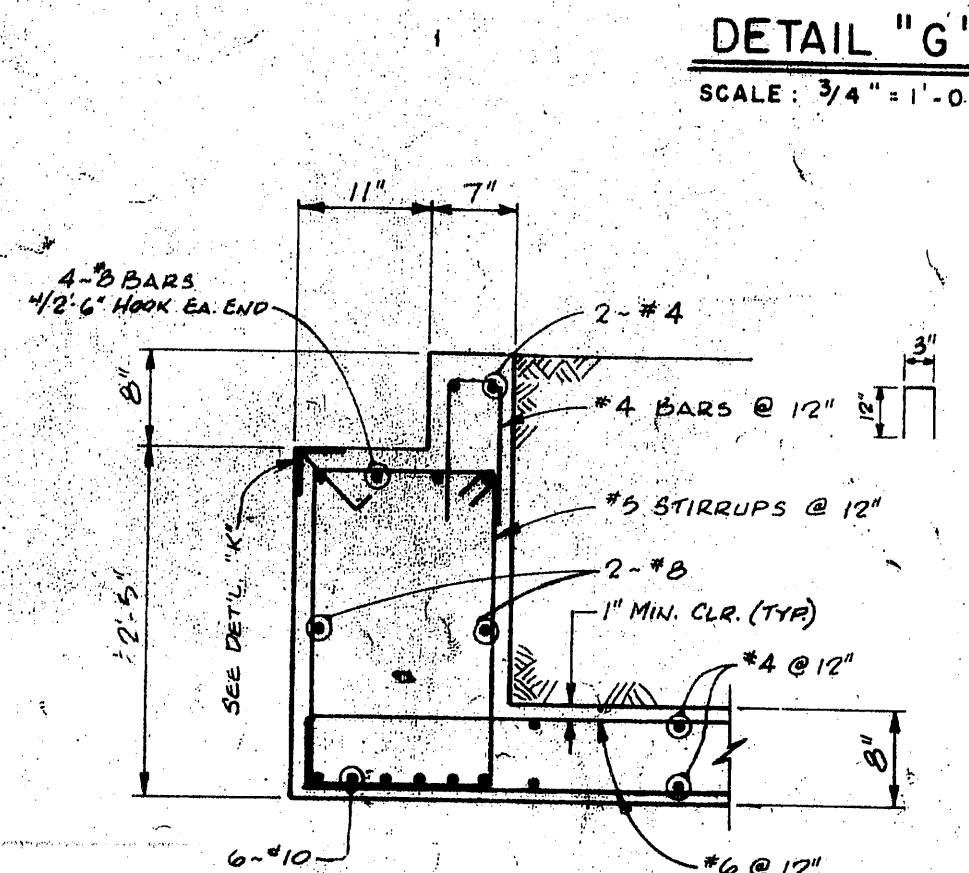
DETAIL "D"
SCALE: 3/4" = 1'-0"



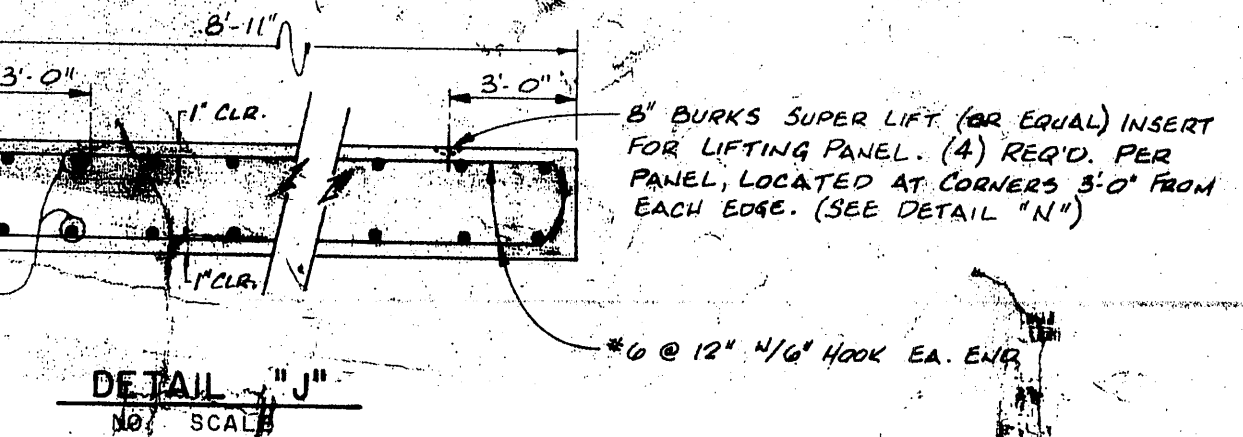
DETAIL "K"
SCALE: 3/4" = 1'-0"



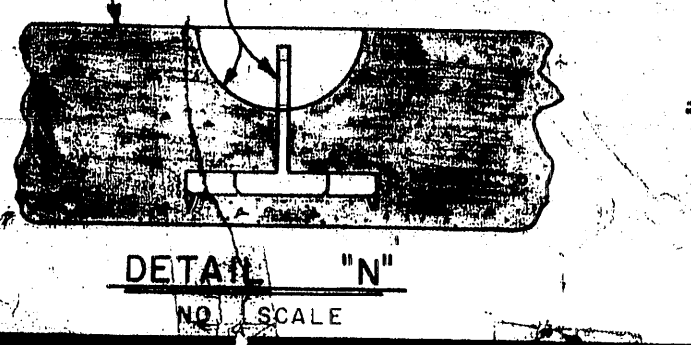
DETAIL "F"
SCALE: 3/4" = 1'-0"



SECTION "H"
SCALE: 3/4" = 1'-0"



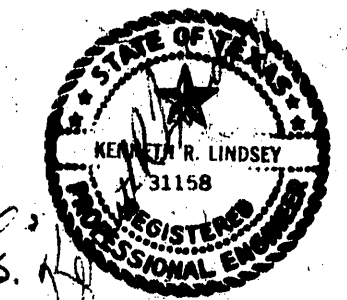
DETAIL "J"
SCALE: 3/8" = 1'-0"



DETAIL "N"
NO SCALE

- NOTES:**
1. REINF. STEEL SHALL HAVE $f_y \geq 60,000$ P.S.I., AND CONCRETE SHALL HAVE $f'_c \geq 4,000$ P.S.I. @ 28 DAYS.
 2. LOADING IS FOR H15-44.
 3. DOWEL BARS SHALL BE GROUTED INTO THE CENTERS OF VERTICAL FACES OF WALLS AND DECK AND IN HORIZONTAL FACE OF EXIST. APRON.

Approved for Hydraulics Only



APPROVED: *J.R.P.*
James R. Peterson
16/5/83

THE ABOVE SIGNATURE VALID FOR ONE (1) YEAR ONLY

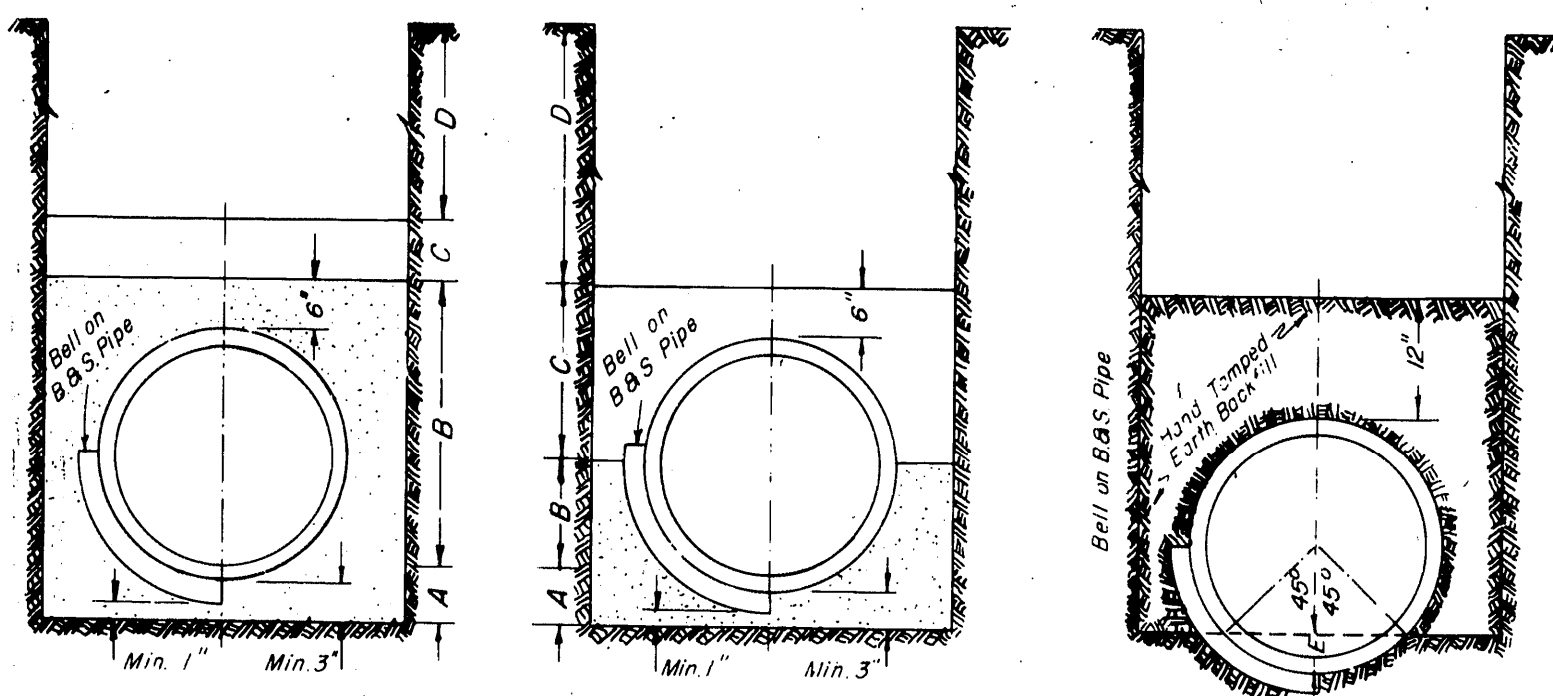
Rev. Date Description
S-21-83 CONSTRUCT JUNCTION BOX SEPARATE FROM EXIST. HEADWALL EXCEPT FOR BARREL EXTENSION

CHAMPION CENTRE SECTION, NO. 1
WILLOW CENTRE SECTION, NO. 1
H.C.M.D. # 19

JUNCTION BOX DETAILS

Design By: J.R.P. Job No: 455005
Drawn By: J.R.P. Scale: AS NOTED
Checked By: Date: MARCH 1983

LANDEY ENGINEERS
1706 S. GARDNER DRIVE
HOUSTON, TEXAS 77006



CLASS AA
 A-Cement Stabilized Sand Placed Before Pipe is Laid up to Flow Line of Pipe or Above-Minimum Depth 5"
 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

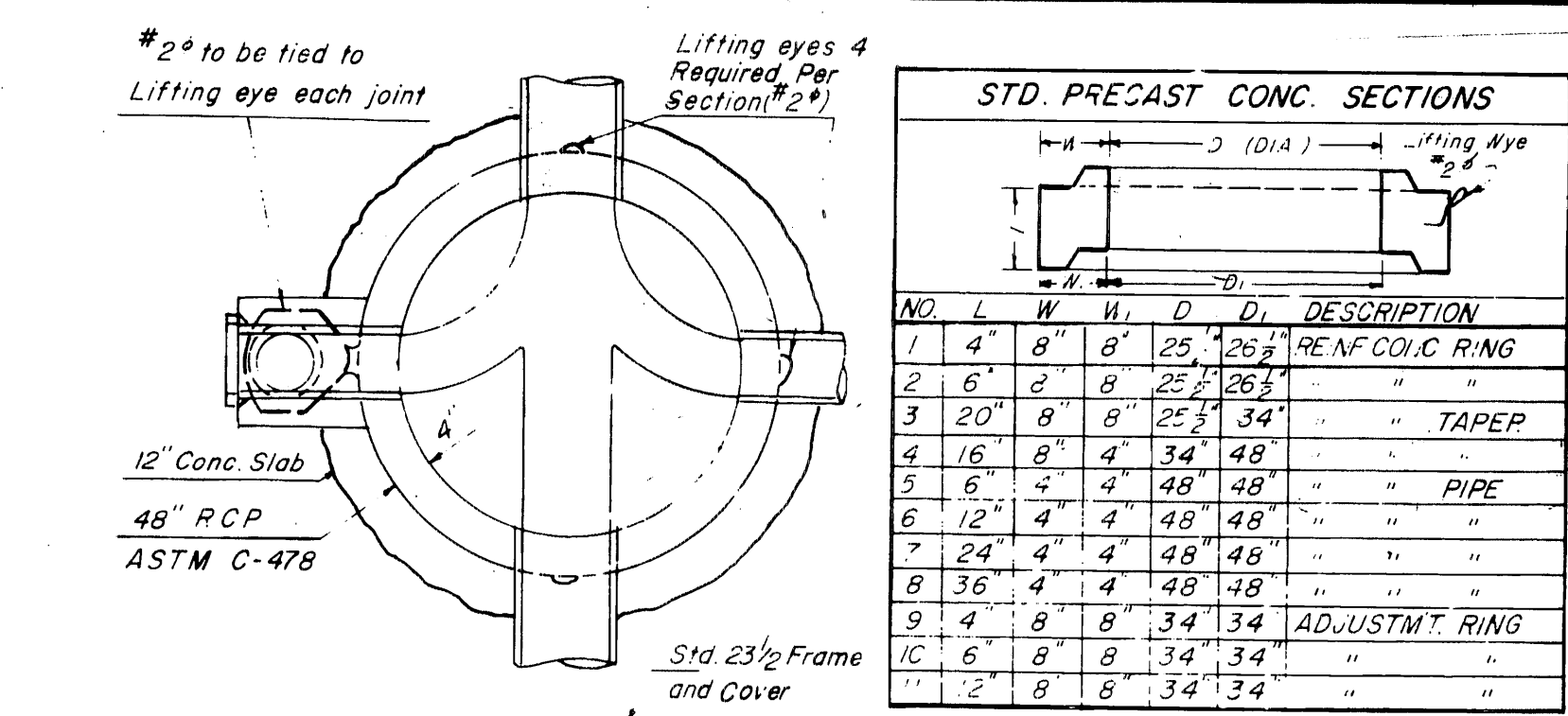
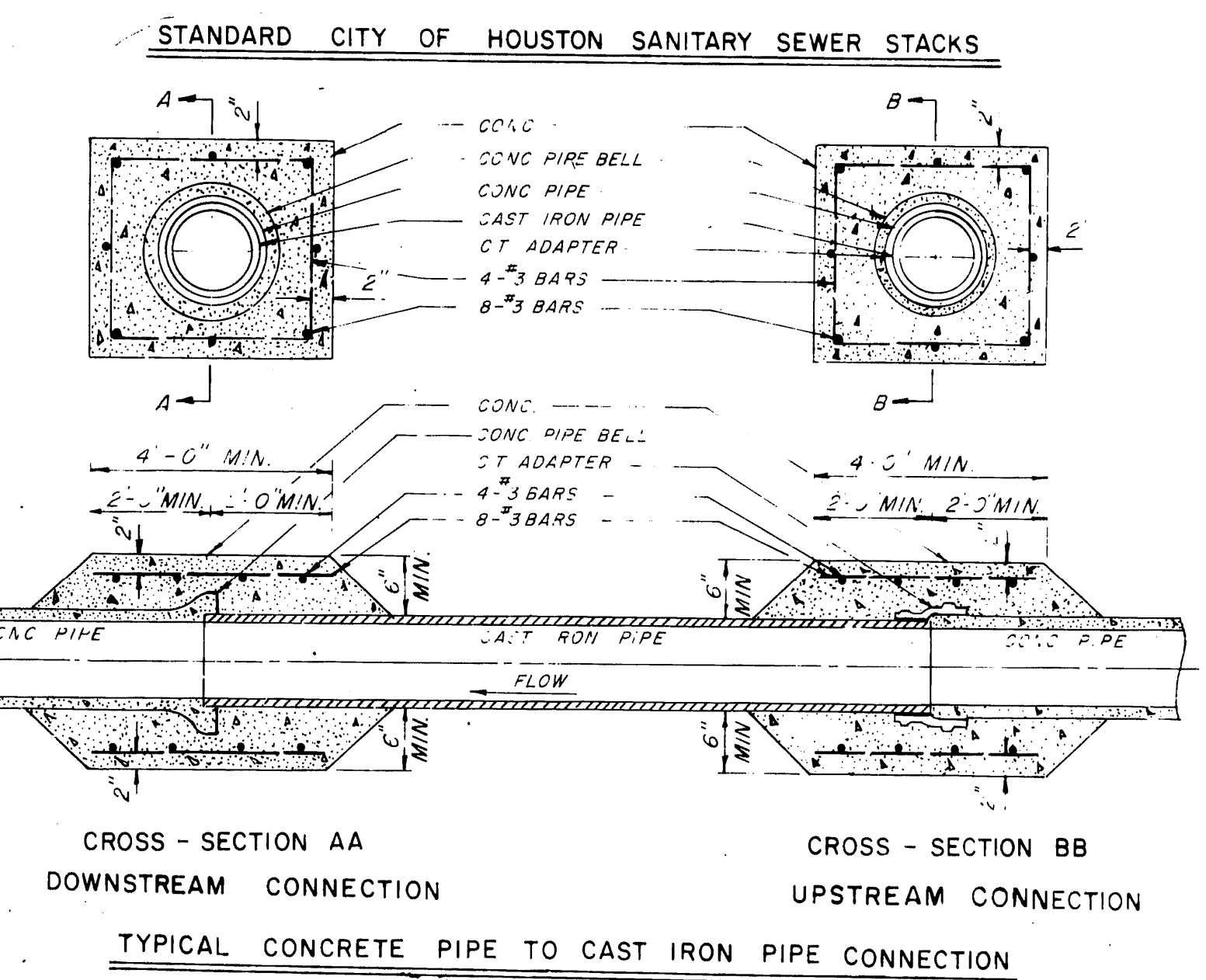
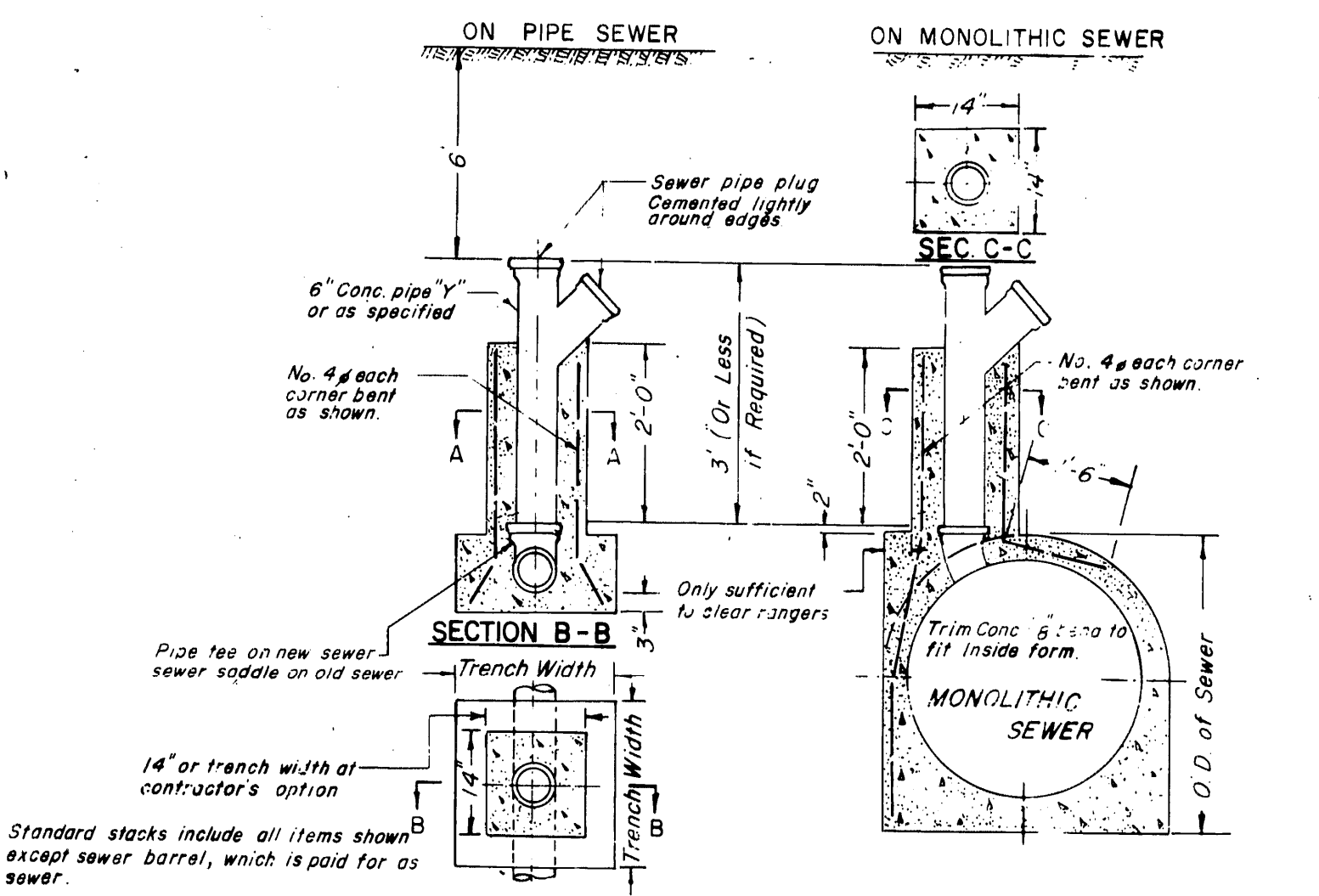
CLASS A
 A-Cement Stabilized Sand Placed Before Pipe is Laid up to Flow Line of Pipe or Above-Minimum Depth 5"
 B-Cement Stabilized Sand, Thoroughly Rodded, Placed After Pipe is Laid
 C-Earth Fill Placed Same Day as Pipe is Laid
 D-Earth Fill Placed next day (or later) After Pipe is Laid

CLASS B
 A-Cement Stabilized Sand Placed Before Pipe is Laid up to Flow Line of Pipe or Above-Minimum Depth 5"
 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.

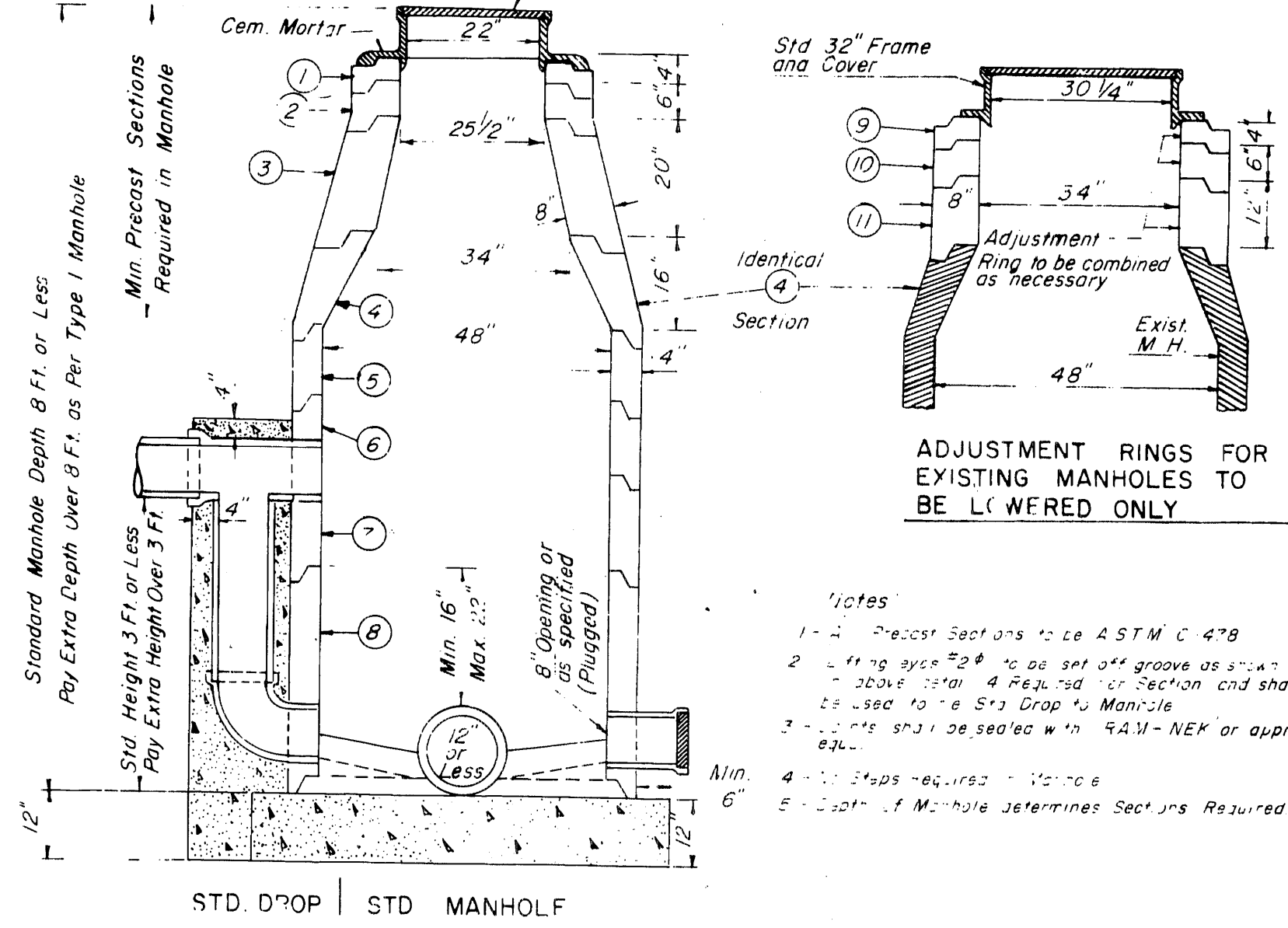
| Size of Pipe (in) | 6 | 8 | 10 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 42 | 48 |
|-------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| C-16 (ft) | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| C-75 (ft) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

BEDDINGS FOR PIPE SEWERS

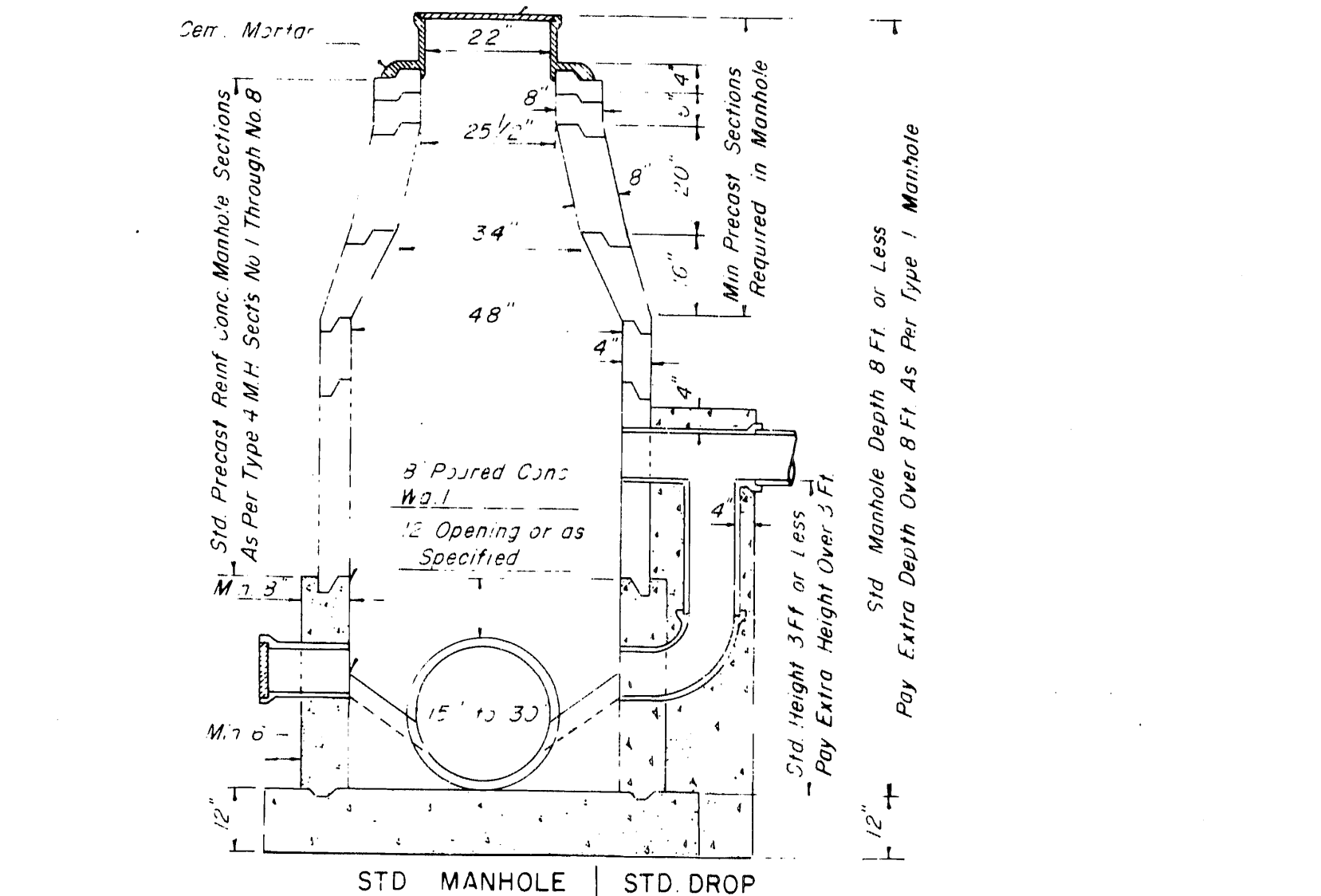
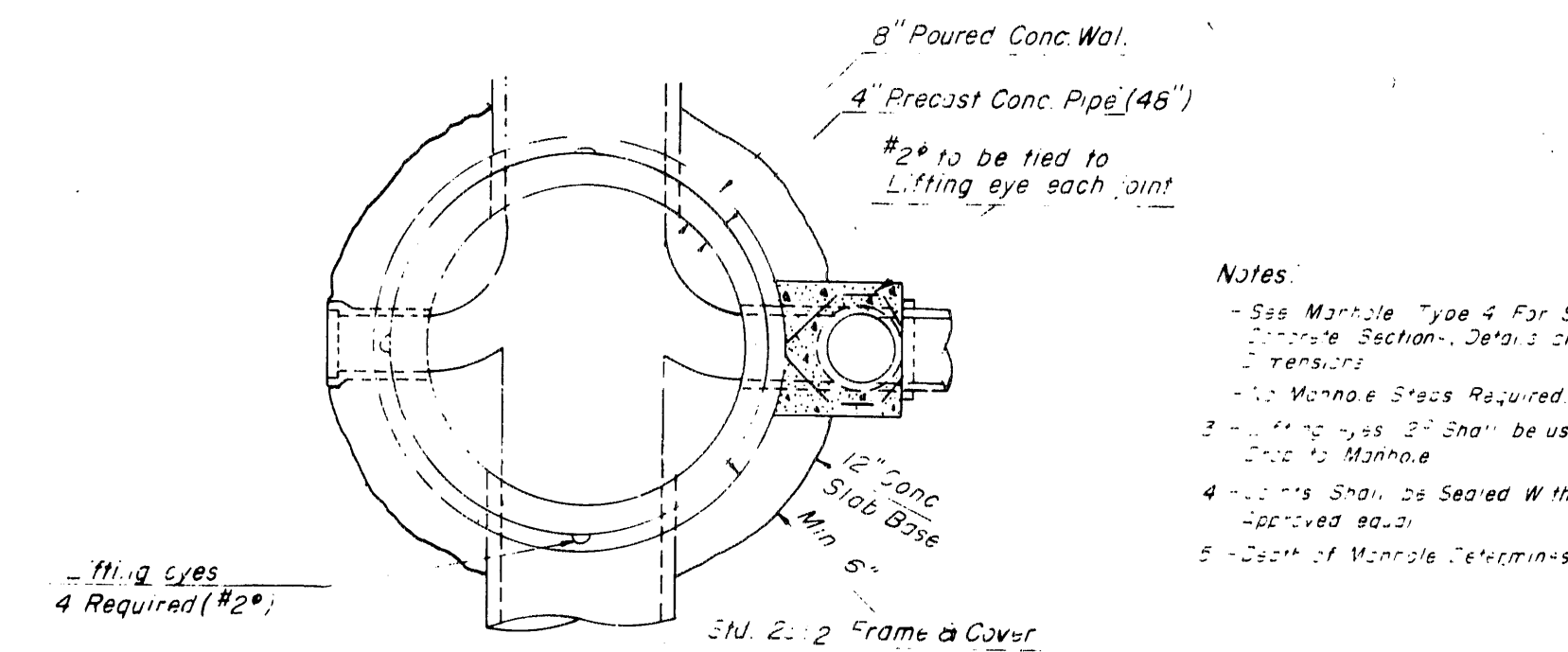


STD. PRECAST CONC. SECTIONS

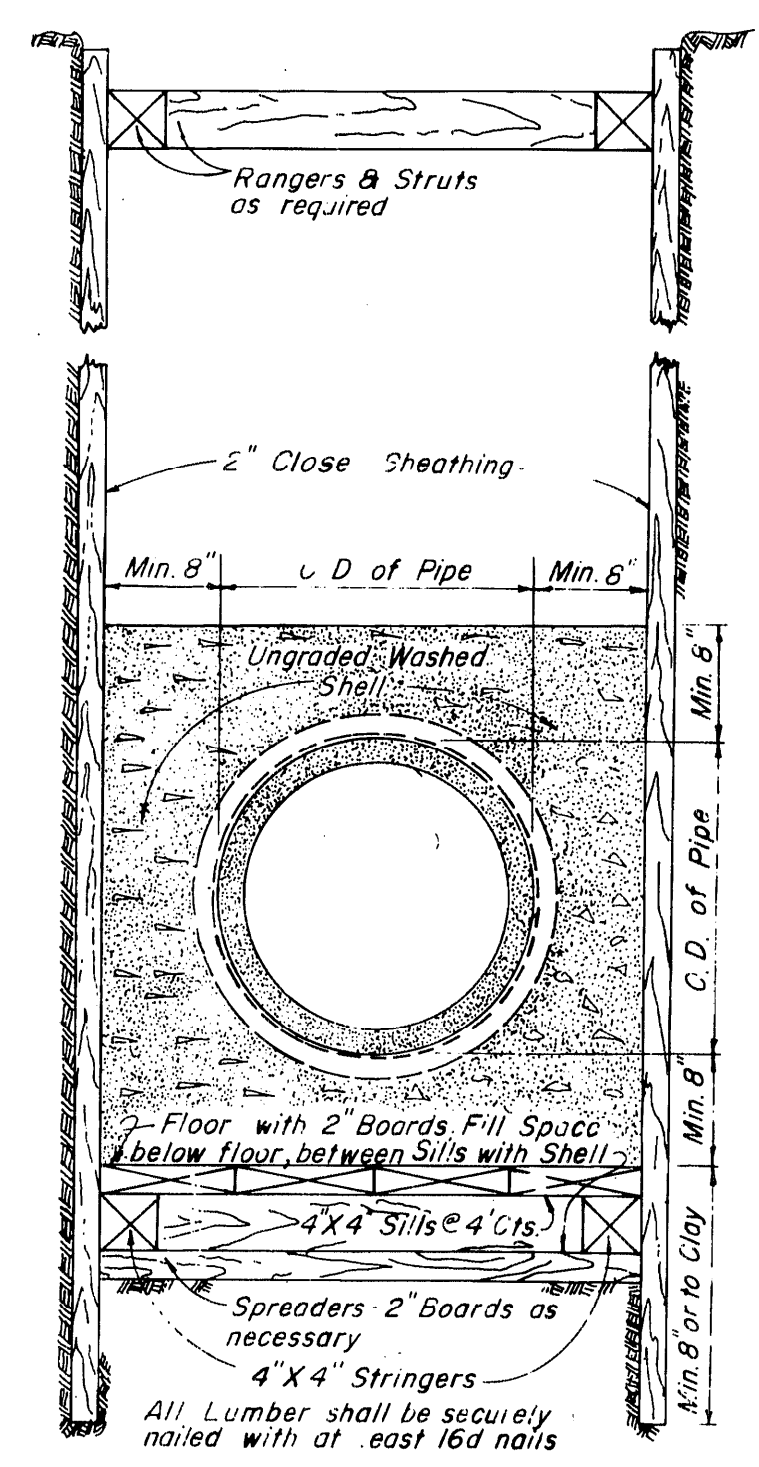
| NO. | L | W | H | D | DESCRIPTION |
|-----|-----|----|----|-----|------------------|
| 1 | 4' | 8' | 8' | 25" | REF. CO. C. RING |
| 2 | 6' | 2' | 8' | 25" | " |
| 3 | 20' | 8' | 8' | 25" | TAPEP |
| 4 | 16' | 4' | 4' | 34" | " |
| 5 | 6' | 4' | 4' | 48" | " |
| 6 | 12' | 4' | 4' | 48" | " |
| 7 | 24' | 4' | 4' | 48" | " |
| 8 | 36' | 4' | 4' | 48" | " |
| 9 | 4' | 8' | 8' | 34" | ADJUSTM. RING |
| 10 | 6' | 8' | 8' | 34" | " |
| 11 | 2' | 8' | 8' | 34" | " |



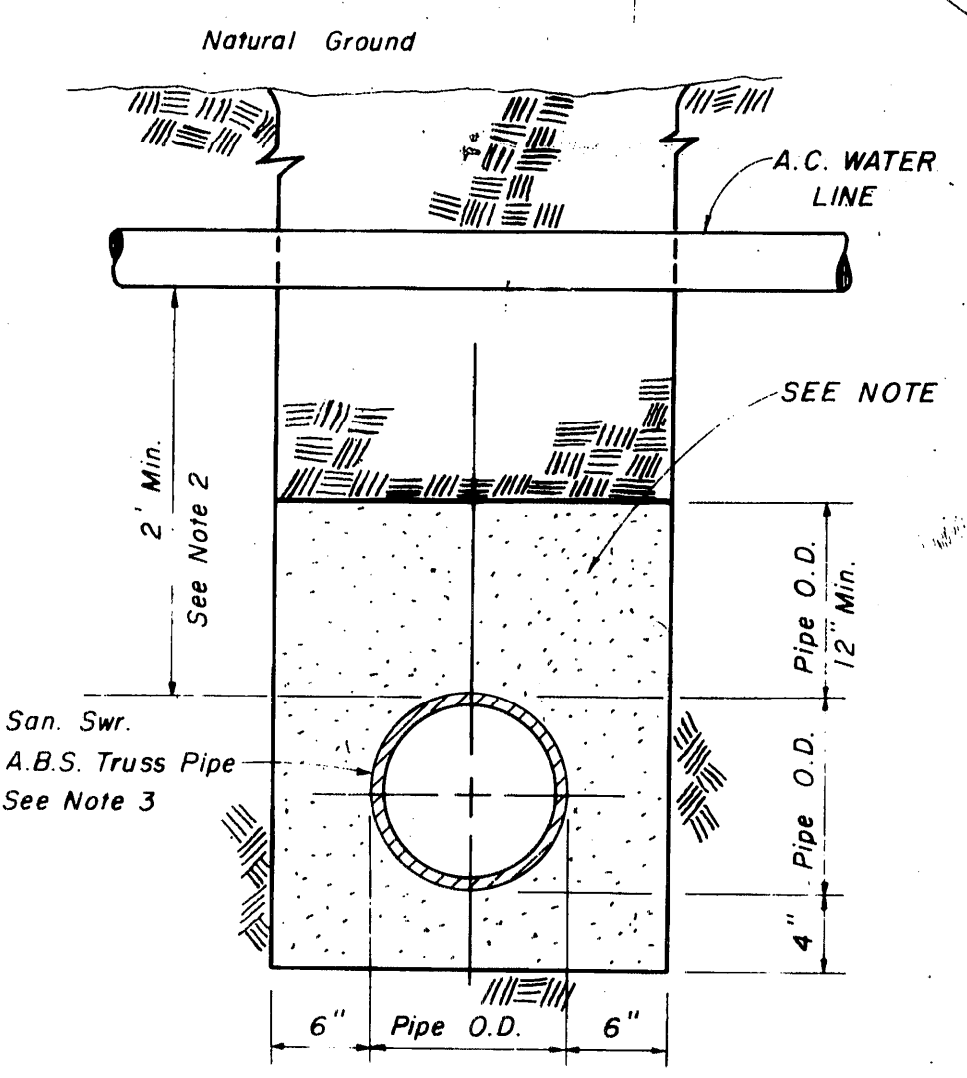
SANITARY SEWER MANHOLE TYPE 4 FOR 6" TO 12" SEWERS



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



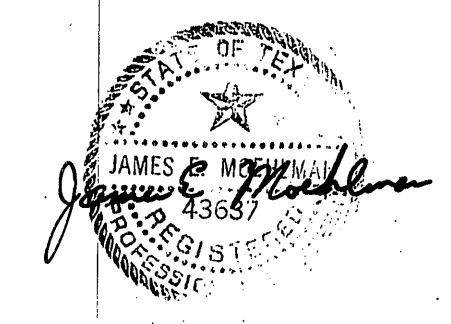
SPECIAL SECTION No. 5



- NOTES**
1. 18 L.F. of cement stabilized sand (1/2 or more bags of cement per cubic yd. of sand), centered on the water line.
 2. When depth is less than 2 feet O.D. to O.D.; 18" J.T. of San. Sw. C.I.P. (Thk. Cl. 22, 150 p.s.i.) shall be used at all water line crossings, centered on the water line.
 3. If San. Sw. is above water main, 1-18" J.T. of C.I.P. (Thk. Cl. 22, 150 p.s.i.) shall be used at all water line crossings, centered on the water line.
 4. D.I.P. Thk. Cl. 50 or as specified, may be used in lieu of C.I.P.

SPECIAL BACKFILL FOR WATER LINES

Note: 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. Ungraded washed shell dimensions shown here are typical but are to be varied as ordered by the Engineer. 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.



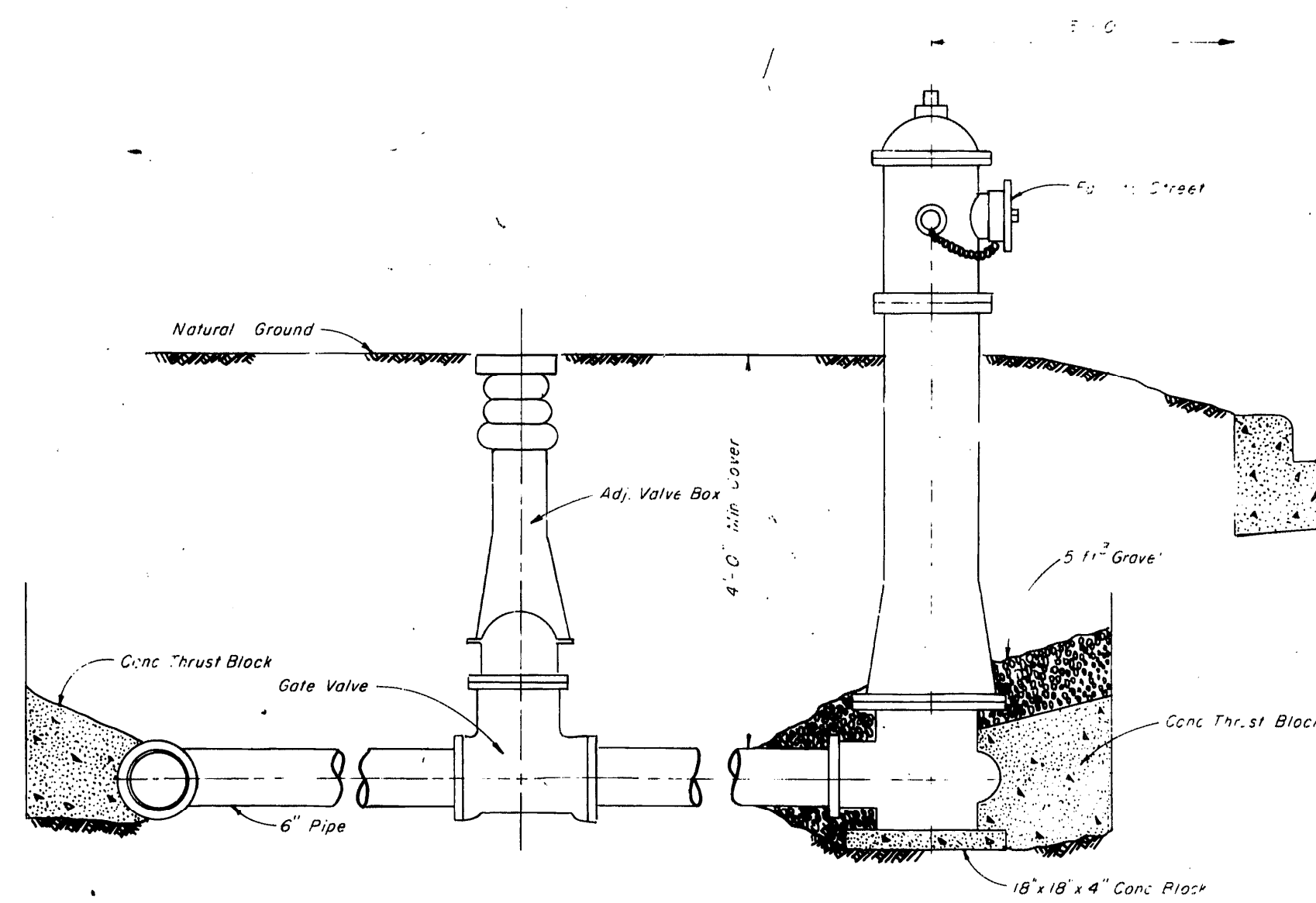
APPROVED FOR CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS

Water Usage: _____
 Water Quality: _____
 Assistant Director - Water Use: _____
 Director: _____
 Date: _____

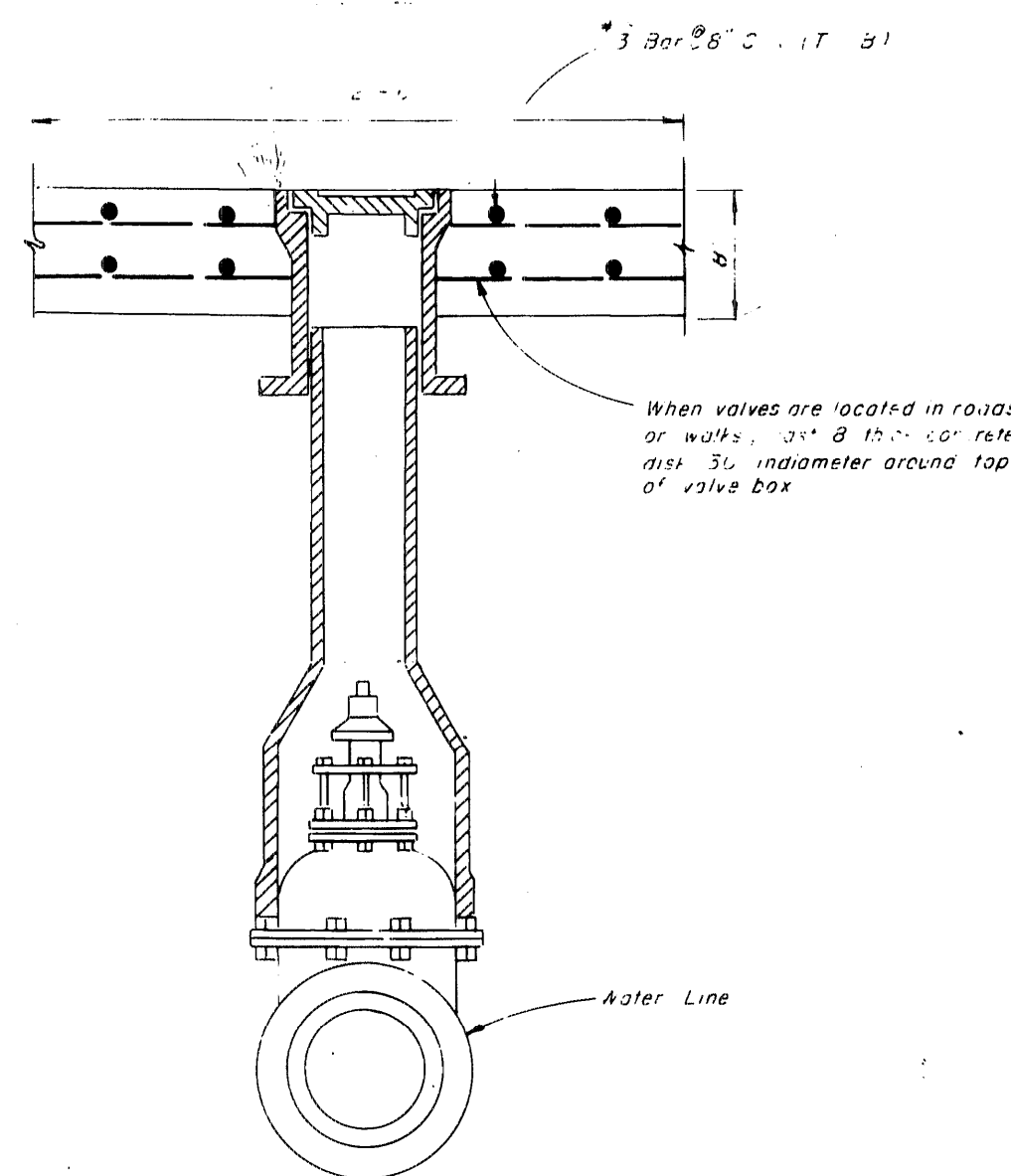
OTHER DEPT'S: _____
 Traffic & Transp. Dept. _____
 City Planning Dept. _____

| Rev. | Date | Description | App. |
|---|------------------|-------------|-------|
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE | | | |
| H. C. M.U.D. No. 191 | | | |
| SANITARY SEWER DETAILS | | | |
| Design By: J.W. | Job No: 85003 | Sheet | 18 |
| Drawn By: | Scale: NONE | | |
| Checked By: J.E.M. | Date: SEPT. 1982 | | of 21 |

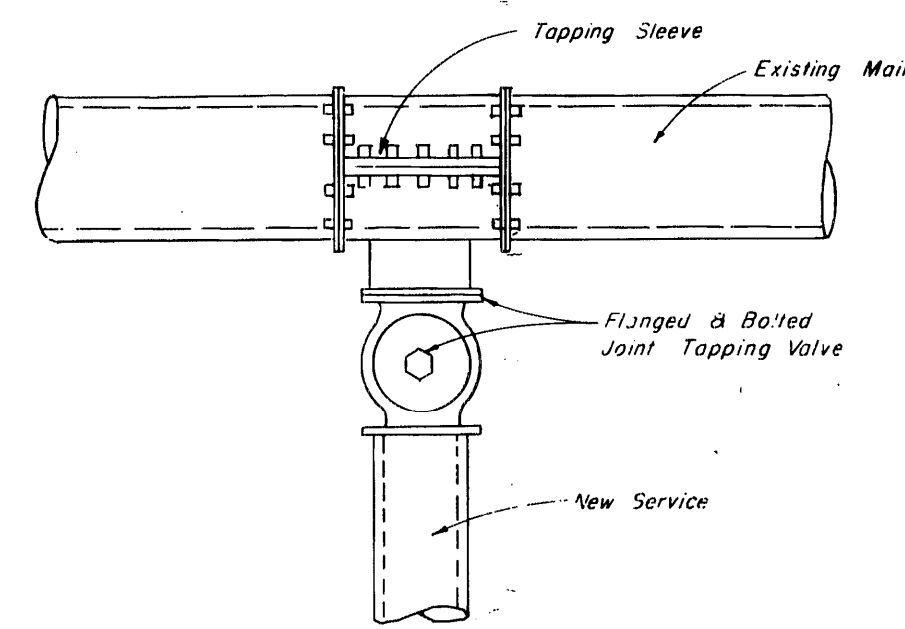
LANDEV ENGINEERS, INC.
 1706 SEAMIST DRIVE
 Houston, Texas 77008



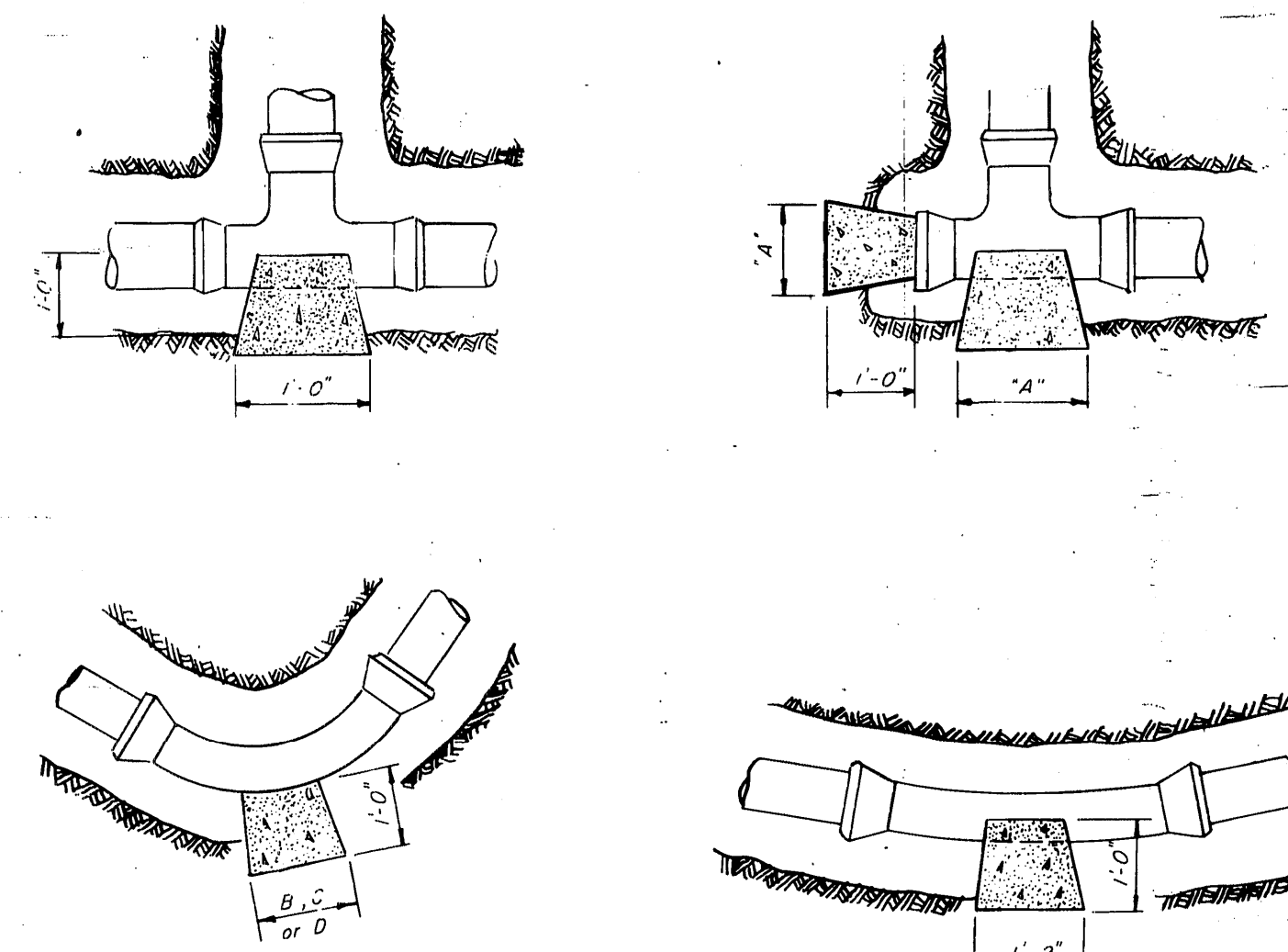
TYPICAL GATE VALVE & HYDRANT INSTALLATION



VALVE BOX DETAIL



WATER SERVICE CONNECTION

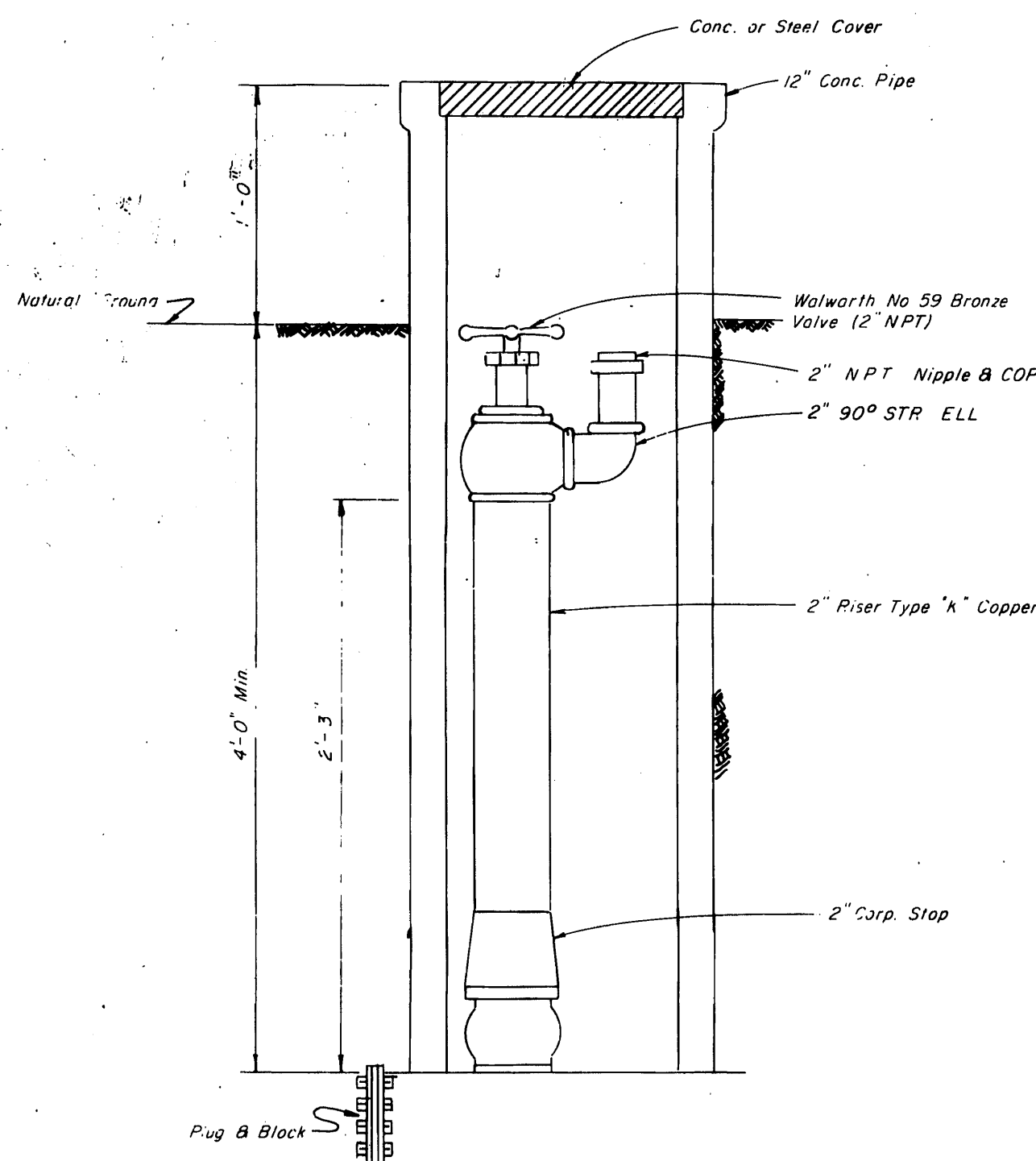


| PIPE SIZE | "A" PLUGS & TEES | "B" 90° BEND | "C" 45° BEND | "D" 22 1/2° BEND |
|-----------|------------------|--------------|--------------|------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

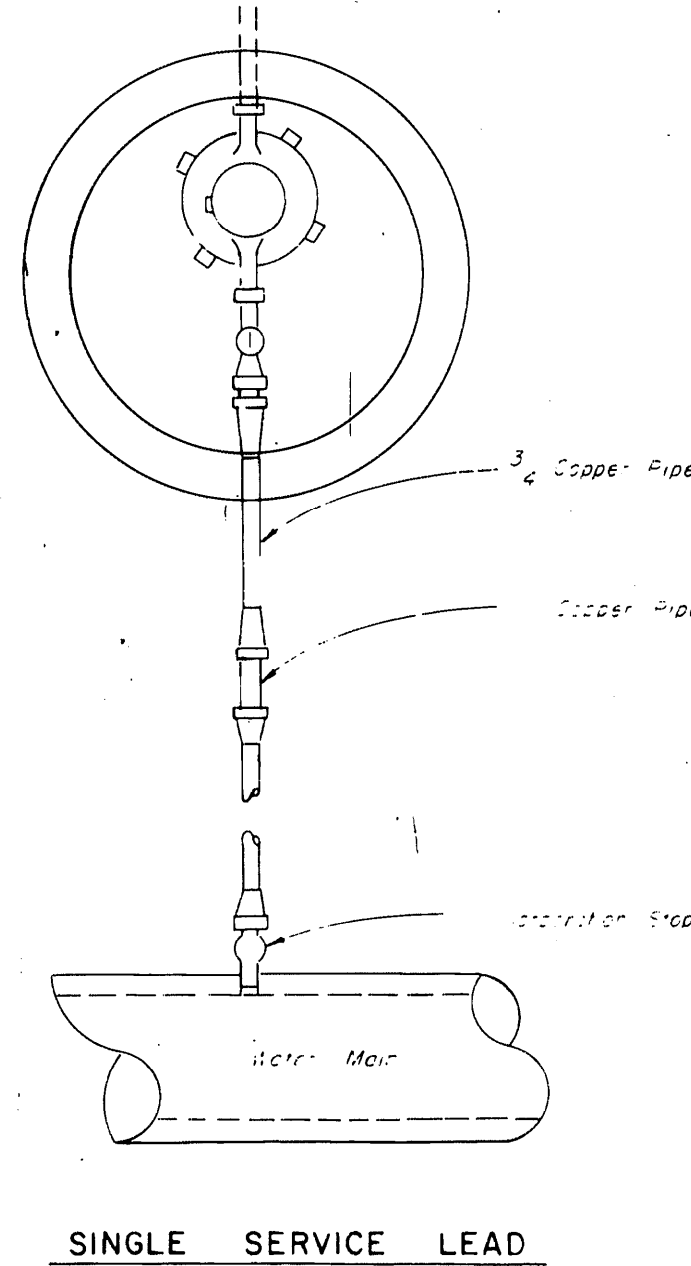
NOTE: Safe Bearing Load

NOTE: Thrust Block at trench face must have a minimum bearing surface of 1 sq. ft., and the least dimension shall be no smaller than 1.5 x pipe diameter, but not less than 10 ft.

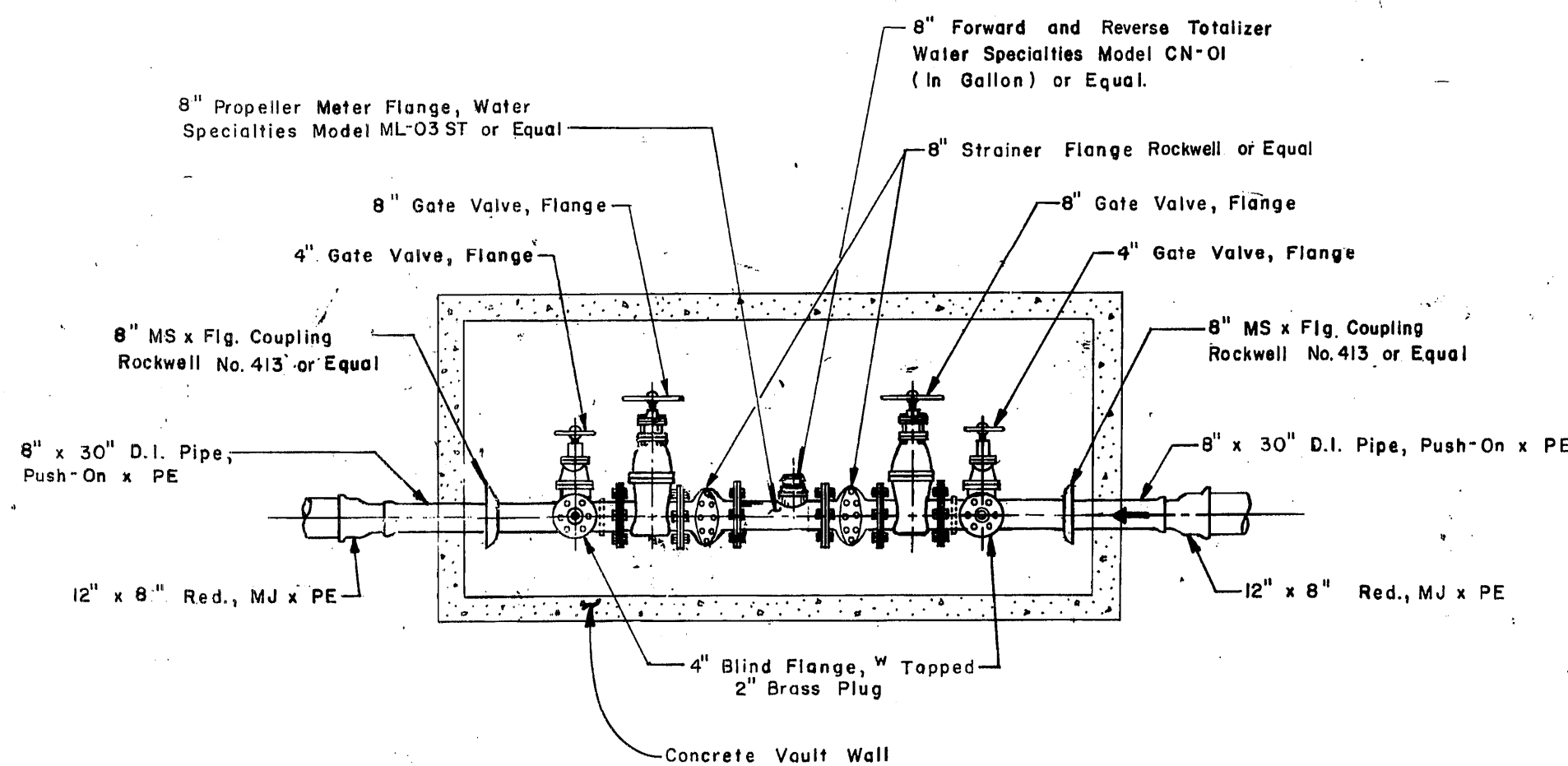
THRUST BLOCK DETAIL



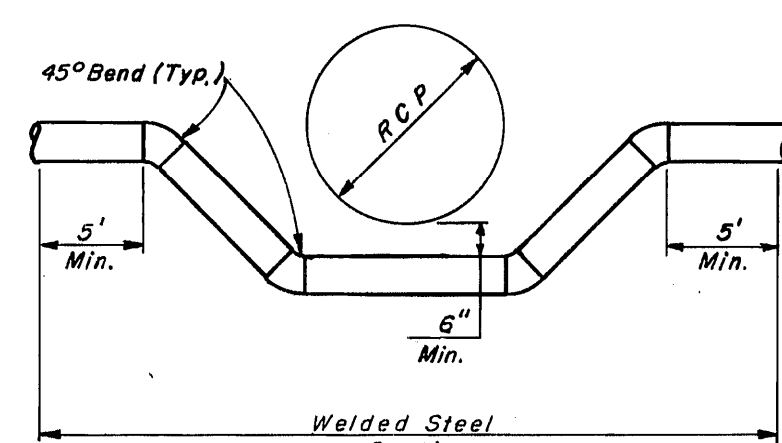
2" BLOW-OFF VALVE ASSEMBLY



SINGLE SERVICE LEAD



TYPICAL PIPING ARRANGEMENT METER VAULT N.T.S.



WELDED STEEL SECTION

APPROVED FOR CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS

James E. Milligan
1982

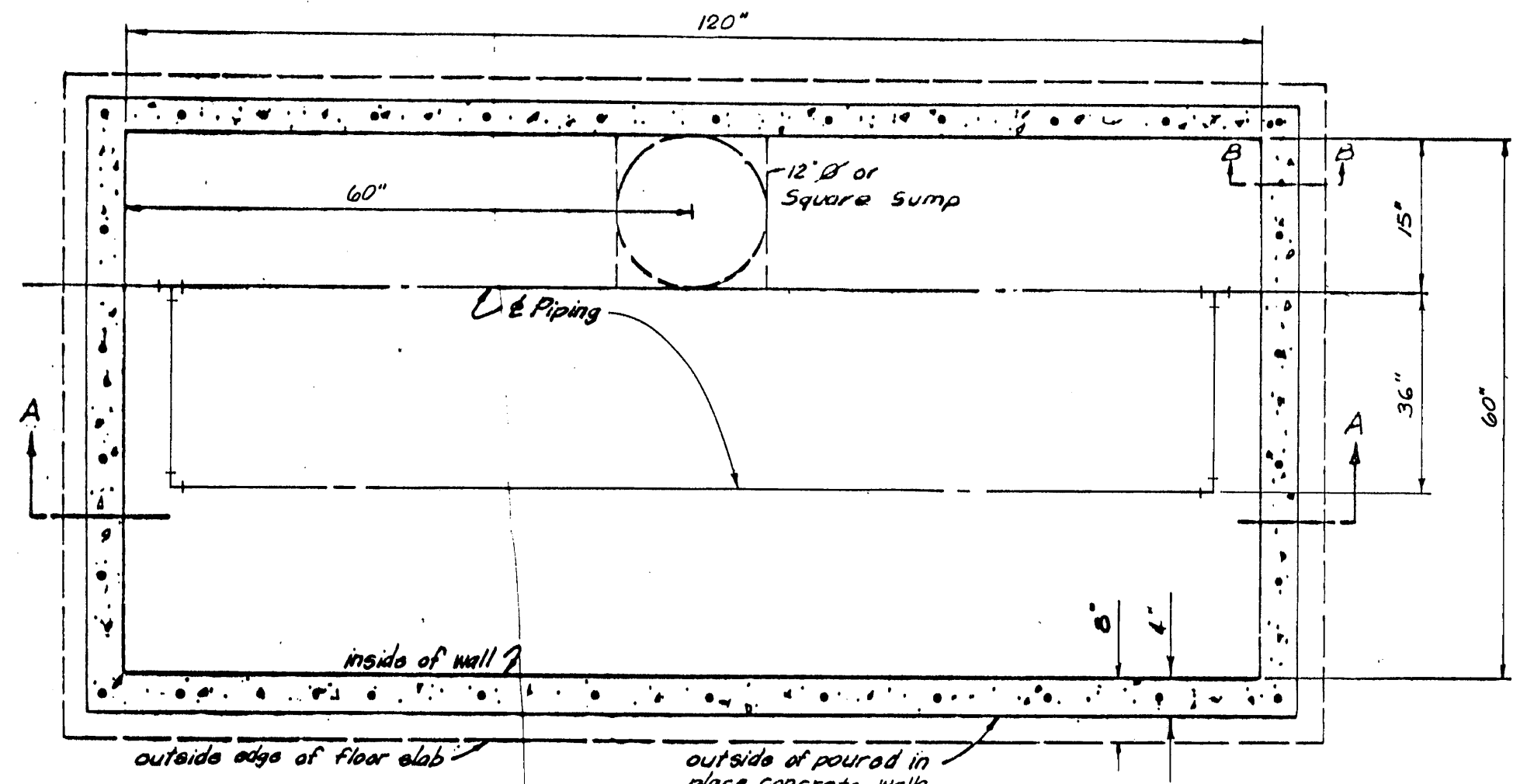
William Miller
with *John*

John
1982

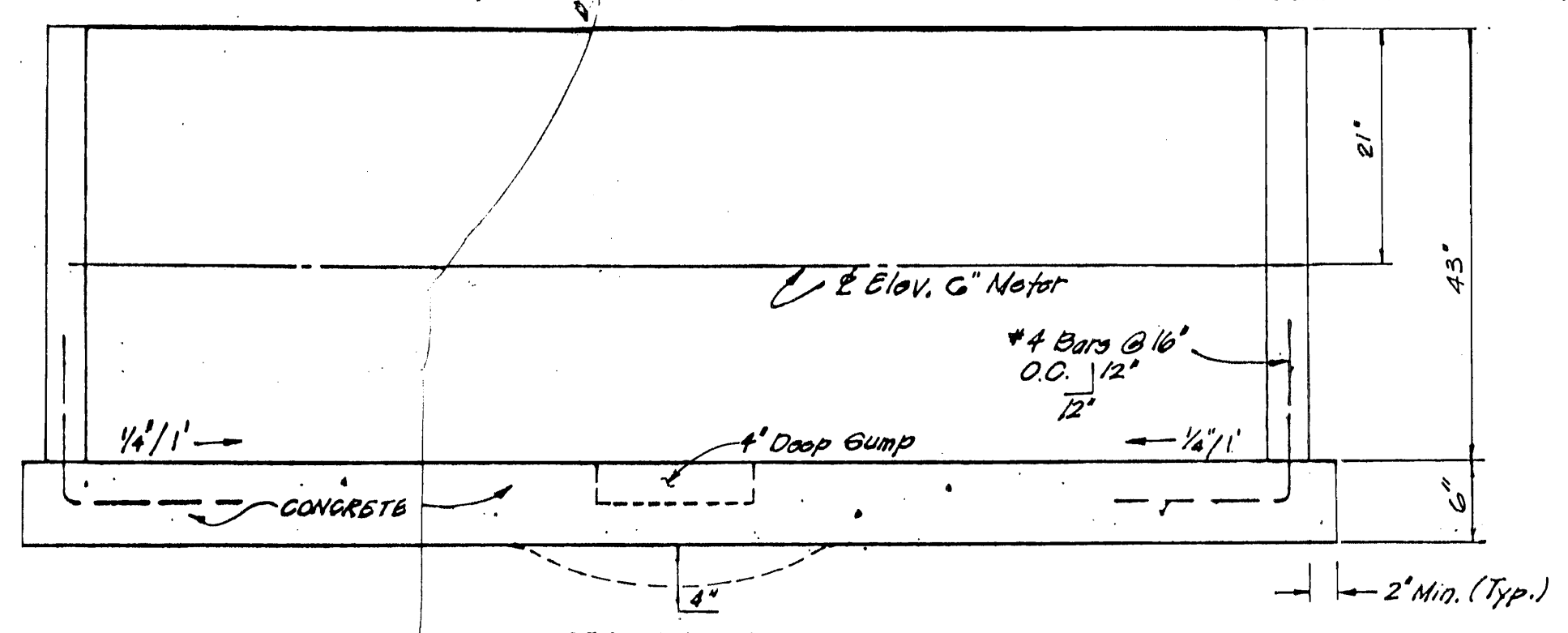
John
1982

OTHER DEPT'S: *11-5-a*
Franklin Riley

| | | |
|---|---------------------------------|------------------|
| 3-2-83 | Added Meter Vault Piping Detail | App. |
| Rev. | Date | Description |
| CHAMPION CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE | | |
| H.C. M.U.D. No. 191 | | |
| WATER DETAILS | | |
| Design By: | C. O. H. | Job No: 85003 |
| Drawn By: | R. T. | Scale: NONE |
| Checked By: | D. C. L. | Date: SEPT. 1982 |
| Sheet | | 19 |
| of | | 21 |
| LANDEV ENGINEERS, INC. 1706 SEAMIST DRIVE Houston, Texas 77008 | | |



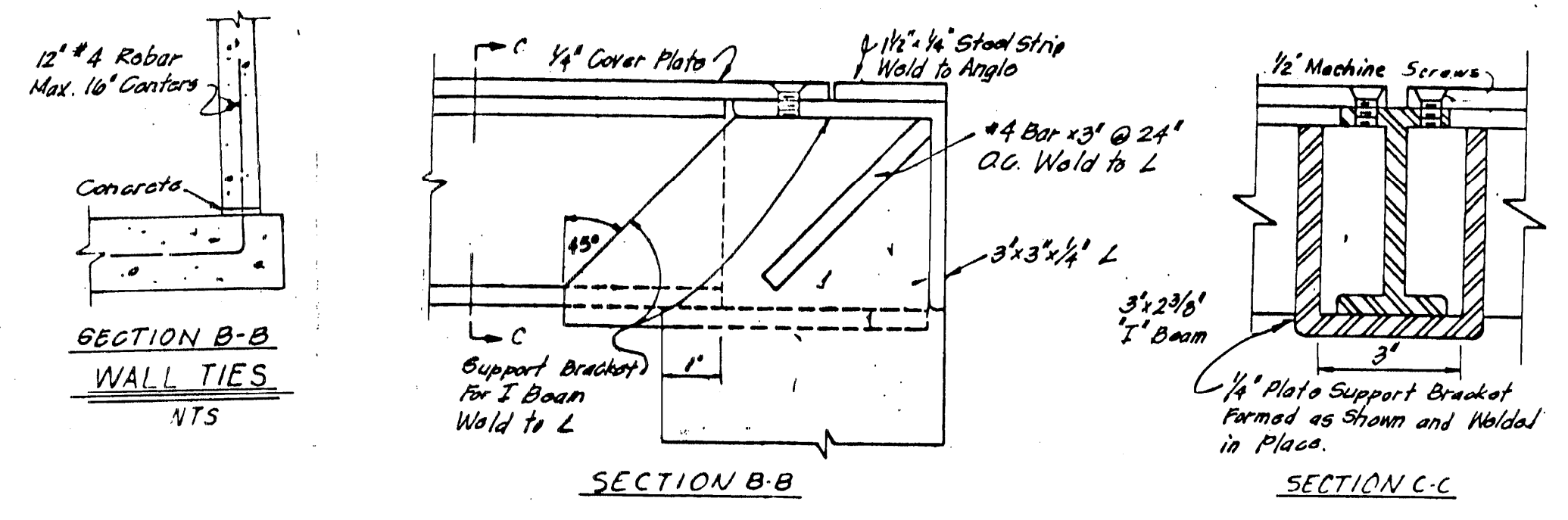
PLAN - WATER METER VAULT
NTS



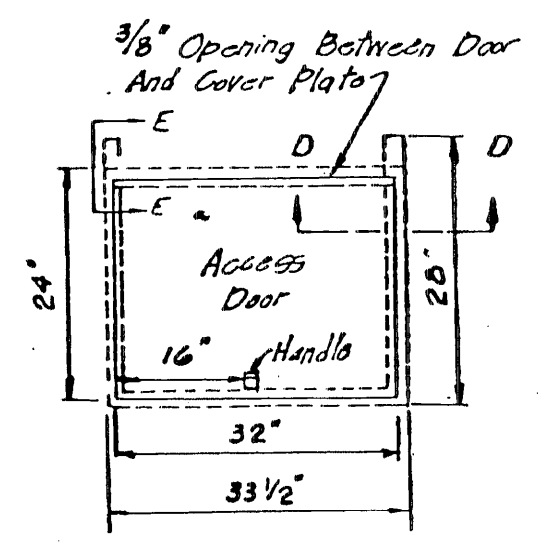
SECTION - A-A

- Construction Notes**
- Vault may be constructed by either of the following methods on a 6" thick concrete floor sloped towards sump.
 - (a) A cast in place concrete wall min 4" thick keyed to floor formed and poured to the proper height and the cover frame set in.
 - (b) A solid masonry wall 8" thick keyed and mortared on top of the floor slab and brought to grade through the use of bricks and the cover frame mortared in.
 - See Specification for materials and specific construction notes (WD-7)
 - Both walls and floors shall use 4 1/2 sack/cu yd concrete or better.

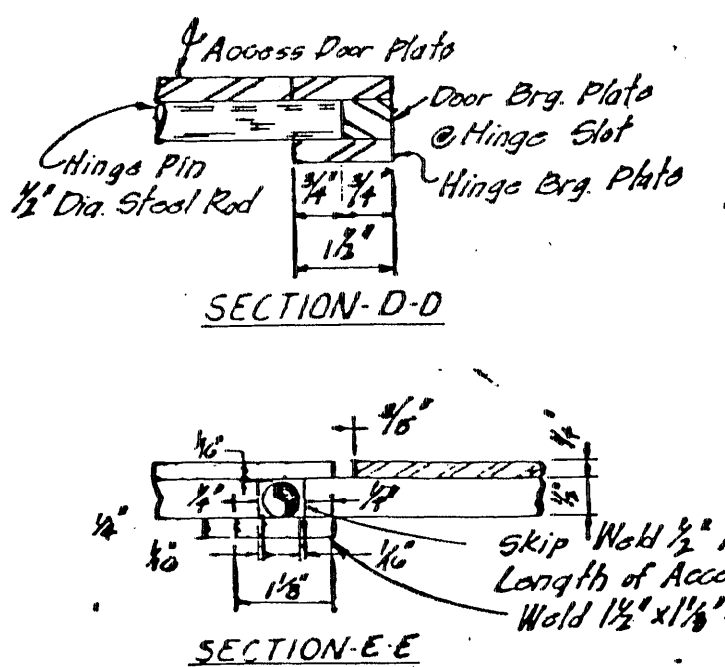
WATER METER VAULT
NTS



FRAME FABRICATION DETAIL
NTS

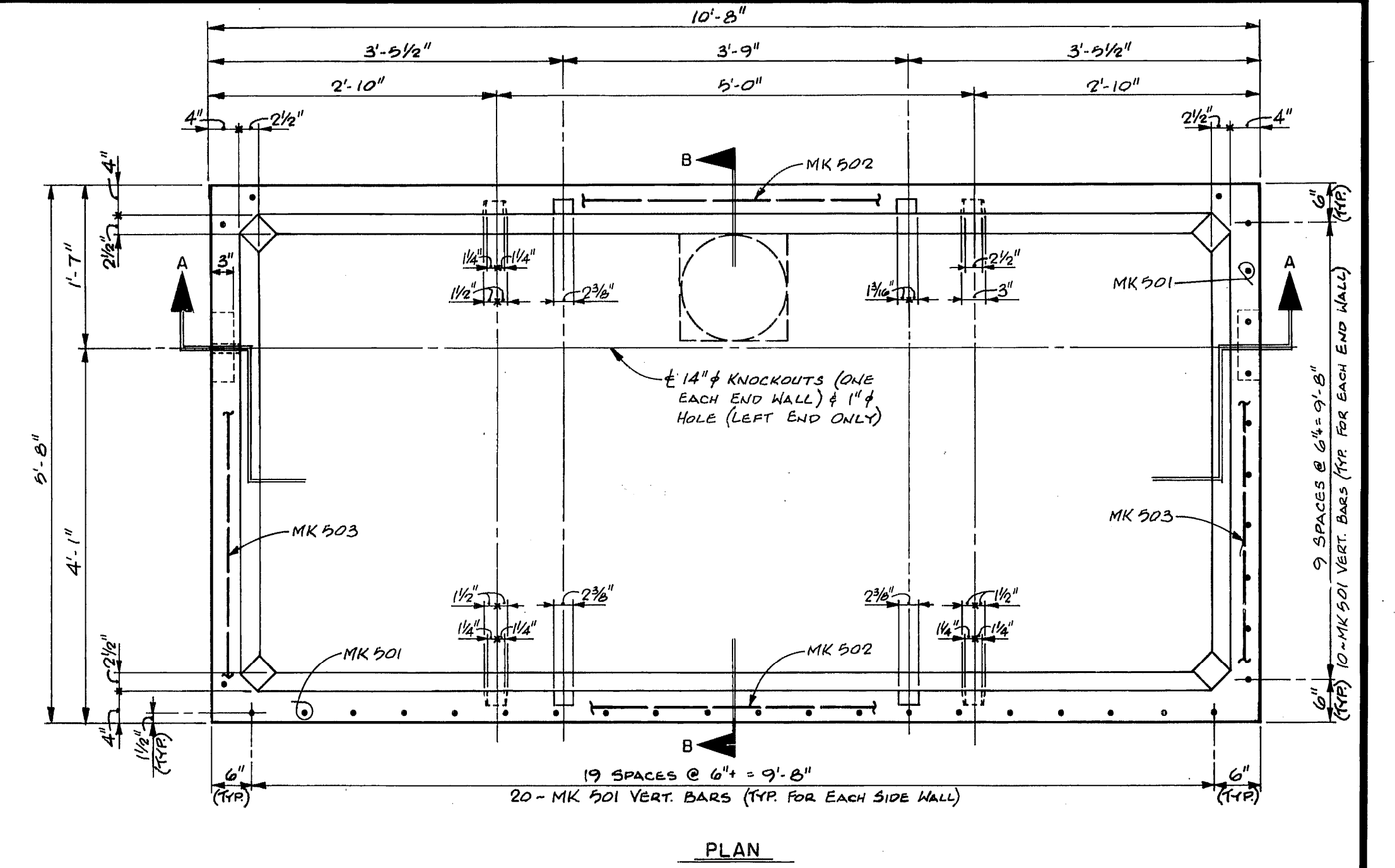


SECTION D-D

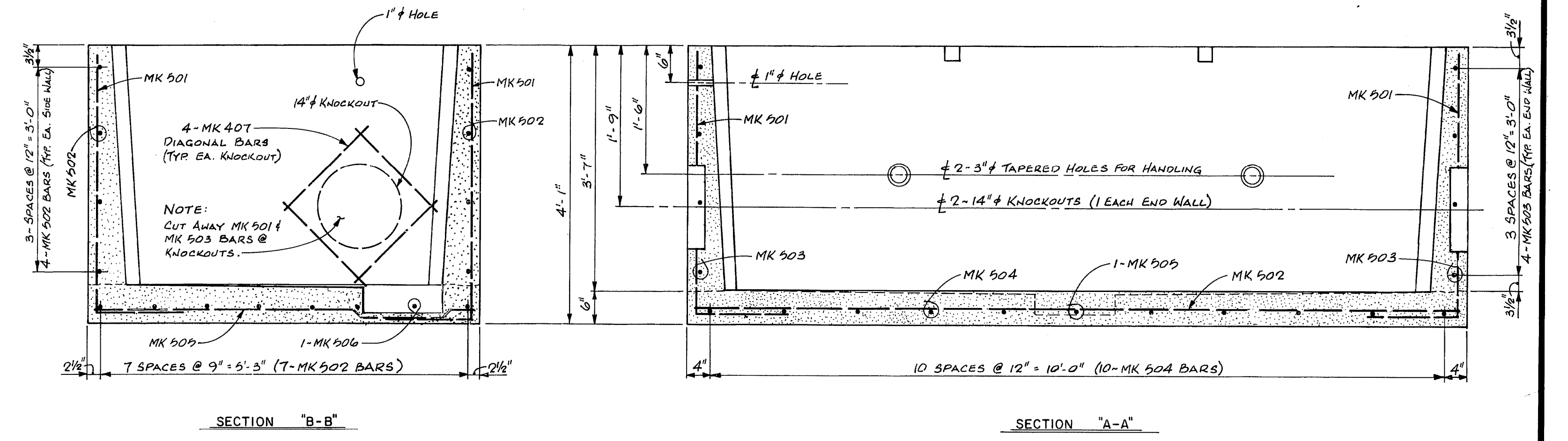


SECTION E-E

METER ACCESS DOOR AND HINGE DETAIL
NTS



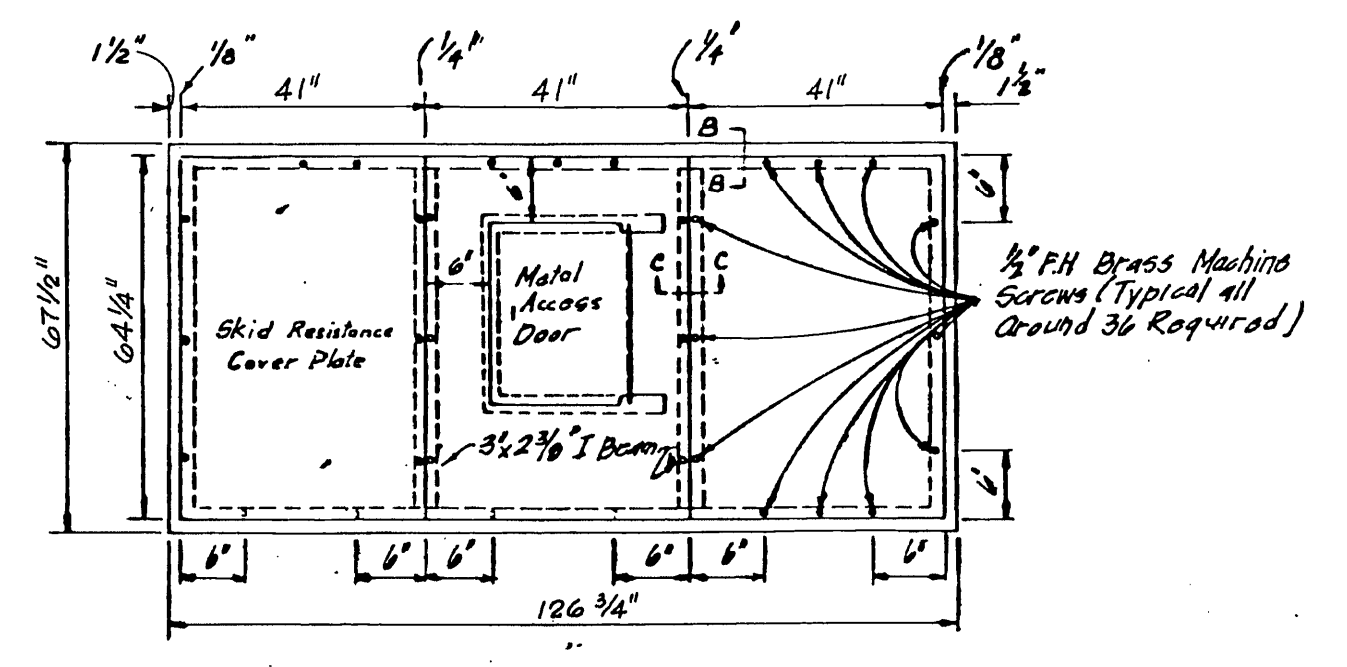
PLAN



SECTION "B-B"

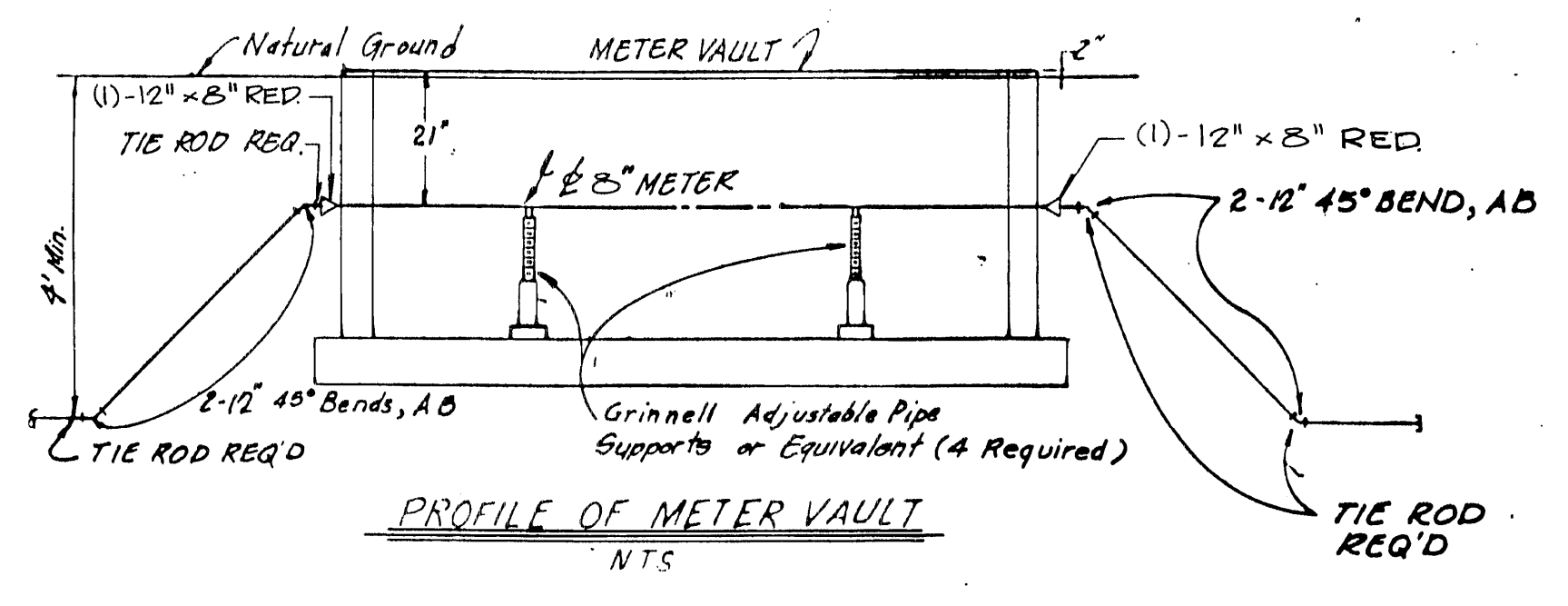
SECTION "A-A"

WATER METER VAULT - REINFORCING DETAILS
NTS



METAL VAULT COVER
NTS

- Fabrication Notes**
- Cover plate to be 1/4 inch skid resistant raised pattern floor plate cut in (3) sections as shown. Opening to be made to fit meter access door as per detail.
 - Cover plates and angle iron frame to be drilled for 1/2 inch RH brass machine screws. Holes in covers to be counter-sunk. Fabricator to furnish screws. Allow clearance on all sides of cover plate. All Weld to be free of burrs.
 - All covers shall be furnished in accordance with O/H drawings and design, and all covers shall have a coat of metal primer and one coat of black industrial roof enamel paint on all other surfaces of the meter vault covers except portion of frame against concrete shall have a thick coat of asphaltic paint.
 - Fabricator to make meter door (as shown) of same floor plate.
 - Miter and Weld frame at corners.

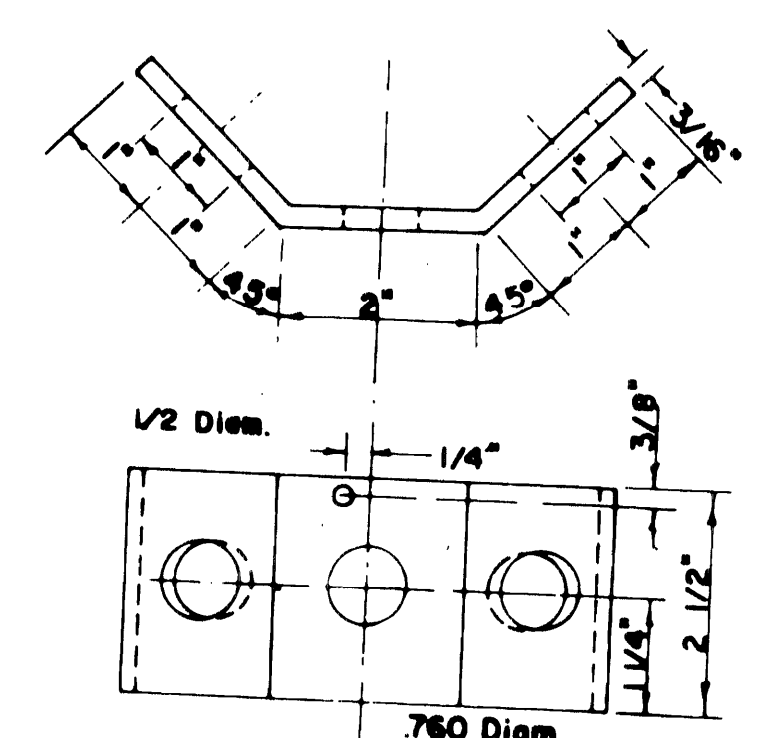
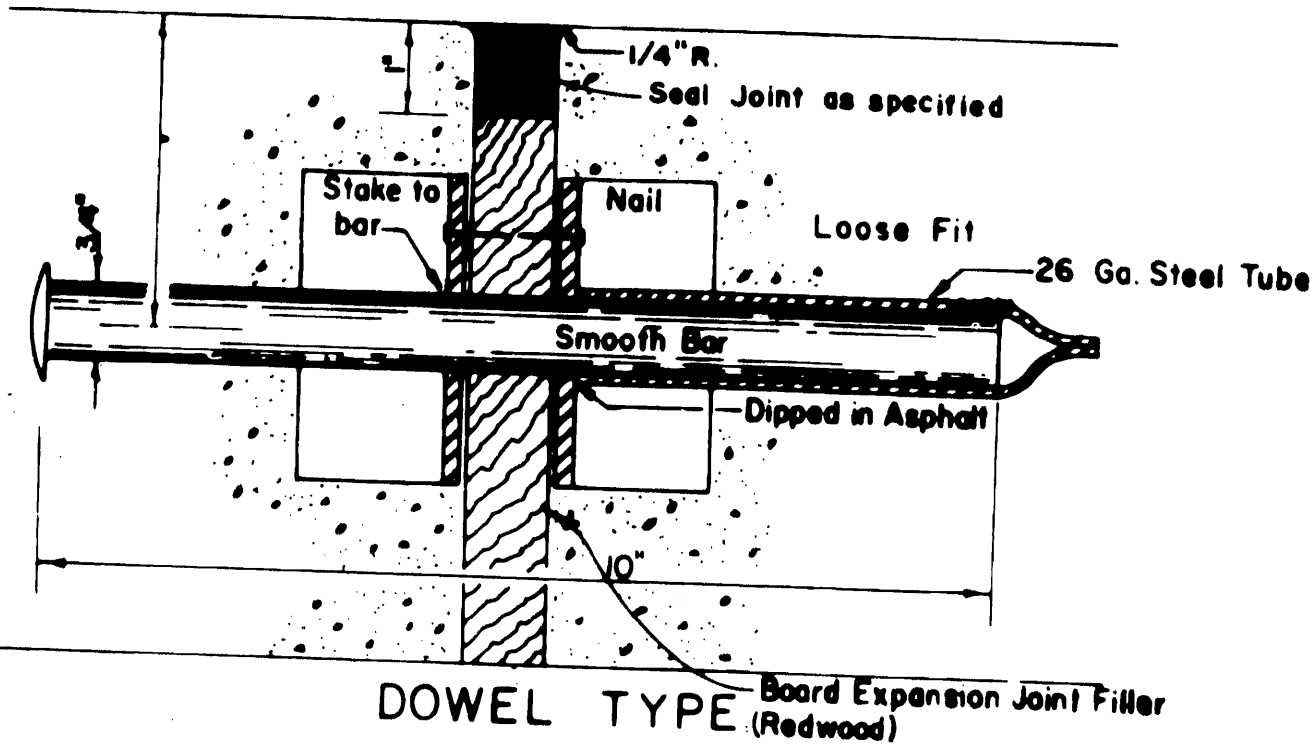


PROFILE OF METER VAULT
NTS

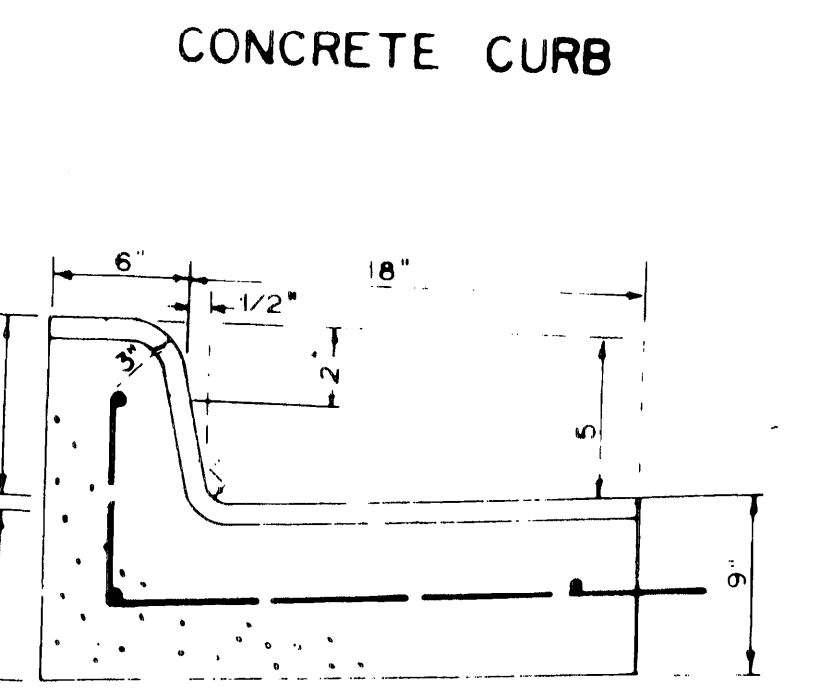
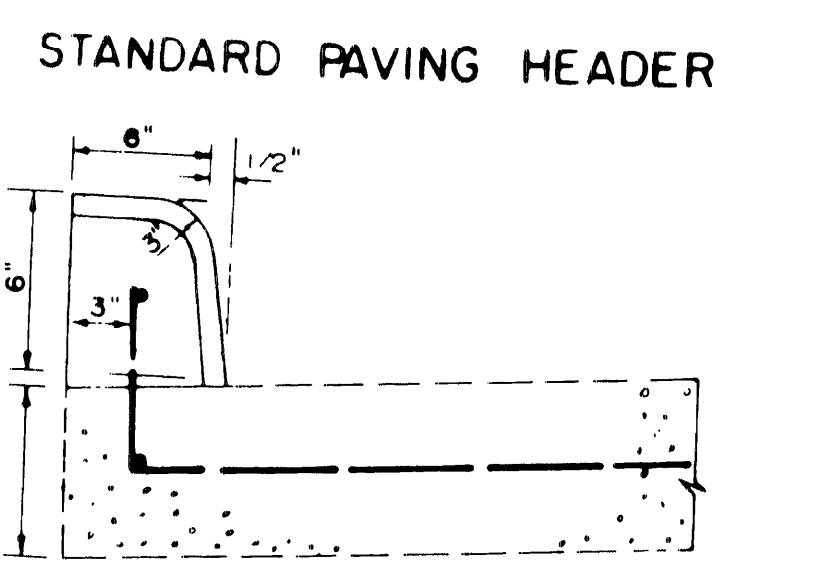
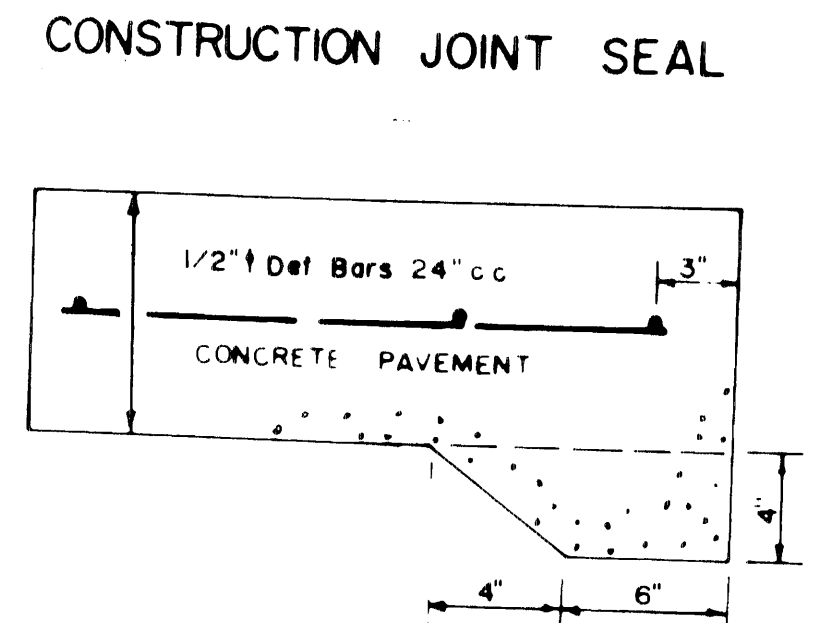
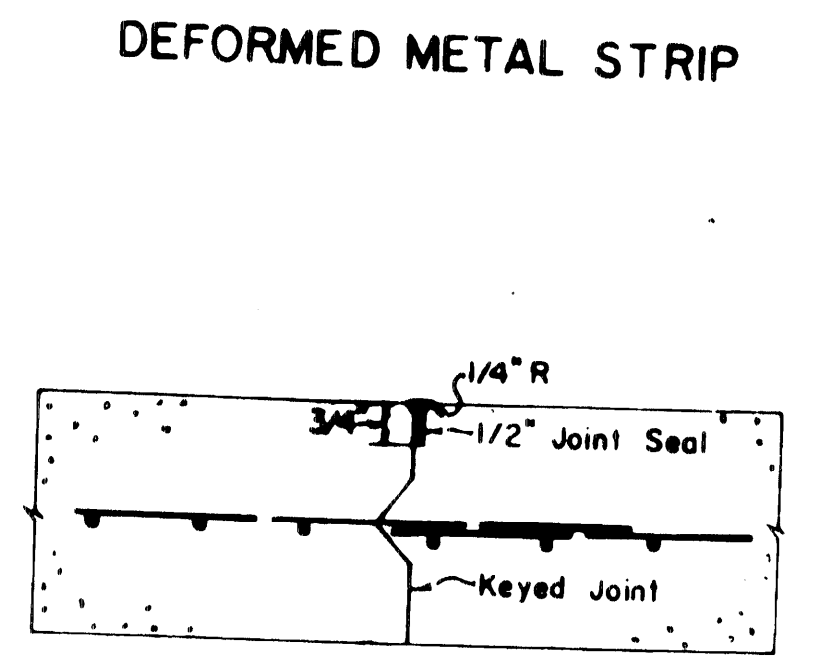
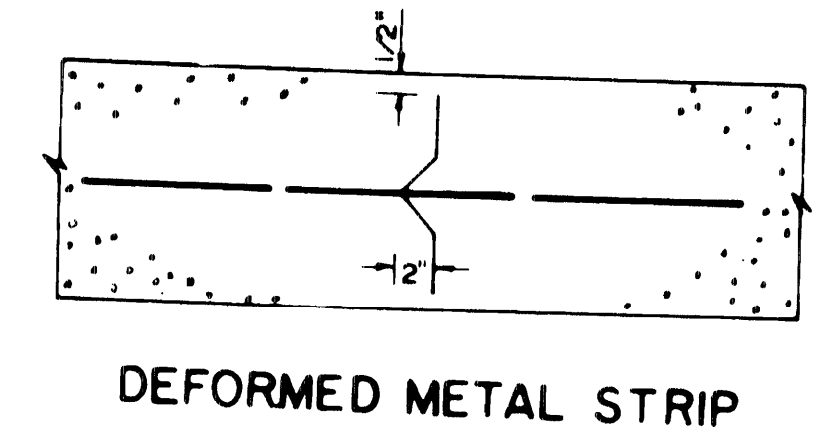
| RE-BAR SCHEDULE | |
|---------------------|--------------------|
| 3'-9 1/2" | 5'-5" |
| MK 501 60 Req'd. | MK 505 1 Req'd. |
| 10'-5" | 10'-5" |
| MK 502 15 Req'd. | MK 506 1 Req'd. |
| 5'-5" | 3'-0" |
| MK 503 8 Req'd. | MK 407 8 Req'd. |
| 5'-5" | |
| MK 504 10 Req'd. | |

| Rev. | Date | Description | App. |
|---|---------------|-------------|------|
| CHAMPIONS CENTRE SECTION ONE & WILLOW CENTRE SECTION ONE H.C. M.U.D. N° 191 WATER DETAILS | | | |
| Design By: | Job No: 85003 | Sheet | 19-A |
| Drawn By: | Scale: NONE | of | 21 |
| Checked By: | Date: 3/07/83 | | |

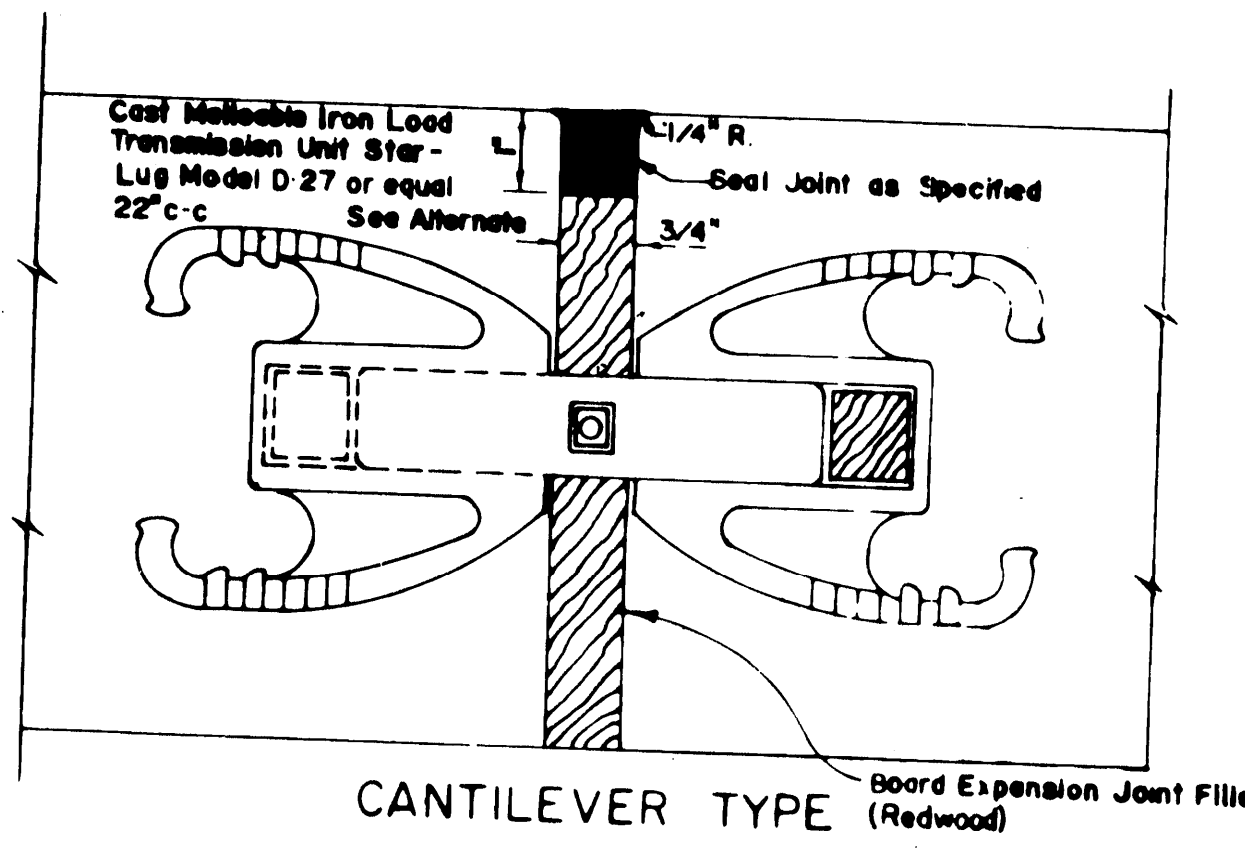
LANDEV ENGINEERS, INC.
1706 SEAMIST DRIVE
Houston, Texas 77008



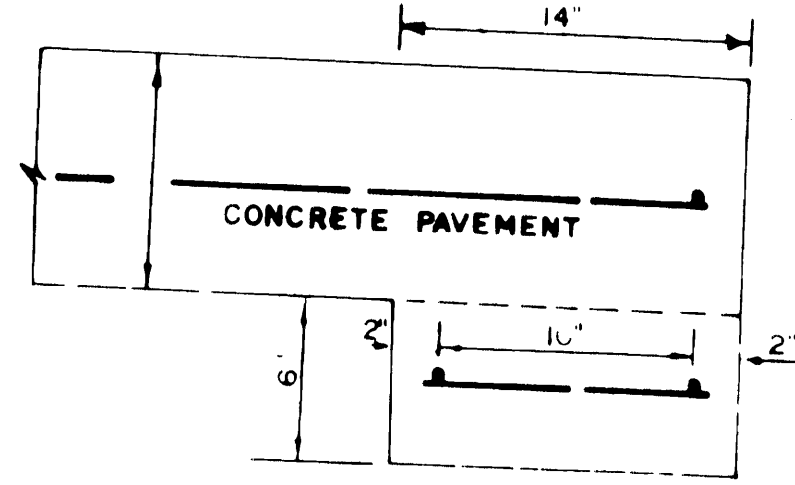
EXPANSION JOINT TO BE PLACED AT THE END OF EACH CURB RADIUS AND SPACED APPROX. 80' APART.



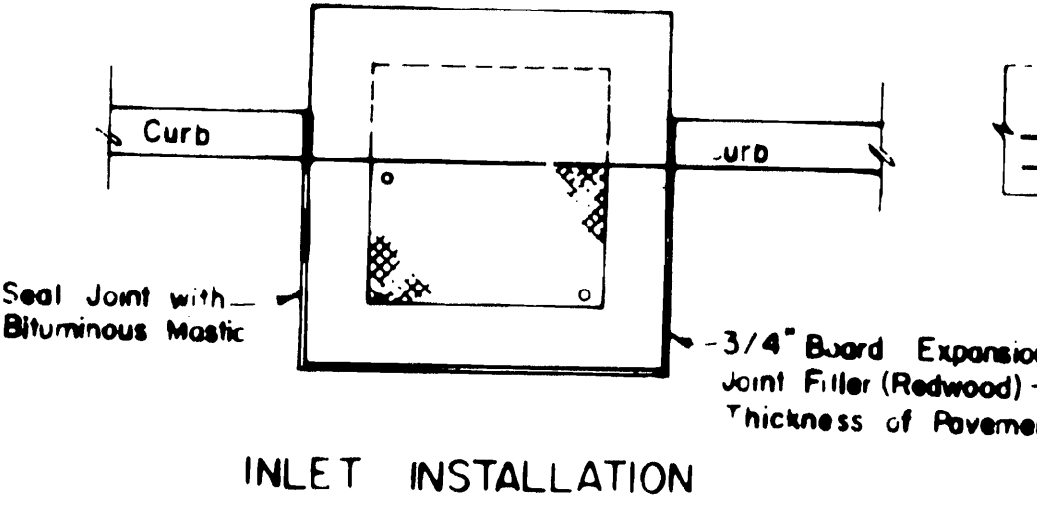
MONOLITHIC CURB AND GUTTER (VERTICAL STEEL OPTIONAL) 100' MIN. (MAJOR THOROUGHFARES)



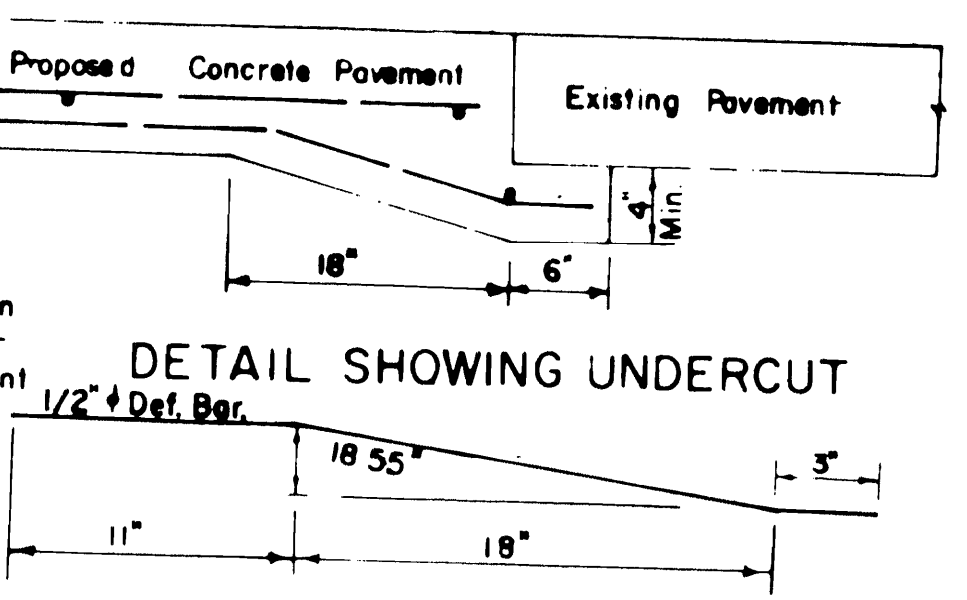
EXPANSION JOINT DETAILS



STANDARD RAILROAD HEADER NOTE: Railroad header to be poured monolithically with concrete base

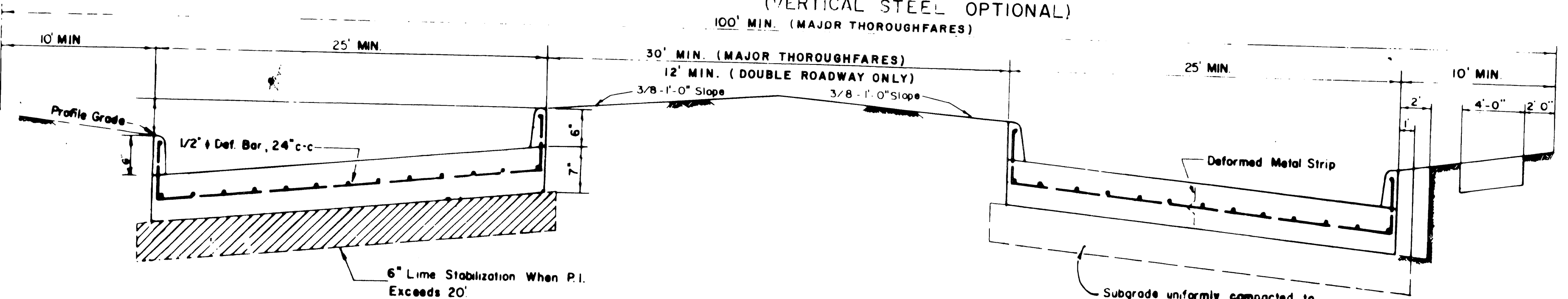


INLET INSTALLATION

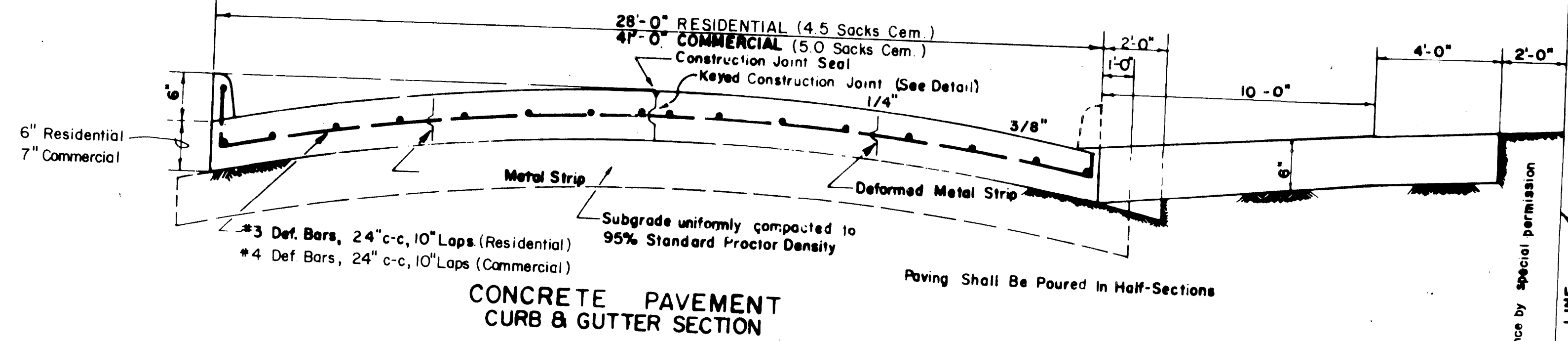


DETAIL SHOWING UNDERCUT

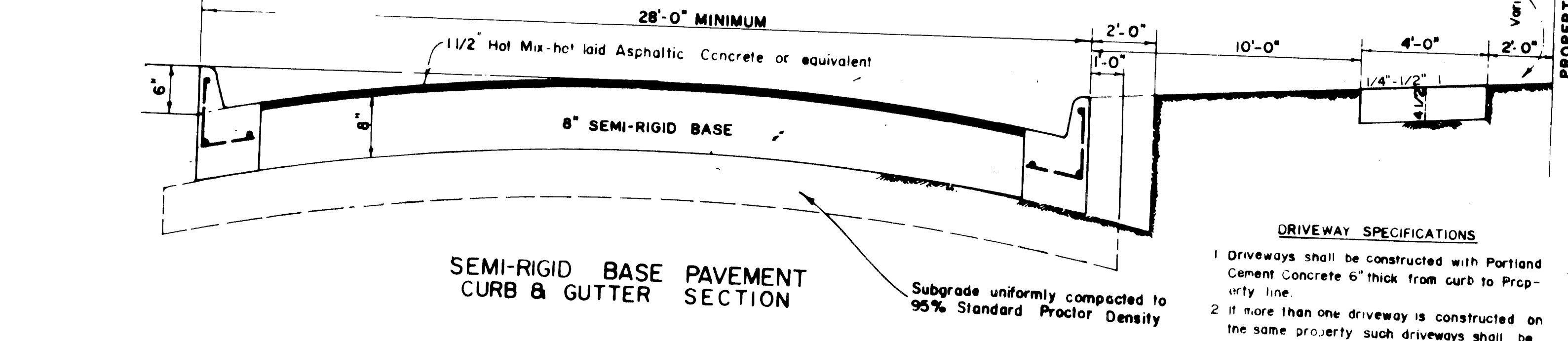
UNDERCUT BAR



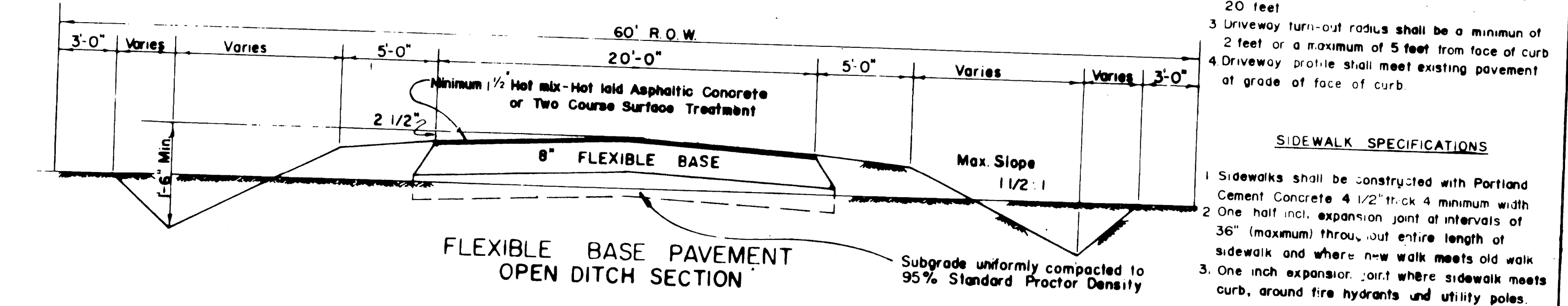
TYPICAL SECTIONS FOR MAJOR THOROUGHFARES AND DOUBLE ROADWAYS



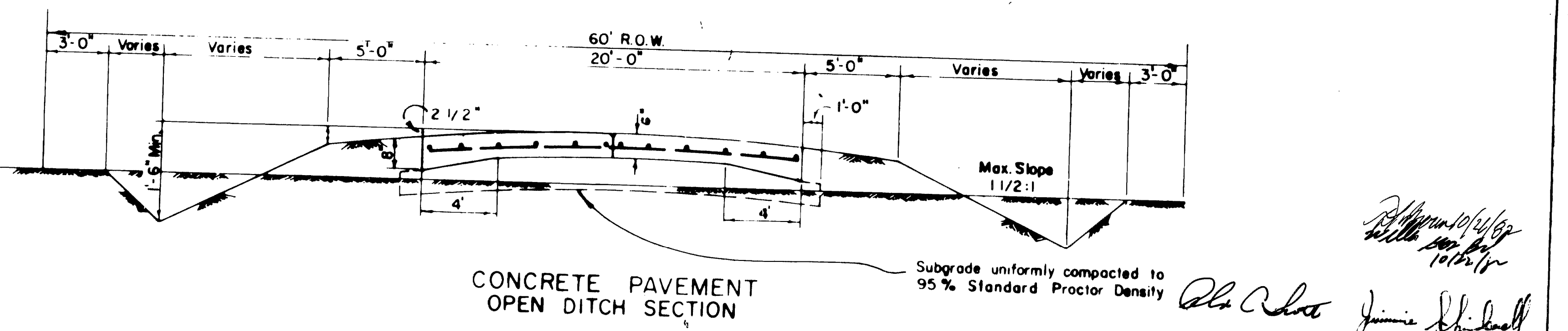
CONCRETE PAVEMENT CURB & GUTTER SECTION



SEMI-RIGID BASE PAVEMENT CURB & GUTTER SECTION



FLEXIBLE BASE PAVEMENT OPEN DITCH SECTION



CONCRETE PAVEMENT OPEN DITCH SECTION

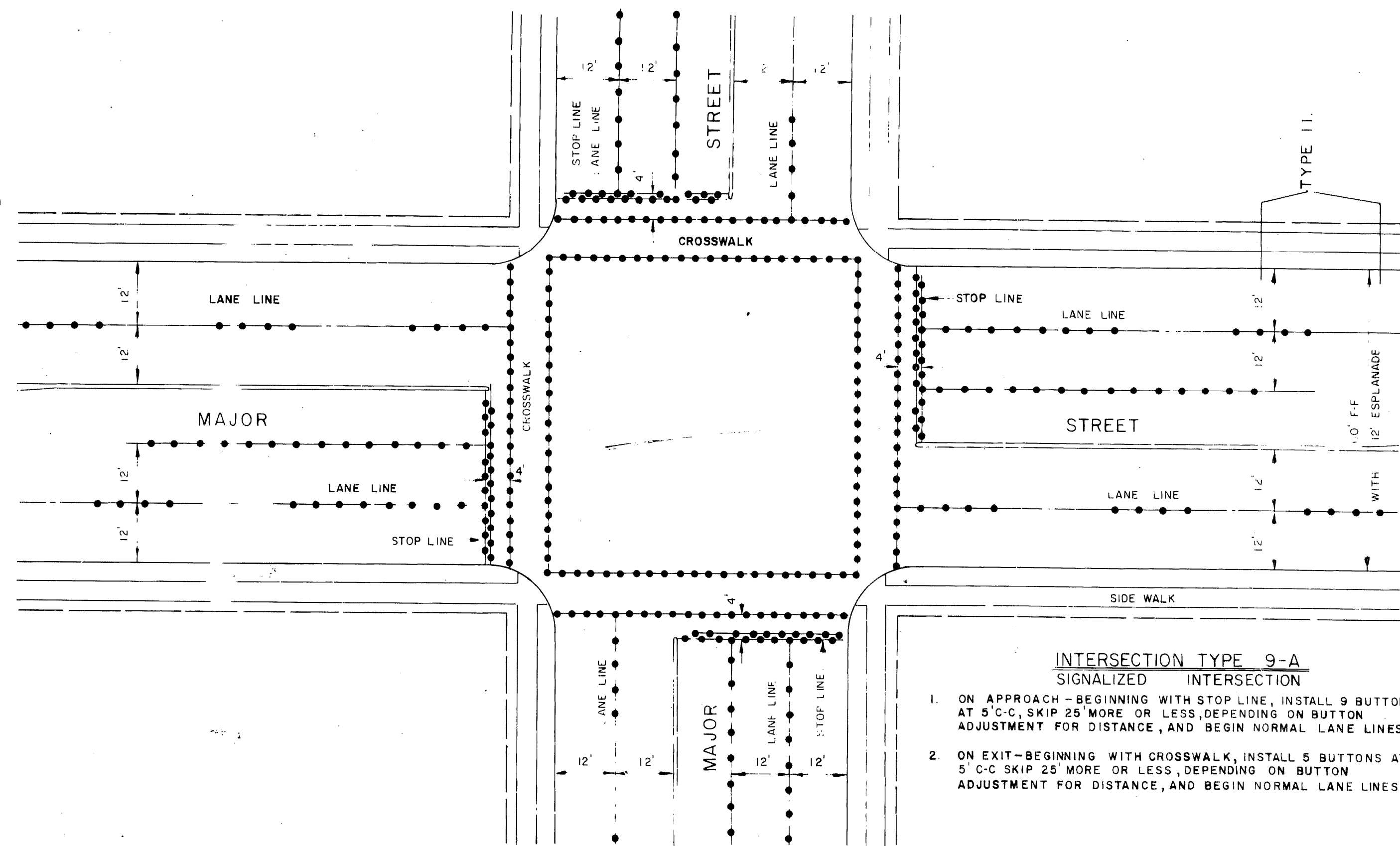
- DRIVEWAY SPECIFICATIONS**
1. Driveways shall be constructed with Portland Cement Concrete 6" thick from curb to Property line.
 2. If more than one driveway is constructed on the same property such driveways shall be separated by a minimum distance of at least 20 feet.
 3. Driveway turn-out radius shall be a minimum of 2 feet or a maximum of 5 feet from face of curb.
 4. Driveway profile shall meet existing pavement at grade of face of curb.

- SIDEWALK SPECIFICATIONS**
1. Sidewalks shall be constructed with Portland Cement Concrete 4 1/2" thick 4" minimum width.
 2. One half inch expansion joint at intervals of 36" (maximum) throughout entire length of sidewalk and where new walk meets old walk.
 3. One inch expansion joint where sidewalk meets curb, around fire hydrants and utility poles.

SUBDIVISION PAVEMENT STANDARDS

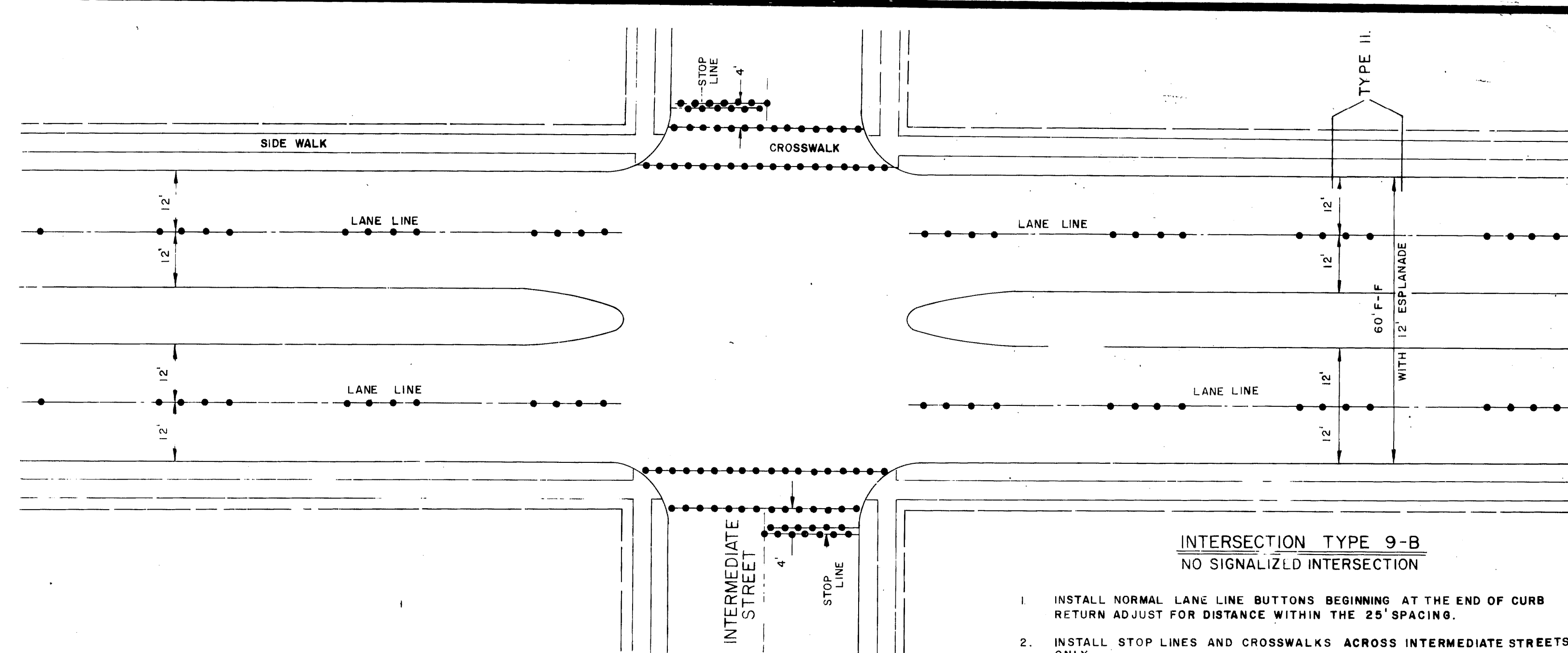
James E. Macklow
Approved by: Richard P. Doss
County Engineer

| | |
|--|-------------------|
| COUNTY OF HARRIS ENGINEERING DEPARTMENT | |
| Drawn by g. c. moreno | Date October 1969 |
| Checked by m. j. marek | |
| Revised | Drawing N° S/D-1 |



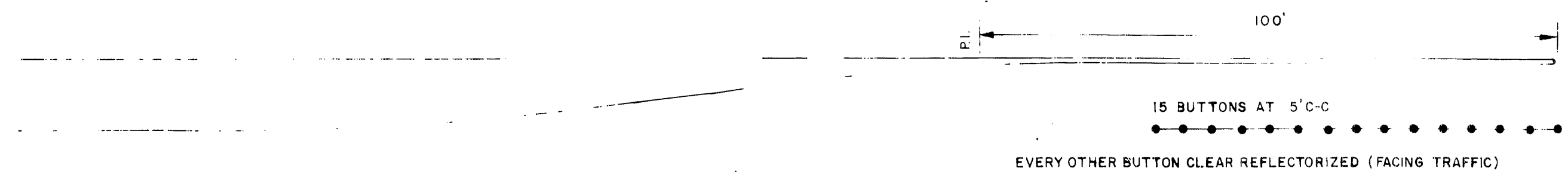
INTERSECTION TYPE 9-A
SIGNALIZED INTERSECTION

1. ON APPROACH - BEGINNING WITH STOP LINE, INSTALL 9 BUTTONS AT 5' C-C, SKIP 25' MORE OR LESS, DEPENDING ON BUTTON ADJUSTMENT FOR DISTANCE, AND BEGIN NORMAL LANE LINES
2. ON EXIT - BEGINNING WITH CROSSWALK, INSTALL 5 BUTTONS AT 5' C-C SKIP 25' MORE OR LESS, DEPENDING ON BUTTON ADJUSTMENT FOR DISTANCE, AND BEGIN NORMAL LANE LINES.

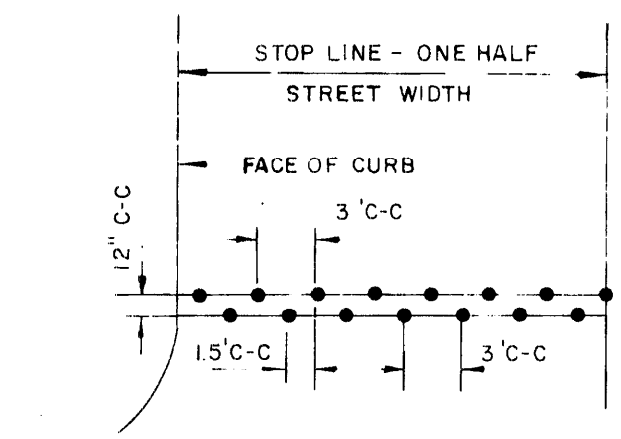


INTERSECTION TYPE 9-B
NO SIGNALIZED INTERSECTION

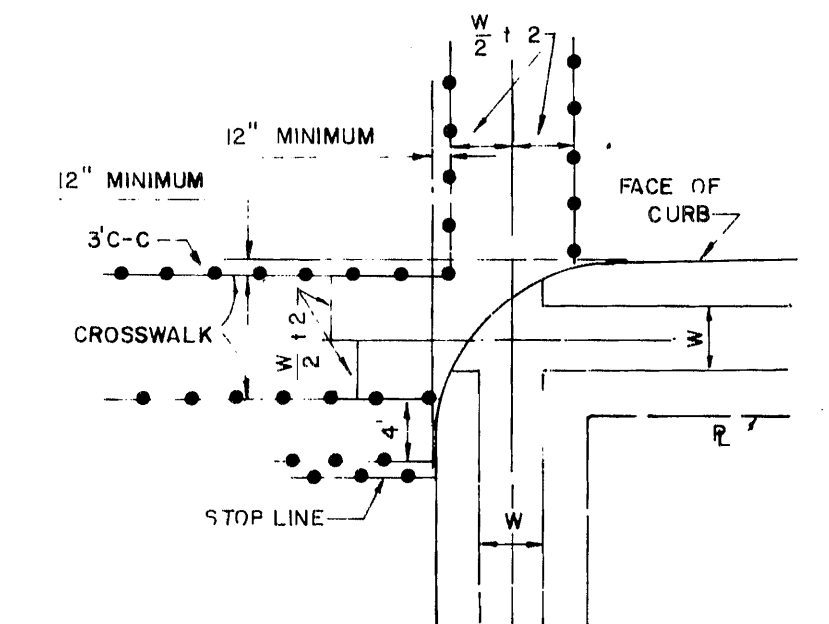
1. INSTALL NORMAL LANE LINE BUTTONS BEGINNING AT THE END OF CURB RETURN ADJUST FOR DISTANCE WITHIN THE 25' SPACING.
2. INSTALL STOP LINES AND CROSSWALKS ACROSS INTERMEDIATE STREETS ONLY.



TYPE 10-A - 100' LEFT TURN LANE



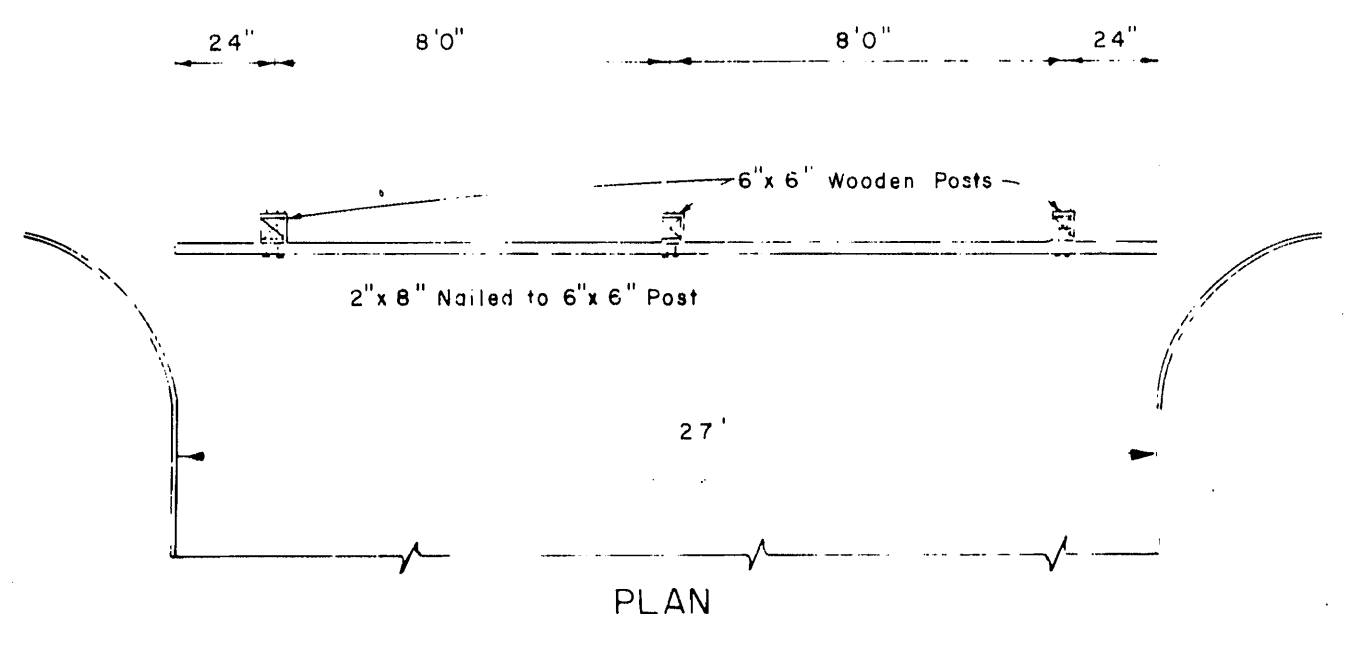
STOP LINE BUTTON DETAIL



CROSSWALK BUTTON DETAIL

GENERAL NOTES

1. MINIMUM CROSSWALK WIDTH 3' C-C
2. CROSSWALK BUTTONS AND STOP LINE BUTTONS TO BE STAGGERED AS SHOWN
3. FOR SKEW INTERSECTIONS AND STREET WIDTHS NOT SHOWN SEE DEPARTMENT.
4. ROADWAY WIDTHS OF 27' OR LESS SHALL HAVE NO BUTTONS.
5. ALL CENTER LINE BUTTONS SHALL BE YELLOW. ALL LANE LINE BUTTONS SHALL BE WHITE.

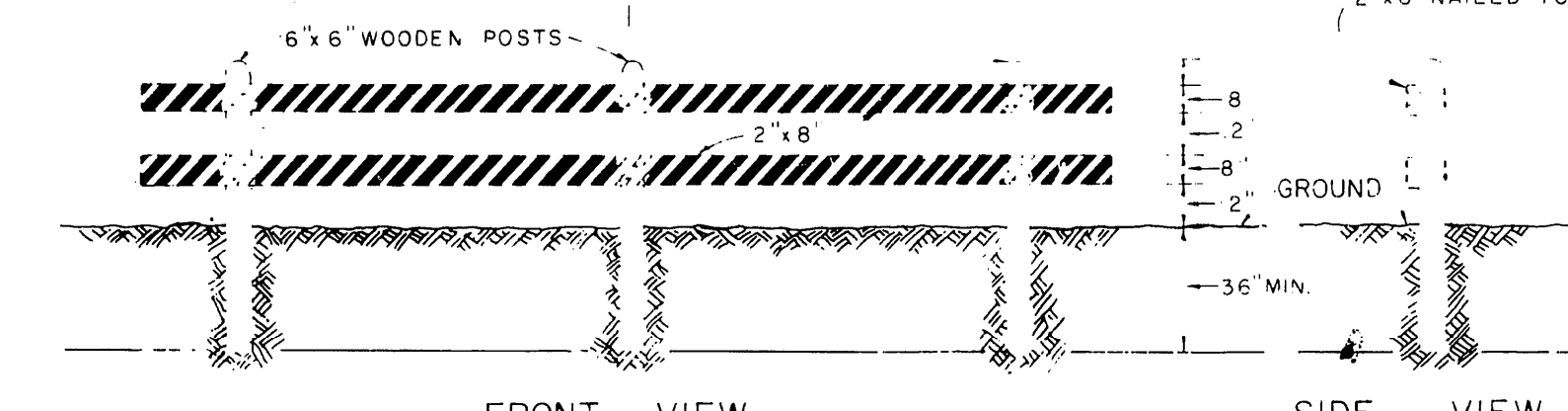


PLAN



BLACK & WHITE STRIPING

NOTE:
8 PENTA TREATED WOOD SHALL BE PAINTED AS FOLLOWS:
1 ONE COAT SPAR VARNISH
VEHICLE ALUMINUM PAINT
2 ONE COAT OUTSIDE WHITE PAINT
3 DIAGONAL STRIPED WITH BLACK PAINT

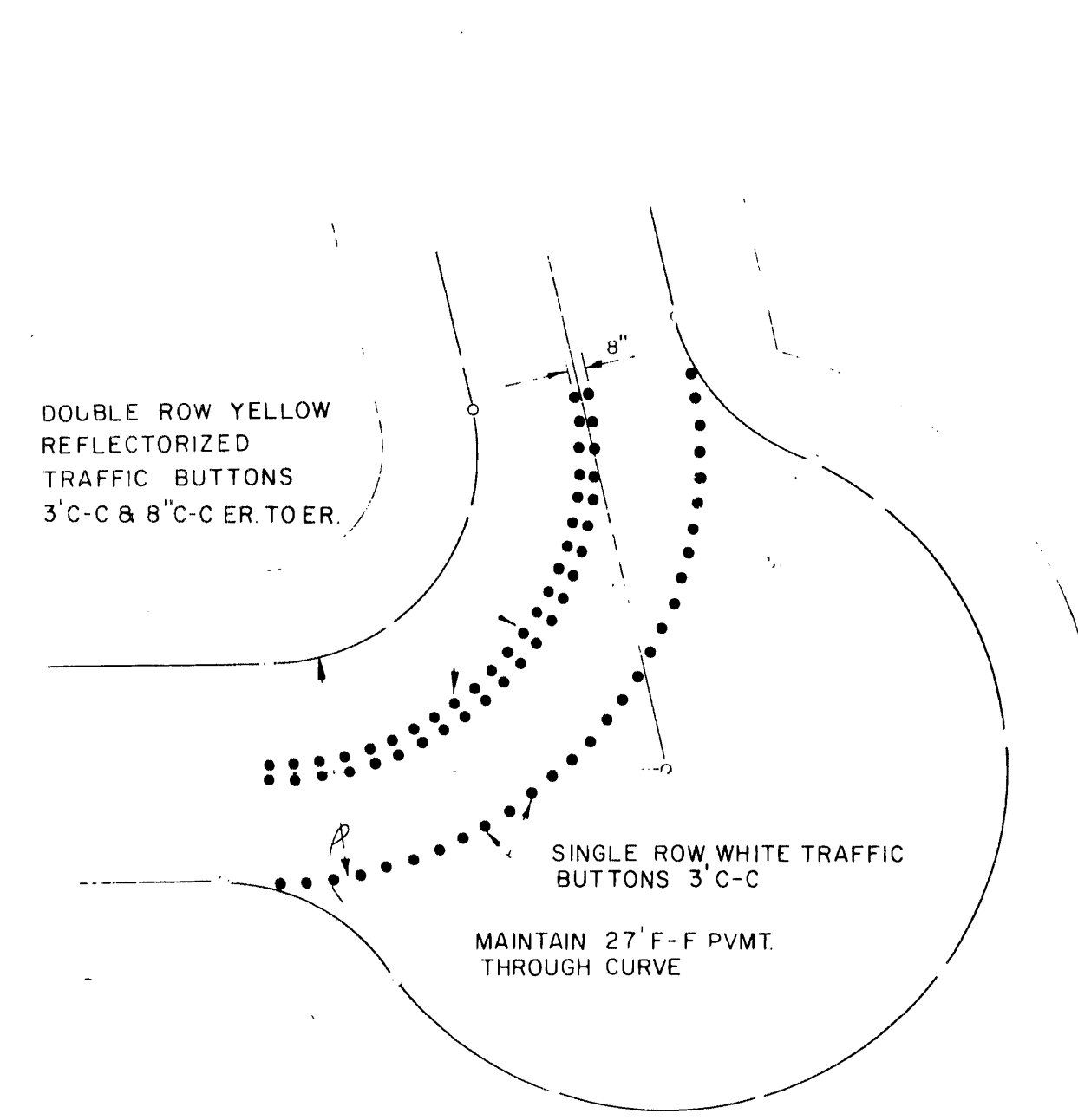
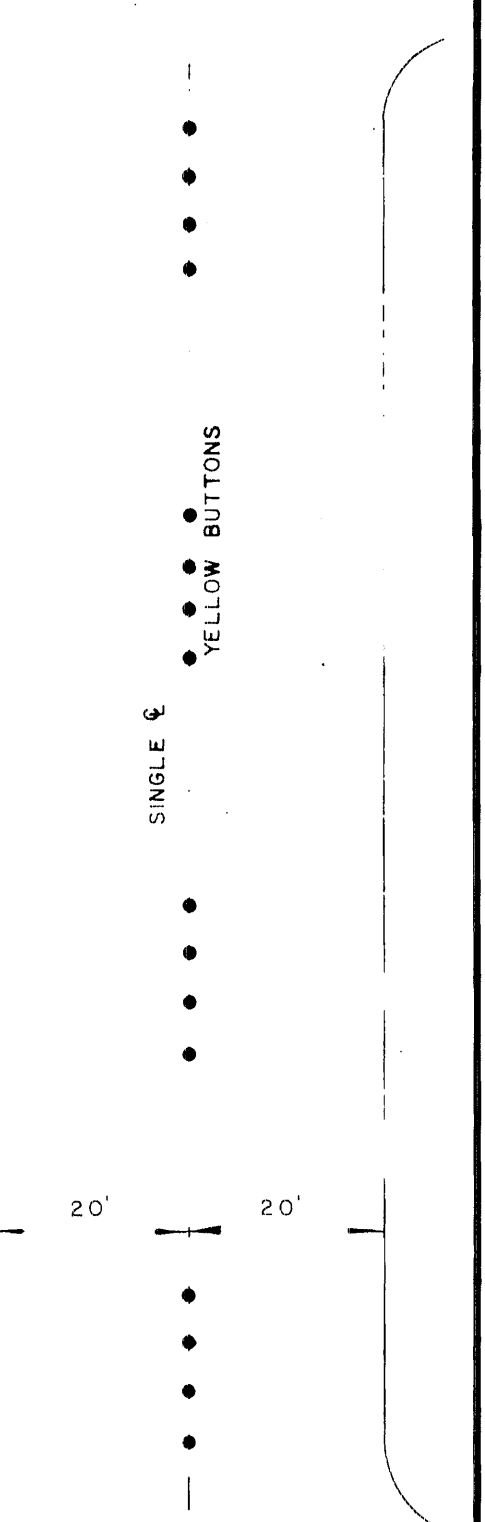


FRONT VIEW

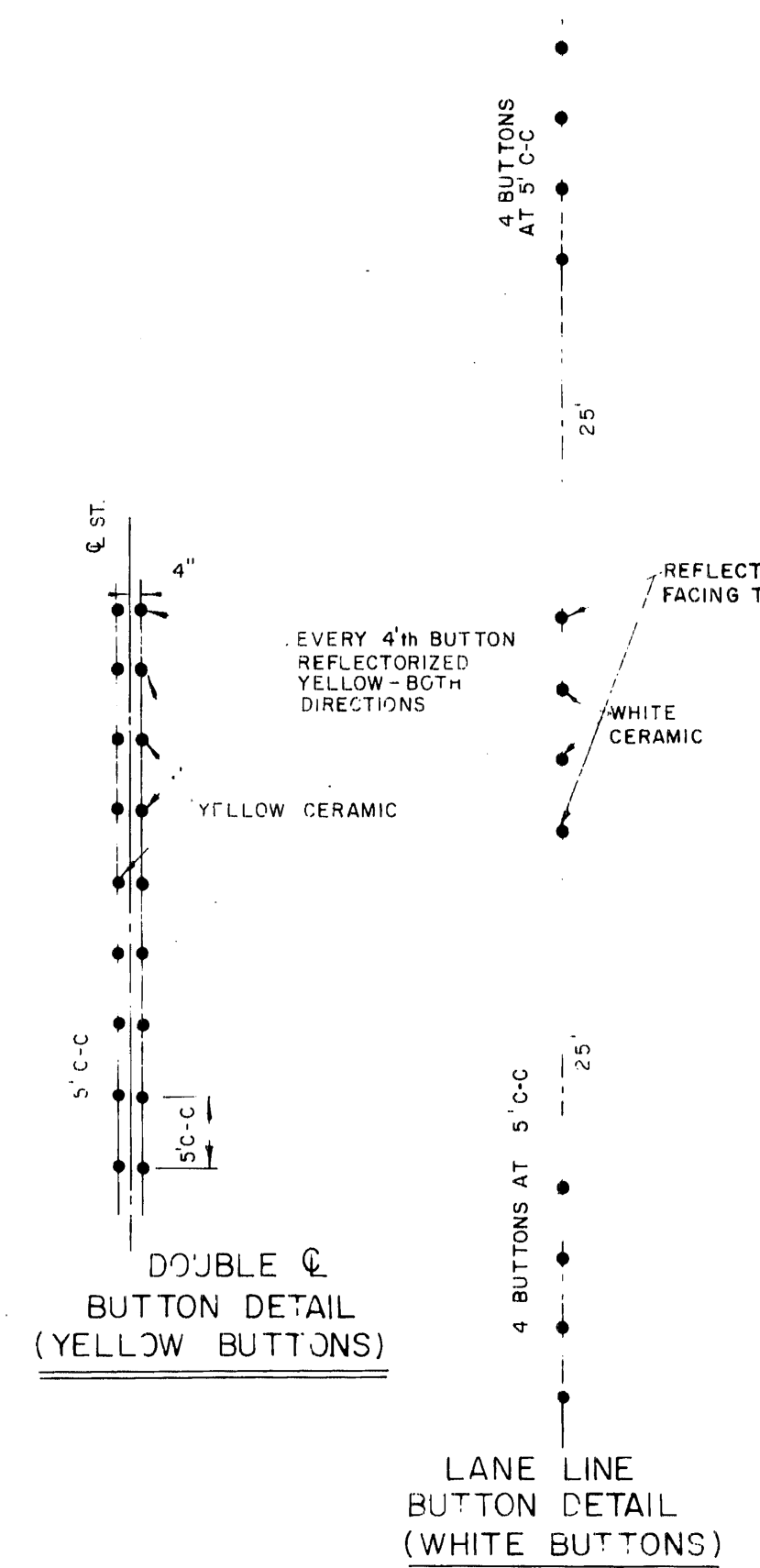
SIDE VIEW

BARRICADE

40' ROADWAY

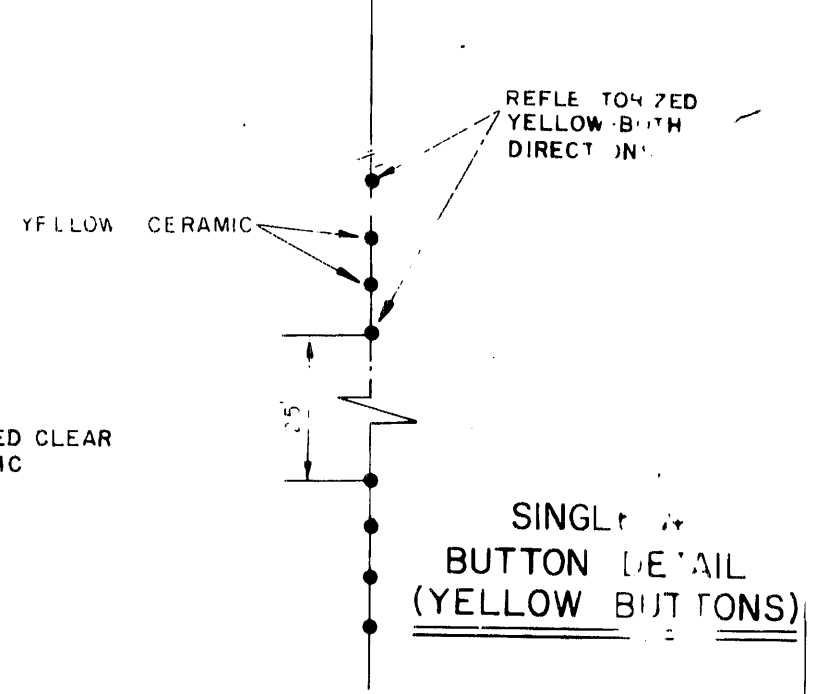


TYPICAL BUTTON DETAIL FOR CUL-DE-SAC



DOUBLE ROW BUTTON DETAIL (YELLOW BUTTONS)

LANE LINE BUTTON DETAIL (WHITE BUTTONS)



SINGLE ROW BUTTON DETAIL (YELLOW BUTTONS)

James E. Madeline

| Rev. | Date | Description | App. |
|------|------|-------------|------|
| | | | |

**CHAMPIONS CENTRE SECTION ONE
B WILLOW CENTRE SECTION ONE**

H. C. M.U.D. No. 191

BUTTONS DETAIL

| | | | |
|----------------------|------------------|-------|----|
| Design By: J. W. | Job No: 85003 | Sheet | 21 |
| Drawn By: J. T. | Scale: NONE | of | 21 |
| Checked By: J. E. M. | Date: SEPT. 1982 | | |

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Houston, Texas 77008